THE EFFECT OF SUPPLY CHAIN INTEGRATION PRACTICES ON SUPPLY CHAIN PERFORMANCE: THE CASE OF UNILEVER MANUFACTURING PLC ETHIOPIA

BY

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DECLARATION

I, the undersigned, hereby declare that this thesis, entitled "The Effect of Supply Chain Integration Practices on Supply Chain Performance: The Case of Unilever Manufacturing PLC Ethiopia," is my original work. The study was conducted under the guidance and support of my research advisor, Zelalem Bayisa (PHD). To the best of my knowledge, this work has not been submitted for the award of any degree or diploma at this or any other institution. All sources and references used in the preparation of this thesis have been duly acknowledged.

Declared by

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CERTIFICATION

This is to certify that Woinshet Getahun has carried out her research work on the topic entitled, The Effect of Supply Chain Integration Practices on Supply Chain Performance: The case of Unilever manufacturing plc Ethiopia, the work is original in nature and is suitable for submission for the award of the degree of master Arts in Logistics & Supply Chain Management

Advisor Name: Zelalem Bayisa (PhD)

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Date _____

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ACRONYMS AND ABBREVIATIONS

CI:	Customer Integration
EI:	External Integration
FMCG:	Fast-Moving Consumer Goods
II:	Internal Integration
KPI:	Key Performance Indicator
MI:	Measurement Integration
NT:	Network Theory
PLC:	Private Limited Company
RBV:	Resource-Based View
SCI:	Supply Chain Integration
SCM:	Supply Chain Management
SCOR:	Supply Chain Operations Reference
SCP:	Supply Chain Performance
SI:	Supply Integration
IT:	Information Integration
SPSS:	Statistical Package for Social Sciences
TCA:	Transaction Cost Analysis
ULET:	Unilever Ethiopia

ABSTRACT

Supply chain integration (SCI) practices are widely recognized as a strategic approach to improving organizational performance. This study investigates the impact of six key SCI dimensions internal, external, supplier, customer, information, and measurement integration on the supply chain performance of Unilever Manufacturing PLC in Ethiopia. The research was prompted by persistent challenges within the company's supply chain, including a lack of trust and coordination among stakeholders, extended lead times, limited visibility of real-time information, high inventory levels, and operational inefficiencies.

An explanatory research design was adopted to explore these relationships. Data was collected through a structured questionnaire distributed to 141 employees across various supply chain functions, including Planning, Logistics, Procurement, Manufacturing, Warehousing, Customer Service, and Distribution. A total of 120 valid responses were received, yielding a response rate of 85.11%. Responses were measured using a five-point Likert scale.

The study employed Pearson correlation analysis to assess the relationships between the SCI dimensions and supply chain performance, followed by multiple linear regression to determine the extent of their impact. The results revealed that the six SCI dimensions collectively explained approximately 59.7% of the variance in supply chain performance. Among these, external, supplier, customer, and measurement integration showed statistically significant positive effects ($p < 0.05$), while internal and information integration did not demonstrate a meaningful impact ($p > 0.05$). These findings suggest that Unilever's supply chain performance is strongly influenced by its external partnerships, supplier and customer relationships, and the effectiveness of its performance measurement systems. Conversely, the limited impact of internal and information integration highlights areas for improvement. The study concludes by recommending that the company enhances its internal coordination and information-sharing mechanisms to further optimize supply chain performance.

Keywords: Internal integration, External integration, Supplier integration, Customer integration, Information integration, Measurement integration, Supply Chain Performance

CHAPTER ONE

1. INTRODUCTION

This chapter outlines the study's background, the problem statement, research objectives, scope, and delimitations. It also highlights the significance and organization of the study.

1.1 Background of Study

Supply Chain Performance (SCP) is a cross-functional strategy that manages the flow of materials, services, and information from raw materials to end consumers (Kaleab, 2017). Achieving high SCP requires careful planning, implementation, and control of activities like procurement, production, and delivery (Roy & Roy, 2013). The ultimate aim of SCP is to create value and boost customer satisfaction and competitiveness by efficiently aligning suppliers, transporters, manufacturers, and retailers (Misra et al., 2010).

In today's competitive environment, firms partner with other companies because such alliances yield competitive benefits. Businesses now adopt supply chain integration (SCI), recognizing that internal processes must be aligned with suppliers and customers in their strategic planning. SCI enhances organizational performance by linking internal operations with external partners (Kumar and Lona, 2017). As a result, manufacturing companies worldwide have made integration a core operational practice. Strategically integrating supply chain activities has proven fundamental for improving efficiency, customer service, and market responsiveness (Chopra & Meindl, 2016).

Integrating supply chain operations is more than just a logistical improvement, it's a strategic move that can significantly boost productivity and reduce manufacturing expenses. By streamlining processes throughout a product's entire lifecycle, companies can achieve faster delivery times and make more efficient use of their resources (Masa'deh, Muheisen, Obeidat, & Mohammad, 2022). When different functions within the supply chain are well-coordinated, businesses often face fewer delays and benefit from lower costs related to inventory, transportation, and storage. This level of integration not only reduces waste but also helps companies offer more competitive prices in the market (Uyar, 2024).

Multiple studies indicate SCI imposes positive results on firm performance worldwide. Ahmed et al. (2020), Njagi & Muli (2020), and Ghariani & Boujelbene (2024) research findings indicate that internal procedures aligned with suppliers and customers lead to enhanced financial performance and competitive advantage. The main SCI practices include customer

and supplier relationship. For example, Yunus (2013) found that Indonesian firms' performance improved when they strengthened SCI practices. Likewise, Njagi and Muli (2020) observed that Kenyan manufacturers significantly improved performance through internal and customer integration. Leuschner (2013) also confirmed a positive relationship between SCI and firm performance. Kumar (2017) reports that UK manufacturers achieve higher productivity and lower costs by using SCI for efficient information exchange and strategic partnerships. SCI can be broken down into key elements. Alfalla-Luque et al. (2013) highlight information integration, resource coordination, and organizational linking as crucial SCI components

According to Njagi & Muli (2020) technology integration together with internal operations integration play an essential role in improving manufacturing performance. Research has confirmed that Supply Chain Integration (SCI) enhances quality performance in manufacturing companies through the essential elements which include knowledge sharing and technology adoption and production design optimization and resource integration (Dametew et al., 2016). Export performance shows an immediate improvement through internal integration although this improvement results from better supply chain performance which comes from customer integration (Abdallah et al., 2021).

Organizations pursue ongoing innovative approaches to preserve their operations because international business competition continues to rise. Researchers endorse a systemic method to supply chain integration which requires supply chain partners to create harmonious beneficial relationships (Lambert & Cooper, 2000) and develop common inter-organizational procedures (Zhao et al., 2011). Elmuti et al. (2008) recognize collaborative partnerships as essential components according to their findings. In summary, SCI is viewed as a vital strategy for improving performance and yielding valuable results in today's competitive manufacturing environment (Lambert & Cooper, 2000; Zhao et al., 2011; Elmuti et al., 2008).

1.2 Statement of the Problem

A company's performance is largely driven by how comprehensively it applies different supply chain integration dimensions. Firms that fully implement this integration practices in their strategic planning tend to achieve better outcomes. In contrast, companies that use limited integration approaches may face problems like poor responsiveness, reduced flexibility, greater uncertainty, higher inventory levels, and longer cycle and lead times. Effective SCI practices thus directly influence manufacturers' performance and competitiveness in the Ethiopian market (Damtew et al., 2021).

To achieve successful supply chain collaboration, it is important for every member to not only optimize their own individual performance, but to also optimize the performance of the entire supply chain. When partners share information, it is possible to coordinate efforts that improve delivery speed and reduce costs (Assefa, 2011).

In developing countries, supply chain operations face numerous challenges such as old technology, distrust, documentation issues, and even counterfeit goods (Msimangira and Tesha, 2014). Many companies still rely on outdated communication methods such as phones and faxes, damaging their competitiveness as well as their efficiency (Georgise et al., 2014). For example, companies often struggle to organize their relationships with suppliers due to a lack of capacity and resources (Khalifa et al., 2008).

Within Ethiopia's manufacturing industry, various businesses encounter numerous challenges while integrating within their supply chain when utilizing conventional communication methods and inflexible organizational structures (Georgise et al., 2014; Atnafu, 2018). In addition, Ethiopia's manufacturing industry is constrained by limited skilled labor, inadequate and antiquated infrastructure, and it is fragmented (Gebreslassie, 2020). Collectively, these issues indicate a need for market infrastructure improvements and enhanced integration through collaborative alliances (Georgise et al., 2014; Gebreslassie, 2020). It is additionally important to note that the vast majority of supply chain initiatives studies have generally been conducted in developed economies, which have markedly distinct supply chain conditions than found in the developing economy (Masa'deh et al., 2022).

Unilever Manufacturing PLC is one of the largest fast-moving consumer goods companies in Ethiopia, with plant in Dukem and head office in Addis Ababa, which manufactures many well-known products, such as Lifebuoy soap, OMO and Sunlight detergents, Knorr bouillons, Signal toothpaste, and Sunsilk hair-care products.

Based on pilot interviews with Unilever employees, the researcher identified several challenges that were affecting the company’s supply chain performance that are related to issues with integration such as demand volatility and uncertainty, low levels of trust among stakeholders, extended lead times, limited visibility of real-time information across the supply chain, high inventory levels, and operational inefficiencies as key problems.

Addressing these issues requires strengthening relationships both within the company and with external partners (intra- and inter-organizational relationships). Evidence shows that effective supply chain integration can significantly improve organizational outcomes, including competitive advantages (Ramesh et al., 2014).

Some research in Ethiopia has examined SCI in different contexts. For instance, Birhanu Akele (2020) studied its effects in humanitarian organizations, Meron (2022) in the food processing sector, and Kassahun Zergaw (2020) in logistics. Although existing literature has improved our understanding of SCI and performance, there is still a need for further research. Many studies emphasize farther examination of the relationship between various integration practices and firm performance across different industries.

To help Unilever Ethiopia improve its supply chain efficiency and overcome bottlenecks, this study investigated how SCI practices affect the supply chain performance of the company. By focusing on Unilever, the research aimed to provide practical insights for optimizing operations and closing performance gaps. It also contributes to the broader SCI knowledge by exploring these issues in the context of manufacturing industry in a developing market specifically in Ethiopia.

1.3 Research Questions

1. To what extent does internal integration practice affect Supply Chain Performance at Unilever Ethiopia?
2. To what extent does external integration practice affect Supply Chain Performance at Unilever Ethiopia?
3. To what extent does supplier integration practice affect Supply Chain Performance at Unilever Ethiopia?
4. To what extent does customer integration practice affect Supply Chain Performance at Unilever Ethiopia?
5. To what extent does information integration practice affect Supply Chain Performance at Unilever Ethiopia?
6. To what extent does measurement integration practice affect Supply Chain Performance at Unilever Ethiopia?

1.4 Research Objectives

1.4.1 General Objectives

The general objective of this study is to assess the effect of Supply Chain Integration (SCI) practices on supply performance at Unilever Manufacturing PLC Ethiopia.

1.4.2 Specific Objectives

1. To measure the effect of internal integration practices on supply chain performance at Unilever Ethiopia.
2. To measure the effect of external integration practices on Supply Chain Performance at Unilever Ethiopia.

3. To measure the effect of supplier integration practices on Supply Chain Performance at Unilever Ethiopia.
4. To measure the effect of customer integration practices on Supply Chain Performance at Unilever Ethiopia.
5. To measure the effect of information integration practices on Supply Chain Performance at Unilever Ethiopia
6. To measure the effect of measurement integration practices on Supply Chain Performance at Unilever Ethiopia.

1.5 Significance of Study

This study holds substantial significance for both academic and practical domains. Academically, it contributes empirical insights that enrich the existing literature on supply chain integration (SCI), particularly within the context of manufacturing industries in developing markets. It serves as a valuable reference for students, researchers, and scholars seeking to deepen their understanding of SCI practices and their impact on supply chain performance.

Practically, the findings offer actionable recommendations for the case company, Unilever Ethiopia, by identifying appropriate integration strategies to enhance supply chain efficiency and effectiveness areas that have previously hindered performance. Furthermore, the study provides relevant insights for other firms operating in similar sectors, as well as for policymakers.

1.6 Scope of the Study

This study is defined by two main scopes: the subject matter and the area of focus. The subject scope is limited to assessing how supply chain integration (SCI) practices affect supply chain performance within Unilever Manufacturing PLC.

The area scope is restricted to Unilever Manufacturing PLC only. This addressed employees from the planning, procurement, logistics, manufacturing, customer service, distribution, and warehouse departments only. This targeted approach is justified by the understanding that these departments constitute the main and major divisions of the supply chain. Also, employees within these units possess the expert knowledge crucial for providing insightful data directly related to this study. Therefore, the perspectives of other departments within the company or external supply chain partners are not included in this study. Geographically, the study covers the company's head office in Addis Ababa and its manufacturing facility located in Dukem.

1.7 Limitations of the Study

This study focuses on assessing the effect of supply chain integration practices on the supply chain performance of Unilever Ethiopia. However, due to limitations in time and resources, the research was limited to a single organization and a specific geographic area. These constraints prevented the researcher from expanding the study to include multiple companies or broader regions.

1.8 Definition of Terms

Supply Chain -is a network of organizations, resources, and processes involved in producing and delivering goods or services from suppliers to end consumers. It includes sourcing, manufacturing, and distribution activities.

Supply Chain Integration (SCI) - refers to the strategic collaboration and alignment of processes and information among supply chain partners, such as suppliers, manufacturers, and distributors, to improve efficiency and performance.

Supply chain Performance (SCP)- measures how well a supply chain achieves its goals.

Integration- is the process of coordinating and aligning different systems, functions, or activities to work together seamlessly, reducing inefficiencies and enhancing overall performance.

FMCG (**Fast-Moving Consumer Goods)-**are products that are sold quickly and at a relatively low cost. They include items like packaged foods, beverages, toiletries, and other consumables that people use frequently.

1.9 Organization of the Study

This thesis is organized into five chapters. Chapter One introduces the study by presenting the background, problem statement, research objectives and questions, as well as the significance, scope, limitations, and overall structure of the document. Chapter Two provides a comprehensive review of relevant literature, establishing the theoretical and empirical foundation for the study. Chapter Three outlines the research methodology, including the study area, research design, population and sampling techniques, data sources, data collection procedures, and considerations related to reliability, validity, and ethical standards. Chapter Four presents and analyzes the collected data in relation to the research objectives and questions. Finally, Chapter Five summarizes the key findings, draws conclusions, and offers recommendations for future research.

CHAPTER TWO

2 LITERATURE REVIEW

This chapter deals with theoretical literature review, empirical literature review and conceptual framework in detail.

2.1 Theoretical Literature Review

2.1.1 Supply Chain Management

The integrative method of Supply Chain Performance operates to supervise resources and data movements within supply chains from source materials through manufacturing stages until it reaches final consumers. The planning and implementation and control of supply chain tasks produces value while enhancing satisfaction for customers and securing effective competition (Kleab, 2017). SCM requires coordinated efforts between suppliers and manufacturers and distributors through three core operations such as procurement and production and delivery as identified in Stank et al. (2009).

SCM functions as a multifunctional system focusing on managing product movement from materials to market consumers (Khairi Kaleab, 2017). The operations solution entails strategic planning together with implementation and control activities encompassing procurement and production and delivery to create value and competitive infrastructure and enhance customer satisfaction (S. Roy & S. Roy, 2013). Supply Chain Performance requires coordination with suppliers together with intermediaries as well as third-party service providers and customers for achieving substantial benefits (Power, 2005).

2.1.2 Supply Chain Integration

Supply Chain Integration (SCI) is recognized as a strategic approach that enhances both operational efficiency and customer satisfaction by aligning key activities across the supply chain. It involves both internal processes and external partnerships, emphasizing coordinated information sharing and resource alignment to foster collaborative relationships across organizational boundaries (Alfalla-Luque et al., 2013). By adopting SCI, organizations can strengthen their competitive position in global markets. This is achieved through fostering collaboration among stakeholders, which reduces inefficiencies and enables cost-effective operations (Topolšek et al., 2009; Imam, 2023).

Productual success in supply chain partnership demands that companies establish effective communication between their separate departments (Topolšek et al., 2009). Empirical studies widely support the role of SCI as a key business strategy that contributes to gaining competitive advantage and improving the operational effectiveness of supply chains (Odkhishig Ganbold,

2017). The fundamental reasons behind integration stem from the information revolution alongside increasing global competition together with new inter-organizational relationship development (Power, 2005).

SCI permits organizations to distribute information resources and knowledge which directs product flow across every stage of the supply chain. The integration model includes three elements which are supplier integration and internal integration and customer integration (Yandra Rahadian Perdana, 2019). Standardization of company procedures through integration boosts teamwork and organizational choices to minimize production errors along with waste costs (Imam, 2023). Customer Relationship Management together with Supplier Relationship Management constitute essential strategic processes for logistics and Supply Chain Performance (Azmi et al., 2017).

Supply chain integration (SCI) stands as an essential factor for improving performance and enhancing business competitiveness according to Childerhouse & Towill (2011) and Chen et al. (2009). Research shows that performance improvement in supply chains tightens directly with increased integration, but many operational supply chains lack effective implementation (Childerhouse & Towill, 2011). According to Childerhouse & Towill (2011) the standard path of supply chain integration moves from internal effectiveness to upstream streamlining before finishing with downstream integration.

Supply chain integration enables organizations to use market differences for innovation and better handle economic environment uncertainties (Stank et al., 2009). Integration process monitoring needs to remain continuous to optimize supply chain performance measurements (Imam, 2023). Multiple relevant factors and characteristics of Supply Chain Integration appear in available research material to improve total Supply Chain outcome performance. Organizational effectiveness resulting from integration generates better responsive operations with cost reductions and higher client contentment (Power, 2005). The essential parameters of Supply Chain Integration consist of internal integration alongside supplier integration and customer integration together with information integration as well as external integration and measurement integration (Kumar et al., 2017).

2.1.2.1 Key Dimensions of Supply Chain Integration practice

The theoretical literature on supply chain integration identifies several key dimensions that collectively contribute to the overall effectiveness and performance of the supply chain. These dimensions can be broadly categorized as follows:

2.1.2.1.1 Internal Integration

Internal integration is foundational to broader supply chain integration efforts, as it ensures that different departments within an organization operate in a synchronized and cooperative manner. This strategic alignment supports improved performance by enabling departments to pursue common goals effectively (Kumar et al., 2017). Single organizations must integrate their processes and functions, so departments work together to achieve shared goals because this ensures operational efficiency.

The combination of internal department relations at the company level creates enhanced supply chain performance through SCP (Cheng et al., 2016). The organization establishes a knowledge-sharing framework that allows departments to exchange expertise toward developing new information and gaining sustainable competitive advantages (Li et al., 2022). The main purpose of internal integration is to merge departments, so they share information while solving problems together (Khanuja & Jain, 2021).

2.1.2.1.2 External Integration

External integration, which involves collaboration with key supply chain partners such as suppliers and customers, is critical for enhancing organizational performance and achieving competitive advantage (Sanders & Premus, 2005). High levels of supplier and customer integration have been linked to improved financial performance, innovation, and operational efficiency (Sanders & Premus, 2005).

While internal integration stresses intra-organizational processes, external integration concentrates on relationships with important suppliers and customers (Braunscheidel et al., 2010). The relationship between supply chain integration and firm performance has been the subject of conflicting research; some studies indicate a direct relationship, while others suggest mediation through intermediate outcomes (Nikhat Afshan & Ranga Reddy, 2013). By facilitating faster customer preference identification and improved information sharing, external integration greatly improves supply chain performance (Tavana et al., 2019).

2.1.2.1.3 Supplier Integration

Supplier integration refers to the strategic collaboration and exchange of information between a company and its key suppliers. This integration aligns supplier activities with organizational goals, enabling improved responsiveness and operational efficiency (Nguyen, 2022). Integration generates multiple advantages so that manufacturers can achieve cost efficiencies and heightened customer satisfaction and faster delivery times (Kumar et al., 2017).

Supplier integration represents the level of cooperative strategic management and academic sharing which suppliers conduct with their clients to achieve mutual objectives (Madzimure

2020; Vanpoucke et al. 2014; Zhang et al. 2020). When suppliers operate extensively with companies the resultant cost reduction and shorter lead times create competitive benefits (Ramos et al., 2021). The alignment of firms and their suppliers both stabilizes processes and increases operational speed. Product quality issues together with raw material shortages can be identified early through supplier integration which allows firms to improve their disruption response through planning and execution coordination (Nguyen, 2022). Visibility in supply chains improves with supplier integration according to Li et al. (2022) which leads to better market response.

2.1.2.1.4 Customer Integration

Customer integration focuses on aligning a firm's operations with customer expectations by fostering close coordination and communication. This approach enhances the organization's ability to meet market demands effectively and boosts customer satisfaction (Li et al., 2022; Fianko et al., 2022). Successful customer integration helps businesses develop market-responsive operations which results in improved satisfaction among their clients (Basnet, 2011). Investigatory literature supports customer integration as a performance-enhancing practice because it delivers better supply chain alignment to client needs which leads to enhanced operational productivity and less business expenses. By improving predictions of customer demand and inventory control the system supports better financial results while reducing expenses and raising company revenues.

Organizations implement strategic abilities and operational activities that establish strong bonds with customers to provide maximum service benefits through customer integration (Kumar et al., 2017). Such methodology proves vital for companies because it creates better communication systems and makes decisions while standardizing procedures to minimize mistakes and waste (Imam, 2023).

2.1.2.1.5 Information Integration

Information integration involves the seamless exchange of timely and accurate data among supply chain partners, often enabled through advanced IT systems. This transparency supports collaborative decision-making and increases overall supply chain visibility and responsiveness (Kumar et al., 2017). Data exchange operations between supply chain partners generate simultaneous information sharing that enhances decision making and coordination capabilities for end-to-end visibility across supply networks. The high degree of partner visibility provides them with the flexibility to react swiftly against demand or supply condition changes (Szymczak et al., 2018).

Supply chain performance requires information integration for the successful management of data exchange. Data traits together with Information and Communication Technology utilization and collaborative information reach and specific measurement guidelines determine the success of supply chain interconnectivity (Szymczak et al., 2018). The sharing of effective information decreases uncertainties in dynamic environments by enabling companies to reorganize their resources (Foerstl et al., 2020). Inside organizations the integration of information and material flows produces enhanced Supply Chain Performance that links internal business functions and supplier relationships while decreasing operational expenses and building superior customer benefits and operational results (Kumar et al., 2017).

2.1.2.1.6 Measurement Integration

Integrating measurement across the supply chain means getting everyone on the same page when it comes to tracking performance. By using the same indicators and evaluation methods, all partners can measure success in a consistent way. This not only makes it easier to hold each other accountable but also helps everyone keep improving over time (Kumar et al., 2017).

Such integration between partners becomes essential to build supply chain collaboration through one standardized success evaluation framework. The process of measurement integration ensures both partners understand each other and builds trust essential for retaining strong connections between supply chain parties leading to joint beneficial results.

2.1.2.1.7 Supply Chain Performance

Supply chain performance is defined by the ability of an organization's supply network to meet customer needs efficiently. This involves maintaining optimal inventory levels, ensuring timely delivery, and achieving consistent product availability (Balfaqih et al., 2016). In manufacturing contexts, performance across the supply chain is commonly evaluated based on how effectively customer and end-user expectations are fulfilled. Systematic assessment of these outcomes enables firms to identify improvement areas and drive performance enhancement (Gunasekaran et al., 2004).

Measuring supply chain performance plays a vital role in effective management and ongoing development, particularly within today's highly competitive business landscape (Balfaqih et al., 2016). Various frameworks and systems have been developed over the past two decades to address this need (Balfaqih et al., 2016). Effective SCP measurement systems play a vital role in setting objectives, evaluating performance, and determining future actions for organizational success (Sharma, 2016).

Gunasekaran et al. (2004) suggest that performance evaluation should match the different stages of the supply chain like planning, sourcing, production, and distribution. To make smart decisions and track results effectively, it's important to use the right metrics at every level: strategic, tactical, and operational. Strategic metrics help top executives by focusing on big-picture goals like competitiveness, financial health, and overall performance. Tactical metrics, on the other hand, are more about helping middle managers meet those high-level goals by guiding how resources are used and ensuring targets are met.

Research by Gligor et al. (2020) and Feizabadi et al. (2019) shows that companies using the Triple-A supply chain model built around agility, adaptability, and alignment often see better results. These include quicker delivery times, stronger customer service, and improved financial performance. The idea behind this framework is that supply chains work best when these three capabilities are developed together. However, studies also suggest that the right mix of these elements can vary depending on a company's strategy (Gligor et al., 2020).

The Triple-A concept was first introduced by Lee (2004), who highlighted agility, adaptability, and alignment as essential for boosting supply chain performance. Since then, it's been recognized as a key approach for gaining a competitive edge especially when it comes to cost efficiency, quality, delivery speed, and flexibility (Alfalla-Luque et al., 2018; Whitten et al., 2012).

1. Agility

Agility is all about how quickly a supply chain can react to unexpected disruptions or sudden changes in the market. It's the ability to stay flexible and keep things running smoothly, even when plans shift (Lee, 2004). In simple terms, it means a company can quickly tweak its supply chain strategies and operations to respond to new challenges or opportunities (Gligor et al., 2013).

2. Adaptability

Adaptability is more about the long game. It refers to a company's ability to reshape its operations over time in response to bigger shifts like changes in regulations, customer preferences, or market trends (Lee, 2004). It's about being prepared for long-term changes and having the capacity to evolve when the business environment demands it (Stevenson & Spring, 2007; Christopher & Holweg, 2017; Sethi & Sethi, 1990).

3. Alignment

Alignment means making sure everyone involved both inside the company and across external partners is working toward the same goals. When teams and partners are aligned, the supply chain runs more smoothly and efficiently (Lee, 2004). It's about creating strong collaboration and shared direction across the entire network (Matthyssens & Vandenbempt, 2008).

2.1.3 Theoretical Framework

Supply Chain Integration (SCI) is complex in nature as it compels firms to change their operational architecture in the quest of a competitive edge (Chen et al., 2009). Different scholars have attempted to define and integrate SCI with relative emerging frameworks which focus on different aspects of integration and its implications on performance. According to Chen et al. (2009), a theoretical model was proposed based on four theories that underscore the importance of strategic focus on integration to achieve better outcomes, inter one, strategic focus alignment theory. Stonebraker and Liao (2006) explored SCI using vertical integration theory, one of the much advocated integration approaches, and argued that its effectiveness is contingent on product lifecycle stage as well as environment dynamics. Zhang et al. (2015) advanced an all-embracing model of SCI incorporating strategic, managerial, operational, and foundational elements. Their model stresses the integration of processes and resources which is essential to advance strategic planning and improve overall performance. These studies enhance understanding of SCI and its application and implementation across contexts.

Supply chain integration (SCI) is described as a nuanced concept that is composed of information sharing, process coordination, and collaboration (Cao & Zhang, 2011; Flynn et al., 2010). Researchers have used theories, like the resource-based view (RBV) and transaction cost economics (TCE), as a framework for understanding the impact of SCI on performance (Prajogo & Olhager, 2012; Khanuja & Jain, 2019).

This study builds its theoretical foundation by drawing from four key perspectives: Transaction Cost Analysis (TCA), the Resource-Based View (RBV), Network Theory (NT), and Stakeholder Theory. Together, these frameworks help explain how Supply Chain Integration (SCI) influences performance from different but complementary angles. TCA helps us understand how better coordination between firms can reduce costs. RBV focuses on how combining resources across the supply chain can create unique strengths that give companies a competitive edge. Network Theory looks at how integration improves collaboration and responsiveness across the supply chain network. Meanwhile, Stakeholder Theory reminds us that long-term success depends on balancing the needs and expectations of all involved parties.

By combining these viewpoints, the study offers a well-rounded approach to understanding how SCI contributes to stronger supply chain performance.

2.1.3.1 Transaction Cost Analysis (TCA)

Transaction Cost Analysis (TCA) measures the efficiency of various modes of governance by calculating the costs involved with a process of economic exchanges. In terms of SCI, transaction cost analysis is simply an explanation of a firm's decisions to internalize or externalize processes to reduce uncertainty and enhance capacity to cooperate (Williamson, 1981). Kissell (2008) describes a transaction cost analysis framework from a financial transaction cost perspective but emphasizes the disaggregation of cost vs. performance and developing methods to quantify performance in transactions. Kissell (2008) argues that the use of a financial transaction cost analysis framework is very important for minimizing transaction costs in pursuit of best execution (Gomes & Waelbroeck, 2005).

Transaction cost analysis is relevant to supply chain integration by employing the rationale that it is important to integrate processes where firms would spend time and effort reducing the transaction costs involved in managing their suppliers and customers. Firms that adopt integration practices will, in turn, lower their costs and increase performance through the efficiency of their operations and communication

2.1.3.2 Resource-Based View (RBV)

The Resource-Based View (RBV) theory stipulates that a sustainable competitive advantage lies entirely in the exploitation of a firm's unique resources and capabilities. With respect to supply chain integration, if firms can integrate valuable, rare, and non-substitutable resources (e.g. technology, capability, or collaborative relationships with competitors), they have a better chance of improving supply chain performance (Barney, 1991; Wernerfelt, 1984) .

From the Resource-Based View (RBV) perspective, a firm has a competitive advantage if it can obtain valuable, rare, and inimitable resources. The RBV theory works together with SCI because it accepts the notion that a firm's resources across the supply chain can create value to customers if they are integrated resources, rather than simply possessing resources independently. Firms are more capable of deploying their resources to ensure they realize their efforts for value-creation when they can develop productive partnerships with their suppliers and customers.

2.1.3.3 Network Theory (NT)

NT provides an all-encompassing view regarding inter-organizational relationships in a network context focusing on the partner relations and how they affect organizational functioning (Halldórsson et al., 2007). Network Theory seeks to understand the relationships that exist among firms in a supply chain and analyzes their interdependences. It points out that cooperation, trust, as well as communication in networks have an impact on performance, innovation, and many other desirable outcomes (Granovetter, 1973; Halldórsson et al., 2007). Network Theory (NT), a branch of applied mathematics using graphical representations to study complex systems (Estrada & Knight, 2015), is used in different fields such as public health (Chami et al., 2013) and organizational studies (Onday, 2013). In organizations, NT measures social capital, analyzes institutional impact, and evaluates resource dependency graphs. Applying motives such as self-interest, social exchange, and system social embeddedness, NT enriches our understanding of the evolution of networks and their structures (Onday, 2013).

As far as Supply chain Integration (SCI) is concerned, NT relatives emphasize the degree of coordination and information exchange between supply chain partners and expounds on the level of network incorporation and responsiveness, innovativeness, and performance (Fayezl & Zomorrodi, 2016).

2.1.3.4 Stakeholder Theory

According to Stakeholder Theory, to be successful, organization needs to pay attention to the interest of all stakeholders and not just focus shareholders to succeed. As applied to SCI, this theory stresses the need to work with suppliers, customers, employees, and other members of the community to develop responsive and comprehensive supply chain systems. Stakeholder backing acts as a moderator in the relationship between supply chain integration and organizational resources and capabilities, articulating the role of both primary and secondary stakeholders in constructing competitive capabilities. Stakeholder theory is recommended in Lavassani & Movahedi (2010) to fulfill complementary requirements to other operational concepts dealing with supply chains. Opening the boundaries of SCM with stakeholder theory allows definers to see and understand the dynamism of supply chains more fully.

The stakeholder theory asserts that the success of a firm is reliant on how well it manages the needs of its stakeholders, not just its shareholders. When looking at supply chain integration, it becomes important to address the demands of all participants such as suppliers, customers, employees, the community, and the environment.

2.2 Empirical Literature Review

2.2.1 Supply Chain Integration

Empirical studies constantly highlight the positive effects of SCI practices. For example, how strong integration within China's agriculture sector helped firms become more adaptable to changes in the market (Syed, M.W., 2019). Smooth internal integration which merges internal processes, takes cross-departmental coordination to a new level as it greatly boosts functional operational responsiveness and efficiency. In the context of Jordan's food and beverage industry, effective collaboration across departments led to considerable rewards in performance (Masa'deh et al., 2022).

Huo (2012) highlights the importance of internal integration in cost reduction and customer satisfaction by optimizing resource utilization, removing functional boundaries, and promoting collective efforts toward resolving issues. Khanuja and Jain (2021) state that interdepartmental collaboration advances innovation and encourages knowledge transfer that is crucial for supply chain agility. On the other hand, external integration deals with cooperation with suppliers and customers. Flynn et al. (2010) note that fostering trust and aligning goals among supply chain partners has a positive effect on operational and financial performance.

Wong et al. (2021) found that working closely with customers accelerates product innovation through better information sharing. Earlier research by Stank et al. (2001) also emphasizes that both internal and external collaboration positively affect logistics service performance. A recent study conducted in the UK, focusing on the food sector, identified four key dimensions of SCI: internal integration, supplier integration, customer integration, and information integration. The study identified that all four constructs had a positive impact on supply chain performance, with information integration holding particular gravitas (Kumar et al., 2023).

However, the authors also acknowledged that there is a greater need for research to enhance our understanding of how strong integration might impact long-term relationships with customers and suppliers. Overall, the empirical evidence indicates that, while many SCI practices appear to improve performance, more must be carried out to understand the multi-faceted relationships between integration practices, performance metrics and outcomes, especially within developing economies (Sundram, Chandran, & Bhatti, 2016).

Customer integration, in relation to improving service, has a strong emphasis on understanding and servicing customer needs. While enhancing overall supply chain performance and decision making are considered crucially reliant on information integration, defined as commonly sharing key information that can be shared among supply chain partners through IT systems. Overall, the data confirms that all four constructs have a positive effect on supply chain

performance, where information integration, serves as an important driver.Yet, the authors note a gap in understanding, and highlighted that more research must be conducted to understand the role of information sharing, as well as the impacts of strong integration on relationships with customers and suppliers in the future (Kumar, Chibuzo, Garza-Reyes, Kumari, Rocha-Lona, & Lopez-Torres, 2023).

Sundram, Chandran, and Bhatti (2016) contend that there is a lack of empirical evidence on the complexity and inter-relationship between Supply Chain Performance practices, supply chain integration (SCI) and supply chain performance (SCP) within developing countries such as Malaysia. The need for additional empirical research and an overarching model that identifies the ability for SCI to mediate the relationship between SCMPs and SCP, is highlighted. Supplier strategic partnerships, customer relationship management, information sharing, information quality, postponement strategies, shared vision and goals, and risk and reward sharing. Some of the key supply chain management practices that have been identified include sharing high-quality information, using postponement strategies, having a shared vision and common goals, and fairly distributing both risks and rewards.

The study finds that SCI serves as a partial mediator for supplier strategic partnerships, customer relationship management, and information sharing, while fully mediating the relationships with SCP and information quality, agreed vision and goals, and postponement strategies. Sharing of risks and rewards was determined to be not significant. The pivotal role of SCI in the enhancement of SCP, as highlighted in the study, calls for further research on the impact of information systems and integrated topology on supply chain quality performance (Sundram, Chandran, & Bhatti, 2016).

The effect of supply chain integration (SCI) on quality performance in the manufacturing industries of Ethiopia is covered by Dametew, Ebinger, and Abebe (2016). This research analyzes four components of SCI: knowledge integration, technology integration, production and design integration, and resource integration. The analysis shows that the determinant of high-quality performance is knowledge integration. Production and design integration provide assurance of quality and innovation while technology integration enhances efficiency and quality. Resource integration also improves performance through efficient resource management. All dimensions were found to positively influence quality performance, which subsequently boosts customer satisfaction in the region. It increases operational efficiency, reduces expenses, and boosts customer happiness. Further research into the effects of additional elements, such as integrated topology and information systems, on supply chain quality performance is advised by the study.

Georgise, Thoben, and Seifert (2014) identify the primary challenges and assess the level of supply chain integration (SCI) in Ethiopian manufacturing firms. The study highlights the importance of SCI for competitiveness, particularly in emerging countries where companies are dispersed, and relevant information is scarce. Internal integration, supplier integration, customer integration, and information integration are the four aspects of SCI that are the subject of this study. According to the findings, Ethiopian businesses largely employ conventional communication techniques and have adopted few contemporary ICT tools. Unpredictable raw material quality, delayed deliveries, price swings, and budgetary limitations are among the difficulties. Customers' and suppliers' relationships are frequently ad hoc and devoid of official integration processes.

To promote greater integration within businesses as well as with their suppliers and customers, the study highlights the necessity of enhanced ICT infrastructure. Furthermore, the significance of external integration with suppliers and customers is not well understood. The study recommends that future investigations look into the role of information and communication technology in improving integration as well as successful SCI practices in developing nations (Georgise, Thoben, & Seifert, 2014).

Although numerous studies have explored the topic, there remains a lack of empirical evidence supporting the link between supply chain performance and supply chain integration (SCI), particularly in developing markets. This study aims to address this gap by examining the relationship between SCI practice and supply chain performance across six key dimensions: internal integration, external integration, supplier integration, customer integration, information integration, and measurement integration.

2.2.2 Supply Chain Integration on Supply Chain Performance

Many empirical studies have documented the effect of SCI on performance. Higher degrees of integration are linked to better efficiency and responsiveness. For instance, Li et al. (2022) highlight technological integration, such as Industry 4.0 technologies, as major drivers of performance improvements. Wamba et al. Wamba et al. (2020) show that closer supplier integration through cooperative planning and real-time data sharing enhances operational efficiency. Likewise, Fianko et al. (2022) find that customer integration further aligns supply chain operations with market demand, improving forecasting and inventory management. As global competition grows, firms increasingly form alliances.

In order to obtain a competitive edge, businesses are now looking to form alliances with other businesses rather than just developing and implementing strategies due to the growing global

competition among them. Manufacturing companies have concentrated on creating plans to bring about major changes and enhance operational performance over the years. However, businesses have come to understand that the best way to gain a competitive edge is to develop strategies while also integrating internal operations, suppliers, and customers into a single, harmonious business relationship (Abdulhakim Haji, 2018).

A meta-analysis by Leuschner, Rogers, and Charvet (2010) confirms a strong positive correlation between SCI and firm performance. They observe that, while internal process integration has a modest effect, relational and informational integration greatly impact key performance indicators. Most studies show that SCI especially improves customer-focused and operational outcomes, with its effect on financial performance often being indirect (Leuschner et al., 2010).

Khanuja and Jain (2018) also emphasize SCI's role in enhancing performance. They found that integration positively affects many performance metrics—operational and financial performance, product quality, flexibility, delivery speed, and innovation capacity. Multiple meta-analyses consistently demonstrate the benefits of SCI (Leuschner et al., 2013; Li et al., 2022), though factors like organizational characteristics and environment can influence the strength of the integration performance link (Tarifa-Fernández & Burgos-Jiménez, 2017). Overall, companies that adopt integrated supply chain practices tend to have better visibility into their operations, reduce costs, and run more efficiently. These advantages make it easier for them to adapt quickly to market shifts and stay ahead of the competition (Li et al., 2022).

However, the extent of the relationship indicated by both reviews is influenced by moderating factors which produced inconsistent impacts per each study (Tarifa-Fernández & Burgos-Jiménez, 2017).

The SCI-performance relationship has been described by several theories and conceptual models, with ten constructs noted in recent literature. Most of the studies indicates a strong relationship between various dimensions of SCI and supply chain performance, such as enhanced visibility, cost reductions, and enhanced operational effectiveness (Li et al., 2022). Research has also shown that organizations that use integrated supply chain practices are able to respond rapidly to environmental conditions and changes, creating an opportunity to gain competitive advantage, reinforcing that SCI is valued for enhancing Suppl chain performance.

Supply Chain Integration (SCI) is reported by Haq and Aslam (2022), to improve performance by reducing costs and lead times while increasing product availability and visibility. They stated that internal integration leads to greater information interchange and having the ability

to solve problems collaboratively across departments which leads to improved performance. The authors describe, supplier integration practices leads to early insights of market behavior (opportunities) that can be leveraged. Thus, if organizations engage in integrated supply chain practices that lead to integrating their internal processes with their external partners, they can enhance customer value while simultaneously reducing costs. It was noted that higher levels of integration allow organizations' service levels to gain competitive advantage by demonstrating adaptability capabilities to changes in the environment; therefore, supply chain flexibility is critical to improving the integration-performance link. Overall, the findings confirmed that efficient SCI adopting practices would provide an organization with a strategic advantage when improving performance.

There has been substantial support for the influence of successful supply chain integration (SCI) on operational performance from studies. For example, a study covering 317 survey responses from the food and beverage sector of Jordan found that SCI-oriented technology management significantly enhanced operational outcomes from improvements in performance. There is also evidence implying that SCI enhances organizational resilience as indicated in a study conducted on Chinese agricultural organizations suggesting that organizations with integrated supply chains are better able to respond to shocks (Masa'deh et al., 2022). Firms using integrated supply chain practices also fare better in competitive markets, as research has linked various types of SCI and competitive strategies. This illustrates that SCI is both a strategic resource that can enhance general firm performance as well as a logistic imperative (Fabbe-Costes & Jahre, 2008).

Atnafie (2020) carried out research on Ethiopian Airlines' Maintenance, Repair, and Overhaul (MRO) facility based on survey data and mixed-methods research. The result indicated that the integration of suppliers had the highest positive effect on operational performance, internal integration, followed by customer integration

There is an examination of supply chain integration in the World Food Programme's Ethiopia office by Usman et al. (2021) that made use of survey data and multiple regression analysis. From their research, the general integration level—external, internal, supplier, customer, information, and measurement integration explained a significant variance in organizational performance. It was concluded that supply chain integration significantly influences performance positively.

Research conducted on Kenya's manufacturing sector has also shown that stronger supply chain integration tends to go hand in hand with better overall firm performance. A study by Omondi and Wachiuri (2022) involving firms in Nairobi's metal and allied manufacturing

industry found that enhanced integration—such as improved collaboration and data sharing with suppliers and customers—was significantly associated with better organizational performance (Omondi & Wachiuri, 2022).

Despite numerous studies in this area, there remains a lack of empirical evidence supporting the relationship between supply chain integration (SCI) and supply chain performance, particularly in developing markets. Most existing research focuses on the developed market and only on a few dimensions of SCI. This study aims to fill this gap by examining the relationship between SCI and supply chain performance and its effect on Supply chain performance across six dimensions: internal, external, supplier, customer, information, and measurement integration.

2.2.3 Supply Chain Performance Measurement

Measuring supply chain performance is essential for improving productivity and competitiveness (Sharma, 2016). Organizations use a variety of financial and non-financial metrics to assess how well their supply chains perform (Sillanpää, 2015). Modern measurement approaches include indicators such as customer satisfaction, sustainability, and resilience in addition to traditional financial measures (Tripathi & Gupta, 2019). Since supply chains are complex, Kurien (2011) advises considering different viewpoints: financial vs. business process metrics, strategic, tactical, operational focus, and cost vs. non-cost measures. Successful companies often implement integrated measurement systems that align with their overall objectives (Kurien, 2011).

Integrated measurement systems are used by successful supply chains to accomplish organizational objectives (Kurien, 2011). Even though there are several frameworks for measuring performance, more study is required to validate them and meet the various demands of various industry sectors (Kurien, 2011; Tripathi & Gupta, 2019).

One influential framework by Beamon (1999) evaluates supply chain performance on three levels: output, resources, and flexibility. Output metrics (like delivery time and product quality) gauge customer responsiveness. Delivery time, product/service quality, and the volume of products produced are examples of output metrics that evaluate customer responsiveness. Resource metrics assess how well resources are used, including shared infrastructures, equipment use, inventory control, energy use, and overall operating costs, which include labor, maintenance, and manufacturing costs.

Several studies emphasize that key dimensions of supply chain performance namely agility, adaptability, and alignment are critical to achieving competitive advantage. Ali (2021)

demonstrates that enhancements in these “Triple-A” capabilities are each positively linked to improved overall supply chain performance.

In Kenya’s food and beverage sector, Mogaka et al. (2024) conducted a cross-sectional survey of 73 manufacturers and found that higher levels of supply chain integration are strongly associated with greater supply chain adaptability. This adaptability, in turn, contributes to a stronger competitive advantage for firms.

Lee’s (2004) Triple-A supply chain strategy, which emphasizes agility, adaptability and alignment, was assessed empirically by Whitten, Green Jr and Zelbst (2012). Their research suggests that the strategy positively influences supply chain performance, which in turn, positively impacts organizational performance. The researchers found that supply chain performance is related more to marketing performance than financial performance, which in turn enhances financial performance. These ideas are essential in the context of a large company such as Unilever, which must be agile, adaptable and aligned in relation to their suppliers and customers. Each of the three dimensions in the Triple-A framework requires specific key performance indicators (KPIs) that indicate the effectiveness of the supply chain.

These guidelines are critical for any organization, but even more critical for a global organization such as Unilever, that must be adaptable, responsive, and aligned with their suppliers and customers (Lee, 2004). Such adaptability, responsiveness and alignment ensure that the supply chain is efficient, responsive and resilient.

Accordingly, this study adopted a Triple-A framework to investigate supply chain performance at the case company, and measures agility, adaptability, and alignment in terms of outcomes.

2.2.4 Drivers of Supply Chain Integration (SCI Drivers)

Many factors that drive the adoption of SCI ultimately increase organizational performance (Yunus & Tadisina, 2016; Richey et al., 2009). A company's internal orientation, or how customer oriented the company is, can influence SCI (Yunus & Tadisina, 2016). Fazli and Afshar (2014) found internal and external drivers of SCI capabilities; and they found that the internal drivers can fast track the integration capabilities, but external drivers did not find overall direct correlation. Interpersonal relationships (IPRs) and formal inter-organization relationships (IORs) also affect supply chain integration. IPR's initiates organizational relationships and will have different effects depending on the integration process stage being observed (Wang et al., 2018).

The connection between drivers and SCI is positively facilitated by organizational culture, especially external focus (Yunus & Tadisina, 2016). Barriers can moderate the relationship that exists between SCI drivers and firm performance (Richey et al, 2009).

Supply chain integration (SCI) has emerged as a primary strategy for firms trying to achieve improved firm performance within a global and competitive environment. Many drivers influence SCI. For example, one driver is consumer demand, which drives businesses to integrate their operations with market needs and also requires that supply chain partners share resources of information. Another driver is competitive pressure which is leading businesses to form strategic cooperations. Third, cost constraints encourage businesses to minimize costs internally and externally by improving internal and external processes. Finally, technology capacity makes it easier to collaborate and manage data in real time.

Key constructs supporting supply chain performance are information integration, supplier integration, customer integration, and internal integration. These constructions improve order fulfillment and flexibility in production. Unfortunately, effective integration can experience barriers, such as lack of trust, competing departmental agendas and cultural inertia. Nevertheless, SCI can deliver considerable value, including lower costs, increased profitability from supply chain arrangements, and increased flexibility to respond to changing market conditions. Research from the UK food industry supports these claims. They found strong strategic alignment and teamwork are important elements of sound operational efficacy and competitive advantage (Khanuja & Jain, 2018).

Kumar et al. (2017) identified several critical drivers of supply chain integration (SCI). One of the drivers appears to be the call for improved performance, since SCI and information sharing enhanced performance through reduced costs and increased operational efficiency. Better performance also means building strategic relationships with customers and suppliers that align with a firm's competitive strategy. Uniting bodies creates the resources to facilitate improved performance measures in terms of customer service, internal efficiency or demand flexibility with suppliers and customers.

One of the key reasons companies pursue supply chain integration is the need for greater agility in managing supply chain performance. To stay responsive in a fast-changing environment, businesses require an integrated setup that allows them to roll out new solutions quickly while still making the most of their existing IT systems. Cost reduction is another major driver behind integration efforts. By bringing different supply chain functions together, companies can cut down on waste and unnecessary expenses while adding more value to their operations. Integration also helps improve delivery performance and overall quality by streamlining internal processes, ultimately boosting efficiency and customer satisfaction (Keller, Seru & Lisanza, 2013).

2.3 Conceptual Framework

The conceptual framework for this study is derived from Kumar et al. (2017), Abdulhakim H. (2018) and Lee (2004) and identifies six capabilities of SCI, used as independent variables: internal integration, external integration, supplier integration, customer integration, information integration, and measurement integration, while the dependent variable is supply chain performance defined through the constructs of agility, adaptability, and alignment (Lee, 2004).

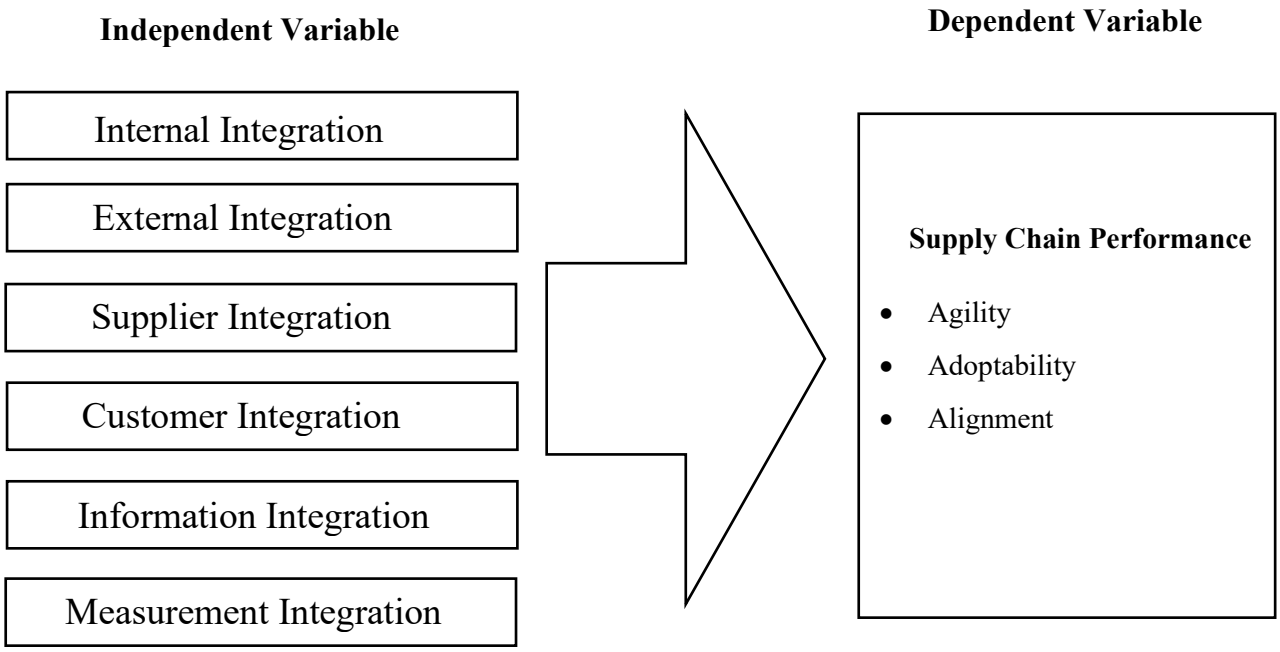

FIGURE 2.1: CONCEPTUAL FRAMEWORK

(Source: Adapted from: Kumar et al., 2017, Abdulhakim, H. (2018). and Lee, 2004)

2.4 Research Gaps

Although SCI has received significant attention as a critical factor in improving performance, the full extent of SCI´s effects in developing markets remains underexplored. The majority of SCI studies are from developed economies, with strong institutions, infrastructure, and predictable marketplaces (Masa'deh et al., 2022). This means we need to be careful with the gap of knowledge here, as the variation in the firms in developing countries may well come from the unique issues associated with weaker institutions, market instability and poor infrastructure (Georgise et al., 2014). This study intends to fill this knowledge gap and closely examine how the key dimensions of SCI (internal, external, supplier, customer, information and measurement integration) can affect supply chain performance (agility, adaptability, and alignment) within the Ethiopian manufacturing context.

This study utilizes Unilever Manufacturing PLC Ethiopia as a case study to study and explore the effect of SCI practice dimensions on supply chain performance in the context of the Ethiopian manufacturing industry. It aspires to provide practical insight for the utilizing of SCI as a performance improvement strategy and pillar for sustainable competitive advantage for manufacturing firms in the developing market.

CHAPTER THREE

3 RESEARCH METHODOLOGY

This chapter outlines the approach used to explore how supply chain integration (SCI) practices influence Supply chain performance at Unilever Ethiopia. It provides an overview of the study's background, research design, target population, sampling methods, and data collection techniques. It also explains how the data was analyzed and describes the steps taken to ensure the study's reliability, validity, and ethical integrity.

3.1 Description of the Study Area

Unilever is a well-established global company with a presence in over 190 countries and a history that spans more than a century. It offers a wide range of products from personal and home care to food and ice cream and is known for its strong commitment to sustainable and responsible business practices. In East Africa, Unilever has been present for over 80 years; with a strategy of local production (about 81% of products sold are manufactured regionally). Unilever Ethiopia, established in 2015, is a major player in the country's fast-moving consumer goods sector. Its manufacturing plant in the Dukem Eastern Industry Zone produces goods such as Lifebuoy soap, OMO and Sunlight detergents, Knorr bouillons, Signal toothpaste, and Sunsilk hair care products. This facility and its operations provided the specific study context for examining supply chain integration practices in a manufacturing setting.

3.2 Research Approach

The research process is guided by research approaches, which include choices ranging from general hypotheses to techniques (Lamoth Haynie, 2022; Tschampel, 2020). Using methods like experiments, surveys, interviews, and observation, the three main approaches quantitative, qualitative, and mixed methods (Taherdoost, 2022) offer unique applications, benefits, and drawbacks (Wilson et al., 2000).

A quantitative research approach was adopted, as the goal was to measure the effect of SCI practices on supply chain performance. Quantitative methods are appropriate for this objective because they allow for statistical analysis of how independent variables (the SCI dimensions) relate to a dependent variable (supply chain performance, here measured in terms of agility, adaptability, and alignment).

The study sought to provide quantitative insights into the effect of Supply Chain Integration (SCI) practices on Supply Chain Performance (SCP) at Unilever Manufacturing PLC Ethiopia. This aligns with the study's objective of assessing the extent to which each dimension of SCI

influences SCP, thereby enabling a data-driven understanding of these relationships within the context of the selected case company.

3.3 Research Design

An explanatory research design used in this investigation. Since the goal of the study is to measure the effect of Supply Chain Integration (SCI) practices and Supply Chain Performance (SCP), an explanatory design was selected. In terms of non-financial performance metrics agility, adaptability, and alignment, the study measure how and to what degree different SCI dimensions internal, external, supplier, customer, information, and measurement integration influence SCP.

An explanatory research design was chosen to explore these relationships; this design examines how and to what degree the independent variables influence the dependent variable without asserting strict causality. In this case, the explanatory design enabled the study to quantify the extent to which each SCI dimension affects performance and to understand the direction and strength of these effects in the Unilever Ethiopia context.

3.4 Target Populations and Sampling Techniques

3.4.1 Target Population

The target population for this study consists of 218 employees within the supply chain division at Unilever Manufacturing PLC Ethiopia. The study focuses specifically on employees holding key positions within the following Supply Chain Performance departments: planning, logistics, procurement, manufacturing, warehousing, customer service, and distribution. These departments play a central role in Unilever Ethiopia's day-to-day supply chain operations, and the employees working within them bring valuable experience and insight to the topic of supply chain integration and its effect on supply chain performance. By focusing on these key areas, the study aimed to gather meaningful input from those who are directly involved in putting supply chain strategies into action.

3.4.2 Sampling Techniques

To ensure maximum efficiency in research, careful sampling methods are needed to select representative subsets (Nabila Amir et al 2020; S. Ajay, 2014). Stratified sampling and simple random sampling are the most probable choices in these cases because they allow for calculating probabilities and include population subgroups (Omair, 2014).

This research was done by Stratified sampling so that all relevant supply chain functions were represented. Planning, Logistics, Procurement, Manufacturing, Warehousing, Customer service, and Distribution are the variable divisions to which the 218 employees were assigned. Each stratum will have a sample size proportionate to its size in the population. The HR

department had the files of all the departmental employees, and these were used as the basis for sample selection.

3.4.3 Sample Size Determination

Sample size estimation is critical for achieving accurate results and depends on factors such as population size, confidence level, expected proportion, and required precision (Omair, 2014; E. Haute, 2021). A sample size of 141 employees is determined using Yamane's formula (Yamane, 1967), a simplified approach assuming a 95% confidence level and a 5% margin of error. This calculation, based on a total population of 218, yields a statistically robust sample size thought sufficient for the study while remaining manageable within the study constraints.

Where the formula: $n = \frac{N}{1+N(e^2)}$

Calculation:

N = Population size (218 employees)

e = Margin of error (0.05)

The calculation resulted in a sample size of approximately 141 employees.

Tabel 3.1: Number of Target population list by Strata

Department	Number of Employees	Proportion of Total	Sample Size (out of 218)
Planning	14	6%	9
Logistics	23	11%	15
Procurement	18	8%	12
Manufacturing	117	54%	76
Warehousing	24	11%	15
Customer Service	12	6%	8
Distribution	10	5%	6
Total	218	100%	141

3.5 Data Sources and Collection Procedures

Primary data were collected using a structured questionnaire, which contained statements related to each SCI dimension and to supply chain performance. Respondents indicated their agreement on two five-point Likert scales: one scale measured the extent to which each integration practice dimension was implemented (1 = “not at all” to 5 = “to a very large extent”), and the other measured perceptions of supply chain performance based on its three

dimensions (1 = “strongly disagree” to 5 = “strongly agree”). The questionnaire was administered to the 141 sampled employees, and 120 completed questionnaires were returned. Before the main survey, a pilot test with a small group of supply chain staff was conducted to refine the questions and check for clarity. The consistency of responses was verified by calculating Cronbach’s alpha coefficients for the scales. All questionnaire items were adapted from established sources and were reviewed by the research advisor to ensure they validly captured the intended constructs.

Secondary data (e.g., journal articles, books, and company documents) were also reviewed to provide background context, but the analysis focused on the primary survey data.

3.6 Method of Data Analysis

Data analysis is essential for extracting useful information that supports decision-making (Mohaiminul Islam, 2020). Various techniques including data mining and text analytics employed during analysis (Mohaiminul Islam et al., 2020). Quantitative analysis involved transforming raw data into tables and charts using frequencies, percentages, means, and standard deviations to summarize the data (Mugenda & Mugenda, 2009).

For this study data analysis conducted in two stages. Descriptive statistics (frequencies, percentages, means, standard deviations) summarized demographic data and responses related to Supply Chain Integration (SCI) practices and Supply Chain Performance (SCP). Inferential statistics, specifically correlation and multiple linear regressions, used to measure the effect of SCI practice dimensions on SCP (agility, adaptability, alignment). Missing data is handled using listwise deletion. The assumptions of multiple linear regression, including linearity, normality, homoscedasticity, and multicollinearity, were assessed before conducting the analysis. Collected data was coded and entered SPSS software (Version 2024) for analysis according to each variable studied.

3.7 Data Reliability and Validity

Validity refers to the extent to which an instrument accurately measures what it is intended to measure (Kothari, 2004). To ensure the validity of the data collection instruments, the researcher engaged in continuous consultation with a respected research advisor. Furthermore, the instruments were adapted from publications of internationally recognized institutions and other reputable sources.

According to Toke et al. (2012), the purpose of reliability analysis is to determine the extent to which a measurement procedure yields consistent results when repeated under identical

conditions. In this study, the consistency, stability, and accuracy of the instruments were assessed using Cronbach's Alpha Coefficient.

Cronbach alpha was computed for each of the variables, the result, which is 0.868, This indicates a high level of internal consistency among the items, meaning the items reliably measure the same underlying concept. Additionally, the use of closed-ended questions minimized the influence of individual interpretation and promoted consistent data collection across participants.

Table 3.2: Reliability statistic

Reliability Statistics	
Cronbach's Alpha	No. of Items
.868	36

Source; Survey Data,2025

Table 3.3: Item Total statistic

Variables	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Internal Integration	.833	.841	4
External Integration	.804	.801	4
Supplier Integration	.747	.780	4
Customer Integration	.862	.730	4
Information Integration	.738	.727	4
Measurement Integration	.853	.762	4
Supply chain Performance	.848	.831	12

Source; Survey Data,2025

3.8 Ethical Considerations

The researcher had all ethical clearances through permissions and support letter from Unilever Manufacturing PLC. Participation was voluntary, and confidentiality was assured. The data were used exclusively for academic purposes, in accordance with all safety protocols. Respondents were fully informed of the research purpose and were guaranteed privacy prior to their participation.

CHAPTER FOUR

1. DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter shows results and interpretation of collected data from the respondents. It consists of four sections. The first section shows the response rate of respondents. The second section shows the demographic characteristics of respondents in terms of sex, age, department, Experience in Supply chain and educational background. The third section discusses the analysis and interpretation of data were collected through questionnaire from staffs of Unilever Ethiopia about the effect of supply chain integration practices on supply chain performance: the case of Unilever Manufacturing PLC Ethiopia. This section presents the findings from the survey, using the statistical tools and methods chosen for data analyses with summarized analysis on the results. Finally, the results of correlation analysis, multiple linear regression assumptions and regression analysis for the research variables were discussed.

4.2 Response Rate

Out of the 141 questionnaires distributed, 120 were returned with complete responses, yielding a response rate of 85.11%. This high response rate provides confidence that the findings are representative of the surveyed population.

4.3 Demographic profile of the respondent

Table 4.1: Demographic Information

Variable		**Frequency**	**Percent**
Gender	Male	77	64%
	Female	43	36%
	Total	**120**	**100%**
		Frequency	**Percent**
Age	18 - 25 years	10	8%
	26-35 years	47	39%
	36-45 years	32	27%
	Above 46 years	31	26%
	Total	**120**	**100%**
		Frequency	**Percent**
Department	Planning	9	8%
	Logistics	15	13%
	Procurement	12	10%
	Manufacturing	55	46%

	Warehousing	15	13%
	Customer service	8	7%
	Distribution	6	5%
	Total	**120**	**100%**
		Frequency	**Percent**
Work Experience	Less than 2 years	21	18%
	2–5 years	32	27%
	6–10 years	39	33%
	More than 10 years	28	23%
	Total	**120**	**100%**
		Frequency	**Percent**
Educational Background	Diploma	25	21%
	Bachelor's Degree	67	56%
	Master's Degree	28	23%
	Total	**120**	**100%**

Source; Survey Data,2025

The study sample comprised a diverse group of respondents, with 64% male and 36% female participants, ensuring gender representation. The majority were aged between 26 and 45 years (66%), reflecting a workforce that is both experienced and dynamic. Most respondents (46%) were from the Manufacturing department, with others representing key functions such as Logistics, Warehousing, Procurement, Planning, Customer Service, and Distribution. In terms of work experience, 55.5% had over six years of experience, contributing a blend of seasoned and fresh perspectives. Educationally, the majority held at least a bachelor's degree (56%), with 23% having a master's degree, indicating a well-educated workforce that enhances the credibility and depth of the study findings.

4.4 Descriptive Analysis

The six objectives to this study focus on measuring the effect of each supply chain integration practice dimension, **internal integration, external integration, supplier integration, customer integration and measurement integration** on **supply chain performance** measured by metric agility, adaptability and alignment. The participants were asked to measure the extent to which each supply chain integration practice affects Supply Chain Performance and rated their responses on a five-point Likert- type scale where: 5-to a very large extent, 4-to a large extent, 3-to a moderate extent, 2-to a small extent, and 1-to not occur. In addition,

they were also requested indicate their level agreement on organization's supply chain performance using the scale 1-5 where : 1 =-Strongly Disagree, 2 - Disagree, 3 -Neutral, 4 - Agree, 5 -Strongly Agree) and the their response has been analysis using different data analysis techniques to find a result of each specific objective of the study and presented and interpreted below.

4.4.1. Supply Chain Integration

Table 4.2: Supply Chain Integration Practice

Supply Chain Integration Practice	N	Mean	Std. Deviation
Internal integration	120	3.51	1.03
External Integration	120	3.42	0.05
Supplier Integration	120	3.63	1.01
Customer Integration	120	3.77	0.95
Information Integration	120	3.74	0.93
Measurement Integration	120	3.59	0.96
Overall Grand Mean of Supply Chain Integration Practice	**3.61**		

Source; Survey Data,2025

According to the survey results, the mean values of all the independent variables (Internal Integration, External Integration, Supplier Integration, Customer Integration, Information Integration, and Measurement Integration) fall within a moderate to moderately high range, from 3.4175 for External Integration to 3.7725 for Customer Integration. These mean values correspond to approximately 68% to 77% of the survey measurement scale, indicating a generally positive extent of supply chain integration practices within the organizations surveyed. The standard deviations for these variables range from a very low 0.0475 in External Integration to 1.0288 in Internal Integration, showing varying levels of response dispersion, with External Integration exhibiting the least variability and Internal Integration the highest. This suggests that while most respondents consistently perceive external integration at a similar level, there is more diversity in opinions regarding internal integration practices. The findings imply that supply chain integration is well established across the organizations, particularly in Customer Integration, Information Integration, and Supplier Integration, which show relatively higher mean scores. However, Internal Integration and External Integration appear comparatively less developed. These results align with previous studies such as (Uwamahoro ,2018), which also reported high mean values across supply chain integration dimensions,

suggesting that moderate to moderately high mean scores tend to be associated with high significance levels in statistical testing. Overall, the findings show that the company has a strong base when it comes to supply chain integration. However, there's still room to strengthen both internal and external collaboration to further boost overall supply chain performance.

4.4.2. Supply Chain Performance

Table 4.3: Supply Chain Performance

Supply Chain Performance	**N**	**Mean**	**Std. Deviation**
Agility	120	3.54	0.94
Adaptability	120	3.81	0.98
Alignment	120	3.49	1.01
Overall Grand Mean of Supply Chain Performance	**3.61**		

Source; Survey Data,2025

Based on the survey results, the estimated averages of the supply chain performance metrics Agility, Adaptability, and Alignment sit in the range of moderate to moderately high, at 3.5375, 3.8100, and 3.4875 respectively. These values represent approximately 69% to 76% of the survey measurement scale which reflects a reasonably favorable view of supply chain performance among the respondents. The respondents provided a grand mean value of 3.6117 which denotes that, on the whole, these organizations perceive to a moderate extent achieve performance results on these facets. Their standard deviations varied from Agility at 0.9398 to Alignment at 1.0050 which indicates understanding concerning the average and these respondents tended to differ in their perception about these dimensions of performance. Adaptability had the highest mean which indicates that organizations are more adept at dealing with changes and uncertainty in the supply chain context. Alignment, which measures the degree to which supply chain activities are synchronized with the organizational objectives, was, however, the most poorly scored, indicating some need for improvement.

These findings are in line with earlier research in the field of supply chain management. For example, Christopher (2016) and Swafford et al. (2006) both highlight the importance of adaptability and agility as key factors in driving supply chain performance, especially in fast-

changing markets supporting the higher average scores seen in this study. Likewise, the moderate score observed for alignment reflects what Ketchen and Hult (2007) found: while many organizations aim for strategic alignment, fully achieving it remains a common challenge. The moderate variability in responses also reflects the heterogeneous nature of supply chain practices across different firms, as reported in previous empirical studies.

Overall, the results indicate that organizations demonstrate a reasonable level of supply chain performance, particularly in adaptability and agility, but there remains scope to enhance alignment to fully leverage supply chain capabilities. These insights corroborate existing literature and highlight the ongoing need for integrated strategies to improve overall supply chain effectiveness.

4.5. Correlation Analysis

In this study Pearson correlation was computed to determine if there was a significant relationship between the dependent and independent variable. According to (Mukaka, 2012) Correlation is a statistical method used to assess a possible linear association between two continuous variables and how closely two variables co-vary; it can vary from -1 (perfect negative correlation through 0(no correlation to +1 (perfect positive correlation).

Tabel 4.4: Interpretations and Characteristics of Correlations

Interpretation	Correlation	Directions	Form	Degree
Small	0.10 - 0.29	+ve	Linear vs Non-linear	Strength
Medium	0.30 - 0.49	vs		
Large	0.50 - 1.00	-ve		

Correlation analysis examines the strength and direction of the linear relationship between two variables. This analysis helps determine if a relationship exists, allowing for predictions of one variable based on the other. It's also used to demonstrate the validity of a test scale by showing its association with other relevant measures.

Table 4.5 presents the results of the correlation matrix analysis, illustrating the relationships between the various indicators of supply chain integration (External, Internal, Supplier, Customer, Information, and Measurement Integration) and supply chain performance.

Table 4.5: Correlation Matrix

CORRELATION								
		Internal Integration	External Integration	Supplier Integration	Customer Integration	Information Integration	Measurement Integration	Supply Chain Performance
Internal Integration	Pearson Correlation	1	.415**	.225*	.246**	0.127	0.161	.256**
	Sig. (2-tailed)		0	0.014	0.007	0.167	0.08	0.005
	N	120	120	120	120	120	120	120
External Integration	Pearson Correlation	.415**	1	.329**	.517**	.292**	.206*	.563**
	Sig. (2-tailed)	0		0	0	0.001	0.024	0
	N	120	120	120	120	120	120	120
Supplier Integration	Pearson Correlation	.225*	.329**	1	.427**	.344**	.280**	.547**
	Sig. (2-tailed)	0.014	0		0	0	0.002	0
	N	120	120	120	120	120	120	120
Customer Integration	Pearson Correlation	.246**	.517**	.427**	1	.351**	.239**	.557**
	Sig. (2-tailed)	0.007	0	0		0	0.009	0
	N	120	120	120	120	120	120	120
Information Integration	Pearson Correlation	0.127	.292**	.344**	.351**	1	.358**	.330**
	Sig. (2-tailed)	0.167	0.001	0	0		0	0
	N	120	120	120	120	120	120	120
Measurement Integration	Pearson Correlation	0.161	.206*	.280**	.239**	.358**	1	.504**
	Sig. (2-tailed)	0.08	0.024	0.002	0.009	0		0
	N	120	120	120	120	120	120	120
Supply Chain Performance	Pearson Correlation	.256**	.563**	.547**	.557**	.330**	.504**	1
	Sig. (2-tailed)	0.005	0	0	0	0	0	
	N	120	120	120	120	120	120	120
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Source; Survey Data,2025

The correlation analysis reveals that all dimensions of supply chain integration are positively and significantly related to supply chain performance (SCP), indicating that improvements across any of these areas are beneficial.

The results show a clear hierarchy in the strength of these relationships. The strongest associations with SCP are observed with external integration ($r = 0.563$, $p < 0.01$), customer integration ($r = 0.557$, $p < 0.01$), supplier integration ($r = 0.547$, $p < 0.01$), and measurement integration ($r = 0.504$, $p < 0.01$). These strong, positive correlations suggest that focusing on external partnerships (with both customers and suppliers) and performance measurement plays a critical role in enhancing supply chain outcomes.

Comparatively, information integration ($r = 0.330$, $p < 0.01$) and internal integration ($r = 0.256$, $p < 0.01$), while still statistically significant demonstrate moderate to weak positive correlations with SCP.

Furthermore, the various dimensions of integration are positively correlated with each other. Notably strong relationships exist between external and customer integration ($r = 0.517$), as well as supplier and customer integration ($r = 0.427$). This suggests that capabilities in one area of integration often support and enhance capabilities in others.

In summary, while all measured forms of integration contribute to better supply chain performance, the analysis strongly indicates that the greatest impact is derived from improving integration with external partners and rigorously measuring performance.

4.6. Regression Analysis

4.6.1. Multiple Linear Regression Assumptions

1. Linearity Assumption

In regression analysis, it's important to ensure that the relationship between each independent variable and the dependent variable is linear. This also applies to the relationship between predicted values and residuals. To check this, scatterplots were created comparing each explanatory variable with the outcome, and regression lines were added to make the patterns clearer. Additional plots showing actual versus predicted values, along with residual analyses, were used to assess how well the model fits the data and to spot any outliers or influential points (Tabachnick & Fidell, 2013).

Outliers usually show up as data points with large residuals but don't always have a big impact on the model. Influential points, on the other hand, might not have large residuals but can still significantly affect the regression line. Tools like Cook's distance were used to identify these

cases (Wang, Rosner, & Goodman, 2016). When residual scatterplots form a pattern close to a diagonal line, it suggests the data is normally distributed. Any major deviations from this pattern could signal a problem with the model's assumptions.

2. Multicollinearity

Multicollinearity occurs when two or more independent variables in a multiple regression model are highly correlated, meaning they share overlapping information. This condition does not affect the overall fit or predictive power of the model but makes it difficult to isolate the individual effect of each predictor because it inflates the variances of the estimated regression coefficients. As a result, coefficients may become statistically insignificant, confidence intervals widen, and p-values become unstable, leading to unreliable inferences (O'Brien, 2007; Shrestha, 2020). Multicollinearity is typically detected using diagnostic measures such as the variance inflation factor (VIF), where values above 5 or 10 indicate problematic collinearity, and condition indices (Midi, Sarkar, & Rana, 2010). Addressing multicollinearity often involves removing or combining correlated variables to produce a more stable and interpretable regression model (O'Brien, 2007)

Tabel 4.6: Collinearity Diagnostics

Model		Collinearity Statistics	
		Tolerance	**VIF**
1	(Constant)		
	Internal integration	0.814	1.228
	External Integration	0.63	1.588
	Supplier integration	0.745	1.343
	Customer integration	0.637	1.569
	Information integration	0.763	1.31
	Measurement Integration	0.833	1.2
a. Dependent Variable: Supply Chain Performance			

Source; Survey Data,2025

The collinearity statistics confirm that multicollinearity is not an issue among the independent variables in the model. All tolerance values exceed the threshold of 0.1, and all Variance Inflation Factor (VIF) values are below 2. This indicates that each integration dimension internal, external, supplier, customer, information, and measurement can be included as distinct predictors of supply chain performance without concerns about inflated standard errors or

compromised estimate reliability due to multicollinearity. Therefore, the regression estimates can be considered reliable and valid.

3. Homoscedasticity

In regression analysis, one important assumption is homoscedasticity, which means that the spread of the error terms should remain consistent across all levels of the independent variables. In simpler terms, the residuals or prediction errors should be evenly distributed, no matter what the predicted values are. This consistency helps ensure that the model's predictions are reliable throughout the entire data set. When this assumption is violated, a condition known as heteroscedasticity it can lead to biased or less efficient estimates and may compromise the accuracy of statistical tests (Statistics Solutions, 2025).

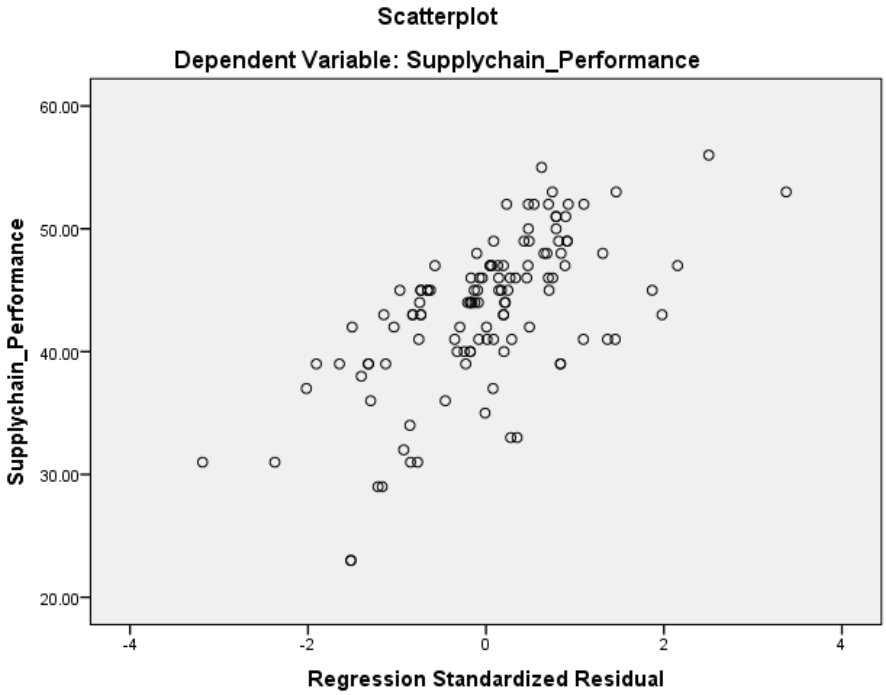

Figure 4.1: Homoscedasticity Multiple Regression Assumption

Source; Survey Data,2025

To check whether the regression model met key assumptions, a scatterplot of standardized residuals against supply chain performance (SCP) was examined. The residuals appeared to be randomly and evenly distributed across all levels of SCP, with no visible patterns; indicating that the assumptions of linearity and constant variance (homoscedasticity) were satisfied.

There were also no significant outliers or unusual data points, which adds confidence in the model's reliability. Overall, these findings suggest that the regression model fits the data well,

supporting the validity of the conclusions drawn about the relationship between integration variables and supply chain performance.

4. Normally Distributed Residuals

A histogram of residuals can give a general sense of whether they are normally distributed around the predicted values. However, it can be difficult to judge normality based on a histogram alone. A P-P plot offers a more precise evaluation. In this case, the plot shows that the observed cumulative probabilities closely follow the expected line, indicating that the residuals are normally distributed. This supports the assumption of normality in the regression

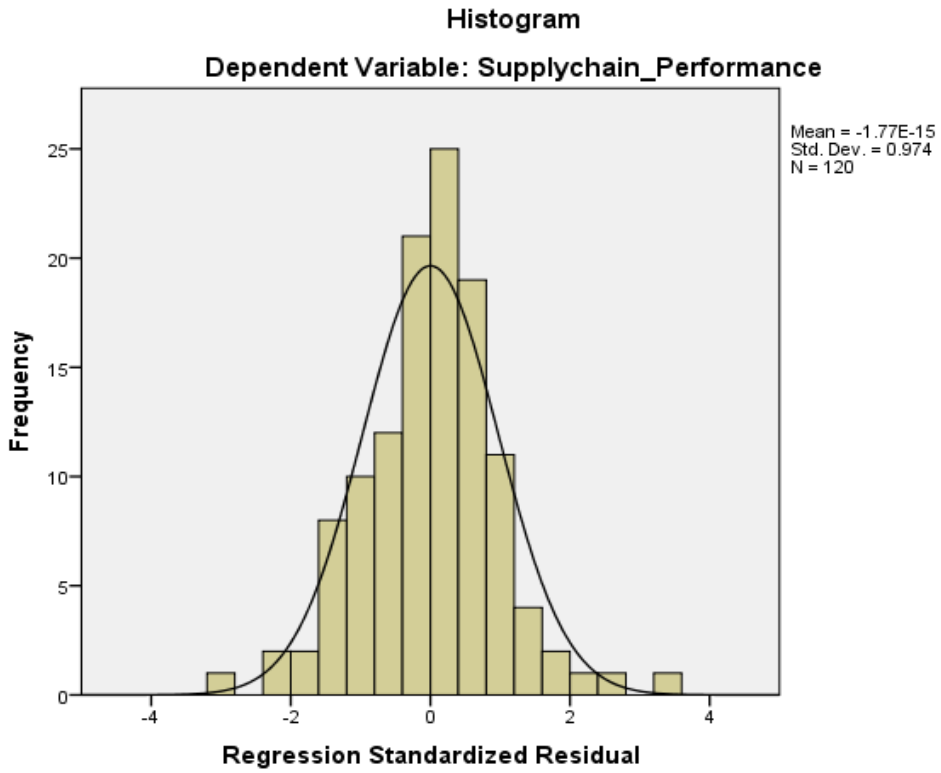

Figure 4.2: Normality Distribution Histogram

Source; Survey Data,2025

The distribution appears bell-shaped and symmetrical, centered around zero, with most residuals clustered near the mean and fewer at the extremes. The overlaid normal curve closely matches the shape of the histogram, and there are no signs of significant skewness or outliers. As shown in the figure above, the residuals follow a normal distribution. This suggests that the assumption of normality is satisfied in this study, and the assumption of normality is not violated.

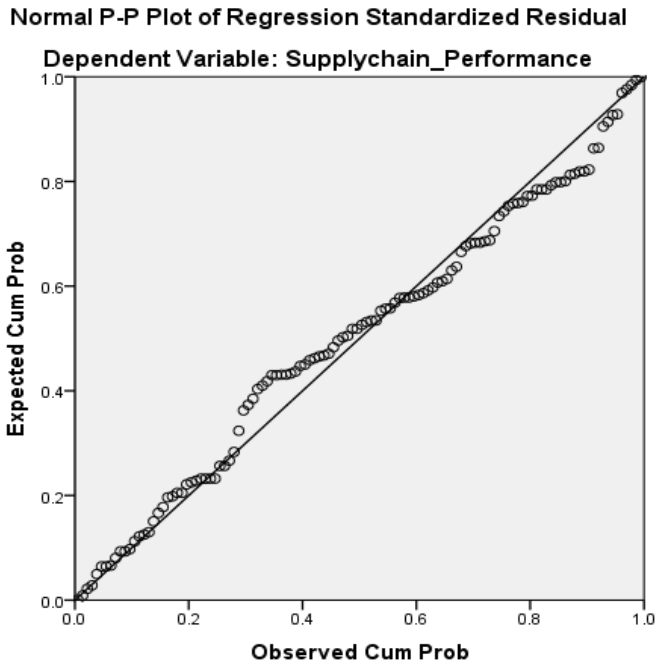

Figure 4.3: Normality Distribution P-P Plot

Source; Survey Data,2025

The Normal P-P Plot of regression standardized residuals form Figure 4.3. indicates that the residuals are approximately normally distributed, as the data points closely follow the diagonal line. This suggests that the assumption of normality for the regression analysis is satisfied. Therefore, the results of the regression analysis can be considered reliable and valid.

4.6.2. Model Summary

Multiple regression analysis was used to explore how different aspects of supply chain integration external, internal; supplier, customer, information, and measurement predict supply chain performance. The Model Summary table shows how much of the variation in the dependent supply chain performance is explained by the model.

The Sig. F Change value indicates whether the independent variables significantly contribute to predicting the dependent variable. The R value, which ranges from -1 to +1, reflects the strength and direction of the linear relationship: 0 means no linear relationship, +1 indicates a perfect positive correlation, and -1 a perfect negative one (Ge, 2013).

Table 4.7: Model Summary

Model Summary[b]									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.772[a]	0.597	0.575	4.07236	0.597	27.848	6	113	0.00

a. Predictors: (Constant), Measurement Integration, Internal integration, Customer integration, Information integration, Supplier integration, External Integration

b. Dependent Variable: Supply Chain performance

Source: Survey Data,2025

The model summary from the regression analysis demonstrates that the SCI variables (measurement, internal, customer, information, supplier, and external integration) collectively explain a substantial portion of the variance in supply chain performance (SCP). The R Square value of 0.597 indicates that approximately 59.7% of the variability in SCP can be accounted for by these predictors. The adjusted R Square of 0.575 confirms that this explanatory power remains strong even after adjusting for the number of predictors in the model.

The standard error of the estimate is 4.07, reflecting the typical deviation of observed SCP values from the values predicted by the model. The F-test result ($F = 27.848$, $p < 0.001$) shows that the regression model is statistically significant, meaning the integration variables together provide a meaningful and reliable explanation of supply chain performance.

In summary, the regression model is both statistically significant and practically meaningful, confirming that SCI practices are important drivers of supply chain performance in this study.

4.6.3. ANOVAa

Table 4.8: ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2770.989	6	461.832	27.848	.000[b]
	Residual	1874.002	113	16.584		
	Total	4644.992	119			

a. Dependent Variable: Supply Chain performance

b. Predictors: (Constant), Measurement Integration, Internal integration, Customer integration, Information integration, Supplier integration, External Integration

Source: Survey Data,2025

The ANOVA table for the regression analysis demonstrates that the model, which includes measurement integration, internal integration, customer integration, information integration, supplier integration, and external integration as predictors, significantly explains the variance in supply chain performance (SCP). The F-value is 27.848 with a significance level of $p < 0.001$, indicating that the regression model provides a much better fit to the data than a model with no predictors.

This result confirms that, collectively, the integration variables have a statistically significant impact on supply chain performance. Therefore, the model is appropriate for further interpretation and provides strong evidence that SCI practices are important determinants of supply chain performance in this study.

4.6.4. Regression Coefficientsa

Table 4.9: Regression Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	6.932	3.559		1.948	0.054			
	Internal Integration	-0.092	0.152	-0.04	-0.606	0.545	0.256	-0.057	-0.036
	External Integration	0.721	0.170	0.319	4.237	0	0.563	0.37	0.253
	Supplier Integration	0.702	0.173	0.282	4.068	0	0.547	0.357	0.243
	Customer integration	0.604	0.205	0.22	2.945	0.004	0.557	0.267	0.176
	Information integration	-0.156	0.209	-0.051	-0.746	0.457	0.33	-0.07	-0.045
	Measurement integration	0.758	0.150	0.332	5.065	0	0.504	0.43	0.303

a. Dependent Variable: Supply chain Performance (SCP)

Source: Survey Data,2025

The regression coefficient is the independent variable associated with it is contributing significance to the variance accounted for in the dependent variable. From the findings in the above table 11, the regression equation is:

$\boldsymbol{Y}$ = 6.932 - 0.092x1 + 0.721x2 + 0.702x3 - 0.604x4 -.156x5+0.758x6 + €

Where: Y = Supply Chain Performance

X1 = Internal Integration

X2= External Integration

X3 = Supplier Integration

X4= Customer Integration

X5=Information Integration

X6=Measurement Integration

$\boldsymbol{\beta}$ = Beta coefficients,

e = Error term

B coefficient (- or +)

From the above table the significance values of each variable have been interpreted as per the below details.

4.7. Result and Discussion

The effect of Internal Integration Practices on Supply Chain Performance

The analysis shows that **internal integration** practices have **no significant effect** on supply chain performance at Unilever Ethiopia. The standardized beta coefficient is -0.040 with a t-value of -0.606 and a p-value of 0.545, indicating the relationship is not statistically significant. This suggests that changes in internal integration do not meaningfully influence supply chain performance in this study.

The effect of External Integration Practices on Supply Chain Performance

External Integration practices **significantly and positively influence** supply chain performance at Unilever Ethiopia. The standardized beta is 0.319, with a t-value of 4.237 and a highly significant p-value of 0.000. This demonstrates that improving external integration is associated with a moderate and meaningful increase in supply chain performance.

The effect of Supplier Integration Practices on Supply Chain Performance

Supplier Integration practices have a **significant positive impact** on supply chain performance. The standardized beta coefficient is 0.282, with a t-value of 4.068 and a p-value of 0.000, indicating a strong statistical significance. This result confirms that enhancing supplier integration contributes positively to supply chain outcomes.

The effect of Customer Integration Practices on Supply Chain Performance

Customer Integration practices also show a **significant positive effect** on supply chain performance. The beta coefficient is 0.220, with a t-value of 2.945 and a p-value of 0.004. This indicates that better customer integration is moderately associated with improved supply chain performance at Unilever Ethiopia.

The effect of Information Integration Practices on Supply Chain Performance

Information integration practices **do not have a statistically significant effect** on supply chain performance. The standardized beta is -0.051, with a t-value of -0.746 and a p-value of 0.457, suggesting no meaningful relationship between information integration and supply chain performance in this context.

The effect of Measurement Integration Practices on Supply Chain Performance

Among the six SC integration practices dimensions examined in this study, measurement integration showed the strongest positive impact on supply chain performance. The analysis revealed a standardized beta coefficient of 0.332, with a t-value of 5.065 and a p-value of 0.000 indicating a highly significant relationship. This means that improvements in how performance is measured and aligned across the supply chain are closely linked to better overall performance at Unilever Ethiopia.

These results are consistent with previous research that highlights the important role of supply chain integration in improving performance. Earlier studies have shown that different integration practices can significantly influence how well organizations perform. For example, Klemencic (2006) found that aligning performance measurement across the supply chain can lead to better organizational outcomes. Similarly, Aschalew and Bayisa (2024) identified both measurement integration and external integration as key contributors to stronger supply chain

performance. Barroso, Gouveia, and José (2016) also noted that working closely with external partners can positively affect internal operations, further reinforcing the value of integration.

Research conducted at Unilever Kenya revealed a strong positive relationship between integrated supply chain practices particularly supplier and customer integration and performance outcomes (Wasike, 2010). Further studies on small and medium-sized enterprises (SMEs) demonstrated that customer, internal, information, and supplier integration significantly improved supply chain performance, accounting for a substantial portion of performance variance. These findings broadly support the notion that multiple forms of Supply chain integration contribute meaningfully to performance, although some studies report mixed results.

In the context of Rwandan manufacturing firms, internal and customer integration were found to significantly enhance performance, with supplier integration also playing a crucial role especially when combined with customer integration. This partially supports findings that highlight the positive effects of customer and supplier integration, while internal integration showed less consistent results (Uwamahoro, 2018).

CHAPTER FIVE

2. SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Introduction

This section contains a summary of major findings and conclusions that are drawn from the findings of the study, which are presented, discussed and interpreted in chapter four. In addition, the chapter also includes the recommendation which is based on the findings of the study.

5.2. Summary of Major Findings

This study investigated the effects of six Supply integration practices internal, external, supplier, customer, information, and measurement integration on supply chain performance (SCP) at Unilever Ethiopia. The findings from correlation analysis, regression modeling, and ANOVA provide robust evidence on how these integration dimensions influence SCP.

Correlation Analysis

The correlation analysis reveals that all dimensions of supply chain integration are positively and significantly associated with supply chain performance (SCP). The strongest relationships are observed with external integration ($r = 0.563$, $p < 0.01$), customer integration ($r = 0.557$, $p < 0.01$), supplier integration ($r = 0.547$, $p < 0.01$), and measurement integration ($r = 0.504$, $p < 0.01$), indicating that collaboration with external partners and effective performance measurement are key drivers of SCP. In contrast, information integration ($r = 0.330$, $p < 0.01$) and internal integration ($r = 0.256$, $p < 0.01$) show weaker, though still significant, positive correlations. Furthermore, the integration dimensions are interrelated, with notable correlations between external and customer integration ($r = 0.517$) and between supplier and customer integration ($r = 0.427$), suggesting that improvements in one area can reinforce others. Overall, the findings emphasize that enhancing external partnerships and performance tracking offers the most substantial benefits for supply chain performance.

Multiple Linear Regression Analysis Summary

The regression model explained 59.7% of the variance in supply chain performance ($R^2 = 0.597$, Adjusted $R^2 = 0.575$), indicating that the integration practices collectively have a substantial explanatory power. The model's F-statistics ($F = 27.848$, $p < 0.001$) confirm that the predictors significantly explain variations in SCP, reinforcing the overall relevance of integration practices in supply chain management.

Effects of Specific supply chain Integration Practices

Internal Integration: The effect of internal integration on SCP was not statistically significant ($\beta = -0.040$, $p = 0.545$). This suggests that internal coordination alone may not directly enhance supply chain performance without strong external linkages or other complementary practices.

External Integration: External integration had statistically a significant positive effect ($\beta = 0.319$, $p < 0.001$), confirming that collaboration with external partners improves supply chain efficiency and responsiveness.

Supplier Integration: Supplier integration also significantly influenced SCP positively ($\beta = 0.282$, $p < 0.001$), highlighting the role of effective supplier relationships in ensuring timely supply and quality inputs.

Customer Integration: Customer integration showed a moderate but significant positive effect ($\beta = 0.220$, $p = 0.004$), emphasizing the importance of aligning with customer needs and sharing information to enhance performance.

Information Integration: Information integration did not show a statistically significant effect ($\beta = -0.051$, $p = 0.457$), which may reflect challenges in leveraging information systems or the need for better integration of information flows.

Measurement Integration: Measurement integration had the strongest statistically significant positive effect ($\beta = 0.332$, $p < 0.001$), underscoring the critical role of performance measurement and feedback in driving continuous improvement and coordination.

Supply chain Integration practice and Supply Chain Performance in Context

The findings agree with previous studies that emphasize the significance of external-facing integration and measurement systems in improving supply chain outcomes. The non-significant effects of internal and information integration suggest that Unilever Ethiopia might benefit from strengthening internal processes and information technology capabilities to fully leverage these dimensions.

For Unilever Ethiopia, prioritizing external, supplier, customer, and measurement integration can yield substantial improvements in supply chain performance. Investments in supplier and customer relationships, along with robust measurement systems, should be central to supply chain strategies. Additionally, efforts to enhance internal coordination and information integration could further optimize performance.

In summary, this study highlights the crucial role that supply chain integration plays in driving supply chain performance at Unilever Ethiopia. Dimensions such as external, supplier, customer, and measurement integration have shown to be especially impactful. Through a

combination of correlation, multiple regression, and ANOVA analyses, the findings clearly demonstrate that these practices significantly contribute to a more agile and responsive supply chain. However, the results also point to areas like internal and information integration, which still have room for growth to fully unlock their potential benefits.

5.3. Conclusion

This study undertook a comprehensive investigation of the effect of six dimensions of supply chain integration practice namely, internal, external, supplier, customer, information, and measurement on supply chain performance in Unilever Ethiopia. By employing a systematic analytical framework of correlation analysis, regression modeling, and ANOVA testing, the study aimed to better understand how these integration practices work together and influence supply chain performance,

The correlation analysis revealed strong positive correlations for most SC integration dimensions with supply chain performance, with external, customer, supplier, and measurement integration showing especially high correlations. Regression analysis, supported by thorough diagnostic tests for multicollinearity, normality, linearity, and homoscedasticity, confirmed that external, supplier, customer, and measurement integration statistically significantly positively contributed to supply chain performance. Of these, integration of measurement was the most significant predictor, which underscores the role played by effective performance measurement systems in enhancing supply chain outcomes.

By contrast, information and internal integration did not exert statistically significant effects. This may be interpreted to mean that while these dimensions are of theoretical important, their actual effect in the real world in Unilever Ethiopia may be limited or open to other mediating factors. This finding highlights the delicacy of supply chain integration and how important it is to situate integration strategies within specific organizational contexts.

The model accounted for approximately 59.7% of the variance in supply chain performance, an indication of excellent explanatory power, which indicates that the SCI factors studied account for a meaningful part of the supply chain performance outcomes. The step-by-step analysis process used throughout the study also helps strengthen the reliability and relevance of the results.

In conclusion, the study offers a good amount of insight that targeted supply chain integration in particular in external, customer, supplier and measurement integrations are a key supply chain performance drivers. The findings suggest meaningful contributions to the pool of scholarly research and provide managerial insights for supply chain practitioners seeking to improve supply chain activities within a dynamic and complex environment.

5.4. Recommendations

The following recommendations are proposed based on the key findings and conclusions of this study. They aim to guide future improvements in supply chain integration and performance at Unilever Ethiopia:

Enhance External Integration: Strengthen collaboration with external partners such as distributors and logistics providers to boost responsiveness and improve overall supply chain efficiency. Building stronger external relationships can help streamline operations and better meet market demands.

Improve Supplier Integration: Develop closer partnerships with suppliers through joint planning, open information sharing, and regular performance reviews. This approach can lead to more reliable input quality, timely deliveries, reduced excess inventory, and less waste ultimately making the supply chain more agile and responsive.

Strengthening Customer Integration: Work more closely with customers by aligning processes and sharing relevant information. This can help anticipate demand more accurately, improve service levels, and enhance the overall performance of the supply chain.

Invest in Measurement Integration: Establish strong systems for tracking and evaluating performance across the supply chain. Regular feedback and performance monitoring promote accountability and help ensure that all stakeholders are working toward shared goals. This not only supports continuous improvement but also boosts operational efficiency.

Develop Internal Integration: Although not significant in this study, improving internal functional coordination and breaking down silos among departments remains essential for supporting external integration efforts. Doing so can also help build trust among stakeholders and foster a shared commitment to collaborative teamwork in pursuit of overarching supply chain objectives.

Upgrade Information Integration: Bridge existing gaps in information systems and technologies to enable seamless data sharing and real-time communication across the supply chain. This enhancement will help address visibility challenges and ensure more transparent and efficient information flow throughout the network.

5.5. Suggestions for further research

The study recommends that similar research be conducted on more global and locally owned FMCG manufacturing industries to investigate whether they have adopted supply chain integration strategies and how these practices have influenced their supply chain performance. While this study makes a significant contribution to the literature on supply chain integration dimensions, it also calls for further research into factors affecting these practices, such as organizational culture, environmental conditions, and various social and economic influences, as these factors play a crucial role in shaping supply chain integration and overall organizational operations.

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APPENDIX

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS & SUPPLY CHAIN MANAGEMENT

Consent Form

I am a graduate student at Addis Ababa University School of Commerce. I am conducting research on "The Effect of Supply Chain Integration Practices on Supply Chain Performance: The Case of Unilever Manufacturing PLC" as part of the requirements for an M.A. degree in Logistics & Supply Chain Management. The information collected is for academic purposes only and will be treated confidentially.

Please complete all sections of this document. All questions are interrelated and equally important for the study.

Thank you for your time and patience in responding to this questionnaire.

General Instructions:

- Do not write your name or address on the questionnaire.
- Please put a tick (√) mark in the appropriate box for your answer.

Contact Information: If you have any questions, please contact me at: Woinshet Getahun

Telephone: 09 07 58 94 19

Email: woinygetahun@gmail.com

Part One: Respondent's personal information

1. Sex: ☐ Male ☐ Female

2. Age: ☐ 18 - 25 years ☐ 26-35 years ☐ 36-45 years ☐ Above 46 years

3. Your department in the organization:
   ☐ Planning ☐ Logistics ☐ Procurement ☐ Manufacturing ☐ Warehousing
   ☐ Customer service ☐ Distribution ☐ Other (please specify)
4. Years of experience in supply chain management:
   ☐ Less than 2 years
   ☐ 2–5 years
   ☐ 6–10 years
   ☐ More than 10 years
5. Educational background:
   ☐ Diploma
   ☐ Bachelor's Degree
   ☐ Master's Degree
   ☐ Other (please specify)

Part Two: Extent of Supply Chain Integration Practice on supply chain performance
Please indicate the extent to which the following practices occur in your organization using the following scale: ***(1 = Does not occur, 2 = Small extent, 3 = Medium extent, 4 = Large extent, 5 = Very large extent)***

Supply Chain Integration Practice		**Rating**				
No	**Internal Integration**	**1**	**2**	**3**	**4**	**5**
1	In my organization every supply chain functions jointly undertake activities among others functions of the organization in terms of developing short-, medium- and long-term plans	☐	☐	☐	☐	☐
2	Internal processes are aligned to support seamless supply chain operations	☐	☐	☐	☐	☐
3	In my organization every supply chain joint undertakes activities among others functions of the organization in terms of developing periodical forecasting and demand management process	☐	☐	☐	☐	☐
4	There are internal integration of functions and activities	☐	☐	☐	☐	☐
No	**External Integration**	**1**	**2**	**3**	**4**	**5**
1	Distribution and delivery are made at the right time and place due to SC	☐	☐	☐	☐	☐

	integration, information sharing and coordination.					
2	The organization is actively involved in joint planning with external partners	☐	☐	☐	☐	☐
3	There is integration of objectives, planning and resource with external organization	☐	☐	☐	☐	☐
4	The organization has established procedures for managing external supply chain relationships	☐	☐	☐	☐	☐
No.	**Supplier Integration**	**1**	**2**	**3**	**4**	**5**
1	Orders are easily processed as a result of supplier integration	☐	☐	☐	☐	☐
2	The organization shares forecasts and demand information with suppliers	☐	☐	☐	☐	☐
3	Supply chain integration is led to a better supplier relationship management	☐	☐	☐	☐	☐
4	SC Integration has provided the organization the ability to quickly and easily relate with suppliers.	☐	☐	☐	☐	☐
No.	**Customer Integration**	**1**	**2**	**3**	**4**	**5**
1	Customer integration has enabled to deliver services easily and quickly	☐	☐	☐	☐	☐
2	There is market information sharing practice with major customer	☐	☐	☐	☐	☐
3	The speedy customer collaboration has been maintained because of SCI.	☐	☐	☐	☐	☐
4	The supply chain provides customers with real-time information about order status and delivery	☐	☐	☐	☐	☐
No.	**Information Integration**	**1**	**2**	**3**	**4**	**5**
1	Supply chain information is readily available across the organization	☐	☐	☐	☐	☐
2	My organization share information with implementing partners in undertaking assessment	☐	☐	☐	☐	☐
3	The organization share information with implementing Partners on supply chain strategy and operational processes preparedness	☐	☐	☐	☐	☐
4	My organization share information with implementing partners in terms of forecasting demand planning	☐	☐	☐	☐	☐
No.	**Measurement Integration**	**1**	**2**	**3**	**4**	**5**
1	With an integrated SC technologies and systems established, Inter and intra	☐	☐	☐	☐	☐

	organizations communications are optimized					
2	Supply chain performance metrics are aligned with the organization's strategic goals	☐	☐	☐	☐	☐
3	Distribution and delivery are made at the right time and place due to SC integration, information sharing and coordination	☐	☐	☐	☐	☐
4	Firms in our supply chain create compatible communication and information system.	☐	☐	☐	☐	☐

Part Three: Supply Chain Performance

Please indicate your level of agreement with the following statements regarding your organization's supply chain performance using the following scale**: (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).**

Supply Chain Performance		**Rating**				
No.	**Agility**	**1**	**2**	**3**	**4**	**5**
1	My organization's supply chain responds quickly to changes in customer demand.	☐	☐	☐	☐	☐
2	My organization's supply chain is flexible enough to handle unexpected disruptions	☐	☐	☐	☐	☐
3	My organization's supply chain effectively adjusts its strategy in response to evolving business needs	☐	☐	☐	☐	☐
4	My organization's supply chain can quickly introduce new products to the market.	☐	☐	☐	☐	☐
No.	**Adaptability**	**1**	**2**	**3**	**4**	**5**
1	My organization's supply chain effectively modifies its structure in response to long-term market changes in the business environment.	☐	☐	☐	☐	☐
2	My organization's supply chain successfully develops new capabilities to meet evolving customer requirements.	☐	☐	☐	☐	☐
3	My organization's Supply chain effectively adjusts the supply chain strategy in response to evolving business needs	☐	☐	☐	☐	☐

4	My organization's supply chain effectively integrates new partners into its network	☐	☐	☐	☐	☐
No.	**Alignment**	**1**	**2**	**3**	**4**	**5**
1	Our supply chain goals are well-aligned with the overall business strategy of Unilever Ethiopia	☐	☐	☐	☐	☐
2	My organization's supply chain activities are consistent with the value proposition offered to our customers	☐	☐	☐	☐	☐
3	My organization's supply chain partners are aligned on shared goals and objectives.	☐	☐	☐	☐	☐
4	My organization's supply chain performance metrics are well-aligned with business performance metrics	☐	☐	☐	☐	☐