Effect of Supply Chain Management Practices on Organizational Performance: The Case of Ethiopian Pharmaceutical Manufacturing

A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfilment of the Requirements for the Degree of Master of Business Administration (MBA)

By: Meron Samuel

Advisor: Hailemariam Gebremichael (Ph.D.)

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Addis Ababa, Ethiopia

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Approved by Board of Examiners

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LETTER OF CERTIFICATION

I hereby declare that Meron Samuel conducted the study presented in this project work entitled "Effect of Supply Chain Management Practices on Organizational Performance: The Case of Ethiopian Pharmaceutical Manufacturing" as part of the partial fulfillment of the requirements for the award of a master's degree in MBA. To the best of my knowledge, this is his original work, and it has never been presented as partial fulfillment for any degree at this or any other university.

13/02/2026

Hailemariam G. (PhD) Date

STATEMENT OF DECLARATION

I, Meron Samuel, hereby declare that this research paper entitled "Effect of Supply Chain Management Practices on Organizational Performance: The Case of Ethiopian Pharmaceutical Manufacturing" is my original work. This research paper has not been submitted to this or any other institution for a degree or master's program.

Meron Samuel

Signature: 

Date: 13/02/2026

Addis Ababa, Ethiopia

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ABBREVIATIONS AND ACRONYMS

EPHARM	Ethiopian Pharmaceutical Manufacturing
SCM	Supply chain management
SPSS	Statistical Package for the Social Sciences

Abstract

This research focused on the effect of supply chain management practices on organizational performance for the Ethiopian Pharmaceutical Manufacturing Industry. A census survey was conducted with 243 supply chain employees. The key variables examined in this study included supplier management, customer management, information exchange, and internal operations. This study utilized a mixed methodology, including both a quantitative survey and a qualitative interview, to address these factors. Descriptive and explanatory analysis methods were utilized to analyse the data. Regression and correlation analysis and thematic analysis were employed to identify relationships between variables and to determine if specific variables may cause others to exist. Overall, the results indicate that the proper management of suppliers and customers, the dissemination of quality information, and rational processes within organizations play a major role in increasing the performance of organizations, which is demonstrated through the increased efficiency, customer satisfaction, and competitive advantage in the marketplace. This study found that strategic alliance, clear communication, and continuous process improvement are necessary in achieving optimal performance in pharmaceutical supply chain systems.

Keywords: Supply Chain Management, Organization Performance, Pharmaceutical Industry.

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Supply Chain Management (SCM) has become a critical strategic function for organizations seeking to enhance efficiency, reduce operational costs, and achieve sustainable competitive advantage. In today's dynamic and highly competitive business environment, effective SCM practices enable organizations to coordinate suppliers, internal processes, and customers in a manner that improves overall organizational performance. As organizations increasingly operate in complex and uncertain markets, SCM is no longer viewed merely as a logistics function but as a key driver of organizational success (Popoola, 2019).

The importance of SCM is particularly pronounced in the pharmaceutical manufacturing industry, where timely production and distribution of medicines directly affect public health outcomes. Pharmaceutical supply chains are characterized by strict regulatory requirements, high quality standards, complex procurement processes, and the need for reliable coordination among suppliers, manufacturers, and distributors. Inefficiencies in SCM within this sector may result in production delays, increased operational costs, medicine shortages, and reduced customer trust (Singh et al., 2016).

In Ethiopia, the pharmaceutical manufacturing sector, including Ethiopian Pharmaceutical Manufacturing (EPHARM), has been expanding due to increasing demand for healthcare products. Despite this growth, the sector continues to face significant supply chain challenges such as inadequate infrastructure, limited technological integration, weak supplier coordination, and inefficiencies in internal operations. These challenges constrain firms' ability to operate efficiently and to meet market and regulatory demands. Aligning SCM practices with international best practices is therefore essential for improving performance and ensuring sustainable development within the Ethiopian pharmaceutical industry (Tesfa Marew et al., 2022).

Empirical studies indicate that effective SCM practices such as supplier management, customer management, quality information sharing, and efficient internal operations—have a positive influence on organizational performance. Organizations that manage supplier relationships strategically, share accurate and timely information, and streamline internal

processes tend to achieve better operational efficiency, higher customer satisfaction, and improved competitive positioning (Munir et al., 2020). However, the implementation of such practices in developing economies is often constrained by technological limitations, regulatory complexities, and skill gaps (Kagande et al., 2022).

In this study, organizational performance is conceptualized as a multidimensional construct reflecting the extent to which an organization achieves its operational and strategic objectives. Within the pharmaceutical manufacturing context, organizational performance is reflected through indicators such as operational efficiency, cost effectiveness, customer satisfaction, reliable product availability, and competitive positioning. These dimensions are particularly relevant to EPHARM, where performance is closely tied to efficient inventory management, timely production, regulatory compliance, and responsiveness to customer needs. As a result, organizational performance is an appropriate and meaningful outcome variable for evaluating the effectiveness of SCM practices in this sector.

Information sharing among supply chain partners is another critical element influencing organizational performance. Effective information sharing enhances transparency, improves coordination, and supports informed decision-making across the supply chain. In pharmaceutical manufacturing, timely and accurate information exchange helps reduce uncertainties related to demand forecasting, inventory control, and production planning, thereby improving responsiveness and efficiency (Udeh et al., 2024).

Similarly, Internal operation including production planning, inventory management, warehousing, and logistics play a vital role in determining supply chain effectiveness. Weak internal operations can undermine even well-designed supply chain strategies, leading to inefficiencies, waste, and increased operational costs. Conversely, efficient internal processes enable organizations to maximize resource utilization and improve overall performance.

In addition to operational challenges, pharmaceutical manufacturers in Ethiopia operate under stringent regulatory frameworks and changing market conditions. Compliance with regulatory standards requires effective coordination across the supply chain, and failure to manage these requirements efficiently can negatively affect organizational performance (Bilal et al., 2024). Consequently, understanding how SCM practices interact with organizational performance within this regulatory environment is essential.

Although previous studies have established a positive relationship between SCM practices and organizational performance (Alam et al., 2022, there is limited empirical evidence focusing on the Ethiopian pharmaceutical manufacturing context. Existing studies often overlook how specific SCM practices influence performance outcomes in this sector. This creates a clear research gap that necessitates context-specific investigation.

The purpose of this study is therefore to empirically examine the effect of supply chain management practices namely supplier management, customer management, information sharing, and Internal operation on organizational performance in Ethiopian Pharmaceutical Manufacturing. By addressing this gap, the study contributes to both academic literature and managerial practice by providing evidence-based insights that support improved decision-making and performance enhancement in the Ethiopian pharmaceutical manufacturing sector.

1.2. Statement of the problem

The management of the supply chain is viewed as an important determinant of success for businesses, including the pharmaceutical industry. This is because proper SCM practices improve the efficiency and effectiveness of organizations, which, in turn, leads to customer satisfaction and the timely distribution of drugs (Christopher, 2021). It is ideal that pharmaceutical companies make the flow of their supply chains smooth by leveraging the latest technology and collaboration between various stakeholders (Kumar & Singh, 2022). This is because the latest SCM systems make it possible for companies in the pharmaceutical industry to offer high service levels while meeting the required standards (Tang & Musa, 2023). The use of proper SCM practices in the pharmaceutical industry has been encouraged by the relevant authorities to enhance the delivery of healthcare (Lee et al., 2021).

Although SCM plays a crucial role in pharmaceutical manufacturing, SCM approaches in EPHARM are limited by a variety of factors. For example, the underdevelopment of SCM infrastructure leads to delayed production, increased operating costs, and less-than-optimal use of resources (Birhanu et al., 2018). Problems in logistics and storage infrastructure limit the ability to operate effectively in SCM in EPHARM, therefore limiting the potential for optimal results (Assefa & Tadesse, 2021).

The technological limitations of EPHARM also contribute to these problems. Specifically, EPHARM currently does not utilize current technology to assist in making SCM related decisions (Devaraj et al., 2021), which results in the inability to efficiently manage inventory,

leading to medicine shortages, expired medicine, and inefficient production (Gebre & Alemayehu, 2022). As a result, EPHARM lacks the efficiency to meet the demand from the marketplace.

One additional factor that can be cited as contributing to inefficiencies in SCM is the lack of coordination and teamwork among SCM members. Lack of good quality communication and coordination among suppliers, manufacturers, and distributors can create operational inefficiencies (Paulraj et al., 2022). In addition to the external environmental conditions of EPHARM, the internal environment creates barriers to effective SCM due to silos of operation and the inability to coordinate and make decisions collectively, therefore leading to inadequate resource allocation (Alemu, 2023).

Training and engagement of employees with best practices in SCM, and ultimately creating consistent work processes and creating a sense of ownership of improvements in a process, can all impact the efficiency of SCM (Fellows & Liu, 2020). Any organization that is not committed to being a continuously developing and learning organization is unlikely to optimize their supply chain (Mengesha, 2023).

Finally, regulatory challenges are significant obstacles to the efficiency of SCM. In fact, the pharmaceutical industry in Ethiopia is highly regulated, and therefore, high costs are associated with compliance and quality control (Abaku et al., 2023). Additionally, the time required to complete and the inefficiency of the process to comply with regulations negatively impacts the production plan and product output (Tesfaye & Bekele, 2022).

If the challenges facing SCM in EPHARM are left unaddressed, they will remain as impediments to the realization of both the operational and strategic objectives of EPHARM. Inadequate SCM practices in material procurement, production and distribution can lead to increased costs, decreased service performance and a decrease in the competitive position of the pharmaceutical industry (Baisa et al., 2023). Stock outs or overstocked situations caused by ineffective SCM practices can also inhibit access to medications needed by patients in Ethiopia, which is a major goal of improving public health (Gebremariam & Solomon, 2022).

Therefore, the existing gaps in knowledge suggest that the need now exists to examine the relationship between SCM practices and organizational performance in EPHARM. The question to be addressed by this research is whether the practices of supplier management, customer management, and information sharing positively influence operational efficiency,

cost-effectiveness and customer satisfaction in EPHARM. By addressing this void in knowledge, this research provides some actionable recommendations for improving SCM techniques so that the pharmaceutical supply chain in Ethiopia can be improved to the point where it becomes strong and efficient.

1.3. Objectives of the study

1.3.1. General objective

To examine the effect of supply chain management practices on organizational performance at Ethiopian Pharmaceutical Manufacturing (EPHARM).

1.3.2. Specific objectives

1. To examine the effect of supplier management practices on organizational performance at EPHARM.

2. To assess the effect of customer management practices on organizational performance at EPHARM.

3. To evaluate the effect of quality information sharing on organizational performance at EPHARM.

4. To analyze the effect of Internal operation on organizational performance at EPHARM.

1.4. Significance of the study

The importance of this study is to connect the gap in knowledge related to the impacts of supply chain management practices on organizational performance within the Ethiopian pharmaceutical sector. The Ethiopian pharmaceutical industry has several problems, including regulatory changes, market competition, and supply chain disruptions; therefore, understanding these problems via empirical research provides a great opportunity for insight. This research will provide information to decision makers at Ethiopian Pharmaceutical Manufacturing (EPHARM) and other similar firms regarding best practices in supply chain management, which would lead to increased operational efficiency and greater organizational performance. This research contributes to the current body of knowledge and could be used as a foundation for future academic or practitioner-based research into the dynamics of supply chains in developing countries.

This research will have value to a greater number of people, in particular to the many stakeholders at different levels (decision-makers, regulators) who will use this information as well as the suggestions provided in this study to develop an appropriate environment for the manufacture of pharmaceuticals under the suitable regulatory conditions. The evolving supply chain practices are an example of how the new approaches to the supply chain will positively affect the healthcare sector and the entire system by ensuring that the two aspects of medicine availability (production/delivery) are carried out in the most efficient and effective manner possible. Therefore, these new approaches to supply chains will be the primary drivers of positive impacts on public health through their support of making sure that there is product availability at the time it is required by the marketplace.

The value of this study lies within its focus toward sustainable business practices, particularly from an operational perspective for the pharmaceutical manufacturing industry. Given the growing importance placed upon supply chain management in the context of sustainability (such as the environment and ethics), this study will identify how well-planned and well-executed supply chain strategies may be utilized as leverage for sustainable organizational performance. Through providing a more detailed examination of such a phenomenon within the Ethiopian case, this study is designed to encourage corporations to move beyond typical corporate objectives and adopt socially responsible and environmentally sustainable strategies in their supply chain operations.

1.5. Scope of the study

This study examined, in a conceptual manner, the impact on organizational performance of different Supply Chain Management (SCM) practices based on various theoretical models. Four major SCM practices are defined: supplier management, customer relationship management, information sharing, and operational effectiveness. This study analysed each of these factors through the example of EPHARM to illustrate potential benefits to the firm resulting from the implementation of a specific practice. A broad literature review identified and correlated the research framework with existing theory to establish the basis for relating the findings of this study to the broader body of knowledge regarding SCM and performance.

The study focused on Ethiopian Pharmaceutical Manufacturing (EPHARM) from a geographic standpoint, as it is one of the major pharmaceutical manufacturing companies within Ethiopia. This was helpful for the study, as it would allow for an in-depth review of

the company; however, if the study had focused on the entire pharmaceutical manufacturing industry in Ethiopia, this would likely have been impossible. The study of the specific problems associated with the Ethiopian pharmaceutical manufacturing industry made it possible for the study to gather substantial information, as the issues affecting the pharmaceutical manufacturing industry in Ethiopia are distinct.

The methodology for this study is based upon a mixed-methods approach that utilizes the strengths of both qualitative and quantitative approaches as a means to provide a complete picture of how supply chain management influences organizational performance. A quantitative approach used surveys to gather data from a representative sample of the employee population of the organization, and a qualitative approach was used through the collection of interview data to obtain additional information. Given the complexity of the supply chain process involved within the pharmaceutical industry, the use of the mixed-methods approach was an appropriate choice for addressing these complexities.

1.6 Organization of the thesis

The research was divided into five chapters. Chapter one provided an overview of this study by reviewing the background information, defining the problems, explaining the research question(s), and explaining the objectives of this study. Chapter two reviewed the literature. This review briefly explained the previous studies relative to the study being conducted. Chapter three described the research design and methodology. All of the designs and methodologies that were used are included in this area. Chapter four discussed and analysed the results of the data collected. Finally, Chapter five outlined the results from the analysis of the data collected and made some recommendations.

1.7. Definition of terms

Supply Chain Management (SCM) practices

In this study, supply chain management practices refer to the coordinated activities undertaken by EPHARM to manage supplier relationships, customer interactions, information flows, and internal operations. These practices are measured using multiple questionnaire items rated on a five-point Likert scale ranging from “strongly disagree” to “strongly agree.” Specifically, 10 questionnaire items measure each dimension, each rated on a 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree).

Supplier Management

Supplier management refers to the extent to which EPHARM effectively selects, evaluates, collaborates with, and maintains long-term relationships with suppliers. In this study, supplier management is measured using 10 questionnaire items rated on a 5-point Likert scale, including items such as "Our organization has established strong relationships with key suppliers" and "Supplier selection criteria are well-defined and consistently applied", capturing supplier reliability, quality consistency, communication effectiveness, and partnership orientation.

Customer Management

Customer management refers to the practices employed by EPHARM to understand customer needs, manage relationships, handle feedback, and ensure customer satisfaction and retention. In this study, customer management is measured using 10 questionnaire items rated on a 5-point Likert scale, including items such as "We actively gather feedback from customers to improve our products and services" and "We maintain strong communication channels with our customers", assessing responsiveness, service quality, complaint handling, and customer relationship management effectiveness.

Quality of Information Sharing

Quality of information sharing refers to the accuracy, timeliness, adequacy, and relevance of information exchanged among supply chain partners at EPHARM. This variable is measured using 10 questionnaire items rated on a 5-point Likert scale, including items such as "The information shared within our supply chain is accurate and reliable" and "We have established standards for the quality of information shared", related to information transparency, real-time data sharing, communication frequency, and information reliability.

Internal operation

Internal operation refer to the effectiveness of EPHARM's internal processes, including production planning, inventory management, warehousing, and logistics coordination. In this study, internal operation is measured using 10 questionnaire items rated on a 5-point Likert scale, including items such as "Our supply chain processes are well-documented and

standardized" and "We continuously monitor and improve our internal operations", that assess process efficiency, resource utilization, workflow coordination, and operational flexibility.

Organizational Performance

Organizational performance refers to the extent to which EPHARM achieves its operational and strategic objectives. In this study, organizational performance is measured using both financial and non-financial indicators, including operational efficiency, customer satisfaction, profitability, cost reduction, and overall effectiveness, as assessed using 10 questionnaire items rated on a 5-point Likert scale, including items such as "Our organization meets its supply chain performance targets consistently" and "The supply chain contributes significantly to overall profitability."

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. The Concept of Supply Chain Management (SCM)

Supply Chain Management (SCM) refers to all the processes or activities involved in acquiring raw materials for processing into finished goods and then delivering those finished goods to customers. SCM encompasses the planning and control of the flow of goods, services and related information and financial flows from the supply organization to the final customer and all other parties in between, as defined by (Mentzer et al., 2001). SCM encompasses a number of different processes including the planning of routes; as defined by (Queiroz et al., 2020), and the planning of streams to streamline a variety of different business processes throughout the Supply Chain (SC); as defined by (Lambert and Enz, 2000). SCM encompasses the practice of managing the entire Supply Chain (SC) process to deliver products in an effective manner, as defined by Chopra and Meindl, 2019. Additionally there are many new or modern concepts of SCM that suggest SCs should be agile as defined by Ivanov, 2020, and agile as defined by (Queiroz et al., 2020). This is particularly important in the Pharmaceutical Industries.

The historical developments in SCM have been characterized by advances in technology and shifts globally. For example, initially SCM was primarily focused on logistics, transportation, and warehousing. However, with the advent of computer technology, the focus began to shift toward managing the flow of information within the supply chain. These advances in computer technology have enabled companies to improve their forecasting, monitor their supply chains in real time, and make decisions quickly and effectively (Dash et al., 2019). More recently, the focus has shifted away from simply managing logistics and toward developing overall strategic approaches that include multiple aspects of function and coordination across various groups located geographically around the world. Advances in newer technologies including cloud computing, IoT, and blockchain have revolutionized the concept of SCM and have greatly enhanced the efficiency of the supply chain network (Grover et al., 2024).

SCM is of great importance in manufacturing industries like the pharmaceutical industry for achieving efficiency. SCM is important to improve efficiency and reduce costs (Ashraf,

2024), but pharmaceuticals are strictly regulated and are responsible for the delivery of critical medicines and vaccines around the world. Thus SCM plays an important role in providing consistent access to pharmaceuticals for people all over the world and has a direct impact on public health. The WHO (2016) stated SCM is important because it allows the availability and reliability of medicines and vaccines to people around the world, which directly impacts public health. Companies that optimized their SCM functions have improved their ability to respond to changes in efficiency and therefore are able to improve the overall efficiency of their organization.

The practices of SCM are related to both operational and organizational performance, in that they contribute to lower operating costs through improved quality and customer satisfaction. Yang et al. (2021) found that using just-in-time inventory management and making a strategic partnership with suppliers will improve lead time and the manufacturing process. Thatte et al. (2013) have provided evidence for the competitive advantage from efficient use of SCM in a business. Yang et al. (2021) also found that the use of just-in-time inventory management and strategic partnerships with suppliers are effective in improving the costs involved with the business operations and the ability of the business to be responsive to changes in the marketplace, thus providing the necessary relationship between SCM practice and business success.

Collaboration among team members in each stage of the supply chain process is very important for companies to be successful. This partnership in the supply chain will help reduce risks and enhance flexibility (Sreedevi & Saranga, 2017). In addition, a pharmaceutical manufacturer that partners with their supplier can increase the quality of materials they use to produce products and also develop new products through innovation. Additionally, the strategic alliance with the distributor(s) can assist the company with increasing its penetration into the market and improving its customer service level(s) (Grant, 2024). Often relationships in SCM are defined by three things: trust, reciprocity, and transparency (Grant, 2024).

Technology has become increasingly critical in helping businesses manage their supply chains. Technologies such as ERP systems, barcoding, RFID, and blockchain technology have been used in managing supply chains. These technologies improve visibility, enhance decision-making, and create an environment in which a business can make better decisions

about the operation of their supply chain (Grover et al., 2024). As such, through the use of these technologies, manufacturers can respond more effectively to disruptions in the shipping process and respond faster to changes in consumer demand (Grover et al., 2024).

Furthermore, improved information flow throughout a supply chain can assist in creating a more effective predictive model, thereby reducing the likelihood of the bullwhip effect. This is essential in ensuring adequate levels of inventory at all times (Barlas & Gunduz, 2017). Manufacturers must understand the various challenges and pressures associated with the management of their supply chains to ensure success. Political instability, government regulation, and the lack of infrastructure can all present challenges to the effective management of supply chains (Debela, 2013). However, those organizations that implement agile supply chain strategies will be able to withstand the challenges of supply chain management and ensure their supply chain remains resilient.

In conclusion, supply chain management is becoming an indispensable component of increasing the operational efficiency of the pharmaceutical manufacturing industry. The synergy created by combining logistics, procurement, and relationship management components of SCM is instrumental in achieving optimal SCM performance in meeting demand in the marketplace (Ashraf, 2024). Each pharmaceutical manufacturing company's ability to achieve success is contingent upon the level of success it achieves in managing its supply chain management.

2.1.1. Dimensions of Supply Chain Management

Dimensions of SCM are numerous and represent a vast range of connected functions and processes designed to improve the movement of products, information, and money throughout the supply chain network. These include, but are not limited to, supply chain planning, sourcing, procurement, manufacturing, inventory management, logistics and distribution, and customer relationship management (Christopher, 2016). As each of the individual dimensions provides significant value to the total supply chain (i.e., efficiency, effectiveness, and responsiveness), recent research has identified sustainability, risk, and digital transformation as increasingly relevant dimensions of SCM (Ivanov, 2020).

Supply chain planning is one of the key areas of SCM optimization and relates to demand forecasting, capacity planning, and sales and operations planning (S&OP) (Stadtler, 2015). Demand forecasting is essential to allow companies to forecast future customer demand and

thus prevent shortages or overstocking. Capacity planning is required to confirm whether the company has sufficient capacity to meet the predicted demand (Shapiro et al., 2018).

Sales and Operations Planning involves various activities that align production, inventory, and distribution decisions based on expected future demand.

Sourcing and procurement is a major area in SCM and is comprised of the identification of suppliers, contracting with suppliers and maintaining relationships with suppliers (Monczka et al., 2016). Proper sourcing will result in products and services arriving at an organization at the lowest possible price and in the shortest possible time while providing the highest possible level of product quality (Mishra et al., 2021).

Production is the conversion of raw material into finished products via manufacturing, assembly and packaging. Production entails planning; allocating resources and quality assurance to ensure the most efficient usage of resources and minimizing waste (Stevenson, 2018). Companies may apply the concept of lean manufacturing to their production processes to achieve improvements in lead time and quality (Womack & Jones, 2003).

Another major component of ERP is inventory management which guarantees that the correct amount of inventory arrives at the correct location at the appropriate time (Silver et al., 2016). Inventory management entails controlling inventory levels, inventory control and inventory turn-over rates. An effective inventory system will enable companies to minimize inventory expenses and ensure that the product is available to the customer when they request it (Coyle et al., 2013).

Logistics and Distribution encompass the movement of products from suppliers to manufacturers; from manufacturers to wholesalers/distributors; and ultimately to the end-user (Rushton et al., 2017). Logistics is comprised of the movement of products via transportation; storage; fulfilling customer orders; and reverse logistics. Practices of logistics excellence enable companies to ensure timely delivery of products to customers; in good condition; and at the lowest possible cost (Bowersox et al., 2018).

Customer Relationship Management (CRM) refers to the process of managing customer relations and interactions (Payne & Frow, 2005). CRM provides companies with the knowledge of customer requirements and delivers quality customer service and builds lasting business relationships (Gupta et al., 2013). CRM also enables companies to design

customized products and services to meet specific customer needs, leading to increased customer satisfaction and loyalty (Gupta et al., 2013).

Current studies emphasize the growing importance of sustainability as an SCM dimension (Carter & Easton, 2011). Sustainability in SCM represents environmentally responsible practices; socially responsible practices and economically viable practices (Seuring & Müller, 2008). Organizations engage in environmentally responsible practices (such as reducing waste; utilizing renewable energy; purchasing green materials); socially responsible practices (such as fair labour practices; fair employment practices) and economically viable practices (such as increasing revenue; reducing operational costs) (Sarkis, 2003).

Risk management is also an important dimension of SCM and is concerned with the identification and mitigation of disruptions to the supply chain (Manuj and Mentzer, 2008). Examples of disruptions include natural disasters; geopolitical issues; supply chain failures; and market volatility. Companies can mitigate supply chain risks by using supply chain redundancy and diversifying their supply base (Zsidisin et al., 2004).

Digital Transformation is a new and rapidly evolving trend in SCM where technology such as cloud computing; the Internet of Things and blockchain are used to enhance supply chain visibility; efficiency and transparency (Grover et al., 2024). Digital transformation includes the utilization of data analysis; automation and tracking systems to create better decision-making and improve supply chain operations (Ross, 2018).

Each dimension of SCM is interdependent and thus cannot be managed in isolation. Contemporary SCM is therefore the management of multiple dimensions in order to create optimal flows of goods, information and funds and thereby to maximize the performance of the entire supply chain.

2.1.2. Definitions and Concepts of Organizational Performance

Organizational performance is the ability of an organization to achieve its goals in terms of effectiveness and efficiency. As a large field, organizational performance looks at how successful an organization has been in meeting the needs of its stakeholders using its available resources or adapting to its environment (Richard et al., 2009). Organizational performance can be viewed in many ways (i.e., financially, operationally, or strategically) (Neely et al., 2005). The methodology and definitions associated with organizational

performance continue to evolve; however, there is a greater emphasis being placed on those items that are not financial, i.e., customer satisfaction, employee engagement, sustainability, etc. (Kaplan & Norton, 1996).

The financial component of organizational performance is one of the most important factors in determining whether an organization is successful in its operations. The financial aspects of an organization measure the organization's profitability (such as return on investment and revenue growth rate), the organization's profit-making abilities (such as net profit margin), the organization's cost management (such as return on assets), and ultimately the value provided to the organization's shareholders (through earnings per share and the organization's stock price) (Brigham & Ehrhardt, 2016). The organization's financial ratios (i.e., net profit margin, return on assets, and earnings per share) provide evidence of the organization's profit-making capabilities, its cost management, and the organization's stock price performance for shareholders (Brigham & Ehrhardt, 2016). All of these financial ratios are calculated quantitatively to measure an organization's financial performance and success (Geringer & Herbert, 1989).

Operational effectiveness focuses on the operating efficiency of internal business processes, for example, production and delivery, as well as supply chain management, while assessing the performance of these processes through cycle time, inventory turns, and response rates (Slack et al., 2010). Improving these processes can be successful in reducing cost and improving both the quality of a product as well as customer satisfaction (Melnyk et al., 2004). A company's ability to achieve operational excellence will ultimately determine whether it is able to compete successfully (Hayes & Wheelwright, 1984).

Performance at a strategic level is defined as the measurement of an organization's success toward the achievement of their long-term goals or objectives. In order to measure the strategic performance of an organization, Porter (1985) states that an organization should focus on achieving market share, increasing client satisfaction, and developing innovative products or services. Therefore, in order for an organization to achieve performance with regard to its strategic plan, it must be able to adapt to changing conditions within the environment of the business and to meet the ever-changing needs of its clients and customers and produce innovative products and services (Drucker, 1954).

The performance of an organization extends beyond the traditional measures of success; in addition to customer satisfaction, employee engagement, and corporate social responsibility (CSR), performance also measures other important metrics such as employee engagement (Kaplan & Norton, 1996). The satisfaction of the customer is typically determined through surveys, and it is a key factor in measuring whether the organization can provide consumers with what they want (Lämsä, 2018). Employee engagement refers to the degree to which employees are committed to the organization, which is critical to the overall productivity of an organization (Harter et al., 2002). CSR assesses whether the organization conducts its business activities in an ethical manner, which contributes to enhancing its reputation (Carroll, 1979).

2.1.3. Measuring Organizational Performance

Organizational performance measurement is vital to determining whether your organization is achieving its desired outcomes and effectively accomplishing its mission and objectives. Performance measurement entails obtaining data about your organization and making judgments regarding areas within your organization where there are opportunities to improve performance. Therefore, the use of performance measures is essential to the assessment of organizational performance (Neely et al., 2005).

A performance measurement system is a structured method for organizations to evaluate themselves in multiple aspects, including but not limited to finance, operations, and strategy (Kaplan & Norton, 1996). To create a performance measurement system, each aspect of an organization must have its own unique measures (Eccles, 1991).

Financial Performance Ratios are utilized to assess an organization's financial performance and are typically categorized into three types: profitability ratios, growth ratios, and return on investment ratios (Brigham & Ehrhardt, 2016). Financial performance ratios are essentially monetary-based measurements of how well an organization has managed costs and produced earnings for shareholders (Geringer & Herbert, 1989). Examples of financial performance ratios include net profit margins, return on investment ratio, and earnings-per-share ratio.

While financial performance ratios provide valuable insight into an organization's profitability and can be useful in decision-making, the evaluation of an organization based solely on its financial performance provides limited information.

Operational Performance Indicators (OPIs) measure and analyse an organization's internal processes in terms of efficiency and effectiveness of the production, logistics, and supply chain management functions (Slack et al., 2010). OPIs include production cycle time, inventory turnover rate, order fulfilment rate, and defect rate. Organizations that implement and manage operational systems efficiently can expect to save costs and improve the quality of their products and services, ultimately leading to satisfied customers (Melnyk et al., 2004).

The implementation of process improvements and the utilization of various tools to enhance organizational efficiency can positively affect an organization's operations.

Customer metrics are utilized to assess an organization's customer satisfaction, customer loyalty, and customer retention levels. Customer satisfaction is assessed through customer surveys, customer feedback, and customer ratings. Customer loyalty is defined as the number of repeat purchases made by customers and customer lifetime value and is an indicator of an organization's ability to retain its customers. Higher levels of customer satisfaction lead to higher rates of customer repeat business and referrals.

Employee metrics are used to measure the degree of employee engagement, employee satisfaction, and employee productivity. Employee engagement is measured using employee surveys and employee feedback processes, which measure the degree of employee commitment and participation. Employee satisfaction is defined as the degree to which employees are satisfied with their work, while employee productivity is defined as the amount of money or output generated by employees (Harter et al., 2002). As employee engagement increases, so too do employee productivity and organizational performance.

Strategic performance measures are utilized to measure the ability of an organization to achieve its long-term goals and objectives. Strategic measures commonly employed in organizations include market share, innovation, and sustainability (Kaplan & Norton, 1996). A company's market share is how much of the market a company controls compared to its competition. Innovation is when companies come up with something new such as a product or service (Drucker, 1954). Sustainability is defined by the social responsibility of an organization to be environmentally conscious and socially responsible (Carroll, 1979).

In addition to measuring the effects of an organization's actions, it is equally as important for an organization to utilize frameworks or guidelines when developing an approach to measure the performance of an organization to ensure that the performance of the organization is

accurately reflected. One example of a framework or guideline that organizations can utilize to develop an approach to measure the performance of an organization is the Balanced Scorecard developed by Kaplan & Norton (1996). The Balanced Scorecard enables an organization to establish goals and objectives that will enable the collection of data related to the strengths and weaknesses of an organization.

2.1.4. The Relationship between Independent and Dependent Variables

Understanding the relationship between the independent variable and the dependent variable is essential to understanding the relationship between SCM practices and the results of organizational performance. As research is conducted, the independent variable represents the variable manipulated in an attempt to determine its impact upon the dependent variable, which is the variable being measured (Shadish et al., 2002). Studying the independent variable provides insight into the manner in which SCM practices provide the greatest impact upon organizational outcomes (Sekaran & Bougie, 2016).

Examples of independent variables in the area of SCM would generally include many of the practices that organizations implement to enhance their position within the global marketplace, including building strong strategic relationships with suppliers, developing collaborative relationships with them, implementing technological solutions, and managing inventory levels. Examples of independent variables would include establishing collaborative relationships with suppliers, using technology to facilitate real-time communication with suppliers, and/or creating just-in-time (JIT) inventory systems (Monczka et al., 2016; Grover et al., 2024).

Dependent variables are organizational performance measures. These measures may include financial metrics (revenue growth, profit margins), process improvement metrics (lead time, production costs), and customer-centric metrics (satisfaction, market share) (Neely et al., 2005; Richard et al., 2009).

The objective is to understand how the variation in the independent variables (SCM practices) impacts changes in the dependent variables (organizational performance metrics). Relationships between the independent and dependent variables may be identified using several theoretical frameworks. The resource-based view theory suggests that the utilization of an organization's unique supplier base and/or utilizing superior technology will result in a competitive advantage, ultimately leading to enhanced organizational performance (Barney,

1991). Therefore, the independent variables (use of SCM strategies) have a direct impact upon the dependent variables (the level of performance of the organization). Similarly, according to the Information Processing Theory, the ability of an organization to utilize and process supply chain information will reduce uncertainty, improve decision-making, and ultimately improve performance (Galbraith, 1973).

To identify the type of relationship between the independent and dependent variables, a causal link must exist. Regression Analysis can be used to describe the type of relationship between the independent variable(s) and the dependent variable (s). Regression Analysis can also be used to determine whether the independent variable(s) have a positive relationship with the dependent variable and the strength of that relationship. Additionally, regression analysis will permit consideration of other variables that may influence the relationship between the independent variables and the dependent variable. Correlation analysis is used to evaluate the magnitude of the co-relationship between the independent and dependent variables (Field, 2018).

However, the relationship between the independent variables and the dependent variables is not always directly related. Other variables, such as mediation variables and moderating variables, may affect the relationship between the independent and dependent variables. Mediation variables help explain how an independent variable affects a dependent variable. An example includes the effect of information sharing (independent variable) on customer satisfaction (dependent variable) through the response of the organization to customers (mediation variable). Moderating variables represent the conditions under which an independent variable affects a dependent variable. An example includes the effect of the adoption of new technologies (independent variable) to increase operational efficiency (dependent variable) through employee training (moderation variable).

2.1.5. Effect of Independent Variables on Dependent Variable

In the context of Supply Chain Management (SCM), the study of the independent variables' impact on the dependent variables relates to the effect that various SCM practices have on the performance of the organization. Understanding how the independent variables will positively or negatively affect the dependent variables will enable the company to determine which SCM practices are most important to achieve maximum positive changes in performance.

Independent Variable(s)(also referred to as SCM Practice): The independent variable(s) refer to different SCM practice(s), for example Supplier Relationship Management (SRM), Technology Adoption, Information Sharing, Inventory Management, and Logistics Optimization (Chopra & Meindl, 2019). For example, managing your relationships with Suppliers effectively means developing a long term, collaborative relationship with suppliers (Monczka et al., 2016). This relationship provides a better quality product at a lower cost than competitors and enables faster response to changing market conditions. The use of technology, including the use of Enterprise Resource Planning (ERP) Systems, Radio Frequency Identification (RFID), and Blockchain, improves the visibility of the entire supply chain (Grover et al., 2024). This increases the accuracy of inventory positions and enables decision-making between all parties (Kumar & Kiran, 2018). It optimizes inventory positions and enables the organization to make accurate predictions of future market demand (Coyle et al., 2013). Finally, it ensures that goods are delivered to customers at the lowest possible cost while ensuring the quickest delivery time (Rushton et al., 2017).

Dependent Variable Measures of Organizational Performance: Dependent variable(s) measure an organization's performance in terms of three areas of performance: Financial, Operational, and Customer (Neely et al., 2005; Richard et al., 2009). The financial area includes metrics of financial growth, profit margin, Return on Investment (ROI), and market share. The operational area includes metrics of production cycle time, inventory turnover, order fulfilment, and defect rate (Melnyk et al., 2004). The customer area includes metrics of Customer Satisfaction, customer loyalty, customer satisfaction, and market share. The objective is to investigate how the independent variable(s) (SCM practices) influence the performance of an organization in one or all of these areas of performance.

There exists evidence of the connection between SCM and financial performance. In particular, the organizations that efficiently manage their SRM can see an increase in their profit margins and ROI due to cost savings and improved efficiency (Nair et al., 2021). Furthermore, organizations that implement technologies, such as ERP, can improve their financial performance, resulting in cost savings (Golinska et al., 2019). The studies indicate that investments made by organizations in various technologies, such as ERP, can lead to improved financial performance, according to Raut et al. (2020). Additionally, SCM practices affect the operational effectiveness of the firm. For example, SCM practices that optimize inventory management (i.e., the use of Just-in-Time (JIT) inventory systems) improve the

production cycle times, which subsequently improves operational effectiveness (Chowdhury & Khatun, 2020). Moreover, SCM practices that optimize logistics improve the rate of fulfilling orders, which consequently improves customer satisfaction (Mentzer et al., 2001).

Finally, SCM practices significantly affect the customer-related outcomes. SCM practices, such as the adoption of demand forecasting and supply chain network architecture, can improve an organization's performance regarding its customers' expectations about the availability of products, leading to higher levels of customer satisfaction and loyalty (Aamer et al., 2021). The sharing of information within the supply chain can enable an organization to meet the needs of its customers more quickly (Kumar & Reinartz, 2016).

There could be many connections between the independent variables and the dependent variables, and there could be many other factors influencing these connections, which are referred to as mediators and moderators in research literature (Baron & Kenny, 1986). For example, the adoption of technology (e.g., ERP systems) can be an independent variable, and the operational efficiency of the organization can be a dependent variable. However, this relationship between the two can be mediated by the sharing of information within the organization (e.g., information sharing) and moderated by employee training (Gunasekaran et al., 2006).

2.2. Empirical literature review

Effective supply chain management practices, including those such as supplier integration and demand forecasting, which were identified by Yu et al. (2013) as having an association with improved organizational performance factors such as profit, customer satisfaction, and productivity, play an important role in the pharmaceutical manufacturing industry, where the industry's delivery needs, regulatory requirements, and complexity of supply and distribution channels are well documented by Kumar et al. (2009).

As well as enabling an organization to gain profit, supply chain agility has an additional importance in relation to enabling an organization to react to changes within the marketplace; this was also emphasized within the literature. Ghatari et al. (2013) explain that the incorporation of agile characteristics into supply chains within the pharmaceutical industry will lead to significant improvements in service levels and customer satisfaction. Furthermore, they propose that agility acts as a mediator in SCM practices and performance results because organizations that apply agility to their supply chains are able to adapt to the

potential market fluctuations and challenges present within market environments generally and thereby achieve higher overall organizational performance (Mishra et al., 2024).

Increasingly, the adoption of sustainable SCM practices has been noted within the recent literature, and authors have investigated how the adoption of environmentally and socially sustainable SCM practices impacts organizational performance. Organizations that adopted sustainable processes, such as environmentally sustainable procurement and waste reduction, demonstrated higher organizational performance than those who did not, according to a study by Fernando et al. (2022). This emphasizes the growing requirement to incorporate sustainable development principles into SCM in order to increase SCM-generated competitive advantage and not just as a compliance obligation.

Another important factor is the role of information sharing within the supply chain. As Koçoğlu et al. suggest, "the global communication/data sharing within the supply chain can result in greater synchronization of activities and therefore greater operational performance." In addition, the ability for "real-time data exchange" within the pharmaceutical industry has been shown to "reduce lead times, reduce stockouts, and provide greater effectiveness in inventory and ocean shipping management and optimization." The authors conclude, "Those organizations, regardless of whether they are for-profit or non-profit, that develop collaborative/trusting relationships with partners in their supply chains are most likely to prosper in unstable market environments."

Finally, the use of technology in SCM practices has been identified as another important theme in SCM. As Khan et al. (2021) note, the application of technologies such as artificial intelligence, big data, and blockchain technology could potentially cause a paradigm shift in SCM practices, as these technologies could assist in improving the decision-making processes in SCM. Using technology, pharmaceutical companies could respond to their supply chain performance by improving their operations.

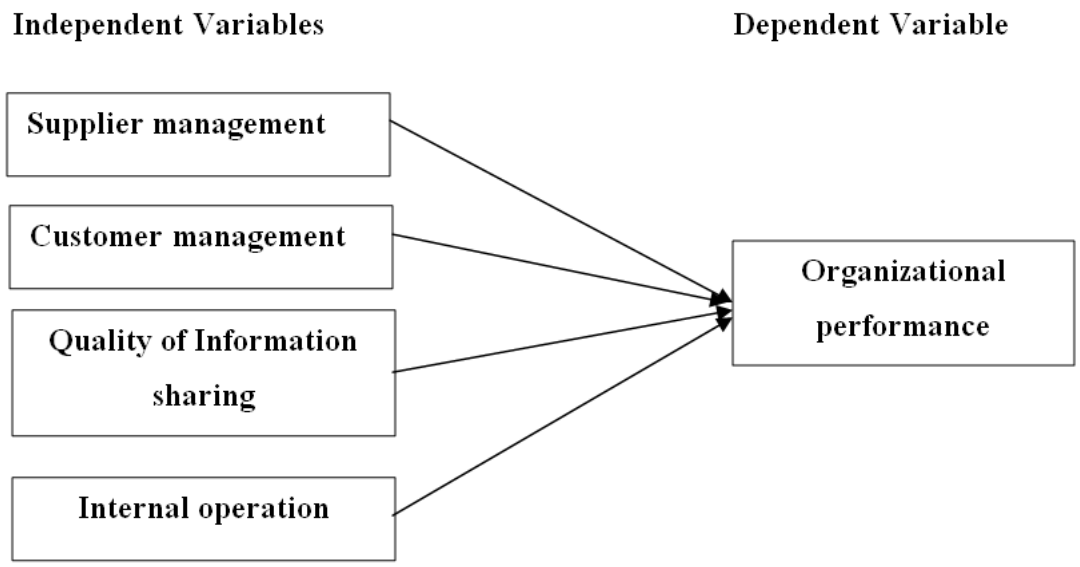
Despite the evidence in the literature regarding the positive impact of efficient SCM practices on organizational performance, differences in context should not be overlooked. For example, in Ethiopia, the developing market conditions combined with infrastructural limitations require alternative SCM solutions. A recent study conducted by Bilal et al. in 2024 highlights that pharmaceutical companies in Ethiopia face challenges in obtaining access to modern

technology, in addition to limited transport infrastructure. Innovative SCM solutions are required based on the context in order to maximize performance.

Additionally, the focus on the human element of SCM practices has gained increasing recognition. Ellinger & Ellinger (2014) highlight that the competence of employees of a supply chain also has a significant impact on the execution of effective SCM practices. Notably, in the Ethiopian pharmaceutical industry, improving employee capability would have a positive effect. Employee skill upgrades through continued professional development would enable the employees to effectively execute the practices implemented for them.

2.3. Conceptual framework

Figure 1: Conceptual framework



Source: Adapted by the Researcher

2.4. Research hypotheses

H1: Supplier management practices have a positive significant effect on organizational performance at EPHARM.

H2: Customer management practices have a positive significant effect on organizational performance at EPHARM.

H3: Quality information sharing has a positive significant effect on organizational performance at EPHARM.

H4: Internal operation have a positive significant effect on organizational performance at EPHARM.

2.4.1 Supplier Management and Organizational Performance

Supplier management is widely recognized as a critical component of effective supply chain management that directly influences organizational performance. Empirical studies indicate that organizations with strong supplier relationships benefit from improved input quality, reduced procurement costs, and enhanced operational reliability (Munir et al., 2020; Kagande et al., 2022). In the pharmaceutical manufacturing context, effective supplier collaboration is particularly important due to stringent quality requirements and regulatory standards.

However, existing studies also reveal contextual limitations. While supplier integration has shown strong performance effects in developed economies, its impact in developing countries is often constrained by infrastructural weaknesses, limited technological integration, and unstable supplier markets (Tesfa Marew et al., 2022). These findings suggest that the effectiveness of supplier management practices may vary depending on institutional and operational contexts.

Despite the growing body of literature, limited empirical evidence exists on how supplier management practices influence organizational performance within Ethiopian pharmaceutical manufacturing firms. This gap underscores the need for the present study, which empirically examines the effect of supplier management practices on organizational performance at EPHARM.

2.4.2 Customer Management and Organizational Performance

Customer management practices play a significant role in enhancing organizational performance by fostering customer satisfaction, loyalty, and long-term relationships. Studies have demonstrated that firms that effectively manage customer interactions and feedback mechanisms are better positioned to improve service quality and sustain competitive advantage (Udeh et al., 2024).

Nevertheless, most empirical investigations focus on service industries, with limited attention given to pharmaceutical manufacturing settings. Moreover, customer management in

regulated markets such as pharmaceuticals is influenced not only by market forces but also by compliance requirements, which are often overlooked in existing studies.

Accordingly, this study contributes to the literature by examining how customer management practices affect organizational performance within the specific regulatory and operational environment of EPHARM.

2.4.3 Information Sharing and Organizational Performance

Quality information sharing enhances coordination, reduces uncertainty, and improves decision-making across supply chain partners. Prior research indicates that timely and accurate information exchange significantly improves supply chain responsiveness and overall organizational performance (Bilal et al., 2024).

However, challenges related to data accuracy, technological capability, and trust among partners often limit effective information sharing in developing economies. As a result, the performance benefits reported in advanced economies may not fully materialize in contexts such as Ethiopia.

This study addresses this gap by empirically evaluating the effect of information sharing quality on organizational performance in Ethiopian pharmaceutical manufacturing.

2.4.4 Internal operation and Organizational Performance

Internal operation form the foundation upon which supply chain strategies are implemented. Efficient production planning, inventory control, and logistics coordination enhance organizational performance by reducing waste and improving resource utilization (Popoola, 2019).

Despite their importance, Internal operation are frequently examined as supporting activities rather than strategic drivers of performance. In pharmaceutical manufacturing, where production delays and inventory shortages have critical consequences, this oversight is particularly problematic.

The present study therefore investigates Internal operation as a key determinant of organizational performance at EPHARM.

2.5 Summary of literature and research gap

Although extensive literature exists on supply chain management practices and organizational performance, most studies are concentrated in developed economies and service-oriented industries. Limited empirical evidence is available on the pharmaceutical manufacturing sector in developing countries, particularly Ethiopia. Furthermore, prior studies often examine SCM practices in isolation rather than within an integrated framework. This study addresses these gaps by empirically examining the combined effects of supplier management, customer management, information sharing, and Internal operation on organizational performance at EPHARM.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter presents the research methodology employed to examine the effect of supply chain management practices on organizational performance at EPHARM. It describes the research approach and design, population and sampling procedures, data sources and collection instruments, methods of data analysis, and procedures used to ensure the reliability and validity of the measurement instruments.

3.2. Research approach

A mixed-methods research approach were used to include both quantitative and qualitative techniques. The mixed methods design enabled methodological triangulation, thereby enhancing the validity and reliability of the findings (Creswell & Plano Clark, 2011).

The quantitative methodology examined the relationship between supply chain management practices (supplier management, customer management, quality information sharing, and Internal operation) and organizational performance using a structured questionnaire data.

The qualitative methodology involved semi-structures interviews with selected stakeholders to explore contextual challenges and gain deeper insights into supply chain management practices within EPHARM.

The integration of quantitative and qualitative evidence is consistent with the pragmatist research paradigm, which emphasizes practical problem-solving and the application of research findings to real world contexts (Tashakkori & Teddlie, 2010). Given the dynamic nature of the pharmaceutical industry, this approach was appropriate for examining supply chain management practices at EPHARM.

3.3. Research design

This research employed both descriptive and explanatory research designs. The descriptive design was used to provide a comprehensive overview of existing supply chain management practices at EPHARM and to summarize respondents' perception using survey data.

Explanatory design was applied to examine the relationship between supply chain management practices (Supplier management, customer management, quality information sharing, and Internal operation) and organizational performance. Through multiple regression analysis, the study assessed the extent to which variations in the independent variables explain changes in organizational performance.

The integration of descriptive and explanatory designs enabled the study to describe both current practices and statistically evaluate the relationships between key variables within the Ethiopian Pharmaceutical Manufacturing context Yin (2018).

3.4. Sources and types of data

This study utilized both primary and secondary data sources.

Primary data were collected through structured questionnaires distributed to employees working in supply chain departments of EPHARM and through semi structured interviews conducted with selected managers and relevant stakeholders. The primary data provided direct evidence regarding supply chain management practices and their perceived effect on organizational performance (Bryman & Bell, 2015).

Secondary data were obtained from academic literature, industry reports, and government publications related to supply chain management and organizational performance within the Ethiopian pharmaceutical sector. These sources were used to contextualize the empirical findings and to support theoretical grounding (Saunders et al., 2019).

The combination of primary and secondary data enhanced methodological triangulation, thereby strengthening the credibility and validity of the study findings (Jick, 1979).

3.5. Instruments for the data collection

Data were collected using structured questionnaires and semi structured interview guides.

The structured questionnaire was designed to measure the key constructs of the study (supplier management, customer management, quality information sharing, Internal operation, and organizational performance). All items were measured using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5), allowing for standardized quantitative analysis (Dawson, 2009).

Semi-structured interviews were conducted with selected managers and relevant stakeholders to obtain qualitative insights into supply chain management practices and operational challenges. This format allowed participants to elaborate on contextual issues while maintaining alignment with the research objectives (Cohen & Crabtree, 2006).

Both instruments were pilot tested to assess clarity, relevance, and consistency. Based on feedback from the pilot study, minor revisions were made to improve item wording and structure. The pilot testing process contributed to strengthening the reliability and validity of the measurement instruments (Neuman, 2014).

3.6. Population of the study

The target population of this study consisted of employees working within the supply chain management department of Ethiopian Pharmaceutical Manufacturing (EPHARM), including procurement, logistics, warehousing, and distribution units. These departments were selected because their activities directly influence operational efficiency and overall organizational performance.

The total population comprised approximately 261 employees across managerial and operational levels. The inclusion of both managerial and non-managerial staff ensured adequate representation of diverse perspectives regarding supply chain management practices within the organization.

This population was considered appropriate for the study due to their direct involvement in supply chain activities and their practical knowledge of operational processes within the Ethiopian pharmaceutical manufacturing context.

3.7. Method of data analysis

Quantitative data obtained from the structured questionnaires were analysed using SPSS. Descriptive statistics, including means and standard deviations, were computed to summarize respondents' perceptions of supply chain management practices and organizational performance. Multiple linear regression analysis was then conducted to examine the effect of supplier management, customer management, quality information sharing, and Internal operation on organizational performance, and to test the study hypothesis.

Qualitative data obtained from semi-structured interviews were analysed using thematic analysis. Interview responses were systematically reviewed to identify recurring patterns and

themes related to supply chain management practices and operational challenges (Braun & Clarke, 2006).

The findings from both quantitative and qualitative analyses were integrated to provide a comprehensive understanding of the relationship between supply chain management practices and organizational performance at EPHARM.

3.8. Model specification

The conceptual framework for this research is based on the various theoretical foundations associated with Supply Chain Management and Organizational Performance. A multiple linear regression model was employed to examine the effect of supplier management, customer management, quality information sharing, and Internal operation on organizational performance.

Prior to establishing the model, an extensive review of literature concerning supply chain management practices and their impact on organizational performance was undertaken to determine the critical variables and relationships. Based upon prior theories and empirical studies, appropriate constructs were defined and operationalized. For example, supplier management practices consisted of performance evaluation measures of suppliers; while Internal operation included inventory management and production efficiency (Mentzer et al., 2001).

The general form of the Multiple Linear Regression Model was:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Where: Y = Organizational Performance (dependent variable)

X1 = Supplier Management (independent variable)

X2 = Customer Management (independent variable)

X3 = Quality of Information Sharing (independent variable)

X4 = Internal operation (independent variable)

$\beta 0$ = Intercept (constant term)

ϵ = error term

This model examines how the four SCM practice dimensions (supplier management, customer management, information sharing, and internal operations0 collectively influence organizational performance, with ϵ representing unexplained variation in the dependent variable.

3.9. Reliability and validity of the instruments

3.9.1. Reliability

Reliability was a primary factor in this study so that the data collected with the measurement tools would be consistent and strong. The reliability of the structured questionnaires was tested using Cronbach's Alpha to measure the internal consistency of the items in each area of the construct being measured (Tavakol & Dennick, 2011). If the Cronbach's Alpha is ≥ 0.7 it is considered reliable (Tavakol & Dennick, 2011): "This indicates that the items are adequately correlated to indicate that they are assessing the same construct."

Pilot testing of the questionnaires allowed the researchers to improve the reliability of the questionnaires prior to the large scale administration of the questionnaires. The researchers received feedback on their items regarding clarity, and also identified items that could have been irrelevant and therefore may have produced inconsistent response from participants (Cortina, 1993) As a result of the pilot study the researchers made changes to the instrument to ensure that the data collected would be dependable for all participants.

The reliability results indicated acceptable internal consistency for all constructs, with reliability coefficients ranging from 0.728 for Internal operation to 0.883 for quality information sharing. The overall Cronbach's alpha value for the entire questionnaire was 0.925. This higher overall reliability value was obtained by computing Cronbach's alpha across all measurement items combined. Since Cronbach's alpha is influenced by the number of items in a scale, combining multiple constructs increases the total number of items, resulting in higher internal consistency. Therefore, the overall reliability coefficient indicates that the instrument used in this study is highly reliable.

No	Variables	Cronbach's Alpha	Number of Items	Status

1	Supplier Management	0.803	10	Good
2	Customer Management	0.827	10	Good
3	Quality of Information Sharing	0.883	10	Good
4	Internal Operations	0.728	10	Acceptable
5	Organizational Performance	0.799	10	Acceptable
The overall value		0.925	50	Excellent

3.9.2. Validity

The reliability of the research tools was essential to the development of a correct and reliable image of the concepts being studied by the data. Content validity of the structural questionnaires was evaluated with the assistance of SCM and organizational performance specialists who carefully reviewed the items on each questionnaire to verify they accurately reflected the variables under review and were appropriate to the Ethiopian pharmaceutical environment (Polit & Beck, 2012).

Structural or construct validity was determined via exploratory and confirmatory factor analysis methods. The researcher analysed if the items satisfied the theoretical expectations from prior research and literature, among each other; the use of invariants relating to constructs such as supplier management, customer management, and organizational performance assisted in this process (Campbell & Fiske, 1959).

For qualitative data, the validity of the findings were enhanced via triangulation with findings from the interviews, as the results of the interviews were compared against numeric results and against existing literature. The use of such triangulation served to enhance the validity of the findings, as it allowed for a comprehensive understanding of the research problem from multiple perspectives (Denzin, 1978). Through rigorous validity assessments of both data collection tools, the study attempted to ensure that the findings provided an accurate

representation of the impact of supply chain management practices on organizational performance in EPHARM.

3.10. Ethical considerations

The study was carried out in accordance with established ethical standards, thereby protecting the rights of participants and maintaining the integrity of the research process. A key ethical concern for informed consent was central to this study; therefore, the participants were provided sufficient information regarding the objectives, methods of the research, possible risks and benefits so they could make an informed decision as to whether or not they would like to participate in the study (Creswell, 2014). Furthermore, the consent document clearly stated that it was the participants' choice whether or not to participate in the study and also that they had the right to withdraw from the study at any point in time without consequences.

Concerns regarding the participant's privacy and the confidentiality of their responses were the major considerations in the public arena. Prior to analysis, the researcher made efforts to de-identify the data to ensure the anonymity of the respondent. Additionally, the participant's confidentiality was further protected through the use of secure data storage procedures such as password protection, limiting who has access to the computer files, and storing paper files securely locked (Flick, 2018).

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1. Introduction

The purpose of this research was to determine how Supply Chain Management affects organizational performance in Ethiopian Pharmaceutical Manufacturing Organizations.

In order to draw reasonable conclusions, the primary data that was collected had to be evaluated based on the objectives and questions of this study.

Therefore, the chapter will begin with a general description of the respondents. In addition to the descriptive statistics, that were used to describe and summarize the data collected, correlation analysis and regression analysis were applied in order to identify the relationship between the variables. All numerical data have been processed by SPSS (version 27) in order to reach reliable conclusions and to develop practical implications.

All surveys were checked in order to ensure that they can be used in the evaluation process of the data. Any completed questionnaire, which has been returned without being filled-in, has been rejected, so that no data from such a form were considered in the evaluation process.

4.2. The Response rate of questionnaires

Since all studies that involve collecting data through surveys have to consider response rates, it is worth noting this study was based on primary data (therefore, data were collected from the participants), and from 261 respondents employed by Ethiopian Pharmaceutical Manufacturing there were 243 complete questionnaires returned, for a response rate of 93.1%. As a result of the high response rate, the study's results are far in excess of the typical minimum acceptable level; consequently, the results are highly reliable and indicative of the population as a whole.

As per Mugenda (1999), a response rate of 50% is adequate, 60% is good, and 70% and above is considered excellent to be able to generalize the findings to the whole population.

4.3. General information about respondents

General Information about Respondents		Frequency	Percentage
Age	18–24 years	25	10.3%
	25–34 years	102	42.0%
	35–44 years	65	26.7%
	45–54 years	34	14.0%
	55 years and above	17	7.0%
	Total	243	100%
Gender	Male	135	55.6%
	Female	108	44.4%
	Total	243	100%
Educational Background	Diploma	50	20.6%
	Bachelor's Degree	130	53.5%
	Master's Degree	58	23.9%
	Other	5	2.0%
	Total	243	100%
Years of Experience in Supply Chain Management	Less than 1 year	30	12.3%
	1-3 years	90	37.0%
	4-6 years	70	28.8%
	7-10 years	40	16.4%
	More than 10 years	13	5.3%
	Total	243	100%
Job Role in Supply Chain Management	Procurement Specialist	60	24.7%
	Logistics Coordinator	71	29.2%
	Warehouse Manager	49	20.2%
	Supply Chain Analyst	43	17.7%
	Other	20	8.2%
	Total	243	100%

Source: Survey data, 2025

In terms of demographic characteristics, most of the respondents within each of the different occupation groups fall into the 25-34 years (42.0%), followed by 35-44 years (26.7%) and then 18-24 years (10.3%), while 21.7% were aged 45 or older. Therefore, the organization has a fairly diverse age profile.

The sample also showed a slight preponderance of males since there were slightly more males (55.6%) than females (44.4%) among the respondents. The above gender distribution can be considered as an example of the gender structure of the company and could provide an insight to gender- related differences in salaries in the Supply Chain Management Division of Ethiopian Pharmaceutical Manufacturing.

Regarding the background education of the respondents, their knowledge of SCM practices is heavily influenced by their education backgrounds. Over half of the respondents (53.5%) hold a Bachelor's Degree, and therefore have a high level of education; 23.9% have a Master's Degree; and 20.6% have a Diploma; so the sample has a high level of qualification overall, but the variation in qualification suggests that the organization contains a wide range of competency levels, and these variations could be influencing how the respondents perceive and engage in SCM.

Lastly, the respondents vary in terms of the number of years they have been engaged in SCM; the majority of respondents (37.0%) have worked in SCM for 1-3 years. The majority of the respondents appear to represent a young, but active, supply chain workforce. Only 12.3% of respondents have less than 1 year of experience; 28.8% have 4-6 years of experience; 16.4% have 7-10 years of experience; and a very small percentage (5.3%) have more than 10 years of experience; this implies that the organization encompasses a variety of competencies and this diversity could affect how the respondents view and participate in SCM.

Finally, the respondents' job title in SCM are illustrated in Figure 1B and demonstrate a wide variety of functions that contribute directly to the organization's performance. These include 24.7% Procurement Officers; 29.2% Logistics Coordinators; 20.2% Warehouse Managers; and 17.7% Supply Chain Analysts. The remaining 8.2% are identified as "other" and presumably comprise a diverse mix of jobs. As all of the roles have responsibilities for aspects of the supply chain, this diversity will provide a rich source of data from multiple viewpoints regarding the supply chain management practices within the organization.

4.4. Descriptive analysis

The purpose of the study includes examining the impact of supply chain management practices upon organizational performance of Ethiopian Pharmaceutical Manufacturing. Following an extensive review of literature and preliminary analysis, respondents evaluated the degree to which each of the 40 important issues (divided into 4 categories) affects organizational performance. As illustrated in chapter 3, a 5 point liker scale was utilized for rating purposes, where

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

Table 1: Interpretation Criteria for Mean Scores on a 5-Point Likert Scale

Likert Mean Range	Interpretation
1.00 – 1.80	Very Low/Strongly Disagree
1.81 – 2.60	Low/Disagree
2.61 – 3.40	Moderate/Neutral
3.41- 4.20	High/Agree
4.21 - 5.00	Very High/Strongly Agree

4.4.1 Supplier Management-Related Factors

Table 2: Supplier Management-Related Factors

	Mean	Std. Deviation
Our organization has established strong relationships with key suppliers.	3.75	.749
Supplier selection criteria are well-defined and consistently applied.	3.90	.738
We regularly assess supplier performance based on predetermined metrics.	3.21	.931
Our organization collaborates with suppliers to improve supply chain efficiency.	3.44	.886
There is a process for resolving conflicts with suppliers effectively.	3.90	.751
We prioritize fostering long-term relationships with our suppliers.	3.88	.757
Supplier risk management strategies are implemented in our operations.	3.96	.743
We include suppliers in product development processes when appropriate.	3.33	1.112
Our organization invests in supplier training and development programs.	3.65	.816
Suppliers are involved in sharing market knowledge to improve our supply chain.	3.77	.762
Grand Mean	3.687	.5166

Source: Survey data, 2025

The average score for a number of items related to the management of suppliers was 3.69 (SD = .52). As per the criteria for the interpretation (see Section 4.4), 3.69 falls into the range of 3.41 – 4.20. Thus, it can be said that the respondents generally thought that many of the supplier management activities had been done fairly well by their organizations, and they were able to see the positive impacts of these activities. These results suggest that the practice of supplier management is widespread throughout the organizations studied; however, there may be areas for improvement.

Companies use risk management practices to protect their businesses from potential disruptions caused by a supplier's actions or decisions, as it ranks number one with a mean of 3.96 (SD = 0.74). This is an overall feeling of most respondents that companies use risk

management as part of their business strategies to help protect them against potential disruptions caused by a supplier's decision or action. Companies also rate high in the area of using well-defined selection criteria when selecting a supplier with a mean of 3.90 (SD = .74). This means that all of the respondents feel that companies will follow structured methods when selecting a new supplier.

The company also ranked high in two other areas: Conflict Resolution (M = 3.90, SD = 0.75), where companies establish long term agreements with their suppliers; and long-term relationships (M = 3.88, SD = 0.76) where companies develop relationships with their suppliers. However, several of the other factors were in the moderate range. For example, a company may regularly evaluate how well they believe a supplier is doing (M=3.21 SD=0.93); and, a company may ask a supplier to participate in the design of products (M=3.33 SD=1.11). This shows that some companies may not always consistently apply these practices in every situation.

The mean value for the response to the survey question "Supply Chain Management – We work together to increase the efficiency of our supply chain" was 3.44 (SD = 0.89), and this exceeds the threshold to support the conclusion that respondents agree to the statement. However, the respondents felt that there was still some room for improvement. Both the mean values for whether a company invests in its suppliers' education/training (M = 3.65 SD = 0.82), and whether a company allows its suppliers to share market information, were above the midpoint of the scale. The standard deviation for each of the two questions indicates some variation in the answers provided by the companies.

Therefore, based on the results of the study, it can be concluded that Ethiopian pharmaceutical manufacturing have developed fairly well defined supplier management practices including managing risks, establishing long-term relationships, and resolving conflicts with suppliers.

However, the study did identify some examples of the companies applying different levels of consistency in various aspects of their practices, such as evaluating their suppliers' performance and collaborating with suppliers in terms of product development/innovation.

The results of the study provide evidence to support previous research (Kiriinya, 2021; Nsawir et al., 2023), which has demonstrated that the involvement of suppliers in supply chains can have a positive impact on supply chain performance and resiliency. The study

identified variability in some of the practices surveyed, suggesting that focused enhancements and capacity building across the board could be beneficial.

4.4.2. Customer Management-Related Factors

Table 3: Customer Management-Related Factors

	Mean	Std. Deviation
We actively gather feedback from customers to improve our products and services.	3.74	.610
Customer needs and preferences are well understood within our organization.	2.79	.885
Our organization prioritizes customer satisfaction in all operational decisions.	3.41	.901
We maintain strong communication channels with our customers.	3.95	.697
There are processes in place to handle customer complaints efficiently.	3.80	.734
Our organization uses customer feedback to drive supply chain improvements.	3.17	.777
We regularly analyze market trends to anticipate customer needs.	3.56	.891
Relationships with key customers are managed strategically.	3.61	.852
Our organization adapts quickly to changes in customer demand.	3.77	.729
Customer service teams are well integrated with other supply chain functions.	3.96	.709
Grand Mean	3.5782	.46308

Source: Survey data, 2025

The findings related to customer management aspects are shown in Table 3. the Grand Mean for the study is 3.58 with a Standard Deviation of 0.46. In addition, based on the criteria for interpreting the scores presented in Table 1, if the average rating falls in the range of 3.41 – 4.20, then the interpretation is that the respondents feel that the customer management practices in their organizations are being done “well” or “highly” agreeable. Therefore, the respondents generally felt that the customer management practices in their organizations are being performed “well” and in a manner in which they agree. The fact that the Standard

Deviation is low (i.e., 0.46) indicates that the respondents agreed on their perceptions at a moderate level too.

The highest scoring item in the study is "Customer Service Teams Are Tightly Aligned With Other Supply Chain Functions," which has a Mean of 3.96 (Standard Deviation of 0.71). Since the Mean is above the midpoint of the scale, it represents an extremely high degree of agreement that the respondents believe it is very important to align customer service teams with other supply chain functions in order to increase operational efficiency and responsiveness to customers. Clearly, this is a critical issue for respondents to address.

A second well-scoring item was "We Have Good Communication Links to Our Customers," which had a Mean of 3.95 (SD = 0.70). As indicated previously, there is a consensus among respondents that there is an adequate communication channel to interact with customers and to provide responses to meet their needs—the essence of Customer Relationship Management.

Other well-scored items included: "There are Processes in Place to Effectively Handle Customer Complaints" (Mean = 3.80; SD = .73); "We Proactively Solicit Feedback From Customers" (Mean = 3.74; SD = .61); and "Our Company Can Rapidly Respond to Changes in Customer Demand" (Mean = 3.77; SD = .73). These represent a high degree of agreement among respondents and indicate that there is a tendency among firms to be proactive in addressing customer issues, adapting to changes in demand, and soliciting customer input to improve services.

On the other hand, several items received moderate ratings (mean rating of 2.61-3.40) representing greater degrees of disagreement or areas of improvement. For example, the item "Our Company Leverages Customer Feedback to Enhance Supply Chain" had a Mean of 3.17 (SD = 0.78). This indicates that some organizations act upon customer feedback, but other organizations do not have structured processes to transform customer feedback into supply chain strategies.

In like fashion, the statement "Customer Needs and Preferences Are Well Known in Our Company" had a Moderate Mean of 2.79 (SD = 0.89) and is very close to the bottom of the Moderately High Range. This suggests that there may be a degree of ambiguity or ambivalence regarding whether customer knowledge exists in the mechanism of delivery—representing a strategic work area.

The item "Our Organization Prioritizes Customer Satisfaction in All Operational Decisions" had a Mean of 3.41 (SD = 0.90) and is located at the lower end of the high agreement range. While the mean shows a high level of agreement among participants on whether they view their company as customer centric, the standard deviation for each item was also relatively high which indicates that some of the respondents may have varying levels of application of customer centricity in their decision-making processes when compared to others within departments or in terms of respondent experience. The last two items were "We regularly analyze market trends to anticipate customer needs" (mean = 3.56; SD = 0.89), and "Relationships with key customers are managed strategically" (mean = 3.61; SD = 0.85). Both of these items are at a high level but the standard deviations indicate that there is still room for development in creating consistent customer engagement strategies and anticipating changes in the marketplace.

Overall, the results reveal a consensus among the Ethiopian Pharmaceutical Manufacturing Firms studied here, on the importance and the existence of customer management practices in their respective organizations, particularly in the practice of communicating with their customers, integrating the customer service functions, and in the practice of complaint management. Nevertheless, the moderate Means and the relatively high Standard Deviations for some elements related to understanding the customers and utilizing customer feedback to improve, suggest that there are still obstacles to adopting and influencing a customer-centric culture of practices in a uniform way.

These results are consistent with other studies that have been done previously. For instance, Reichhart & Holweg (2007) highlighted the central role of customer information/communication in designing agile and legible supply chains. Similarly, Liu & Jiang (2025) demonstrated that an organization that employs a customer management system (CMS) and feedback loops to its core business procedures will generate better performances than those without CMS in terms of superior customer satisfaction and operational excellence. Therefore, the differences that were identified, demonstrate that there is a need for the pharmaceutical companies in Ethiopia to systematically improve in regards to customer intelligence, customer service integration and responsive decision-making.

To conclude, the organizations scored highly in the factor analysis, and none of the factors of customer management showed any significant negative values, there are two factors (deep

understanding of customer preferences and doing the customer a favour by formalized use of customer feedback) that, due to their negativities, suggest that some corrective actions are required. By taking care of these discrepancies, the companies may create more flexible, customer-oriented supply chains and thus become more effective.

4.4.3. Quality of Information Sharing Related Factors

Table 4: Quality of Information Sharing Related Factors

	Mean	Std. Deviation
The information shared within our supply chain is accurate and reliable.	3.84	.915
We have established standards for the quality of information shared.	3.91	.900
Employees are trained on the importance of sharing quality information.	3.75	.806
The timeliness of shared information is prioritized in our organization.	3.25	.956
We verify the quality of information before it is disseminated to stakeholders.	3.53	.878
Stakeholders provide feedback on the quality of information shared with them.	3.12	.880
Information is presented in a clear and understandable format.	3.45	.936
Technology tools are used effectively to ensure the quality of shared information.	3.64	.958
There are metrics to evaluate the quality of information-sharing practices.	3.91	.828
Incorrect information is addressed quickly to minimize its impact on operations.	3.74	.694
Grand Mean	3.6165	.42297

Source: Survey data, 2025

As can Table 4 shows that the overall mean and standard deviation of the quality of information sharing were 3.62 and 0.42. Using the guidelines from Table 1 (Interpretation Criteria for Mean Scores on 5-Point Likert Scales), the overall mean score of 3.62 represents that the respondents all agreed, almost uniformly, that the utilization of instrumentality predicted by its relative performance in quality of information sharing within their

organizations was high. The relatively small standard deviation demonstrates a high degree of consistency in responses; however, some respondent differences are apparent.

Most of the questions that received ratings in the high agreement level indicated positive practices being conducted by the organization. For example, “We have established levels for quality of information exchanged amongst us” had a mean of 3.91 (SD = 0.90) and thus the majority of respondents indicated that there were formalized guidelines in place that preserved the standardization of the information being shared. “There are metrics available to evaluate the quality of information sharing processes” was also given a mean of 3.91 (SD = 0.83) and indicated that there was a perception that businesses are developing methods to quantify and enhance the quality of their communication processes.

Approximately 90% of the respondents agreed with items such as “The information that is being transmitted in our supply chain is reliable and accurate” (M = 3.84, SD = 0.92), and “Employees are trained to ensure that the quality of the information being shared is good” (M = 3.75, SD = 0.81), which indicated that employees are well-informed about data integrity in the supply workforce. “If incorrect information is communicated, then it is corrected promptly so as to limit the impact on operations” was also very high, indicating that the organizations take an active approach to managing errors. There was a strong consensus regarding “Technology is used effectively to assure the quality of the information shared in the EC,” with a mean of 3.64 (SD = 0.96); however, this may have been due to the fact that the standard deviation was higher than desired, and therefore many of the respondents may have viewed the use of technology in the EC among various organizations as a positive aspect; however, the large standard deviation indicates that many of the respondents may view the application of technology in the EC as having varying degrees of success. “Verification of information prior to publication” was one of the high-scoring questions, with an average of 3.53 (SD = 0.88) and indicated that the respondents are aware of the existence of quality assurance processes.

In contrast, several questions were rated as moderate agreement (mean of 2.61-3.40) and indicate areas of possible improvement. For example, “Our organization places a high priority on the timeliness of information being shared” had a mean of 3.25 (SD = 0.96). This indicates that while there is a certain percentage of respondents who agree that timeliness is a priority, when information is received, the respondents experience delays or feel a sense of

urgency in the flows of information. Additionally, 'Stakeholders provide feedback on the quality of the information they receive' had a mean of 3.12 (SD = 0.88), and suggests that stakeholder engagement in evaluating the quality of information being provided is either non-existent or inconsistent. The somewhat larger variability in responses to these two questions could suggest process failures or communication breaks-down.

Lastly, the mean agreement level for "The information provided is in a clear and understandable format" was 3.45 (SD = 0.94), which placed it at the lower-end of the "Strongly Agree" category. Therefore, it likely means that people were generally pleased with the clarity of the information they received, but would have liked additional assistance with design and usability.

These findings support previous studies that identified the importance of quality information sharing in improving supply chain performance. For example, Chen et al. (2018), and Parmigiani et al. (2011) found that the development of formal information standards and feedback mechanisms improved responsiveness and decision-making in the supply chain. Similarly, as Liu et al. (2016) pointed out, the lack of standardized technologies can lead to inconsistencies in the flow of information, as reflected in the standard deviations of this study.

Therefore, the findings of this study indicate that the pharmaceutical manufacturing firms in Ethiopia perceive their information sharing to be positive in general, particularly with regards to the accuracy of information, the verification of information, and the reliance of information sharing. The presence of formalized standards and quality measurements indicate that the organizations have a systemic mindset. However, there are also areas where we can strategically improve our response to time constraints as well as the feedback loop process in regards to the different groups of stakeholders. To create a strong, reliable, and responsive supply chain environment to drive supply chain performance, companies should enhance their real-time communication to create an open dialogue with all stakeholders and implement technology tools across the organization consistently.

4.4.4. Internal Operations-Related Factors

Table 5: Internal Operations-Related Factors

	Mean	Std. Deviation
Our supply chain processes are well-documented and standardized.	3.71	.868
We continuously monitor and improve our internal operations.	3.97	.904
Employee roles within the supply chain are clearly defined.	3.57	.899
Cross-functional teams collaborate effectively on operations.	2.94	.813
We use technology to streamline internal operations.	3.60	.844
Employee training is regularly provided to enhance operational efficiency.	3.29	.923
There are established KPIs to measure the efficiency of internal operations.	3.79	.869
Internal audits are conducted to assess operational performance.	3.92	.793
We implement best practices in our internal operations.	3.44	.857
Internal communication supports effective operational management.	3.71	.771
Grand Mean	3.5922	.48488

Source: Survey data, 2025

In accordance with the interpretation criteria illustrated in Table 1 (Interpretation Criteria for Mean Score of 5-Likert Scale), the mean values of 3.41–4.20 were considered to represent "High" or "Agreement" (4 represents agreement with the statement). Therefore, the results show that respondents agree that the practices of internal operations are being positively implemented within their organization. The magnitude of standard deviation of the responses indicated that the degree of agreement was moderate. Although there were similarities in opinion, there were significant variations in individual perceptions of the performance of internal operations within the organization.

The highest mean score and standard deviation for the items were obtained from “We keep track of and constantly improve our internal operations.” This item had an average score of

3.97 (SD = 0.904), which falls in the "high" range of "Agreement", thereby indicating that respondents perceive a strong organizational commitment to continually improving performance. Item "Internal reviews are conducted to assess the effectiveness of internal processes" received a substantial mean score of 3.92 (SD = 0.793), which further supports the notion that internal management procedures include a formalized system for evaluating each other.

Items rated highly included "There are clear KPIs for the internal processes through which internal operations are monitored and evaluated" (M = 3.79, SD = 0.869), "Our supply chain procedures have been documented and ratified" (M = 3.71, SD = 0.868), and "The internal communications system promotes good operational management" (M = 3.71, SD = 0.771). These results show that the participants agree that their organizations are well-documented, communicated and monitored regarding performance and therefore have well-organized and efficient internal work systems.

Item "We utilize technology to make our internal processes easier" was rated at 3.6 out of 5, and has a standard deviation of 0.844, indicating that respondents generally agree with the statement. This shows a positive attitude toward the use of technology; however, the varying standard deviations indicate that the effect of the tools utilized may vary across different departments or respondents.

Conversely, other elements were less agreed upon. For example, "Employees receive training on a regular basis to enhance operational effectiveness" (M = 3.29, SD = 0.923) is interpreted as showing moderate agreement with the statement (2.61–3.40). This implies that the training provided to employees is sufficient for those receiving the training, yet inadequate or non-existent for others. This was close behind by "The adoption of best practices in internal process" (M = 3.44, SD = 0.857) which is slightly above the cutoff point for "Good", indicating that respondents generally agree, but also reveal that there is much to be accomplished in regards to having consistent best practices in operations.

A departure from the previous section was "Cross-functional teams collaborate effectively on operations," which had a mean of 2.94 (SD = 0.813) . It could be the case that there is inconsistency and/or problems with the collaboration between the functional groups which will prevent effective coordination and the internal process efficiencies.

The average response for the overall grand mean of 3.59 shows that respondents had a predominantly positive view of how operations are managed internally in their respective companies with some variance. These results support prior related research. For instance, Ganbold et al. (2021) indicated that by using technology; providing employee training; evaluating employee performance; etc., can lead to improved performance in SCM. They also concluded that organizations who have standardization throughout their internal processes and use simple communication formats are more efficient in their operations — both of which are similar to the results of this study.

In summary, the results of the internal operations provide evidence of the existence of weaknesses in supply chain-related aspects of Ethiopian pharmaceutical manufacturing companies. However, the results also provide evidence that, at the very least, these companies understand the concept of internal supply chain management. Since conflict arises internally when thousands of team members are never monitored or held accountable for meeting KPIs; this is a very good thing The high consensus on continuous improvement, auditing, documentation and tracking of KPIs suggests a very strong operational foundation. However, the moderate consensus on cross-functional teamwork, training cadence and the dissemination of best practices, highlights areas where additional development is necessary. Closing these gaps through initiatives aimed at increasing inter-departmental collaboration, and developing standardized staff development practices could lead to the refinement of internal processes and ultimately increase organizational success.

4.4.5. Organizational Performance-Related Factors

Table 6: Organizational Performance-Related Factors

	Mean	Std. Deviation
Our organization meets its supply chain performance targets consistently.	3.75	.726
The supply chain contributes significantly to overall profitability.	3.81	.880
Customer satisfaction levels have improved due to supply chain practices.	3.52	.835
Our organization is recognized for excellence in supply chain management.	3.65	.747
Financial performance has improved as a result of better supply chain practices.	3.43	.842

We have seen growth in market share attributed to supply chain improvements.	3.99	.736
Employee productivity has increased due to streamlined supply chain processes.	3.64	.813
Our organization is able to launch new products successfully due to supply chain agility.	3.91	.733
Cost reductions have been achieved through effective supply chain management.	3.73	.733
Overall operational efficiency has improved because of our supply chain strategies.	3.67	.754
Grand Mean	3.7132	.48284

Source: Survey data, 2025

A positive relationship exists between SCM and financial performance of Ethiopian pharmaceutical companies. The average score for organizational performance was 3.71 with an SD of .48, as shown in Table 6. Utilizing the interpretive guidelines provided in Table 1, a mean value of $3.41 \leq x \leq 4.20$ would be considered "High" or "Agree". Therefore, the findings demonstrate a positive image regarding the effects of SCM practices on the financial performance of Ethiopian pharmaceutical companies among respondents. The lower standard error may also indicate that the respondents were highly consensus-based for those performance factors.

The highest rated item in this subscale was "We have experienced an increased market share as a result of supply chain effectiveness" (M = 3.99, SD = 0.736). This rating is at the upper limit of the "Agree" spectrum and therefore shows a wide-spread acknowledgement by participants that supply chain efficiency has a direct effect on increasing market size. A second high mean was seen for "Our organization can successfully introduce new products based on supply chain agility" (M = 3.91, SD = 0.733), indicating that the respondents generally have a positive view that supply chain flexibility will enable innovations in terms of time to market.

An average result for "The supply chain has a significant impact on the profit margin" was 3.81 (SD = 0.880). Also located in the realm of "Agree", however the larger standard deviation indicates that there may be different experiences or levels of knowledge about the profit-related consequences between departments/positions. A similar level of agreement existed for the statement "Our company consistently achieves its supply chain performance

goals" (M = 3.75, SD = 0.726), indicating overall satisfaction with performance results; however, minor inconsistencies in performance do exist.

Other practices, such as "Cost reductions have been realized as a result of effective supply chain management" (M = 3.73, SD = 0.733) and "Overall efficiency of operations has been enhanced as a result of our supply chain policies" (M = 3.67, SD = 0.754) further support this conclusion, illustrating that supply chain management is generally related to cost efficiency and operational improvements.

However, there are several items where the respondents showed somewhat less agreement; though they were still in the "High" category. "Customer satisfaction has increased as a result of supply chain activities" had a mean of 3.52 (SD = 0.835), demonstrating that the respondents either agree or strongly agree. The divergence of responses could possibly indicate uneven customer experience outcomes or variability in how customers perceive the contributions of supply chain practices to their customer satisfaction.

"Financial results have improved due to better supply chain management" has a mean of 3.43 (SD = 0.842), and is therefore at the lower end of the "Agree" spectrum with 3 in a 5-point Likert scale. While there is consensus among the respondents regarding the influence of the supply chain on financial performance, the higher standard deviation indicates that there may be variations among the respondents that could be attributed to varying departmental priorities, financial literacy, or access to organizational performance metrics. Additionally, "Employee productivity has increased due to more efficient supply chain processes" (M = 3.64, SD = 0.813) and "Our company is known for the quality of its supply chain management" (M = 3.65, SD = 0.747) demonstrate positive perceptions of both internal performance and external reputation, respectively, which once again show slight disagreements among the participants.

Overall, the average value of 3.71 in the result indicates that the average answer of the respondents was within the "High/Agree" range and that all the respondents agreed that the supply chain concept played a crucial role in improving the organizational performance, and now is one of the leading roles among the organizational performance dimensions. It covers enhancements in profitability, operational efficiency, market share, customer satisfaction, and new product development. However, the variation in some answers, particularly with respect to financial performance and customer satisfaction, suggests that the respondents may have

different interpretations of what customers/participants derive from these, and also that they may require some additional guidance and confidence-building from leadership.

The findings from this study also confirm similar research conducted globally. Chopra & Meindl (2021) and Christopher (2016), among others, have discussed how design of supply chain strategies impact company competitiveness and overall company performance. Similarly, research conducted by Gunasekaran et al. (2017) identify supply chain agility, supply chain integration, and supply chain responsiveness as determinants of market performance and corporate success.

Therefore, these findings confirm the long-term benefits of establishing a flexible and customer-oriented supply chain for the Ethiopian pharmaceutical producers. Furthermore, higher internal alignment, visibility, and performance measurements may help close the gap between perceptions and provide a common understanding of the value-added function of the supply chain across the entire firm.

4.5. Inferential Statistics

4.5.1. Assumption Testing for Multiple Regression

The basic assumptions are that the data should be normally distributed, linearly related, have constant variance (homoscedastic), have residuals that are independent of each other, and do not have multicollinearity among the predictor variables. The assumption test results are shown below.

A) The Multicollinearity Assumption

Multicollinearity exists when one or more independent variables in a regression model are highly correlated with each other (Saunders et al., 2007), but there does not exist a perfect linear relationship between two or more predictors (Ho, 2006). Ideally, predictor variables should not be very highly correlated with one another (Ho, 2006). If perfect collinearity exists between predictors, an infinite number of regression coefficient estimates may be obtained because there are an infinite number of regression coefficients that will produce the same exact results (Kothari, 2004). This is extremely rare in actual practice, although a condition known as "imperfect collinearity" is nearly unavoidable (Field, 2006).

When two or more independent variables in your study are also highly correlated, you have what is called the "multicollinearity problem"; see Kothari, 2004; Field, 2006. To test whether multicollinearity exists in the independent variables in your study, use the Pearson Correlation Coefficient and analyse collinearity statistics.

To check for multicollinearity, check the Tolerance and Variance Inflation Factor (VIF) values in the SPSS output correlation table of collinearity statistics (Field, 2006). Values of Tolerance below 0.2 and VIF values above 10 indicate a multicollinearity problem. Looking at the values of Tolerance and VIF from the analysis of regression standardized coefficients, it appears that the minimum Tolerance value is 0.471, which is higher than 0.2 and the maximum VIF is 2.124, which is lower than 10. Thus, the predictors were not too correlated with each other and therefore there was no multicollinearity problem.

Table 7: Collinearity statistics value

Coefficients			
Model		Collinearity Statistics	
		Tolerance	VIF
1	Supplier Management	.718	1.392
	Customer Management	.471	2.124
	Quality of Information Sharing	.625	1.599
	Internal Operations	.519	1,928
a. Dependent Variable: Organizational Performance			

Source: Field Survey, 2025

B) Homoscedasticity

Homoscedasticity is the degree of similarity in variances between the dependent and independent variable; it also describes a situation of non-homogeneity of variance and equal variances of error terms among the groups (Saunders et al., 2009). As stated by Field (2009) the variance of the residual should remain constant at all levels of the predictor variable(s). Therefore, evaluating this assumption is important when determining whether your regression model is appropriate. Field (2009) suggested plotting standardized residuals (Y-axis) and predicted values of the dependent variable (ZPRED) based upon the model (X-axis), as a way to determine if homoscedasticity exists.

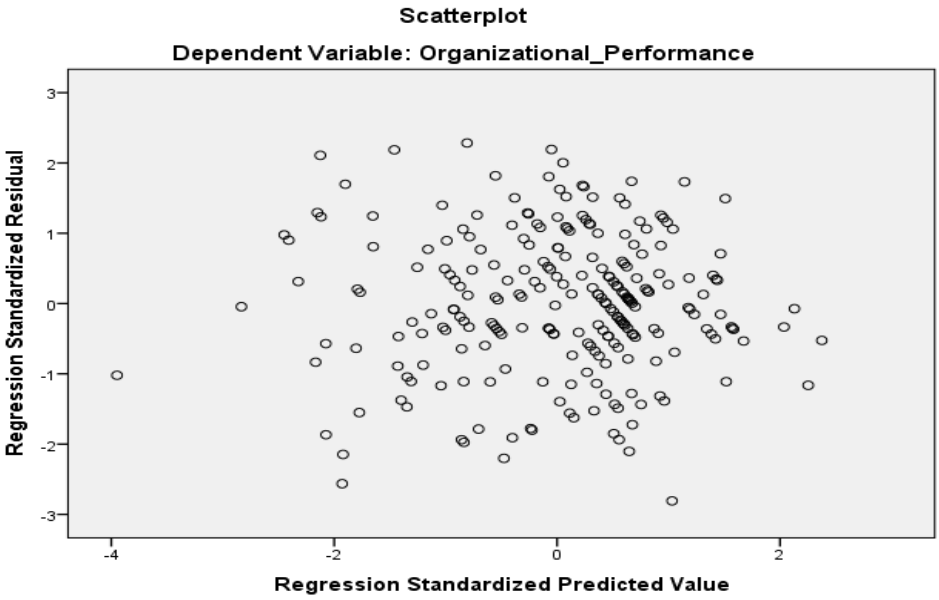


Figure 1: Homoscedasticity test result

Source: Field Survey, 2025

C) Auto-correlation Assumption / Durbin-Watson Test

One of the basic assumptions of all multiple linear regression models is that the residuals are mutually independent. As such, residuals will have an average (expected) value of zero and are uncorrelated with one another. Checking for this assumption is done by examining the regression output in the "Model Summary" box. The Durbin-Watson statistic is used as a test of whether the error terms have an independent or uncorrelated structure. The possible values for the DW statistic range from 0 to 4; therefore, if your DW statistic is less than 1 or greater than 3 you have concerns regarding the validity of your analysis. In our analysis, the Durbin-Watson statistic was greater than 1 (Gujarati, D. 2004; Field, 2009), thus we believe the above premise to be valid. If d = 2, then there is no auto-correlation present. However, when $d \rightarrow 0$, there is positive auto-correlation present. Conversely, when $d \rightarrow 4$, there is negative auto-correlation present (Saunders et al., 2009, p. 622).

Table 8: Durbin-Watson Test

Durbin-Watson
1.703

Source: Field Survey, 2025

D) Normality Test

Frequency Frequency distributions may be in various shapes. Normal and Near-Normal Distributions There are many forms of frequency distributions with respect to shape, which help you sketch those quickly. Symmetry If we lived in an ideal world, there would be a perfectly normal distribution of every single score for data. That means that, when you make a vertical cut through the middle of the distribution, both halves will have the same appearance. We call this a normal distribution and define it using a bell-shaped curve. In practical terms, we are saying the distribution extends 6 standard deviations from the mean; that is 3 in each direction from the mean (Robert Burn and Richard Burns, 2008) . Since the number of cases beyond ±3 standard deviations is so low, it is acceptable to illustrate the upper and lower limits of a normal distribution as ±3. Skewness, as seen in the table above, has a range of +/− 3, therefore we are able to conclude that our data is normal. Also, the histogram is very nearly symmetrical about 0 (the majority of variables we considered were approximately normal.)

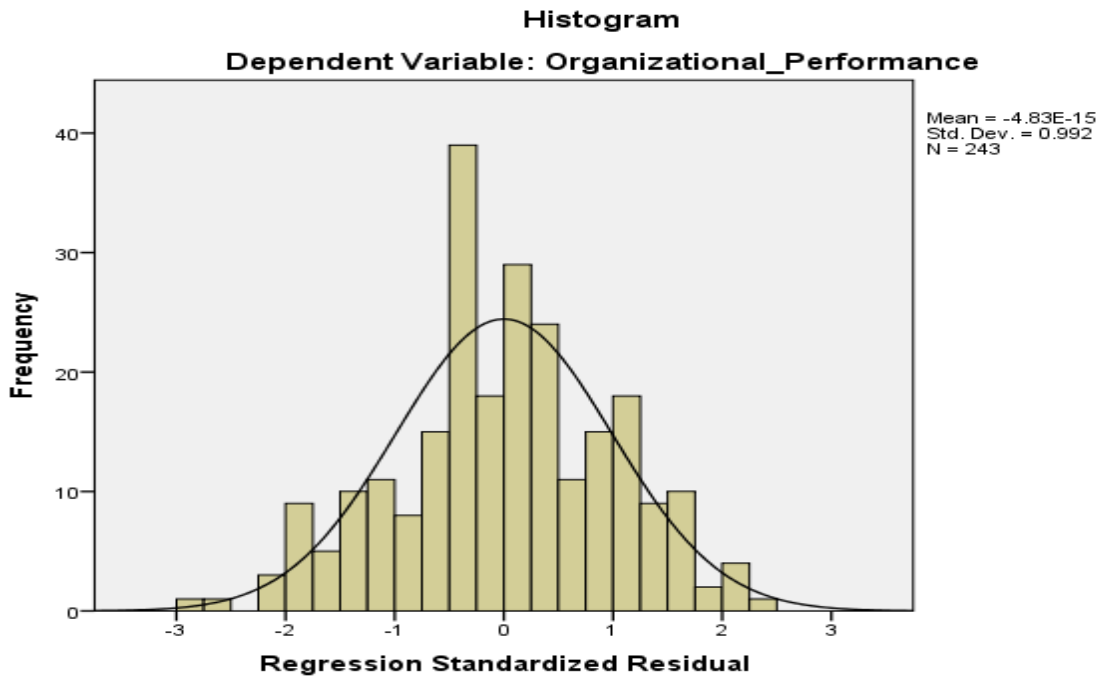


Figure 2: Tests of Normality

Source: Field Survey, 2025

Table 9: Normality Test using Skewness and Kurtosis

Descriptive Statistics					
	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Procurement Plan Implementation	239	-.589	.157	1.298	.314
Employees Competence	239	-.200	.157	.730	.314
ICT Adoption	239	-.769	.157	1.470	.314
Operational Procedures Management	239	-.723	.157	2.053	.314
Public Procurement Practice	239	-.574	.157	.205	.314
Valid N (listwise)	239				

Source: Field Survey, 2025

The kurtosis of any univariate normal distribution is 3. It's also common to make comparisons between the kurtosis of distributions to that of the standard normal distribution. Any distribution with a kurtosis that is less than 3 is described as platykurtic. However, it is often reported that being platykurtic implies the distribution has a "flat-top" shape. In reality, a distribution will have a lower number of outliers and those outliers will be less extreme than those produced by the standard normal distribution.

E) Test of Linearity

The Linearity is the fifth assumption tested in this study. If we observe a linear relationship between two variables then the slope of the Population Regression Function is a single number for all cases. Therefore if we do not see a linear relationship then it simply means that the change in the Dependent Variable depends upon the level of at least one Independent Variable (Stock, 2007). A diagram of the linearity test for disturbances shown in the below figure.

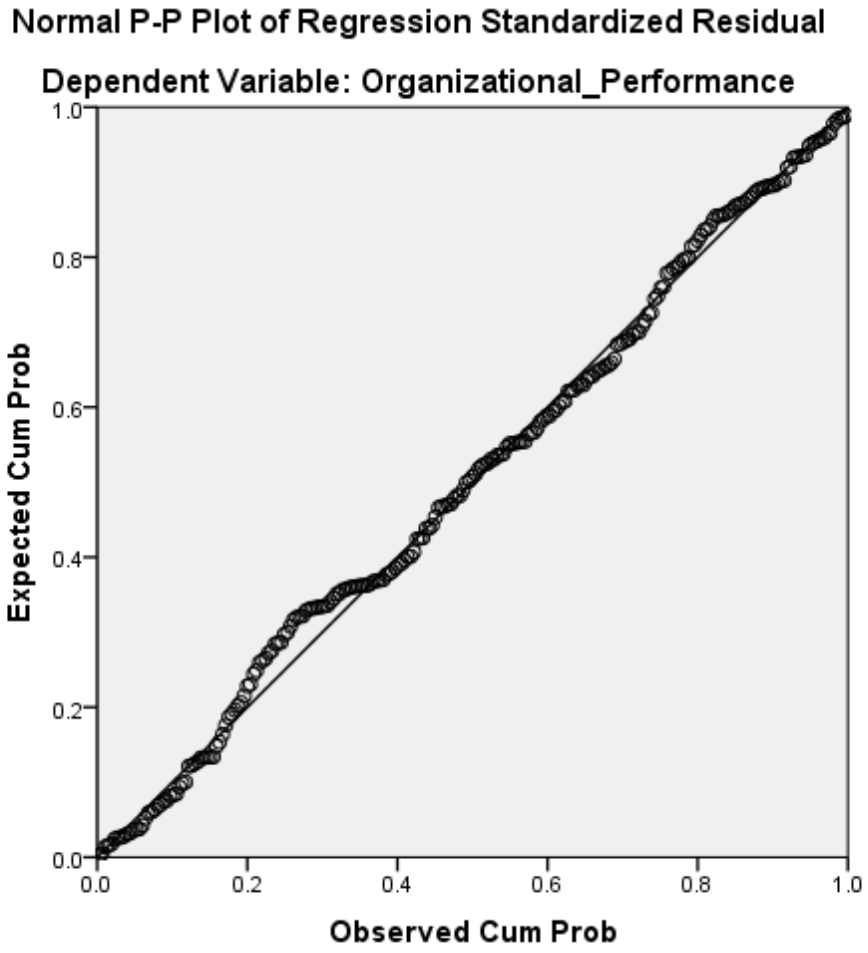


Figure 3: Linear distribution of the data

Source: Field Survey, 2025

4.5.2. Results of Correlation Analysis

The Pearson correlation coefficient measures how strongly related the variable is. The results of the Pearson correlation are shown below and we will interpret them based on guidelines from Field (2006). He said that the magnitude of the Pearson correlation coefficient shows the strength of the relationship between the predictor and outcome variables, and the sign (+/-) of the Pearson correlation coefficient shows whether it is a positive or negative relationship. Values for Pearson correlation coefficient of 0.1 to 0.29 were found to be associated with a weak relationship; values for 0.30 to 0.49 were found to be associated with a moderate relationship; values for 0.50 or higher were found to be associated with a strong relationship; and the positive or negative sign of the Pearson correlation coefficient showed the direction of the relationship between the two variables.

Table 10: Pearson correlation information

Correlations						
		Organizational Performance	Supplier Management	Customer Management	Quality of Information Sharing	Internal Operations
Organizational Performance	Pearson Correlation	1	.679**	.725**	.610**	.737**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	243	243	243	243	243
Supplier Management	Pearson Correlation	.679**	1	.470**	.459**	.381**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	243	243	243	243	243
Customer Management	Pearson Correlation	.725**	.470**	1	.537**	.671**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	243	243	243	243	243
Quality of Information Sharing	Pearson Correlation	.610**	.459**	.537**	1	.508**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	243	243	243	243	243
Internal Operations	Pearson Correlation	.737**	.381**	.671**	.508**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	243	243	243	243	243
**. Correlation is significant at the 0.01 level (2-tailed).						

The The strongest correlations were found to be between supplier management and organizational performance (r = 0.679), indicating a "strong" correlation as described by Field. As a result, it can be stated that effective supplier management is a key factor for successful organization performance. This is consistent with literature such as Monczka et al. (2015), where strategic partnerships with suppliers allow for the reduction of costs while improving the quality and innovation of products or services, ultimately leading to superior overall performance. The positive relationship confirms the importance of collaborative and integrated supplier relations as a method of achieving competitive advantages based upon the Resource-Based View of the firm, which views external collaboration as a strategic asset of the firm.

Additionally, there was a very strong positive correlation of .725 between customer management and organizational performance. This is consistent with the large amount of literature that indicates customer satisfaction and needs are vital for success in business (Kumar et al., 2016). When a company effectively manages its customers, it increases the satisfaction of its customers, their loyalty to the company, and the companies' ability to respond to changes in their markets, all of which directly affect the performance related outcomes. Literature has indicated that firms that focus on customer relationships are more successful than their competitors because the knowledge gained from customers allows for service enhancements and new product development (Narver & Slater, 1990).

There were also statistically significant correlations between the quality of information sharing (r = 0.610) and internal processes (r = 0.737) and organizational performance. The strong relationship between the quality of internal operations and organizational performance supports the idea that the efficiency of internal processes is a major determinant of organizational performance, consistent with research conducted by Hammer and Champy (1993) in the area of Business Process Re-Engineering. Additionally, the positive relationship between information sharing and organizational performance provides additional evidence for the argument that open and real time communication within organizations is beneficial to organizational performance (Zhao et al., 2019). Better information flow allows for better coordination, decreases uncertainty and stimulates creativity, all of which will contribute to better organizational performance.

4.5.3. Regression Analysis

Multiple regression analysis was used to determine the impact of all variables on procurement practice after the assumption tests were completed.

A) Model Summary

Table 11: Model Summary Table

Model Summary				
Model	R	R Square	Adjusted R-Square	Standard Error of the Estimate
1	0.879[a]	0.773	0.769	0.23187

Source: Field Survey, 2025

The table provides information on the major elements used to assess the performance of your regression model. The R = .879 value clearly shows a very strong positive correlation between the independent variables and the dependent variable. The value also implies that the model accounts for a large proportion of the total variation in the dependent variable.

The R-squared value of .773 represents that the model explains 77.3% of the variation in the dependent variable. The high R-squared value further supports the models' ability to account for the variation in the data.

The Adjusted R-squared value of .769 is slightly less than the R-squared value. The slight decrease in the adjusted R-squared value after considering the number of predictor variables indicates that the model still explains approximately 76.9% of the variation in the dependent variable; thus, the model appears to be robust, but not overly complex.

The Standard Error of the Estimate (SE) is .23187. The SE measures the average difference of the observed values from the predicted values. A lower SE implies a closer fit of the model to the data. In this example, the low SE indicates that the model is making very accurate predictions.

Overall, the model has excellent explanatory power with high R and R-squared values and the SE indicates that the predictions are reliable.

B) Analysis of Variance

The results of the ANOVA analyses will provide evidence whether the forecasting model is superior to using the mean (i.e., the average), or best guess (Field, 2006), for predicting outcomes. The likelihood that the ANOVA model will be significant is higher because it would indicate that at least one of the group means differs from the others. It is the correct statistical procedure to use when examining the effects of a less-than-interval independent variable upon an at-least interval dependent variable. When the F-test results are not significant, the model should be rejected and therefore proceeding with the additional steps is unnecessary (William & Barry, 2010).

However, regarding the ANOVA test, Saunders et al. (2012) stated that a small p-value (typically < .05) suggests that your regression coefficient is probably due to something other than random occurrence. On the contrary, if your p-value is larger than .05 then you may infer that the coefficient of determination of your multiple regression model could be due to random occurrence. Therefore, the ANOVA table and test result are provided and reviewed in the next section.

Table 12: ANOVA Table

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.623	4	10.906	202.850	.000[b]
	Residual	12.795	238	0.054		
	Total	56.418	242			

Source: Field Survey, 2025

The ANOVA table presents a sum of squares for regression of 43.623 and an error (residuals) sum of squares of 12.795; as such, the total sum of squares for this study is 56.418. The appropriate allocation of variance is shown by the degrees of freedom for the regression (4), and residuals (238). Using the mean square for regression (10.906), and residual (0.054), the F-statistic is calculated as 202.850.

The associated p-value (Sig.) is 0.000. This p-value is less than the commonly accepted level of 0.05 for establishing statistical significance. As such, the regression model is significantly

better than using the mean of the dependent variable for predicting the dependent variable. Therefore, at least one of the independent variables has a statistically significant relationship with the outcome measure, and the overall regression model is an acceptable fit for the collected data.

C) Regression Coefficients or Model

The standardized regression coefficient (beta) indicates the relationship's magnitude of an independent variable as it relates to a dependent variable when measured in terms of standard deviation units; as such, the larger the beta value, the larger the effect size of that independent variable's influence on the dependent variable. Beta ranges from -1.0 to +1.0 (William and Barry, 2010).

Table 13: Regression Standardized Coefficients

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.288	.147		-1.955	.052
	Supplier Management	.345	.034	.369	10.141	.000
	Customer Management	.242	.047	.232	5.153	.000
	Quality of Information Sharing	.141	.045	.124	3.174	.002
	Internal Operations	.376	.043	.378	8.819	.000
a. Dependent Variable: Organizational Performance						

In summary, we find that there is an extremely positive relationship between supplier management and performance (Beta = .369, P < .001), indicating that the changes in suppliers' management practices are highly associated with the changes in performance. There is prior research supporting our claim that companies can develop successful supplier relationships that enhance their supply chain's resilience, improve their supply chain's efficiency and therefore increase their overall performance (Grant, 2024). The size of the Beta coefficient provides an indication of the importance of supplier management to an organization's ability to succeed as a strategic tool.

Customer management is also a significantly positive factor in achieving performance (Beta = .232, P < .001). Therefore, any improvement in customer relationship management will lead to improved performance. Madhani (2019) suggests that using a customer focused approach builds loyalty and satisfaction in customers, which increases revenue and creates a competitive advantage. Our research supports other studies which have shown the long-term success of organizations to be dependent upon their customer relationship management (CRM) (Wadhwa et al., 2008).

We also find that both Information Sharing Quality (Beta = .124, P = .002) and Internal Processes (Beta = .378, P < .001) are positively related to performance. Specifically, the largest standardized coefficient was found for internal processes, implying that the organization should focus on internal process. Both Wadhwa et al. (2008) and Field (2006) agree that the primary reason for an organization to function well is based on the flow of information internally and externally to the organization which enables the organization to perform its key functions quickly and efficiently. The overall significance of these findings emphasizes the potential to create value through improving internal process and communication within a team.

Overall, our results indicate that both Internal Processes and Supplier Management are the primary drivers of performance in our sample of firms, as indicated by the strength of their path coefficients. However, while customer management and information sharing are both positive factors, they are less so than the other two. Overall, our results support previous research in identifying the complexity of the drivers of organizational performance. For practicing managers and researchers, investing in optimizing supply chains, supported by both internal process and customer centric operational models, will likely generate the greatest increase in performance, as is suggested in a growing body of strategic management theory that emphasizes the need for integrated, customer centered operational models.

4.6. Hypotheses and Interpretation

The following hypotheses were tested using a regression model:

4.6.1 Supplier Management and Organizational Performance

Regression analysis showed that there was a positive and statistically significant relationship between supplier management and organizational performance (β=0.369, p=0.000 (< 0.001)). Hence, the regression results supported hypothesis one. As such, it is clear that

improvements in the practice of supplier relationship management will have a large effect on the performance of an organization. This agrees with Grant (2024) who noted that strategic collaborative sourcing enables efficiency and resilience, both of which are fundamental components of organizational success.

4.6.2 Customer Management and Organizational Performance

Likewise, the results indicate that customer management had a positive and significant relationship with organizational performance ($\beta = 0.232$, $p < 0.001$). Thus, the results provide evidence for H2. In turn, this means that when an organization can understand and meet their customers' needs they are more likely to perform well. This is also supported by Madhani (2019), who found that customer-centric strategies enhance brand loyalty and competitive advantage.

4.6.3 Quality of Information Sharing → Organizational Performance

Although the Beta coefficient for information sharing is 0.124, and the associated p-value is 0.002 which is less than 0.05; this means that the information sharing variable is statistically significant but is a weaker predictor of performance. Therefore, H3 is confirmed. While the effect size is smaller than the other variables, this finding is consistent with Wadhwa et al. (2008), who stated that the accurate and timely dissemination of information facilitates coordination and decision making in complex supply chains.

4.6.4 Internal Operations and Organizational Performance

Among the independent variables, Internal Operations (beta = 0.378) was by far the largest and most statistically significant predictor of performance ($p < .001$). Consequently, there is substantial evidence to confirm H4, i.e., internal operations such as monitoring, auditing, employee coordination etc., that are conducted efficiently contribute positively to performance. These findings are comparable to those of Ganbold et al. (2021), who emphasized the significance of internal operational excellence in the context of supply chain and financial performance.

The regression analysis results support all four hypotheses, clearly illustrating that all independent variables have a positive and statistically significant effect on organizational performance. The findings highlight internal operations and supplier management as the two most important factors affecting organizational performance, while customer management and information sharing are somewhat less important contributors. These results reinforce the

theoretical foundations of this research, which suggest that integrated and effective supply chain practices lead to successful organizations. For managers and policymakers operating within the Ethiopian pharmaceutical sector, the implications are clear: a focus on enhancing internal capabilities, building relationships with suppliers, engaging with customers, and developing robust information systems is the key to sustainable performance improvement.

4.7. Interview Question Responses

1. Can you describe how your organization establishes and maintains relationships with key suppliers? In your experience, how do these relationships impact the operational efficiency of EPHARM?

According to the respondents, EPHARM has a focus on building long-term, strategic relationships with its primary suppliers. The way that EPHARM achieves this begins with conducting a thorough assessment of each supplier based on several criteria including product quality, reliability of delivery, compliance with health-related standards, and competitive pricing. Following the assessment of suppliers, EPHARM invests time into building trust through ongoing communication and regular performance assessments. According to the respondents, maintaining consistency in these relationships requires that EPHARM clearly communicates expectations to its suppliers, shares its forecast information with them, and provides feedback to the suppliers. These forms of communication create collaboration instead of a transactional relationship.

Additionally, the respondents stated that the relationship-building by EPHARM goes beyond just selecting the suppliers. They stated that EPHARM engages with their suppliers through meeting regularly, engaging in joint planning, and working together to solve problems. Through these forms of communication and collaborative work, EPHARM creates an open forum of communication with its suppliers that allow them to become aware of the goals of EPHARM and proactively take action if there is a disruption in the supply chain. As stated previously, this form of collaboration not only creates a reliable source of supplies, but also gives the suppliers of EPHARM the knowledge that EPHARM values them and will give them the same level of priority when other suppliers may need assistance during shortages or emergency situations.

Respondents stated that the strong supplier relationships created by EPHARM, have had a positive effect on the operational effectiveness of the organization. They stated that the strong

relationships built with the suppliers has allowed EPHARM to reduce lead times, improve the quality of the supplies received, and promote innovation. For instance, suppliers may give EPHARM better pricing or priority status during peak demand periods, thus eliminating delays and stockouts. As a result, respondents concluded that EPHARM's supplier relationship management process is essential to the operational success of EPHARM, and enables the organization to produce high-quality pharmaceutical products on a consistent basis and in a cost-effective manner, ultimately improving organizational performance in the highly competitive pharmaceutical industry.

2. What strategies does EPHARM implement to enhance customer satisfaction and retention? Can you provide examples of how these strategies have been successful or areas where they could improve? In your experience, how do these relationships impact the operational efficiency of EPHARM?

Respondents stated that EPHARM is focused on creating a customer-centric environment, primarily through ensuring that pharmaceutical products are delivered to customers in a timely and reliable manner. One major strategy used by EPHARM to achieve this goal is the development of comprehensive logistics and distribution systems, which allow products to be delivered to customers quickly and consistently. Additionally, the organization has an ongoing process for receiving customer feedback, so that any customer complaints or suggestions are responded to promptly. Respondents stated that the proactive engagement of EPHARM with its customers has contributed to the creation of trust and loyalty, particularly with government health organizations and private medical clinics, which depend on timely deliveries of pharmaceutical products from EPHARM.

In addition to the above, respondents stated that EPHARM continually strengthens communication with its customers through a variety of means. Examples include communicating the status of orders to customers, sharing new product information with customers, and providing technical support to customers as needed. Some of the clients who responded to this survey expressed the belief that EPHARM’s goal of creating an environment of customization through offering the customer choice is one method of which they are attempting to do so. For example, EPHARM offers its customers the ability to customize delivery schedules, as well as different ways of paying for their purchases. The result of this was that many of the respondents believed that EPHARM had created higher

customer satisfaction among its clients due to the increased number of repeat purchases made by the clients and favourable comments that they wrote to EPHARM about their experience with the company.

While most of the respondents expressed satisfaction with EPHARM's customer orientation approach, there were also several areas in which the respondents indicated that they believe EPHARM could create a more effective use of digital platforms to allow the tracking of orders and real time communications with the customers. In addition, while all of the respondents indicated that EPHARM customer orientation approach would be beneficial to the company, a few of them indicated that it would be advantageous for EPHARM to create a greater level of personalization in customer service to further enhance the relationship between the company and the clients and to create an enhanced understanding of the needs of the clients.

In general, the respondents felt that the approaches that EPHARM was using to create a customer orientation environment would help the company achieve greater operational efficiency because they would decrease the amount of error potential in the ordering process, reduce the amount of time that products take to reach the customers, and increase the number of repeat customers that the company will have, and therefore create a greater opportunity for continued growth and the development of competitive advantage for EPHARM within the pharmaceutical industry.

3. How would you assess the current level of information sharing among supply chain partners at EPHARM? In your opinion, how does this level of sharing influence the overall organizational performance?

Respondents rated that EPHARM has achieved considerable progress in developing systems to facilitate the exchange of information with its supply chain partners. Respondents characterized EPHARM's adoption of enterprise resource planning (ERP) systems and cloud-based communication platforms as having facilitated the timely and accurate exchange of various types of information, including but not limited to, inventory levels, forecasting of demand, and scheduling of shipments. Respondents stated that this type of information sharing facilitates greater coordination and planning among departments and with external partners. The respondents further stated that this degree of transparency eliminates uncertainty, prevents stock imbalances, and improves planning accuracy.

The participants indicated that EPHARM's ability to share timely and accurate information has led to a smoother flow of work processes and faster responses. Respondents stated that proactive information sharing enables EPHARM to recognize potential disruptions to its supply chains and to take corrective action prior to the occurrence of actual disruptions. For example, advance warning of potential delays or shortages allows EPHARM to modify its procurement processes or to find alternative sources of supply, thus continuing to supply its products to customers. This proactive approach has played a significant role in increasing the resilience of the supply chain of EPHARM and the overall performance of the organization.

In addition, as previously noted, some of the participants have identified areas of challenge (data entry inconsistencies; communications breakdowns) which may lead to communication or data quality issues in relation to EPHARM's stakeholders. The participants indicated that while EPHARM utilizes systems to assist in the exchange of information, they continue to pursue both complete and accurate data. While the mentioned problems exist, the group as a whole was in agreement regarding the need for the sharing of information among supply chain partners in order to reach operational excellence. The sharing of information will allow for better informed decisions by all parties involved and it will help develop better relationships between EPHARM and its supply chain providers, which would result in the production of quality products in an efficient and timely manner.

4. How does EPHARM ensure the quality and reliability of information shared within its supply chain? What challenges have you encountered in this regard, and how have they affected decision-making processes?

Respondents stated that EPHARM has adopted a multifaceted approach to ensure the quality and reliability of the information shared throughout its supply chain. Respondents stated that EPHARM has established standardized protocols for collecting, validating, and transmitting data. EPHARM has also established a regular training program for employees who engage in data collection and management to educate them on best practices and to prevent errors. Respondents stated that EPHARM periodically audits the data and cross checks the data to determine the presence of discrepancies and to correct any errors, thus ensuring that decision makers have access to accurate and timely information.

In addition to the above, respondents stated that EPHARM has developed the capabilities to utilize advanced technologies, such as real-time dashboards and automated alerts, to

continuously monitor data quality. When inconsistencies or anomalies are detected in the data, the systems alert personnel to review and correct the data. Respondents further stated that EPHARM's leadership emphasizes the importance of data quality, and has created a culture of accountability. Through the combination of these strategies, EPHARM strives to minimize the risk that incorrect information will influence the organization's critical decisions, such as those related to procurement planning and inventory management.

Notwithstanding the above, respondents acknowledged challenges, including inconsistent data entry by personnel at different levels of the organization and, occasionally, system downtime that prevents the updating of information in real time. Respondents stated that these challenges have caused temporary delays in decision-making and have occasionally caused misinformation to be communicated to other stakeholders, resulting in actions taken by the organization that are potentially counterproductive, such as overstocking and/or stockouts. Respondents stated that, however, EPHARM is continually upgrading its systems, training its personnel, and improving its processes to mitigate these challenges. Respondents stated that maintaining high-quality and reliable information is essential to the operational efficiency of EPHARM and that ongoing efforts to address data inaccuracies directly impact EPHARM's ability to perform competitively in the marketplace.

5. Could you elaborate on the Internal operation that EPHARM has implemented? Specifically, how do you believe these practices impact the productivity and competitiveness of EPHARM in the pharmaceutical market?

Respondents stated that EPHARM has implemented operational practices that are based upon the principles of standardization and continuous improvement. Respondents stated that the organization has developed detailed Standard Operating Procedures (SOPs) for all operational activities, including procurement, manufacturing, quality control and assurance, and distribution. Respondents stated that the SOPs serve as the benchmark for employee performance and provide consistency in operational processes across departments and locations. Respondents stated that the adherence to these SOPs decreases errors, increases consistency in operational processes, and increases the overall efficiency of the organization.

In addition to the above, respondents stated that EPHARM has established a culture of continuous improvement, which is promoted through regular review meetings, process audits, and employee feedback mechanisms. Respondents stated that EPHARM encourages

employees at all levels of the organization to identify inefficiencies in processes and suggest ways to improve processes, and that these suggestions are then evaluated and implemented through formal change management processes. Respondents stated that this participative approach to process improvement creates a sense of ownership among employees and fosters innovation in operational processes. The participants described that EPHARM's participatory way of improving their operational processes encourages innovation through employee participation in operational processes, and builds employee "ownership" for process improvements. The participants also described that EPHARM has invested in technologies, including enterprise resource planning (ERP), and other automation tools to improve operational efficiency and reduce reliance on manual labour. The participants also described that the aforementioned Internal operation are highly effective in creating high productivity at EPHARM, and that they achieve higher productivity through faster production cycles, less waste, and compliance with international quality standards. The participants also described that the aforementioned Internal operation enable EPHARM to respond quickly to changes in its markets, support the launch of new products, and maintain cost leadership. Therefore, the participants described that EPHARM's Internal operation make it a highly responsive and flexible pharmaceutical company positioned to continue growing and competing in an increasingly volatile pharmaceutical industry.

4.8. Discussion of findings

This section interprets the quantitative regression results and qualitative interview findings in relation to existing supply chain management literature and organizational performance theory. The discussion integrates both sources of evidence to provide comprehensive understanding of how SCM practices influence organizational performance at Ethiopian Pharmaceutical Manufacturing (EPHARM).

4.8.1. Model performance and theoretical implications

The multiple regression model demonstrates strong explanatory power, with an R-squared value of 0.773, indicating that the four supply chain management practices examined in this study explain 77.3% of the variance in organizational performance at EPHARM. The associated F-statistic of 202.850 with a p-value < 0.001 demonstrates that the overall regression model is statistically significant and substantially better than using the mean of the dependent variable for predicting organizational performance outcomes. This strong model

performance provides empirical validation for the integrated supply chain management framework adopted in this study, confirming that SCM practices are indeed significant and meaningful determinants of organizational success in pharmaceutical manufacturing.

The theoretical foundations underlying this research including Resource-Based View theory (Barney, 1991) and Information Processing Theory (Galbraith, 1973) are supported by these findings. Specifically, the results demonstrate that organizations that strategically manage their supply chain resources (suppliers, information, internal processes, and customer relationships) achieve superior performance outcomes. This aligns with Resource-Based View theory, which posits that competitive advantage derives from leveraging distinctive organizational resources and capabilities. In the context of EPHARM, the strong relationships between SCM practices and performance suggest that supply chain management represents a critical organizational resource and capability contributing to competitive advantage in the Ethiopian pharmaceutical industry.

4.8.2. Supplier management as a critical performance driver

Supplier management practices emerged as the second strongest predictor of organizational performance, with a standardized beta coefficient of 0.369 ($p < 0.001$). This finding is statistically significant and carries substantial practical importance, indicating that for every standard deviation increase in supplier management practices, organizational performance increases by 0.369 standard deviations, holding other variables constant. This result strongly aligns with prior literature emphasizing the strategic importance of supplier relationships. Monczka et al. (2015) demonstrated that organizations developing collaborative, long-term supplier partnerships achieve significant cost reductions, improved product quality, and enhanced innovation capabilities. Similarly, Grant (2024) emphasized that strategic supplier relationship management enables supply chain resilience and operational efficiency, both fundamental components of organizational success.

The interview data substantively corroborates these quantitative findings. Respondents consistently described EPHARM's approach to supplier management as involving long-term strategic relationships characterized by regular communication, joint planning, and collaborative problem-solving. As one respondent noted, EPHARM's supplier relationship management process has "allowed EPHARM to reduce lead times, improve the quality of the supplies received, and promote innovation." Moreover, respondents indicated that strong

supplier relationships provide concrete benefits during periods of supply disruption or peak demand: "suppliers may give EPHARM better pricing or priority status during peak demand periods, thus eliminating delays and stockouts."

However, the descriptive analysis revealed important nuances within supplier management practices. While respondents reported high agreement with items assessing risk management (M = 3.96), conflict resolution (M = 3.90), and long-term relationship prioritization (M = 3.88), they reported notably lower agreement with items assessing supplier performance evaluation (M = 3.21) and collaborative product development (M = 3.33). This discrepancy suggests that while EPHARM has successfully established collaborative supplier relationships and manages supplier risks effectively, the organization may lack formalized, consistent systems for regular supplier performance assessment and joint innovation activities. This gap aligns with findings from Bilal et al. (2024), who noted that pharmaceutical companies in developing economies often struggle to implement comprehensive supplier evaluation frameworks due to capacity and resource constraints.

The moderately lower mean for supplier performance evaluation (M = 3.21, SD = 0.93) represents a strategic opportunity for EPHARM. Implementing structured supplier scorecards with clear key performance indicators (quality consistency, on time delivery, regulatory compliance, innovation contributions) could strengthen the supplier management function and potentially further enhance organizational performance. This recommendation is supported by recent literature emphasizing the importance of balanced supplier assessment mechanisms that go beyond relationship management to include objective performance metrics (Prajogo et al., 2012; Kagande et al., 2022).

4.8.3. Internal operation: the strongest performance driver

Internal operation emerged as the strongest predictor of organizational performance, with a standardized beta coefficient of 0.378 ($p < 0.001$). This finding is particularly significant and represents a key contribution of this research. The result indicates that improvements in internal processes, operational standardization, continuous improvement culture, and internal coordination have the strongest association with organizational performance improvements at EPHARM exceeding even the effect of supplier management. This finding extends and refines prior research by emphasizing that while external supply chain relationships are

important, the foundation of organizational performance lies in operational excellence and process efficiency within the organization itself.

This finding is consistent with Ganbold et al. (2021), who found that organizations implementing standardized processes, continuous monitoring systems, key performance indicators, and regular internal audits achieved superior supply chain and financial performance. The authors concluded that "organizations who have standardization throughout their internal processes and use simple communication formats are more efficient in their operations," a finding directly supported by the current research.

The interview data provides rich context for understanding why internal operations are such a critical performance driver at EPHARM. Respondents described a sophisticated approach to operational management based on "principles of standardization and continuous improvement." Specifically, EPHARM has developed "detailed Standard Operating Procedures (SOPs) for all operational activities, including procurement, manufacturing, quality control and assurance, and distribution." These SOPs "serve as the benchmark for employee performance and provide consistency in operational processes across departments and locations." Furthermore, respondents emphasized that EPHARM has "established a culture of continuous improvement, which is promoted through regular review meetings, process audits, and employee feedback mechanisms."

Importantly, respondents indicated that this operational foundation directly drives organizational performance outcomes. One respondent stated: "the aforementioned Internal operation enable EPHARM to respond quickly to changes in its markets, support the launch of new products, and maintain cost leadership," ultimately positioning EPHARM as "a highly responsive and flexible pharmaceutical company positioned to continue growing and competing in an increasingly volatile pharmaceutical industry."

However, the descriptive analysis revealed that this operational excellence is not uniformly distributed across all internal functions. Respondents reported high agreement with items assessing continuous improvement (M = 3.97), internal auditing (M = 3.92), and KPI measurement systems (M = 3.79). These strong indicators suggest that EPHARM has successfully established a culture of systematic performance management and operational accountability. Notably, one respondent acknowledged: "since conflict arises internally when

thousands of team members are never monitored or held accountable for meeting KPIs; this is a very good thing" about EPHARM's approach.

Conversely, respondents reported moderate agreement with items assessing cross functional team collaboration (M = 2.94), employee training frequency (M = 3.29), and best practices dissemination (M = 3.44). The notably lower mean for cross functional collaboration (M = 2.94, SD = 0.813) is particularly noteworthy and represents a potential constraint on further performance improvements. This finding aligns with the problem statement articulated in the introduction, which noted that "the internal environment creates barriers to effective SCM due to silos of operation and the inability to coordinate and make decisions collectively." The interview data corroborates this challenge, as respondents did not explicitly emphasize cross departmental integration as a strength.

The gap between EPHARM's strong performance on standardization and continuous improvement versus moderate performance on cross functional collaboration suggests an organizational opportunity: enhancing inter-departmental coordination and breaking down functional silos could unlock additional performance gains. This recommendation aligns with recent literature on supply chain integration, which emphasizes that internal integration across procurement, operations, logistics, and customer service functions is essential for translating operational improvements into superior market performance (MacCarthy et al., 2016; Ganbold et al., 2021).

4.8.4. Customer management: building competitive advantage through responsiveness

Customer management practices represent the third-ranked predictor of organizational performance, with a standardized beta coefficient of 0.232 ($p < 0.001$). While smaller than the coefficients for supplier management and internal operations, this effect is still statistically significant and substantial in practical terms. The finding reflects that customer-oriented practices understanding customer needs, managing relationships, handling complaints, and adapting to changing demand significantly contribute to organizational performance. This aligns with substantial literature demonstrating that customer-centric strategies are fundamental to competitive advantage. Madhani (2019) found that organizations adopting customer-focused approaches build loyalty and satisfaction, which increases revenue and competitive positioning. Similarly, Liu & Jiang (2025) demonstrated that firms implementing comprehensive customer management systems and feedback loops

achieve superior customer satisfaction and operational excellence compared to organizations without such systems.

The interview data reveals that EPHARM has adopted a sophisticated approach to customer management centered on "creating a customer-centric environment, primarily through ensuring that pharmaceutical products are delivered to customers in a timely and reliable manner." EPHARM has invested in "comprehensive logistics and distribution systems, which allow products to be delivered to customers quickly and consistently," and maintains "an ongoing process for receiving customer feedback, so that any customer complaints or suggestions are responded to promptly." Respondents emphasized that this customer orientation has "contributed to the creation of trust and loyalty, particularly with government health organizations and private medical clinics, which depend on timely deliveries of pharmaceutical products."

Furthermore, respondents described additional customer management initiatives including order status communication, new product information sharing, technical support provision, customized delivery schedules, and flexible payment options. These practices reflect a deliberate effort to move beyond transactional customer relationships toward strategic partnerships. One respondent noted that EPHARM's customer orientation approach "would help the company achieve greater operational efficiency because they would decrease the amount of error potential in the ordering process, reduce the amount of time that products take to reach the customers, and increase the number of repeat customers."

However, the descriptive analysis revealed important performance gaps within customer management practices. Respondents reported high agreement with items assessing communication channels (M = 3.95), customer service integration (M = 3.96), complaint handling (M = 3.80), and customer feedback collection (M = 3.74). These findings suggest that EPHARM has successfully established basic customer management infrastructure and responsiveness mechanisms. Conversely, respondents reported notably lower agreement with items assessing customer knowledge development (M = 2.79) and use of customer feedback for supply chain improvements (M = 3.17). The particularly low mean for customer knowledge (M = 2.79, SD = 0.885) is striking and suggests a significant gap between EPHARM's responsiveness to customers and its deep understanding of customer needs.

This gap is theoretically important because understanding customer needs is a prerequisite for effectively meeting those needs. Porter (1985) emphasizes that strategic performance requires understanding and responding to "client satisfaction" by meeting "ever-changing needs of its clients and customers." The low agreement with "Customer needs and preferences are well understood within our organization" suggests that EPHARM's customer management approach may be more reactive (responding to immediate customer requests and complaints) than proactive (anticipating and shaping customer needs). This finding aligns with interview data noting that some respondents suggested "it would be advantageous for EPHARM to create a greater level of personalization in customer service to further enhance the relationship between the company and the clients and to create an enhanced understanding of the needs of the clients."

The relatively lower beta coefficient for customer management ($\beta = 0.232$) compared to internal operations ($\beta = 0.378$) and supplier management ($\beta = 0.369$) may reflect this gap. Organizations that develop deep customer intelligence understanding needs, anticipating trends, and personalizing offerings may achieve stronger performance impacts than organizations that are primarily responsive to existing customer demands. This suggests that EPHARM could enhance performance by investing in customer research, market analysis, and customer segmentation strategies to move from reactive responsiveness to proactive customer value creation. This recommendation is supported by recent literature on customer relationship management effectiveness (Reichhart & Holweg, 2007; Liu & Jiang, 2025).

4.8.5. Quality information sharing: a foundation for coordination

Quality information sharing practices emerged as the weakest predictor of organizational performance among the four SCM practices, with a standardized beta coefficient of 0.124 ($p = 0.002$). While statistically significant, this smaller effect size warrants careful interpretation. The finding does not suggest that information sharing is unimportant; rather, it indicates that information sharing serves more as a foundational enabler of coordination rather than a direct driver of performance outcomes. In other words, quality information sharing may be necessary but not sufficient for organizational performance it works through its effects on supplier relationships, customer responsiveness, and operational effectiveness.

This interpretation aligns with Information Processing Theory (Galbraith, 1973), which posits that organizations must process information to reduce uncertainty and enable coordination.

Information sharing reduces uncertainty and improves decision-making, thereby enabling the implementation of effective strategies. However, the actual performance impact depends on what organizations do with the information how they manage suppliers, serve customers, and operate internally. This theoretical lens suggests that information sharing is most impactful when combined with strong supplier relationships, customer focus, and operational excellence.

The interview data corroborates this interpretation. Respondents described EPHARM's information systems positively, noting that "EPHARM has achieved considerable progress in developing systems to facilitate the exchange of information with its supply chain partners," including "adoption of enterprise resource planning (ERP) systems and cloud-based communication platforms." Respondents indicated that these systems have "facilitated the timely and accurate exchange of various types of information, including but not limited to, inventory levels, forecasting of demand, and scheduling of shipments," and that "this type of information sharing facilitates greater coordination and planning among departments and with external partners."

The respondents further emphasized that information sharing enables proactive supply chain management: "proactive information sharing enables EPHARM to recognize potential disruptions to its supply chains and to take corrective action prior to the occurrence of actual disruptions. For example, advance warning of potential delays or shortages allows EPHARM to modify its procurement processes or to find alternative sources of supply." This description indicates that information systems support coordination and decision-making, which then drive performance through operational and supplier management activities.

However, the descriptive analysis identified meaningful gaps in information sharing quality. Respondents reported high agreement with items assessing information accuracy and reliability (M = 3.84), standardization of information quality (M = 3.91), employee training on information quality (M = 3.75), and error correction (M = 3.74). These findings suggest that EPHARM has implemented foundational information quality assurance mechanisms. Conversely, respondents reported notably lower agreement with items assessing information timeliness (M = 3.25) and stakeholder feedback on information quality (M = 3.12). The particularly low mean for stakeholder feedback (M = 3.12, SD = 0.880) suggests that information sharing may be somewhat one-directional, with limited mechanisms for external

stakeholders (suppliers, customers) to provide input on whether information received meets their needs.

Interview respondents acknowledged these challenges explicitly: "inconsistent data entry by personnel at different levels of the organization and, occasionally, system downtime that prevents the updating of information in real time" have "caused temporary delays in decision-making and have occasionally caused misinformation to be communicated to other stakeholders, resulting in actions taken by the organization that are potentially counterproductive, such as overstocking and/or stockouts." This candid acknowledgment aligns with the quantitative finding that timeliness remains a moderate rather than strong performance area.

The relatively weaker effect of information sharing on performance in the Ethiopian context may also reflect infrastructural and technological constraints noted by Bilal et al. (2024). In developing economies, supply chain visibility may be constrained by limited technological infrastructure, inconsistent digital adoption across suppliers, and varying technical capabilities. Under such constraints, maximizing the efficiency of internal operations and strengthening direct relationships with suppliers may yield greater performance returns than investments in information systems alone.

Recommendations for strengthening information sharing include:

- Implementing real-time data monitoring systems and automated alerts when inconsistencies are detected;

- Establishing formal feedback mechanisms through which suppliers and customers can provide input on information quality and timeliness;

- Standardizing data collection procedures and providing regular training to personnel involved in data entry and management;

- Developing metrics to evaluate information-sharing practice effectiveness. These improvements could strengthen the relationship between information sharing and organizational performance by ensuring that information systems actively support rather than merely document supply chain activities.

4.8.6. Comparative analysis with prior research and theory

The findings of this study both align with and extend prior research on supply chain management and organizational performance. The identification of supplier management, customer management, and internal operations as significant performance drivers is consistent with comprehensive literature reviews and meta-analyses demonstrating these relationships across diverse industries and contexts (Neely et al., 2005; Richard et al., 2009; Gunasekaran et al., 2017; Chopra & Meindl, 2021).

However, this study makes several novel contributions to the literature. First, the finding that Internal operation are the strongest performance driver extends prior research that often emphasizes external supply chain relationships (supplier partnerships, customer responsiveness) over internal operations. The result suggests that in the pharmaceutical manufacturing context particularly in developing economies establishing operational excellence, standardization, and continuous improvement processes represents the foundation upon which all other supply chain strategies must be built. This finding has important implications for pharmaceutical manufacturers in Ethiopia and similar contexts, suggesting that capacity-building investments should prioritize operational process improvement before pursuing more sophisticated external supply chain integration strategies.

Second, this study demonstrates that the relative importance of SCM practices may vary depending on organizational and contextual factors. Specifically, while information sharing is important in developed economies with mature digital infrastructure, its effect on performance in EPHARM is more modest ($\beta = 0.124$), likely due to infrastructural constraints and the primacy of getting basic internal operations right. This contextual finding aligns with observations by Bilal et al. (2024) and supports the notion that "one-size-fits-all" supply chain strategies may be inappropriate for developing economies.

Third, the integration of quantitative and qualitative evidence in this study provides richer understanding than either method alone. The regression results identify statistical relationships and relative effect sizes; the interview data explains the mechanisms through which these relationships operate and identifies specific practices and challenges. For example, while regression analysis shows that internal operations ($\beta = 0.378$) is more important than information sharing ($\beta = 0.124$), the interview data reveals why: EPHARM has strong process standardization and continuous improvement culture that directly drive

performance, while information systems face infrastructural limitations that constrain their effectiveness.

4.8.7. Contextual factors specific to Ethiopian Pharmaceutical Manufacturing

The strength of these findings and the pattern of relationships observed must be understood within the specific context of Ethiopian pharmaceutical manufacturing. The Ethiopian pharmaceutical industry faces distinctive challenges including infrastructure limitations, regulatory complexities, and supply chain disruptions that differ from those in developed economies. Understanding how these contextual factors shape the relationships between SCM practices and performance is essential for appropriate interpretation and practical application of findings.

First, the prominence of Internal operation ($\beta = 0.378$) as the strongest performance driver likely reflects the fact that basic operational reliability and consistency remain critical in contexts where external supply chain infrastructure is less developed. In developed economies with mature transportation networks, stable supplier bases, and advanced information systems, organizations can focus on optimizing external relationships and information flows. In Ethiopia, where supply chain disruptions are more common and infrastructural constraints are substantial, ensuring that internal production planning, inventory management, warehousing, and logistics are optimized and standardized represents the most direct pathway to performance improvement. As one interview respondent noted, EPHARM's "Standard Operating Procedures serve as the benchmark for employee performance and provide consistency in operational processes across departments and locations," directly addressing the contextual challenge of maintaining consistency in uncertain environments.

Second, the significance of supplier management ($\beta = 0.369$) reflects the critical importance of supplier reliability in contexts where supply disruptions are common. The interview data emphasized that EPHARM's supplier relationships have enabled the organization to "reduce lead times, improve the quality of the supplies received, and promote innovation" and to receive "better pricing or priority status during peak demand periods." In developed economies where supplier relationships are often more standardized and less personal, the effect of relationship strength might be smaller. In the Ethiopian context, where supplier

relationships are more critical for managing scarcity and uncertainty, the strong effect aligns with observed supply chain realities.

Third, the moderate effect of customer management (β = 0.232) may reflect the relatively concentrated customer base in Ethiopian pharmaceutical manufacturing. Many customers are government health organizations and established private clinics that have long-standing relationships with EPHARM. In such contexts, while customer responsiveness is important, customer base growth and revenue expansion may be constrained by market size and regulatory factors rather than by customer satisfaction alone. The finding that customer knowledge remains a gap (M = 2.79) suggests that deepening customer understanding could unlock performance improvements, particularly if EPHARM seeks to expand into new customer segments or geographic markets.

Fourth, the modest effect of information sharing (β = 0.124) reflects infrastructural constraints specific to the Ethiopian context. While respondents acknowledged EPHARM's adoption of ERP systems and cloud-based platforms, they also identified challenges including "inconsistent data entry by personnel at different levels of the organization" and "system downtime that prevents the updating of information in real time." These challenges arise from limited ICT infrastructure, varying technical skills across the supply chain, and the complexities of coordinating with suppliers and customers with diverse technological capabilities. This finding aligns with observations by Bilal et al. (2024) regarding technology access constraints in Ethiopian pharmaceutical supply chains.

Understanding these contextual factors is critical for managers and policymakers seeking to apply the findings of this research. The specific pattern of relationships observed at EPHARM reflects the unique challenges and opportunities of pharmaceutical manufacturing in a developing economy context. While the fundamental importance of supply chain practices for organizational performance is universal, the relative importance of different practices and the most effective implementation strategies must be adapted to reflect local conditions, capabilities, and constraints.

4.8.8. Limitations and constraints on interpretation

Several limitations should be acknowledged when interpreting the findings of this study. First, organizational performance was measured through employee perceptions rather than objective financial metrics (actual revenue, profit margins, cost per unit, market share

percentage). While perceptual measures are widely validated in supply chain literature and serve as reasonable proxies for actual performance, they are subject to response bias and may not perfectly reflect objective organizational outcomes. Social desirability bias wherein respondents rate their organization more favourably than objective measures would justify may have inflated reported performance levels. Future research incorporating objective financial data would strengthen causal inference.

Second, the study employs a cross sectional research design, collecting data at a single point in time (2025). This design precludes causal inference; while regression analysis identifies statistical relationships, it cannot definitively establish that SCM practices cause performance improvements versus organizational success enabling investment in SCM practices. Longitudinal research following EPHARM over multiple years would better establish causal pathways.

Third, results are specific to one pharmaceutical manufacturing company in Ethiopia and may not generalize to other pharmaceutical firms, other industries, or other countries. While the study provides rich understanding of EPHARM specifically, generalizing findings to the broader Ethiopian pharmaceutical industry requires caution. Comparative studies across multiple firms would enhance generalizability.

Fourth, the measurement of constructs through self-report questionnaire data introduces the possibility of common method bias, wherein method variance (questionnaire format) rather than true relationships between variables inflates correlations. While the use of multiple data sources (quantitative surveys and qualitative interviews) provides some mitigation, the primary data source remains self-report survey responses.

Fifth, the interview sample, while purposefully selected to include managers and stakeholders with direct knowledge of supply chain practices, was not randomly selected and may not represent the full diversity of perspectives within EPHARM. Interview findings provide valuable contextual richness but are not statistically generalizable in the way survey findings are.

Sixth, the thesis does not examine potential mediating or moderating variables that might explain the relationships between SCM practices and performance. For example, organizational learning culture, employee capability, and technology infrastructure might

mediate the relationships observed. Including such variables in future research would provide more comprehensive understanding of causal mechanisms.

Despite these limitations, the study provides valuable empirical evidence regarding SCM practice effects on organizational performance in the Ethiopian pharmaceutical context, integrates quantitative and qualitative evidence, and contributes to literature addressing supply chain management in developing economies a domain where research is relatively limited.

4.8.9. Integration of quantitative and qualitative findings

The integration of quantitative regression analysis with qualitative interview data provides more complete understanding than either method alone could achieve. The quantitative analysis identified what relationships exist between variables and how strong those relationships are. The correlation coefficients ($r = 0.679$ for supplier management, $r = 0.737$ for internal operations, $r = 0.725$ for customer management, $r = 0.610$ for information sharing) and regression coefficients (β values ranging from 0.124 to 0.378) quantify the strength and statistical significance of relationships.

The qualitative interview data answers how and why these relationships operate, providing mechanism level understanding. For example:

Why supplier management is important: Respondents described how EPHARM's strategic supplier partnerships enable reduced lead times, quality improvements, and priority status during disruptions

Why internal operations are critical: Respondents emphasized SOPs, continuous improvement culture, and performance monitoring as directly enabling organizational responsiveness and efficiency

Why customer management matters: Respondents noted that responsive customer service, timely delivery, and complaint resolution build customer loyalty and repeat business

Why information sharing's effect is moderate: Respondents acknowledged that while information systems are important, technical limitations and data quality challenges constrain their effectiveness

This integration also allowed identification of performance gaps and recommendations:

Supplier performance evaluation inconsistency (M = 3.21) despite strong relationships

Cross-functional collaboration weakness (M = 2.94) despite strong operational processes

Customer knowledge gaps (M = 2.79) despite strong communication channels

Information timeliness challenges (M = 3.25) despite system investments

These specific gaps, identified through the combination of quantitative means and qualitative insights, provide actionable direction for organizational improvement that generic recommendations could not offer. The mixed-methods approach thus serves a valuable function in bridging the gap between statistical significance and practical organizational understanding.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATION

5.1. Summary of Findings

The study examined the effect of supply chain management practices on organizational performance at Ethiopian Pharmaceutical Manufacturing (EPHARM). Using survey data collected from 243 supply chain employees and supported by qualitative interviews, multiple linear regression analysis was employed to test the proposed hypotheses.

The findings revealed that all four supply chain management practices have statistically significant positive effects on organizational performance: supplier management ($\beta = 0.369$, $p < 0.001$), customer management ($\beta = 0.232$, $p < 0.001$), quality information sharing ($\beta = 0.124$, $p = 0.002$), and internal operation ($\beta = 0.378$, $p < 0.001$). The regression model explained 77.3% of the variance in organizational performance ($R^2 = 0.773$), indicating strong explanatory power.

Among the predictors, internal operation emerged as the strongest determinant of organizational performance, followed by supplier management. Although information sharing demonstrated the weakest coefficient, it remained statistically significant. The qualitative findings further supported the quantitative results, emphasizing the importance of standardized processes, strategic supplier partnerships, responsive customer management, and effective information systems in enhancing performance within the Ethiopian pharmaceutical manufacturing context.

5.2. Conclusion

Based on the findings of the study, the following conclusions are drawn:

Supplier management practices significantly enhance organizational performance by improving supply reliability, production continuity, and cost efficiency at EPHARM.

Customer management practices positively influence organizational performance through improved customer satisfaction, responsiveness, and relationship management.

Quality information sharing among supply chain partners contributes to improved organizational performance by enhancing coordination, reducing uncertainty, and supporting informed decision-making.

Internal operation play a crucial role in improving organizational performance by optimizing resource utilization, reducing operational inefficiencies, and strengthening internal coordination.

Overall, the study concludes that effective implementation of integrated supply chain management practices is essential for improving organizational performance in Ethiopian pharmaceutical manufacturing.

5.3. Recommendation

Based on the findings of the study, the following recommendations are proposed:

Strengthen strategic supplier collaboration:

EPHARM should establish long-term contractual partnership with key suppliers through formal contracts, joint performance evaluation, and collaborative planning mechanisms to improve supply reliability and quality consistency.

Enhance customer relationship management systems:

The organization should invest in structured customer feedback systems and customer relationship management technologies to improve service responsiveness, demand forecasting, and sustain customer satisfaction & retention.

Improve supply chain information integration:

EPHARM should adopt integrated information systems that enable real-time, accurate, and transparent information exchange among supply chain partners to reduce uncertainty, support coordination, and operational planning.

Optimize internal operation processes:

Management should focus on continuous process improvement initiatives, production planning optimization, and inventory management efficiency to strengthen internal coordination and reduce operational inefficiencies.

Capacity building and training:

Regular training programs should be provided to employees involved in supply chain activities to enhance technical skills and promote best practices in supply chain management.

Suggestions for Future Research

Future studies may consider incorporating longitudinal data or comparative analyses across multiple pharmaceutical manufacturing firms to enhance generalization. Additionally, qualitative approaches could be employed to gain deeper insights into supply chain coordination challenges within the Ethiopian pharmaceutical sector.

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APPENDIX

Appendix A: Questionnaire

Welcome, dear respondent: My name is Meron Samuel, and I am a student at Addis Ababa University pursuing a master's degree in business administration (MBA). This research, which serves as partial fulfillment of an academic requirement, is entitled "Effect of Supply Chain Management Practices on Organizational Performance: A Case Study of Ethiopian Pharmaceutical Manufacturing." Your honest responses to this survey are highly valued, as they will significantly contribute to the success of this study. This questionnaire is intended solely to collect primary data for this investigation.

I respectfully ask that you take a few moments out of your busy day to respond to the questions outlined below. There is no need to provide your name. Please answer each question to the best of your ability.

You are only required to mark the option number that you feel best represents your choice. For questions that require explanations, please provide your responses in the space provided.

If you require any clarifications or descriptions of the study or the questions presented, please contact me at +251 91 312 9558 on my cell phone. Please be assured that the information you provide will be treated with the utmost confidentiality. Thank you for taking the time to participate in this study.

Sincerely,

Meron Samuel

Part one: General Information

Age

18-24 years ☐ 45-54 years ☐

25-34 years ☐ 55 years above ☐

35-44 years ☐

Gender

Male ☐

Female ☐

Educational Background

Diploma ☐ Doctorate Degree ☐

Bachelor's Degree ☐ Other (Please specify)

Master's Degree ☐ ……..

Years of Experience in Supply Chain Management

Less than 1 year ☐ 7-10 years ☐

1-3 years ☐ More than ☐ years

4-6 years ☐

Job Role in Supply Chain Management

Procurement Specialist ☐ ☐

Logistics Coordinator ☐

Warehouse Manager ☐

Supply Chain Analyst

Other (Please specify)……..

Part two: Please tick (√) on the appropriate column to indicate your reactions to the following statements.

Key: 1=strongly disagree, 2=disagree, 3=moderately Agree, 4=agree, 5=strongly agree

NO	Statement	Strongly disagree (1)	Disagree (2)	Moderately agree (3)	Agree (4)	Strongly Agree (5)
	1. Supplier Management					
1	Our organization has established strong relationships with key suppliers.					
2	Supplier selection criteria are well-defined and consistently applied.					
3	We regularly assess supplier performance based on predetermined metrics.					
4	Our organization collaborates with suppliers to improve supply chain efficiency.					
5	There is a process for resolving conflicts with suppliers effectively.					
6	We prioritize fostering long-term relationships with our suppliers.					
7	Supplier risk management strategies are implemented in our operations.					
8	We include suppliers in product development processes when appropriate.					
9	Our organization invests in supplier training and development programs.					
10	Suppliers are involved in sharing market knowledge to improve our supply chain.					
	2. Customer Management					
1	We actively gather feedback from customers to improve our products and services.					
2	Customer needs and preferences are well understood within our organization.					
3	Our organization prioritizes customer satisfaction in all operational decisions.					
4	We maintain strong communication channels					

	with our customers.					
5	There are processes in place to handle customer complaints efficiently.					
6	Our organization uses customer feedback to drive supply chain improvements.					
7	We regularly analyze market trends to anticipate customer needs.					
8	Relationships with key customers are managed strategically.					
9	Our organization adapts quickly to changes in customer demand.					
10	Customer service teams are well integrated with other supply chain functions.					
3. Quality of Information Sharing						
1	The information shared within our supply chain is accurate and reliable.					
2	We have established standards for the quality of information shared.					
3	Employees are trained on the importance of sharing quality information.					
4	The timeliness of shared information is prioritized in our organization.					
5	We verify the quality of information before it is disseminated to stakeholders.					
6	Stakeholders provide feedback on the quality of information shared with them.					
7	Information is presented in a clear and understandable format.					
8	Technology tools are used effectively to ensure the quality of shared information.					
9	There are metrics to evaluate the quality of information-sharing practices.					
10	Incorrect information is addressed quickly to minimize its impact on operations.					
4. Internal Operations						
1	Our supply chain processes are well-documented and standardized.					

	effective supply chain management.					
10	Overall operational efficiency has improved because of our supply chain strategies.					

Appendix B: Interview questions

Can you describe how your organization establishes and maintains relationships with key suppliers? In your experience, how do these relationships impact the operational efficiency of EPHARM?

What strategies does EPHARM implement to enhance customer satisfaction and retention? Can you provide examples of how these strategies have been successful or areas where they could improve?

How would you assess the current level of information sharing among supply chain partners at EPHARM? In your opinion, how does this level of sharing influence the overall organizational performance?

How does EPHARM ensure the quality and reliability of information shared within its supply chain? What challenges have you encountered in this regard, and how have they affected decision-making processes?

Could you elaborate on the Internal operation that EPHARM has implemented? Specifically, how do you believe these practices impact the productivity and competitiveness of EPHARM in the pharmaceutical market?

2	We continuously monitor and improve our internal operations.					
3	Employee roles within the supply chain are clearly defined.					
4	Cross-functional teams collaborate effectively on operations.					
5	We use technology to streamline internal operations.					
6	Employee training is regularly provided to enhance operational efficiency.					
7	There are established KPIs to measure the efficiency of internal operations.					
8	Internal audits are conducted to assess operational performance.					
9	We implement best practices in our internal operations.					
10	Internal communication supports effective operational management.					
Dependent Variable: Organizational Performance						
1	Our organization meets its supply chain performance targets consistently.					
2	The supply chain contributes significantly to overall profitability.					
3	Customer satisfaction levels have improved due to supply chain practices.					
4	Our organization is recognized for excellence in supply chain management.					
5	Financial performance has improved as a result of better supply chain practices.					
6	We have seen growth in market share attributed to supply chain improvements.					
7	Employee productivity has increased due to streamlined supply chain processes.					
8	Our organization is able to launch new products successfully due to supply chain agility.					
9	Cost reductions have been achieved through					

Effect of Supply Chain Management Practices on Organizational Performance: The Case of Ethiopian Pharmaceutical Manufacturing

A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfilment of the Requirements for the Degree of Master of Business Administration (MBA)

By: Meron Samuel

Approved by Board of Examiners

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