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Impact of Supply Chain Optimization on Financial Performance of Manufacturing Firms in South-east Nigeria

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Abstract: This study evaluated the impact of supply chain optimization on the financial performance of manufacturing firms in South-East Nigeria. A descriptive survey research design was adopted, and data were collected from a sample of 147 respondents drawn from four selected manufacturing firms using a structured questionnaire. The data were analyzed using descriptive statistics and multiple regression analysis. The findings revealed that inventory management ($\beta = 0.432$, $p < 0.05$), logistics and distribution efficiency ($\beta = 0.385$, $p < 0.05$), and supply chain technology adoption ($\beta = 0.298$, $p < 0.05$) all have significant positive effects on financial performance, with a combined explanatory power (R^2) of 0.68. The study concluded that effective supply chain optimization enhances profitability and operational efficiency. It was therefore recommended that manufacturing firms adopt efficient inventory systems, improve logistics operations, and invest in modern supply chain technologies to achieve sustainable financial growth.

Keywords: *Supply Chain Optimization, Financial Performance, Inventory Management, Logistics and Distribution, Technology Adoption, Manufacturing Firms.*

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Introduction

Background of the study

Manufacturing firms operate in an increasingly competitive and dynamic business environment, where efficiency and cost effectiveness are critical for survival. The supply chain, which encompasses the flow of materials, information, and resources from suppliers to end customers, plays a pivotal role in determining the operational success of these firms. Inefficient supply chain processes can lead to delays, stockouts, excessive inventory, and increased operational costs, all of which negatively affect a firm's financial performance. Conversely, optimizing supply chain processes allows firms to reduce waste, improve responsiveness, and enhance productivity, thereby contributing directly to profitability (Sinoimeri & Teta, 2025).

Over the past decades, globalization and technological advancements have transformed the manufacturing sector, making supply chain management more complex yet more critical. Firms are now required to integrate operations across multiple locations, suppliers, and markets, while adapting to fluctuating demand and regulatory requirements. In this context, supply chain optimization is not merely about cost reduction but also about achieving agility, flexibility, and resilience. Studies have shown that firms with highly optimized supply chains are better positioned to respond to market changes, minimize disruptions, and sustain competitive advantage, all of which positively influence their financial outcomes (Damba, 2024).

The adoption of modern technologies such as enterprise resource planning (ERP) systems, automation, artificial intelligence, and predictive analytics has provided manufacturing firms with new tools to optimize their supply chains. These technologies enable real-time monitoring of operations, improved demand forecasting, and more efficient resource allocation. Despite these advancements, many firms, particularly in developing economies, still face challenges such as inadequate infrastructure, poor logistics, and limited skilled personnel, which hinder the full realization of the financial benefits of supply chain optimization (Auwalin, 2024).

Financial performance is a key indicator of a firm's health and sustainability, often measured through profitability, return on investment, and revenue growth. The link between supply chain optimization and financial performance lies in the ability of an optimized supply chain to reduce operational costs, improve product quality, and accelerate delivery times. By minimizing inefficiencies and improving customer satisfaction, firms can achieve higher sales, lower expenses, and better cash flow management. However, while theoretical studies suggest a strong positive relationship, empirical evidence remains mixed, especially in the context of local manufacturing firms in developing economies (Putra, 2023).

Given the strategic importance of supply chains and the growing investment in optimization initiatives, there is a pressing need to investigate their impact on financial performance. Manufacturing firms that successfully optimize their supply chains not only gain operational efficiency but also achieve tangible financial benefits, positioning themselves for sustainable growth in competitive markets. This study seeks to provide insights into how supply chain optimization strategies influence financial outcomes, highlighting practical implications for managers and policymakers aiming to strengthen the manufacturing sector.

Statement of the Problem

Manufacturing firms are increasingly challenged to remain competitive in a rapidly evolving global market. Despite significant investments in production facilities, technology, and human resources, many firms continue to face operational inefficiencies that negatively affect their financial performance. A major source of these inefficiencies is the management of the supply chain. Poorly coordinated procurement, production, inventory, and distribution processes often result in high operational costs, delayed deliveries, stockouts, and waste (Bolli *et al.,* 2021). These issues undermine profitability, reduce return on investment, and limit the firm's ability to meet customer expectations. While supply chain optimization has emerged as a strategic approach to address these challenges, not all firms are able to effectively implement and leverage optimization strategies. Factors such as inadequate technological infrastructure, lack of skilled personnel, poor logistics, and resistance to process changes often hinder the potential benefits of supply chain initiatives. Consequently, many manufacturing firms struggle to translate operational improvements into measurable financial gains (Azman *et al.,* 2020).

In the context of developing economies, these challenges are often more pronounced. Manufacturing firms may face infrastructural constraints, inconsistent power supply, unreliable transport networks, and limited access to advanced supply chain management technologies. As a result, even firms that attempt supply chain optimization may not achieve the expected reduction in costs or improvement in financial performance. Despite the critical role of supply chain management in influencing profitability, there is a lack of empirical evidence on the specific relationship between supply chain optimization and financial performance, particularly among manufacturing firms in developing countries (Ohara *et al.,* 2020). Many firms continue to operate without fully understanding how supply chain efficiency directly impacts revenue growth, cost savings, and overall financial sustainability. Therefore, this study seeks to investigate the impact of supply chain optimization on the financial performance of manufacturing firms, aiming to identify the key optimization strategies that contribute to improved profitability and provide insights for managers to enhance operational efficiency and financial outcomes.

Research questions

- How does inventory management optimization affect the profitability of manufacturing firms?
- In what ways does efficient logistics and distribution contribute to cost reduction and revenue growth in manufacturing firms?
- How does the adoption of supply chain technologies impact the financial outcomes of manufacturing firms?

Purpose of the study

The main purpose of this study is to examine the impact of supply chain optimization on the financial performance of manufacturing firms.

Specific Objectives of the Study

The study is guided by the following objectives:

1. To examine the effect of inventory management optimization on the financial performance of manufacturing firms.
2. To evaluate the impact of logistics and distribution efficiency on the financial performance of manufacturing firms.
3. To determine the influence of supply chain technology adoption on the financial performance of manufacturing firms.

Research Hypotheses

The following null hypotheses were formulated to guide the study:

- H_{01}: Inventory management optimization has no significant effect on the financial performance of manufacturing firms.
- H_{02}: Logistics and distribution efficiency has no significant effect on the financial performance of manufacturing firms.
- H_{03}: Supply chain technology adoption has no significant effect on the financial performance of manufacturing firms.

Review of Related Literature

Conceptual Review

Supply Chain Management (SCM)

Supply Chain Management (SCM) refers to the coordinated management of activities involved in the sourcing, procurement, production, and distribution of goods and services from the point of origin to the final consumer. It encompasses the planning and control of material flows, information, and financial resources across all stages of the supply chain. The primary objective of supply chain management is to ensure that products are delivered to customers in the right quantity, at the right time, and at minimal cost, while maintaining quality and customer satisfaction (Odike, & Nnaekwe, 2019).

SCM integrates key business processes across organizations, including suppliers, manufacturers, wholesalers, retailers, and customers. This integration enables firms to operate as a unified system rather than as independent entities, thereby improving efficiency and reducing redundancies. Effective supply chain management requires collaboration, information sharing, and strategic partnerships among all stakeholders. By aligning supply chain activities with organizational goals, firms can achieve better coordination, faster response to market demands, and enhanced overall performance (Wijaya, & Patonah, 2019).

In modern business environments, supply chain management has evolved beyond traditional logistics and transportation functions to include strategic decision-making and value creation. It involves demand forecasting, inventory control, production planning, and distribution management, all supported by advanced technologies such as enterprise resource planning (ERP) systems and data analytics tools. These technologies enhance visibility across the supply chain, enabling firms to make informed decisions and respond quickly to changes in demand and supply conditions (Azman *et al.,* 2020).

Furthermore, effective supply chain management contributes significantly to a firm's competitive advantage. By optimizing processes, reducing operational costs, and improving service delivery, firms can enhance customer satisfaction and build long-term relationships. In the manufacturing sector, where production efficiency and timely delivery are critical, supply chain management plays a vital role in ensuring smooth operations and sustaining financial performance. Thus, SCM is not only an operational necessity but also a strategic tool for achieving organizational success and growth (Azman *et al.,* 2020).

Aspects of Supply Chain Optimization

Supply chain optimization involves the strategic improvement of key activities within the supply chain to enhance efficiency, reduce costs, and improve overall performance. The major components of supply chain optimization are discussed below:

Inventory Management Optimization

Inventory management optimization focuses on maintaining the right balance between supply and demand by ensuring that adequate stock levels are available without overstocking or understocking. Effective inventory management reduces holding costs, minimizes waste, and prevents stockouts that can disrupt production or lead to lost sales. Techniques such as demand forecasting, just-in-time (JIT) systems, and economic order quantity (EOQ) models are commonly used to optimize inventory levels. Proper inventory control enhances operational efficiency and contributes significantly to improved financial performance (Choi *et al.,* 2019).

Logistics and Distribution Efficiency

Logistics and distribution efficiency involve the effective movement and storage of goods from the point of production to the final consumer. Optimizing this component ensures timely delivery, reduces transportation costs, and improves customer satisfaction. Efficient logistics systems rely on proper route planning, transportation management, warehousing, and distribution network design. By minimizing delays and reducing costs associated with transportation and storage, firms can achieve faster delivery times and improved service quality, which positively impacts overall performance (Zainea *et al.,* 2020).

Supply Chain Technology Adoption

Supply chain technology adoption refers to the use of advanced technological tools to enhance the coordination and management of supply chain activities. Technologies such as enterprise resource planning (ERP) systems, warehouse management systems (WMS), automation, and data analytics enable real-time tracking, accurate demand forecasting, and improved decision-making. The adoption of these technologies enhances visibility across the supply chain, reduces human errors, and increases operational efficiency. As a result, firms can better respond to market changes and achieve improved financial outcomes (Pambudi, & Harjanto, 2020).

Concept of Financial Performance

Financial performance refers to the extent to which a firm effectively utilizes its resources to generate revenue, maximize profits, and enhance shareholder value. It is a key indicator of an organization's overall health and sustainability, reflecting how well management decisions translate into economic outcomes. Financial performance is commonly evaluated through various metrics such as profitability, return on investment (ROI), revenue growth, and cost efficiency, which provide insight into a firm's ability to achieve its financial objectives (Oviawe, 2018).

In the context of manufacturing firms, financial performance is closely linked to operational activities, including production efficiency, cost control, and effective resource utilization. Firms that manage their operations efficiently are more likely to reduce unnecessary expenses, improve productivity, and increase profit margins. As a result, financial performance is not only influenced by external market conditions but also by internal processes such as supply chain management, inventory control, and logistics efficiency (Cho *et al*., 2019).

Financial performance also serves as a basis for decision-making among stakeholders, including managers, investors, creditors, and policymakers. For managers, it provides feedback on the effectiveness of strategies and operational practices. Investors and shareholders rely on financial performance indicators to assess the profitability and growth potential of a firm, while creditors use them to evaluate the firm's ability to meet its financial obligations. Therefore, maintaining strong financial performance is essential for attracting investment, ensuring business continuity, and achieving long-term growth (Gartenberg *et al.,* 2019).

Furthermore, in today's competitive business environment, financial performance is increasingly influenced by strategic initiatives such as supply chain optimization, technological innovation, and process improvement. Firms that successfully align their operational strategies with financial goals are better positioned to achieve sustainable competitive advantage. In this regard, improving financial performance goes beyond increasing revenue; it involves optimizing costs, enhancing efficiency, and ensuring effective allocation of resources across all aspects of the organization (Alshehhi *et al.,* 2018).

Measures of Financial Performance

Financial performance is assessed using various indicators that reflect a firm's ability to generate profit, utilize resources efficiently, and sustain growth. The key measures of financial performance relevant to this study are discussed below:

Profitability

Profitability measures the ability of a firm to generate earnings relative to its revenue, assets, or equity. It indicates how efficiently a company converts its resources into profit after covering all expenses. Common profitability ratios include net profit margin, gross profit margin, and operating profit margin. High profitability suggests that a firm is effectively managing its costs and generating sufficient returns, while low profitability may indicate inefficiencies in operations or poor cost control (Fatihudin, 2018).

Return on Investment (ROI)

Return on Investment (ROI) evaluates the efficiency of an investment by comparing the gain or loss generated relative to the cost of the investment. It is a widely used measure to assess how well a firm utilizes its capital to generate returns. A higher ROI

indicates better performance, as it shows that the firm is earning more from its investments. In manufacturing firms, ROI can be influenced by factors such as efficient production processes, effective supply chain management, and optimal resource allocation (Kanakriyah, 2020).

Cost Efficiency

Cost efficiency refers to the ability of a firm to minimize its operational costs while maintaining or improving output levels. It focuses on reducing waste, avoiding unnecessary expenses, and optimizing the use of resources. Cost-efficient firms are better positioned to improve profit margins and remain competitive in the market. In the context of supply chain management, cost efficiency can be achieved through optimized inventory levels, reduced transportation costs, and streamlined logistics operations (Abubakar, 2020).

Relationship between Supply Chain Optimization and Financial Performance

Supply chain optimization and financial performance are closely interconnected, as effective management of supply chain activities directly influences a firm's ability to reduce costs, enhance efficiency, and improve profitability. When a manufacturing firm optimizes its supply chain, it ensures that materials, products, and information flow seamlessly from suppliers to customers. This reduces operational inefficiencies, minimizes waste, and shortens lead times, all of which contribute to lower costs and improved financial outcomes (Sinoimeri & Teta, 2025).

Inventory management, as a key component of supply chain optimization, affects financial performance by ensuring that stock levels are maintained at optimal levels. Proper inventory control prevents excess holding costs and reduces the risk of stockouts, allowing the firm to maintain production schedules and meet customer demand consistently. This not only improves operational efficiency but also enhances revenue generation and profitability (Rahiminezhad, & Mokhatab, 2022).

Logistics and distribution efficiency also play a critical role in linking supply chain optimization to financial performance. Efficient logistics systems reduce transportation and storage costs, improve delivery times, and enhance customer satisfaction. Faster and more reliable delivery strengthens the firm's market position, leading to increased sales and higher returns on investment (Lee, 2021).

Furthermore, the adoption of supply chain technologies, such as enterprise resource planning (ERP) systems and data analytics tools, enhances visibility and decision-making across the supply chain. Technology-driven optimization allows firms to anticipate demand fluctuations, manage resources effectively, and respond quickly to market changes. These improvements not only increase operational efficiency but also translate into tangible financial benefits such as higher profit margins, better cost control, and improved return on investment (Alomar, 2022).

Empirical Review

Empirical studies provide evidence of the relationship between supply chain optimization and financial performance in manufacturing firms. These studies help to understand how different supply chain strategies impact profitability, efficiency, and overall organizational performance.

In a study by Saragih *et al.* (2020), it was found that firms that implemented integrated supply chain strategies experienced significant improvements in cost reduction and profitability. The research highlighted that coordination between procurement, production, and distribution processes reduced operational inefficiencies and enhanced financial outcomes. This study underscores the importance of aligning supply chain activities with organizational goals to achieve tangible financial benefits.

Ali *et al.* (2022) examined the impact of inventory management on the financial performance of manufacturing firms in India. Their findings indicated that firms employing just-in-time (JIT) inventory systems and accurate demand forecasting techniques experienced reduced holding costs, minimized stockouts, and improved profit margins. The study concluded that efficient inventory management directly contributes to higher financial performance by optimizing resource utilization and reducing unnecessary expenditure.

A study conducted by Gacuru & Kabare **(2015)** on the effect of logistics and distribution efficiency revealed that firms with well-optimized transportation and distribution networks achieved faster delivery times and reduced operational costs. These improvements led to higher customer satisfaction, increased sales, and better return on investment. The study emphasized that logistics optimization is a critical component linking operational efficiency to financial performance.

Adebiyi ***et al.*** (2021) explored the adoption of supply chain technologies in Nigerian manufacturing firms. The study found that firms leveraging ERP systems, automated warehousing, and real-time tracking tools experienced improved supply chain visibility, better decision-making, and reduced operational delays. Consequently, these firms reported higher profitability and enhanced cost efficiency. The research highlighted technology adoption as a key driver of supply chain optimization and financial success in manufacturing.

In addition, White *et al.* (2014) investigated the combined effect of supply chain optimization practices on financial performance in South-East Nigerian manufacturing firms. The study concluded that inventory management, logistics efficiency, and technology adoption collectively had a significant positive impact on profitability and return on investment. The findings provided empirical support for the argument that optimizing supply chain components is essential for sustaining competitive advantage and improving financial outcomes in the manufacturing sector.

Theoretical Framework

A theoretical framework provides the foundation for understanding the relationship between supply chain optimization and financial performance. It explains the principles and theories that underpin the study and guides the research in analyzing how supply chain practices influence financial outcomes. This study draws on three key theories relevant to supply chain management and organizational performance:

Resource-Based View (RBV) Theory

The Resource-Based View (RBV)**,** proposed by Barney (1991)**,** posits that a firm's competitive advantage is derived from its internal resources and capabilities that are valuable, rare, inimitable, and non-substitutable. In the context of supply chain optimization, RBV suggests that firms that effectively manage their supply chain resources—such as technology, skilled personnel, and logistics infrastructure—can achieve superior financial performance. By leveraging unique capabilities in inventory management, distribution, and technology adoption, manufacturing firms can reduce operational inefficiencies, increase productivity, and improve profitability (Lubis, 2022).

Supply Chain Operations Reference (SCOR) Model

The Supply Chain Operations Reference (SCOR) model**,** developed by the Supply Chain Council (SCC**)**, provides a framework for evaluating and improving supply chain processes. It emphasizes five key performance areas: plan, source, make, deliver, and return. The SCOR model highlights how optimizing these areas—through process standardization, coordination, and technology adoption—can lead to cost reduction, faster delivery, and improved service quality. Applying this model allows firms to identify inefficiencies in their supply chains and implement strategies that enhance operational and financial performance (Prasetyaningsih *et al.,* 2020).

Lean Manufacturing Theory

Lean Manufacturing Theory, introduced by **W**omack and Jones (1996)**,** focuses on minimizing waste and maximizing value in production processes. Lean principles such as just-in-time inventory, continuous improvement, and efficient workflow align closely with supply chain optimization strategies. By reducing unnecessary costs and improving process efficiency, lean practices directly contribute to higher profitability and financial performance in manufacturing firms. The theory supports the idea that operational efficiency gained through optimized supply chain processes can be translated into tangible financial gains (Kumar *et al.,* 2022).

Conceptual Link

Based on the theories above, the study assumes that effective supply chain optimization**,** through inventory management, logistics and distribution efficiency, and technology adoption, enhances operational efficiency, which in turn improves financial performance. The RBV theory explains how unique resources contribute to competitive advantage; the SCOR model provides a framework for process improvement; and Lean Manufacturing emphasizes waste reduction and efficiency. Together, these theories provide a strong rationale for investigating the impact of supply chain optimization on the financial outcomes of manufacturing firms (Hartley *et al.,* 2019).

Methodology

Research design

The study adopted a descriptive survey research design, which is appropriate for investigating the impact of supply chain optimization on the financial performance of manufacturing firms. Descriptive research design allows the researcher to collect data from a large population to describe characteristics, relationships, and patterns among variables without manipulating them. This design is particularly suitable for studies that aim to examine the current practices of manufacturing firms, such as inventory management, logistics efficiency, and technology adoption, and their effects on financial performance (Mwangi, 2019).

Population of the Study

The population of this study comprises employees of four selected local manufacturing firms in South-East Nigeria, purposively chosen based on their prominence and operational scale. These include Innoson Vehicle Manufacturing Co. Ltd**.** in Nnewi with about 2,000 employees, Cutix Plc in Nnewi with approximately 350 employees, Eastern Distilleries and Food Industries in Onitsha with about 150 employees, and Ezenwa Plastic Industries Nigeria Ltd in Onitsha with roughly 100 employees. The total estimated population of the study is therefore 2,600 employees, representing the combined workforce of the selected firms from which data will be collected.

Table 1: Population distribution table

S/N	Name of Firm	Location	Estimated Number of Employees
1	Innoson Vehicle Manufacturing Co. Ltd.	Nnewi, Anambra	2,000
2	Cutix Plc	Nnewi, Anambra	350
3	Eastern Distilleries & Food Industries	Onitsha, Anambra	150
4	Ezenwa Plastic Industries Nigeria Ltd	Onitsha, Anambra	100
	Total		**2,600**

Sample Size

The sample size for this study was determined using Yamane's formula (1967) for finite populations:

$n=N1+N(e)2$

Where n represents the sample size, N is the population size, and eee is the margin of error. The total population of the study, which consists of employees of the selected manufacturing firms, is 2,600. Using a margin of error of 8% (0.08), the sample size was calculated as follows:

$n=26001+2600\ (0.08)2$

$=26001+16.64$

$=260017.64$

$=147$

Based on a population of 2,600 employees, the calculated sample size was 147 respondents. This sample size is considered adequate to provide reliable and representative data for the study.

Table 2: Sample Size Determination

S/N	Name of Firm	Population (N)	Sample Size (n)
1	Innoson Vehicle Manufacturing Co. Ltd.	2,000	113
2	Cutix Plc	350	20
3	Eastern Distilleries & Food Industries	150	9
4	Ezenwa Plastic Industries Nigeria Ltd	100	5
	Total	**2,600**	**147**

Method of Data Collection

The study collected primary data using a structured questionnaire administered to 147 employees of the selected manufacturing firms in South-East Nigeria. The questionnaire was designed to capture information on supply chain optimization practices—inventory management, logistics and distribution efficiency, and technology adoption—as well as financial performance, using a 5-point Likert scale. A pilot test was conducted to ensure reliability and clarity, and ethical considerations such as informed consent and confidentiality were observed throughout the data collection process.

Method of Data Analysis

Data collected were analyzed using descriptive and inferential statistics. Descriptive statistics, including frequencies, percentages, means, and standard deviations, summarized respondents' demographic data and perceptions. Regression analysis was used to test the hypotheses and examine the effect of supply chain optimization variables on financial performance, with a 5% level of significance. All analyses were conducted using SPSS software to ensure accuracy and reliability.

Results and Discussion

Presentation of Data

Table 3: Effect of Inventory Management on Financial Performance

Statement	SA	A	N	D	SD	Mean	Remark
The firm maintains optimal inventory levels to reduce costs	60	50	20	10	7	4.1	Agree
Inventory management improves production efficiency	55	52	25	10	5	4.0	Agree
Accurate demand forecasting reduces stockouts	50	55	25	12	5	4.0	Agree

The results indicate that inventory management practices in the selected manufacturing firms positively influence financial performance. Respondents agreed that maintaining optimal stock levels, efficient production planning, and accurate demand forecasting reduce operational costs and prevent losses.

Table 4: Effect of Logistics and Distribution Efficiency on Financial Performance

Statement	SA	A	N	D	SD	Mean	Remark
Efficient logistics reduce transportation costs	58	50	20	12	7	4.0	Agree
Timely delivery improves customer satisfaction	60	52	20	10	5	4.1	Agree
Well-organized distribution networks enhance profit	55	50	25	10	7	4.0	Agree

Respondents agreed that logistics and distribution efficiency significantly contribute to the financial performance of the firms.

Table 5: Effect of Supply Chain Technology Adoption on Financial Performance

Statement	SA	A	N	D	SD	Mean	Remark
Use of ERP systems improves decision-making	60	50	20	10	7	4.1	Agree
Technology adoption reduces operational delays	58	52	22	10	5	4.0	Agree
Automation enhances profitability	55	50	25	12	5	4.0	Agree

The adoption of supply chain technologies positively affects financial performance. ERP systems, automation, and real-time tracking help reduce delays, improve efficiency, and increase profits.

Test of Hypotheses

The study formulated three null hypotheses to examine the effect of supply chain optimization on financial performance of manufacturing firms. The hypotheses were tested using multiple regression analysis, with financial performance as the dependent variable and the three components of supply chain optimization **(**inventory management, logistics and distribution efficiency, and

supply chain technology adoption**)** as independent variables. The level of significance was set at 0.05 (5%)**.**

Regression Model

$FP = \beta_0 + \beta_1 IM + \beta_2 LD + \beta_3 STA + \varepsilon$

Where:

- **FP** = Financial Performance
- **IM** = Inventory Management
- **LD** = Logistics and Distribution Efficiency
- **STA** = Supply Chain Technology Adoption

$\beta 0$ = Constant, $\beta 1$, $\beta 2$, $\beta 3$ = Coefficients, ε = Error term

Table 6: Regression Analysis of Supply Chain Optimization on Financial Performance

Variables	Coefficient (β)	Std. Error	t-value	p-value	Remark
Constant	1.012	0.102	9.92	0.000	Significant
Inventory Management (IM)	0.432	0.085	5.08	0.000	Significant
Logistics & Distribution (LD)	0.385	0.078	4.93	0.000	Significant
Technology Adoption (STA)	0.298	0.072	4.14	0.000	Significant
R^2	0.68				68% variation explained

The regression analysis indicates that all three independent variables, inventory management, logistics and distribution efficiency, and supply chain technology adoption, have a significant positive effect on financial performance. The p-values for all three variables are less than 0.05, meaning the null hypotheses are rejected. Specifically: Inventory Management (IM): $\beta = 0.432$, $p < 0.05 \rightarrow$ IM positively influences financial performance, **L**ogistics & Distribution (LD)**:** $\beta = 0.385$, $p < 0.05 \rightarrow$ LD positively influences financial performance, and **T**echnology Adoption (STA**)**: $\beta = 0.298$, $p < 0.05 \rightarrow$ STA positively influences financial performance. The R^2 value of 0.68 indicates that 68% of the variation in financial performance is explained by the combined effect of the three components of supply chain optimization.

- **H_{01}**: Inventory management optimization has no significant effect → **Rejected**
- **H_{02}**: Logistics and distribution efficiency has no significant effect → **Rejected**
- **H_{03}**: Supply chain technology adoption has no significant effect → **Rejected**

Discussion of Findings

The findings in Table 4.1 revealed that inventory management positively affects the financial performance of the selected manufacturing firms, with respondents agreeing that maintaining optimal stock levels, efficient production planning, and accurate demand forecasting reduce operational costs and prevent losses. This result can be attributed to the fact that proper inventory control minimizes holding costs and avoids production delays, thereby improving profitability. These findings are consistent with Pal (2023), who reported that firms employing just-in-time inventory systems and accurate demand forecasting experienced improved profit margins and resource utilization.

Table 4.2 shows that logistics and distribution efficiency significantly contributes to financial performance, as respondents agreed that reduced transportation costs, timely delivery, and organized distribution channels enhance revenue and customer satisfaction. This can be explained by the direct link between effective logistics and operational efficiency, which reduces waste and ensures that products reach customers promptly. The result aligns with Oteri *et al*. (2023), who found that well-optimized logistics networks improved profitability and customer service in manufacturing firms.

As shown in Table 4.3, the adoption of supply chain technologies such as ERP systems, automation, and real-time tracking was found to have a positive impact on financial performance. Respondents indicated that technology adoption reduces operational delays, improves decision-making, and enhances overall efficiency. This is because technological tools provide better visibility and control over supply chain processes, which helps firms respond quickly to market demands. The findings corroborate Obiki-Osafiele *et al*. (2024), who observed that technology adoption drives both operational efficiency and financial gains in manufacturing firms.

The regression results in Table 4.4 further confirmed that all three components, inventory management, logistics and distribution efficiency, and technology adoption, collectively explain 68% of the variation in financial performance, indicating a strong and significant relationship. This suggests that manufacturing firms that optimize their supply chains are likely to achieve higher profitability and better resource utilization. These findings support the theoretical framework based on the Resource-Based View (RBV), emphasizing that leveraging internal capabilities such as efficient supply chain processes provides a competitive advantage and improved financial outcomes.

Conclusion

The study concluded that supply chain optimization significantly enhances the financial performance of manufacturing firms in South-East Nigeria. Specifically, effective inventory management, efficient logistics and distribution, and the adoption of supply chain technologies were found to reduce operational costs, improve production efficiency, and increase profitability. These findings highlight that firms that strategically manage their supply chain processes are better positioned to achieve sustainable financial growth and maintain a competitive advantage in the manufacturing sector.

Recommendation

1. **Optimize Inventory Management:** Manufacturing firms should implement robust inventory control systems, such as just-in-time (JIT) and accurate demand forecasting, to minimize holding costs and prevent stockouts, thereby enhancing operational efficiency and profitability.
2. **Enhance Logistics and Distribution Efficiency:** Firms should invest in better transportation planning, streamlined distribution networks, and timely delivery mechanisms to reduce operational costs and improve customer satisfaction, which will positively impact financial performance.
3. **Adopt Advanced Supply Chain Technologies:** Organizations should embrace technologies such as ERP systems, automated warehousing, and real-time tracking tools to improve visibility, decision-making, and responsiveness across the supply chain, leading to higher efficiency and financial gains.
4. **Continuous Training and Capacity Building:** Firms should provide regular training for employees involved in supply chain operations to ensure they are skilled in modern inventory management, logistics practices, and technology utilization, thereby sustaining efficiency and improving financial outcomes.

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