



## Investigating the effects of logistics management on organizational performance: New evidence from the manufacturing industry

Bugri Benjamin Adelwini<sup>1\*</sup>

Lomatey Isaac Toku<sup>2</sup>

Opore Francis Adu<sup>3</sup>

<sup>1,2,3</sup>Koforidua Technical University, Ghana.

<sup>1</sup>Email: [bbugri.adelwini@ktu.edu.gh](mailto:bbugri.adelwini@ktu.edu.gh)

<sup>2</sup>Email: [lomatey.isaac@ktu.edu.gh](mailto:lomatey.isaac@ktu.edu.gh)

<sup>3</sup>Email: [opareadu@gmail.com](mailto:opareadu@gmail.com)

### Abstract

The goal of this study is to determine how logistics management affects the organizational performance of ten Ghanaian roofing sheet manufacturing companies. To analyze the influence of logistics management on organizational outcome, the researchers employed multiple linear regression. The findings showed that the aspects of logistics management that have a beneficial impact on organizational performance include inventory management, physical distribution, and warehouse management. Logistics plays an important role in supporting organizations as they strive for more efficient management systems. Better implementation of inventory management, transportation management, physical distribution, and warehousing management procedures in logistics management will help manufacturing firms to improve their performance.

#### Keywords:

*Logistics management  
Manufacturing industries  
Multiple linear regression  
Organizational performance.*

#### JEL Classification:

*H57; L60; L91.*

#### Copyright:

© 2023 by the authors. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

#### Publisher:

*Scientific Publishing Institute*

**Received:** 18 November 2022

**Revised:** 30 December 2022

**Accepted:** 12 January 2023

**Published:** 7 February 2023

( Corresponding Author)

**Funding:** This study received no specific financial support.

**Competing interests:** The authors declare that they have no competing interests.

## 1. Introduction

Manufacturing industries continue to exhibit an imperative role in the growth of established (Peng, Zhang, & Chang, 2021; Signé, 2018) and developing economies (Mbah, Obiezekwem, & Okuoyibo, 2019; Opoku, Fiati, Kaku, Ankamah, & Opoku-Agyemang, 2020). Manufacturing has historically provided the government with employment possibilities, creative thinking, and financial resources through gross domestic product (GDP) and taxes (Akoto, Awunyo-Vitor, & Angmor, 2013; Bawa, Asamoah, & Kissi, 2018). Manufacturing sectors in developing nations, such as Ghana, have contributed 15%–35% of GDP and 30%–45% of job formation (Peng et al., 2021; Signé, 2018). They also play an important role in converting unused resources into useful goods. The main directive of the industrial division is to alter stockpiles of raw resources, parts or elements, and ongoing projects into finished commodities to satisfy customers' needs (Sitienei & Memba, 2015).

Manufacturing enterprises, according to some, will never operate without relying on logistics, which account for roughly 70% of total current assets (Sitienei & Memba, 2015; Takim, 2014). This demonstrates the critical role of logistics in accomplishing the performance and competitiveness objectives of manufacturing enterprises. According to John, Etim, and Ime (2015) and Panigrahi (2013), the increasingly competitive and dynamic nature of production settings has compelled businesses to develop comprehensive and innovative inventory management strategies. As a result, manufacturing businesses in developing countries can only survive unhealthy competition by continually managing their inventories and responding to changing customer demands (Kontuš, 2014; Raheman, Afza, Qayyum, & Bodla, 2010).

Logistics management refers to the plans and actions that determine and oversee a company's product line (Chalotra, 2013; Ogah, Asiegbu, & Lagos, 2022). In order to meet customer expectations, it is also connected to inventory identification, procurement, planning, storage, packaging, and transportation. Inventory management activities vary by company, industry, and sector, according to Karim, Nawawi, and Salin (2018).

Furthermore, logistics management improves inner controls to assure high-quality catalogue while also offering worth to clients (Karim et al., 2018; Sitienei & Memba, 2015). It essentially lowers logistic waste, scarcities, theft, and production expenses while maintaining sales progress, client satisfaction, competitiveness, and, ultimately, business survival. Manufacturing companies can reduce risk by hedging against variations caused by main risk factors such as economic downturn, financial crises, market fluctuations, extreme weather phenomena, and change in demand with proper logistics management. It also acts as a buffer, allowing for the processing of uncertainties and variances (Brandt et al., 2022; Sitienei & Memba, 2015). It also strikes a good balance between too little and too many logistics, ensuring that inventory levels are always at their best (Ogah et al., 2022). It determines present and future inventory requirements to avoid overstocking or understocking. Lysons and Farrington (2012) stated that effective inventory management guarantees inventory visibility at the upstream and downstream nodes of supply networks.

On the other hand, poorly managed logistics may lock up almost 70% of a company's entire current assets, impacting both its operational and overall performance (Karim et al., 2018; Kontuš, 2014). It could also open large gaps in internal controls, exposing manufacturing organizations to financial risks, such as theft and fraud schemes (Zakaria, Nawawi, & Salin, 2016), production and delivery delays, numerous faulty products, and wasteful product shortages (Jacobs, Chase, & Lummus, 2014; Ogah et al., 2022; Orobia, Nakibuuka, Bananuka, & Akisimire, 2020). It could also put these companies at risk of logistical losses (expirations, pollution, theft, and damage), lack of a competitive advantage, inefficient storage methods, frequent material waste, product shortages, high customer dissatisfaction, poor product quality, a lack of flexibility, and employee dissatisfaction. As a result, the study relied on the theory of limitations and strategic decision theory to correctly understand the notion of logistics management. Manufacturing enterprises, for example, are primarily susceptible to logistic limitations from theft, expirations, shortages, and extended lead periods, which could impede their whole system, according to the idea of constraints (Gupta & Boyd, 2008; Puche, Ponte, Costas, & Pino, 2019). Only by implementing applicable inventory management strategies can manufacturing organizations overcome inventory restrictions while enhancing performance levels (Deressa, 2022; Flynn, Huo, & Zhao, 2010).

These facts also show that logistics management strategies, which aim to balance supply and demand by regulating and tracking manufacturing and purchasing orders to guarantee continuous material flow and value-adding activities (Opoku et al., 2020), can never be successful. The most popular logistics management techniques include economic order quantity (EOQ), just-in-time (JIT) replenishment, vendor-managed inventory (VMI), strategic supplier relationships, material replenishment planning (MRP), and Pareto analysis (Chalotra, 2013; Sitienei & Memba, 2015). These tactics have been shown to lower production costs overall while improving operational performance across a range of metrics, including product quality, operating speed, flexibility, and dependability. In a similar vein, logistics management approaches used by manufacturing companies in developing nations such as Ghana have been shown to be similar (Adu-Fosu, 2016; Bawa et al., 2018). Nevertheless, it is uncertain which procedures the companies choose to use. Furthermore, no previous research in Ghana has shown how alternative logistics management systems affect the operational performance levels of manufacturing businesses. Major logistics management techniques used by Ghanaian manufacturing companies, such as Pareto analysis, EOQ, JIT replenishment, VMI and, more recently, strategic supplier partnerships, were previously identified (Prempeh, 2015; Qrunfleh & Tarafdar, 2013). They continued by saying that it is impossible to overestimate the significance of logistics management techniques as indicators of a company's financial performance. Similar to this, logistics management was found to enhance the performance of Ghanaian manufacturing enterprises (Bawa et al., 2018; Nyamah, Opoku, & Kaku, 2022); however, it remains unclear how much each of the strategies contributes to the operational performance of the manufacturing firms.

Furthermore, the African continent has performed poorly in inventory compared to other continents, according to a 2016 evaluation by the Shippers Council of Eastern Africa (SCEA). The survey found that the five countries with the worst logistic performance are Rwanda (2.04%), Namibia (2.02%), Sierra Leone (1.97%), Eritrea (1.70%), and Somalia (1.34%); this shows how poorly Africa is performing in terms of logistics management techniques. The performance of the manufacturing sector as a whole and its contributions to the economic development of African nations have undoubtedly suffered from poor inventory management and continue to do so. According to a 2016 study by the United Nations Industrial Development Organization (UNIDO), the value of manufacturing sectors to developing countries has significantly reduced during the last

25 years. For instance, the industry's economic growth in Ghana has been progressively dropping over time, with average contributions to GDP and job creation of only 5.5% and 8.2%, respectively, indicating a stagnated and dying sector (Bugri, Michael, & Arthur, 2019). According to a 2018 estimate by the Ghana Statistical Service, the sector's contribution to Ghana's GDP fell by around 50.55% between 2007 (9.1%) and 2017 (4.5%).

Given this backdrop, this study examines the organizational performance and logistics management methods of Ghanaian manufacturing enterprises. Additionally, the study evaluates the logistics management techniques that Ghanaian manufacturing companies found to be most effective. Additionally, it investigates how various methods of logistics management affect the productivity of manufacturing companies.

## **2. Literature Review**

The theoretical, conceptual reviews, and conceptual framework of the study are presented in this section.

### *2.1 Theory of Constraints (TOC)*

Eliyahu Goldratt established the theory of constraints (TOC) as a management philosophy targeted at recognizing restrictions that prevent a system from performing at its best (Gupta & Boyd, 2008). Every organization, according to the idea, has at least one constraint (limiting factor) that prevents the entire system from meeting planned goals (Puche., Ponte, Costas, Pino, & De la Fuente, 2016). Anything that prevents a company from meeting its objectives is referred to as a limitation (Antwi, 2019). It is the weakest link in a system since it is the major limiting factor in achieving the firm's aims (Dodoo, Appiah, & Donkoh, 2020; Prempeh, 2015). The idea also implies that businesses can only overcome their limits by focusing on them in a clear, methodical, strategic, and all-encompassing way. According to Flynn et al. (2010) TOC, a management concept that emphasizes continuous system improvement, any limitations are addressed through total quality management and effective processing processes. Manufacturing organizations may be more susceptible to inventory problems, which result in unnecessarily long lead times, subpar material orders, a high number of unmet and urgent orders, low client satisfaction, and poor performance (Qrunfleh & Tarafdard, 2013). As a result, the theory indicates that businesses can only solve their inventory problems by implementing the best inventory management strategies to alleviate bottleneck concerns while maintaining inventory control and production scheduling. Furthermore, according to Puche. et al. (2016) the concept improves value addition without disrupting the firm's production flow by eliminating any limitations. The research is therefore supported by : Total Ownership Cost (TOC), which helps industrial firms comprehend the idea of inventory limitation and how it may be resolved using practical techniques such as Just In Time (JIT), supply side platform/storage service provider (SSP), Materials Requirement Planning (MRP), Economic Order Quantity (EOQ), and Vendor-managed inventory (VMI) among others.

### *2.2. Strategic Choice Theory*

According to strategic choice theory, decisions made by top management have an impact on organizational performance as well as how internal and external organizations interact (Wangrow & Schloemer, 2019). In order to increase organizational performance levels, the idea underlies the significance of key management decisions, according to Sinaga, Nurfarina, Iskandar, Mozammel, and Rosita (2019). Strategic choice theory also illustrates various environmental factors, such as supply, inventory, and purchase management, which have an impact on a manager's decision-making abilities. The idea states that management with decision-making authority must choose the appropriate inventory investment and inventory optimality options to significantly improve performance results. According to strategic choice theory, management is seen as downstream decision makers who influence choices while modifying organizational procedures, structures, and systems (Sinaga et al., 2019). To maintain high performance levels, they must therefore make wise decisions to protect the organization's culture, resources, and inventory.

Furthermore, Achieng, Paul, and Mbura (2018) also developed a strategic option model that illustrates how an organization's actions, environment, and performance objectives are all interconnected. The methodology seeks to ensure high performance requirements to boost efficiency when resources are constrained or limited. The idea contends that management must make pertinent and wise judgments regarding inventory management in order to prevent future inventory issues. Therefore, managers should use inventory management strategies that are appropriate for their line of work; failing to do so could endanger a company's profitability, operationalization, general performance, and continued existence. The research is informed by the strategic choice theory since it shows how top management choices affect organizational performance levels. Each choice made by management regarding inventory management practices could have a positive or negative effect on the success of their businesses.

### *2.3. Logistic Management and Organizational Performance Linkage*

Transport management is at the center of logistics due to the requirement for the movement of material along a supply chain. As a result, numerous studies have been carried out locally to examine the function of transportation management in supply chain management. Mutangili (2019) conducted a study to examine the influence that electronic logistics has on the performance of logistics firms. The study used a sample of 75

individuals chosen at random from among 107 business employees and discovered that e-logistics had a positive impact on the performance of logistics enterprises. In today's competitive environment, numerous firms are vying for a piece of the global market and hoping to benefit from improved production and sourcing efficiency.

Today, a key indicator of corporate performance is the importance of logistics management services in ensuring the smooth flow of resources, goods, and information throughout a company's supply chain (Soares Aharonovitz, Vidal Vieira, & Suyama, 2018). The relevance of logistics management has expanded across many industries due to nationalization and globalization trends. The aim of logistics management for businesses is to increase productivity and competitiveness of their current production and distribution systems that utilize the same resources (Mendes dos Reis, Sanches Amorim, Sarsfield Pereira Cabral, & Toloï, 2020). For a corporation to maintain a competitive edge in customer service and operational efficiency, logistics management is essential. Over the past ten years, practitioners and the government have paid a lot of attention to logistics management because, when it operates efficiently, it successfully delivers the right product to the right place at the right time. Understanding the importance of sustainability in logistics management is essential for competitive advantage since operational success has a positive effect on a company's financial performance.

In business, sustainability is defined as the ability to maintain and increase competitiveness over time. However, logistics performance had to be measured for logistics management to be deemed a contributor to a firm's performance (Liu, Yuan, Hafeez, & Yuan, 2018). Due to a growing understanding of the advantages of using logistics to create client value and the repercussions of logistics management on corporate performance, Ulutaş and Karaköy (2019) agreed that monitoring logistics performance has become a high priority. According to Kabak, Ekici, and Ülengin (2020), there are at least three primary reasons why a company would want to analyze logistics performance: to lower operating costs, to promote revenue growth, and to increase shareholder value. He went on to note that by measuring running costs, a researcher can determine whether, when, and where to make operational changes to decrease spending, as well as discover areas for better asset management. Studies show that suppliers, delivery of finished goods, inventory management expenses, customer satisfaction, and organizational success are all correlated with logistics management. As a component of the logistics management system, the performance management process is connected to customer satisfaction. Effective logistics operations and capabilities are the foundation for organizational success (Khan, 2020; Pham, Do, & Ngo, 2020).

Luu (2019) evaluated the logistics performance of 150 businesses and how it affected business performance. Increased inventory availability, timely delivery, on-time and damage-free deliveries, line items, fill rates, and sales all increased as a result of improved logistics efficiency, effectiveness, and differentiation, which also improved net margin and asset turnover as well as overall firm performance. Zaid, Sleimi, and Alaqra (2021) investigated the impact of logistics capabilities on manufacturing business performance. The research was based on a survey of 1000 manufacturing companies. Exploratory and confirmatory factor analyses can be used to estimate a manufacturing company's logistics capacity, and the results show that there are three factors to consider when thinking about logistical capabilities: process capability, flexibility capability, and data integration capability.

Muchori (2015) investigated how traffic congestion affected the efficiency of freight logistics at the Port of Mombasa. The study used a descriptive survey methodology with a sample size of 150 replies from a possible 10,450 employees, and it was based on the infrastructural burden caused by the road from Nairobi to Mombasa, which has continued to strain logistics and operations at the port. The correlation statistics show a positive association between traffic congestion and transportation costs. As a result, freight logistics are less effective when there is traffic congestion. Mukolwe and Wanyoike (2015) investigated the effects of logistics management strategies on Mumias Sugar Company's operational effectiveness. The study found, among other things, that physical distribution methods and transportation administration are comparable to a profit-maximizing flow of products and raw materials, which enhances operational efficiency.

In 2016, Macharia and Mwangangi (2016) examined the impact of logistics management on the performance of the industrial sector. The study used primary and secondary data, as well as published and unpublished information. The study found that the use of transport management systems was a significant predictor of business performance using multiple regression analysis. The United Nations High Commissioner for Refugees (UNHCR) program assessed how fleet management methods affect the provision of services to refugees (Mehmood, 2021). The research is predicated on the notion that logistics cannot function without transportation. The study used a descriptive research design and had a target population of 390 employees. The rate of fuel use on tracking, monitoring, fuel sourcing, daily fuel allocation, and the rate at which fuel usage is tracked all have an impact on the supply of services. According to Mutangili (2019), Safaricom Limited's inbound logistics performance was examined in relation to lead time variability. According to the study, lead periods in terms of manufacturing, shipping, turnaround time, time for customs brokerage, and the speed of goods inspection have a direct and significant impact on the efficiency of incoming logistics as assessed by delivery time, cost, and quantity using a linear regression model. Despite the abundance of literature on transportation and logistics management and its advantages, the majority of studies only consider the logistical aspect.

Additionally, there is no data showing, for instance, how transportation management impacts the effectiveness of supply chains for the textile industry. A company's ability to turn a profit today affects whether or not it will continue, but for that to happen, the whole cost must be less than the total revenue. A product or

service should be priced as affordably as possible in an era of fierce competition, but the quality should be as high as possible to expand the market (Azeem, 2018). The only way to do this is to reduce costs. The main goals of logistics and supply chain management are to reduce costs and boost business performance (Liu et al., 2018). Increasing operational efficiency and effectiveness while keeping a competitive advantage requires the introduction, implementation, and continuous improvement of logistics management practices.

Distribution, human abilities, worker competencies, and technology all have an impact on how effectively a supply chain runs (Kanda & Iravo, 2015). The research presented in this paper focuses on logistics management and its relationship with cutting costs, which boosts operational effectiveness and results while also making organizations more competitive in the market. In this study, there are two objectives. The scientific purpose of this research is to obtain new insights into logistics management in manufacturing organizations, as well as to emphasize the long-term implications of implementing proper management techniques in this field. The practical purpose of this study is to make the findings available to domestic businesses to help them improve their operations and, if they are hesitant, convince them to implement a logistics and supply chain organization structure. The general premise that has been established is that if an organization uses proper logistics management strategies, its total expenses will decrease and its business performance will increase. Figure 1 represents the conceptual framework of the study, emphasizing the importance of logistics managements in achieving organizational performance. It shows that five different factors constitute good logistics management practice and will lead to positive organizational performance.

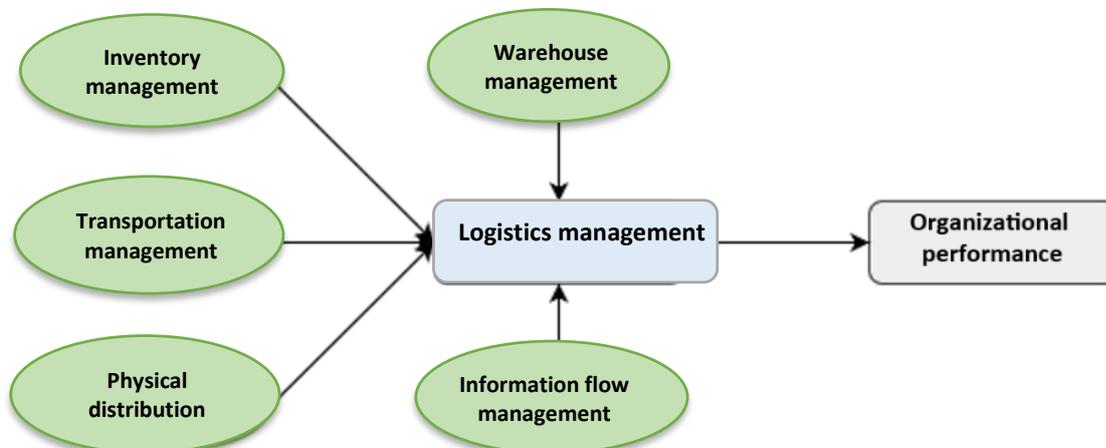


Figure 1. Conceptual framework.

### 3. Population, Sampling, and Data Collection

The participants in this study are employees and executives of 10 chosen roofing sheet manufacturing firms. The total population within walking distance of the workplaces is around 100 people, with 10 respondents representing each firm, but only 97 people responded. Management members were chosen via purposeful sampling, which is the process of selecting respondents who are specialists in the field of research or who have the technical competence to provide the information required by the study (Zikmund, Babin, Carr, & Griffin, 2013). Questionnaires were used as the main data collection instrument to acquire primary data, which is appropriate when there is a specific goal, research topic, or hypothesis in mind (Asenahabi, 2019). Questionnaires were chosen because, according to Zhang (2021), information collected from questionnaires is free of biases and researcher influence, allowing for the collection of reliable and valid data. The questionnaires were self-administered with the help of research assistants. Self-administered questionnaires, according to Osuagwu (2020), are helpful since they are less expensive than face-to-face interviews and allow the researcher to contact people who would otherwise be unavailable. The respondents' answers to the questions related to the five important components in logistics management (inventory management, transport management, physical distribution, warehousing management and information flow management) are resolute and help to determine whether these aspects lead to better company performance.

#### 3.1. Methodology

To analyze the influence of logistics management on organizational outcome, multiple linear regression was employed. At a 95% confidence level, the coefficient, significance, and beta values were used to interpret the data. As a result, the regression equation is stated as:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \quad (1)$$

Equation 1 presents the model for the estimation, with  $Y$  representing the dependent variable (organizational performance),  $\alpha$  is the intercept and  $\beta_1 - \beta_5$  represent the independent variables (inventory management, transportation management, physical distribution, warehouse management, and information flow management).

The equation used to compute the figures provided by the multiple regression analysis is as follows:

$$Y = 0.394 + 0.192 (X_1) + 0.417 (X_2) + 0.408 (X_3) + 0.786 (X_4) + 0.081 (X_5) \tag{2}$$

Equation 2 presents the coefficients of the independent variables that make up logistics management and the dependent variable is organizational performance. Inventory management, transportation management, physical distribution, warehousing management, and information flow management are all independent factors.

#### 4. Results and Discussion

Demographic parameters such as gender, marital status, educational level, and length of service with the municipality were all taken into account in the study.

Table 1. Demographic information of respondents.

Variables	Frequency	Percentage
Gender		
Male	64	66.0%
Female	33	34.0%
Age		
21–30 Years	36	37.1%
31–40 Years	35	36.1%
41–50 Years	26	26.8%
50 Years and above	0	0.0%
Marital status		
Single	34	35.1%
Married	58	59.8%
Divorced/Separated	5	5.2%
Educational qualification		
Master's degree	41	42.3%
First degree	40	41.2%
Higher national diploma	16	16.5%
Years of working with the company		
Under 1 year	3	3.1%
1–2 Years	37	38.1%
3–4 Years	26	26.8%
5 Years and above	31	32.0%

Table 1 explores the findings of the demographic characteristics and reveals that males made up the majority of the respondents (66%). This indicates that the company is dominated by men, and their female colleagues make up 34% of the workforce. When it came to age distribution, the findings revealed that 36 (37.1%) of the respondents were between the ages of 21 and 30, 35 (36.1%) were between the ages of 31 and 40, and 26 (26.8%) were between the ages of 41 and 50. On the subject of marital status, 34 (35.1%) of the respondents were single, 58 (59.8%) were married, and 5 (5.2%) were divorced/separated. In terms of educational attainment, 41 (42.3%) of the respondents had a master's degree, 40 (41.2%) had a first degree, and 16 (16.5%) had a Higher National Diploma. In terms of the number of years that employees have been with the company, 3 (3.1%) of the respondents were employed for less than a year, 37 (38.1%) were employed for 1–2 years, 26 (26.8%) were employed for 3–4 years, and 31 (32.0%) were employed for 5 years or more.

Table 2. Model summary.

Model	R	R-squared	Adjusted R-squared	Std. error in the estimate
1	0.766 <sup>a</sup>	0.587	0.564	0.377

Note: <sup>a</sup> indicates significance at 1%.

The results displayed in Table 2 and Table 3 summarize the model used in the study. The value of 0.766 in the regression output suggests that there is a substantial association between logistics management and organizational outcomes of the roofing sheet manufacturing companies. The R<sup>2</sup> result implies that the performance of these companies may explain 58% (0.587) of logistics management.

Table 3. ANOVA.

Model 1	Sum of squares	df	Mean square	F	Sig.
Regression	17.979	5	3.596	25.337	0.000***
Residual	12.631	89	0.142		
Total	30.609	94			

Note: \*\*\* signifies a 1% significance level. Dependent variable: Organizational performance.

Predictors: (Constant), inventory management, transport management, physical distribution, warehousing management, information flow management. \*\*\* indicates that the model is fit and significant.

Table 4. Regression results.

Model 1	Unstandardized coefficient		Standard coefficient	T-stat.	Sig.
	B	Beta	Beta	-	-
(Constant)	-0.394	0.436	-	-0.903	0.369
Inventory management	0.192	0.085	0.214	2.265	0.026**
Transport management	-0.417	0.100	-0.429	4.175	0.000***
Physical distribution	0.408	0.124	0.325	3.292	0.001***
Warehousing management	0.786	0.129	0.592	6.070	0.000***
Information flow management	0.081	0.075	0.100	1.081	0.282

Note: \*\*\* and \*\* signify 1% and 5% significance levels, respectively.

Table 4 contains the regression results of the study, and they show that inventory management has a favorable and substantial influence on the performance of manufacturing enterprises in Ghana. At a significance level of 5%, this is represented by a coefficient figure of 0.192. This result is linked to manufacturing companies' enhanced inventory management practices. This has three major advantages: Increased production speed and, consequently, sales; lower financing costs (equity capital or debt) that allow for additional project investment; and more control over liquidity levels. Since it governs how inventory decisions are made, to guarantee that the greatest possible quantity of each item is available to purchase, inventory management is an essential component of a manufacturing organization. This process greatly streamlines a business's processes, enabling it to distribute manufactured items successfully and perform well as an organization. This result is backed up by [Karim et al. \(2018\)](#) and [Sritharan \(2019\)](#). Their findings suggest that an organization's profitability and inventory management are significantly related and that effective inventory management increases profitability, while ineffective management results in subpar performance. Using panel regression models again, [Karim et al. \(2018\)](#) discovered that an increase in inventory management effectiveness is positively connected with financial performance as gauged by the return on operating assets. [Omer and Aljaaidi \(2021\)](#) and [Sritharan \(2019\)](#) discovered a favorable relationship between better inventory margin and three performance metrics, as well as a substantial link between improved turnover and earnings per share.

With a coefficient value of -0.417, transportation management has an unfavorable association with the performance of the roofing sheet manufacturing companies. This suggests that transportation management is a hindrance to organizational effectiveness. This is due to ineffective delivery mechanisms, such as insufficient cars for transporting items from warehouses to wholesalers. Other issues could be a bad road network and a significant increase in fuel prices. These variables contribute to delivery system delays. Transportation management is a positive determinant of organizational success, according to major research ([James & Inyang, 2022](#); [Muhalia, Ngugi, & Moronge, 2021](#)). The studies by [Muhalia et al. \(2021\)](#) and [James and Inyang \(2022\)](#) corroborate these findings.

The physical distribution regression output is 0.408, indicating a positive and substantial link with the performance of the roofing sheet manufacturing companies. According to the findings, a rise in physical distribution leads to an improvement in company performance. One probable factor is that physical distribution is straightforward; faster shipment means that more clients will be more likely to complete their purchases rather than abandon their carts. When storing inventory in multiple locations rather than a single centralized warehouse, shipping times can be shortened. When supply chain functions are optimized, they tend to save money in the long run. Both the company and its clients save money when speedy basic shipping is provided. Physical distribution aids in the maintenance of price stability. Even buyers anticipate pricing constancy over time. The proper utilization of transportation and warehousing infrastructure can aid in the matching of demand and supply, resulting in price stability. Physical distribution is a critical factor in company performance, according to [Snoeck and Winkenbach \(2020\)](#) and [Khanal and Pokhrel \(2021\)](#), whose research revealed a link between physical distribution and company performance.

In today's competitive market, a warehouse's functionality must be redesigned to achieve the necessary outcomes and to remain competitive. A well-defined warehouse management system plays an important role in physically completing the specified offering in this context ([Masudin, Sumah, Zulfikarjah, & Restuputri, 2021](#)). The performance of the roofing sheet manufacturing companies has a favorable link with warehousing management, which has a coefficient value of 0.786. According to research by [Wambua, Okibo, Nyang'au, and Ondieki \(2015\)](#) and [Buzu \(2021\)](#), good warehousing management has an influence on organizational results. They discovered that the most effective technique for achieving a balanced stock is a good warehouse management system, which makes it easier to keep track of just-in-time inventory, enhances record accuracy, and allows for proper demand forecasting. This allows warehouses to keep products in the best possible environment and in the most efficient order, lowering on-hand amounts, ensuring the safety of stock, and reducing waste, scrap, and obsolescence.

Effective and prompt reactions to ever-changing client tastes and preferences have become critical components of successful corporate performance in today's competitive climate, and information flow helps to achieve optimal performance ([Kumar, 2022](#)). With a coefficient value of 0.081, information flow management has a positive link with the outcome of the roofing sheet manufacturing companies. When all other independent

factors (inventory management, transportation management, physical distribution, and warehouse management) remain constant, company performance will improve. With a significance value of 0.282, which is more than 0.005 at the 95% confidence level, information flow management is not relevant and significant, and does not contribute positively to the prediction of the performance of the roofing sheet manufacturing companies in the study.

However, when assessing the impact of independent variables on organizational performance (inventory management, transportation management, physical distribution, warehouse management, and information flow management), the beta values are employed without regard for the negative sign. The beta values for inventory management, transportation management, physical distribution, warehouse management, and information flow management are 0.192, -0.417, 0.408, 0.786, and 0.081, respectively. As warehousing management has the largest beta value, this variable contributes the most to the explanation of the roofing sheet manufacturing companies' performance.

**Table 5.** Reliability data using Cronbach's alpha.

Variable	Cronbach's alpha	Number of items
Inventory management	0.662	7
Transport management	0.795	6
Physical distribution	0.728	3
Warehousing management	0.769	6
Information flow management	0.899	9
Organizational performance	0.765	9

Cronbach's alpha values were used to verify the interior steadiness of the variables employed in the study to assure their reliability. The variables and their corresponding values are shown in Table 5. The Cronbach's alpha values were calculated using the data collected to determine the scale's reliability. This was done to see if the scales used in the questionnaire were reliable and consistent, and it relates to how well the items on the scale 'hang together,' i.e., if they're measuring the same thing. The Cronbach's alpha value of a scale should ideally be greater than 0.7 (DeVellis, Lewis, & Sterba, 2003). Values greater than 0.7 are acceptable but values greater than 0.8 are preferred. Other researchers have suggested that an alpha of 0.4 is also acceptable. The Cronbach's alpha values for all of the reliability tests were greater than 0.4, indicating that these variables have strong internal consistency.

## 5. Conclusion

The goal of the study was to determine the influence of logistics management on the performance of manufacturing firms by looking at the individual components of logistics management. According to the findings, one logistics management dimension had a negligible impact on firm performance, while the other four had a significant impact. It was found that information flow management had little influence on the performance of industrial companies. This means that by including inventory management, transportation management, physical distribution, and warehousing management procedures in logistics management, a manufacturing firm's performance is likely to improve. Logistics plays an important role in supporting organizations as they strive for more efficient management systems. In business, an efficient logistics system combined with inefficient internal management would make it impossible for the organization to respond to client needs at the lowest possible price in the shortest possible timeframe, and the quality level would fail to meet client expectations, putting the organization at a competitive disadvantage. Information flow management was found to have a negligible impact on manufacturing firms' performance. As a result, information flow management and company performance have a negative association.

Based on the results, it is advisable for companies to integrate information flow management into their operational procedures, such as fleet management, vehicle scheduling, route planning, and vehicle maintenance, in order to ensure the timely distribution of goods and the purchase of raw materials, as well as increase overall cost effectiveness, market share, and lead time, all of which will improve performance. It is recommended that enough measures be put in place to ensure that organizational performance in the manufacturing sector continues to improve. Employees must also be able to communicate ideas, make decisions, and operate swiftly and accurately. By bringing the relevant people and information together, Slack (instant messaging application) helps to eliminate data bloat and costly bottlenecks caused by inefficient information flow. As a result, the study suggests that suitable budgetary considerations and strategies be examined before beginning any procedure. This will allow the pros and cons of that precise method to be determined and its appropriateness to be assessed. The study also suggests that policymakers and legislators take into account the requirement for assisting and establishing policies to improve the implementation of logistics and transportation strategies. Finally, monitoring and evaluation are essential. Excellent operations management in manufacturing organizations depends on a thorough review of all logistics and transportation procedures.

## References

- Achieng, J., Paul, S., & Mbura, L. (2018). Influence of inventory management practices on performance of retail outlets in Nairobi City County. *International Academic Journal of Procurement and Supply Chain Management*, 3(1), 18-43.
- Adu-Fosu, B. (2016). The relationship between inventory management and productivity in Ghanaian manufacturing industries. *International Journal of Innovative Research and Development*, 5(1), 25-28.
- Akoto, R. K., Awunyo-Vitor, D., & Angmor, P. L. (2013). Working capital management and profitability: Evidence from Ghanaian listed manufacturing firms. *Journal of Economics and International Finance*, 5(9), 373-379.
- Antwi, F. (2019). Capital adequacy, cost income ratio and performance of banks in Ghana. *International Journal of Academic Research in Business and Social Sciences*, 9(10), 168-184. <https://doi.org/10.6007/ijarbss/v9-i10/6471>
- Asenahabi, B. M. (2019). Basics of research design: A guide to selecting appropriate research design. *International Journal of Contemporary Applied Researches*, 6(5), 76-89.
- Azeem, K. (2018). Impact of effective logistic management on organizational performance. *KASBIT Business Journal*, 11(1), 95-109.
- Bawa, S., Asamoah, G. E., & Kissi, E. (2018). Impact of inventory management on firm performance. *International Journal of Finance and Accounting*, 7(4), 83-96.
- Brandt, L., Litwack, J., Mileva, E., Luhang, W., Yifan, Z., & Luan, Z. (2022). Recent productivity trends in China: Evidence from macro-and firm-level data. *China: An International Journal*, 20(1), 93-113. <https://doi.org/10.1353/chn.2022.0004>
- Bugri, B. A., Michael, A., & Arthur, E. A. (2019). Investigating the impact of sustainable procurement on economic growth and development. *Journal of Accounting, Business and Finance Research*, 5(2), 67-76. <https://doi.org/10.20448/2002.52.67.76>
- Buzu, A. (2021). The effect of Warehousing management on Warehouse performance. Available at SSRN 3951785, 1-102. <https://doi.org/10.2139/ssrn.3951785>
- Chalotra, V. (2013). Inventory management and small firms growth: An analytical study in supply chain. *Vision*, 17(3), 213-222. <https://doi.org/10.1177/0972262913496726>
- Deressa, G. B. (2022). A study on supply chain management through information communication technology and apparel industry performance: A case of Hawassa industry park. *Journal of Positive School Psychology*, 6(4), 18-24.
- DeVellis, R. F., Lewis, M. A., & Sterba, K. R. (2003). Interpersonal emotional processes in adjustment to chronic illness. *Social Psychological Foundations of Health and Illness*, 256-287. <https://doi.org/10.1002/9780470753552.ch10>
- Dodoo, R. N. A., Appiah, M., & Donkoh, D. T. (2020). Examining the factors that influence firm performance in Ghana: A GMM and OLS approach. *National Accounting Review*, 2(3), 309-323. <https://doi.org/10.3934/nar.2020018>
- Flynn, B. B., Huo, B., & Zhao, X. (2010). The impact of supply chain integration on performance: A contingency and configuration approach. *Journal of Operations Management*, 28(1), 58-71. <https://doi.org/10.1108/scm-11-2013-0426>
- Gupta, M. C., & Boyd, L. H. (2008). Theory of constraints: A theory for operations management. *International Journal of Operations & Production Management*, 28(10), 991-1012. <https://doi.org/10.1108/01443570810903122>
- Jacobs, F. R., Chase, R. B., & Lummus, R. R. (2014). *Operations and supply chain management*. New York: McGraw-Hill/Irwin.
- James, E. E., & Inyang, I. B. (2022). Logistics management and marketing performance of small and medium-sized manufacturing firms. *Logistics Management*, 5(1), 1-15. <https://doi.org/10.52589/ijebi-d1d3kf26>
- John, N., Etim, J., & Ime, T. (2015). Inventory management practices and operational performance of flour milling firms in Lagos, Nigeria. *International Journal of Supply and Operations Management*, 1(4), 392-406.
- Kabak, Ö., Ekici, Ş. Ö., & Ülengin, F. (2020). Analyzing two-way interaction between the competitiveness and logistics performance of countries. *Transport Policy*, 98, 238-246.
- Kanda, M. K., & Iravo, M. A. (2015). Access factors affecting supply chain efficiency of medical supplies in public health centers in Kenya: A case study of public health centers in Elgeyo Marakwet County. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 5(2), 32-41. <https://doi.org/10.6007/ijarafms/v5-i2/1560>
- Karim, N. A., Nawawi, A., & Salin, A. S. A. P. (2018). Inventory management effectiveness of a manufacturing company – Malaysian evidence. *International Journal of Law and Management*, 60(5), 1163-1178. <https://doi.org/10.1108/IJLMA-04-2017-0094>
- Khan, M. S. R. (2020). The effects of inventory management capability on performance of the firm-business strategies as a mediating role. *Asian Finance & Banking Review*, 4(2), 1-7. <https://doi.org/10.46281/asfbr.v4i2.649>
- Khanal, S. R., & Pokhrel, B. P. (2021). The influence of packaging design on buying behavior of women in Lalitpur metropolitan city for cosmetic products. *Fall Wisdom*, 8(01), 37-45. 10.3126/pragya.v8i01.42345
- Kontuš, E. (2014). Management of inventory in a company. *Ekonomski vjesnik/Econviews - Review of Contemporary Business, Entrepreneurship and Economic Issues*, 27(2), 245-256.
- Kumar, R. (2022). Information and communication technology (ICT) effect on supply chain performance in the dairy industry: A study in the Indian context. *International Journal of Asian Business and Information Management*, 13(1), 1-16. <https://doi.org/10.4018/ijabim.297850>
- Liu, J., Yuan, C., Hafeez, M., & Yuan, Q. (2018). The relationship between environment and logistics performance: Evidence from Asian countries. *Journal of Cleaner Production*, 204, 282-291. <https://doi.org/10.1016/j.jclepro.2018.08.310>
- Luu, T. (2019). Promoting logistics performance in Vietnam-based manufacturing firms. *International Journal of Physical Distribution & Logistics Management*, 49(1), 52-74. <https://doi.org/10.1108/ijpdlm-07-2017-0238>
- Lyson, K., & Farrington, B. (2012). *Purchasing and supply management*. Pearson Education Hall: Great Britain.
- Macharia, W., & Mwangangi, P. (2016). Influence of total quality management on procurement performance in telecommunication industry in Kenya: A case of Safaricom Company Limited. *International Journal of Business & Law Research*, 4(4), 12-33.

- Masudin, I., Sumah, B., Zulfikarjah, F., & Restuputri, D. P. (2021). Effect of information technology on Warehousing and inventory management for competitive advantage: A theoretical framework. *Handbook of Research on Innovation and Development of E-Commerce and E-Business in ASEAN*, 1(3), 570-593.
- Mbah, S., Obiezekwem, J., & Okuoyibo, A. (2019). Inventory management and operational performance of manufacturing firms in South-East Nigeria. *International Business Research*, 12(7), 76-82. <https://doi.org/10.5539/ibr.v12n7p76>
- Mehmood, T. (2021). Does information technology competencies and fleet management practices lead to effective service delivery? Empirical evidence from E-commerce industry. *International Journal of Technology, Innovation and Management (IJTIM)*, 1(2), 14-41.
- Mendes dos Reis, J. G., Sanches Amorim, P., Sarsfield Pereira Cabral, J. A., & Tolo, R. C. (2020). The impact of logistics performance on Argentina, Brazil, and the US soybean exports from 2012 to 2018: A gravity model approach. *Agriculture*, 10(8), 1-21. <https://doi.org/10.3390/agriculture10080338>
- Muchori, P. K. (2015). The effects of road traffic congestion on the efficiency of freight logistics: A survey of the port of Mombasa. *The International Journal of Business & Management*, 3(10), 339-355.
- Muhalia, E., Ngugi, P., & Moronge, M. (2021). Effect of transportation management systems on supply chain performance of FMCG In Kenya. *American Journal of Supply Chain Management*, 6(1), 1-12.
- Mukolwe, G. A., & Wanyoike, D. M. (2015). An assessment of the effect of logistics management practices on operational efficiency at Mumias Sugar Company Limited, Kenya. *International Journal of Economics, Commerce and Management*, 3(6), 1134-1156.
- Mutangili, S. K. (2019). Influence of transportation and logistics law on supply chain performance of energy development agencies in Kenya. Case of Kenya power and lighting company limited. *Journal of Procurement & Supply Chain*, 3(3), 21-38.
- Nyamah, E. Y., Opoku, R. K., & Kaku, G. (2022). Inventory strategies and performance of food and beverage processing industries. *International Journal of Logistics Systems and Management*, 41(1/2), 120-144. <https://doi.org/10.1504/ijlsm.2022.120985>
- Ogah, M., Asiegbu, G., & Lagos, N. M. (2022). Effect of raw material inventory on operational performance in an emerging economy: Insight from the Nigerian manufacturing sector. *International Journal on Recent Trends in Business and Tourism*, 6(2), 31-43. <https://doi.org/10.31674/ijrtbt.2022.v06i02.003>
- Omer, W. K. H., & Aljaaidi, K. S. (2021). Inventory management and performance in energy industry in Saudi Arabia: Empirical evidence. *The Quality*, 22(182), 25-31.
- Opoku, R. K., Fiati, H. M., Kaku, G., Ankomah, J., & Opoku-Agyemang, F. (2020). Inventory management practices and operational performance of manufacturing firms in Ghana. *Advances in Research*, 21(10), 1-18. <https://doi.org/10.9734/air/2020/v21i1030246>
- Orobia, L. A., Nakibuuka, J., Bananuka, J., & Akisimire, R. (2020). Inventory management, managerial competence and financial performance of small businesses. *Journal of Accounting in Emerging Economies*, 10(3), 379-398. <https://doi.org/10.1108/JAEE-07-2019-0147>
- Osuagwu, L. (2020). Research methods: Issues and research direction. *Business and Management Research*, 9(3), 46-55. <https://doi.org/10.5430/bmr.v9n3p46>
- Panigrahi, C. (2013). Relationship between inventory management and profitability: An empirical analysis of Indian cement companies. *Asia Pacific Journal of Marketing & Management Review*, 2(7), 17-120.
- Peng, Y.-T., Zhang, J.-Y., & Chang, J. S. (2021). Exploring the relevance of intangible assets and capital structure. *International Journal of Trade, Economics and Finance*, 12(6), 144-148. <https://doi.org/10.18178/ijtef.2021.12.6.709>
- Pham, V., Do, T., & Ngo, A. (2020). Evaluation of the costs through the logistics value chain (LVC) in Vietnam: An AHP approach. *International Journal of Innovation, Creativity and Change*, 14(2), 868-889.
- Prempeh, K. (2015). *The impact of efficient inventory management on profitability: Evidence from selected manufacturing firms in Ghana*. Germany: University Library of Munich.
- Puche, R. J. C., Ponte, B. B., Costas, G. J., & Pino, D. R. (2019). *Lean vs. Theory of constraints in the wider supply chain: Delving into the impact of noise*. Paper presented at the 13th International Conference on Industrial Engineering and Industrial Management.
- Puche, J., Ponte, B., Costas, J., Pino, R., & De la Fuente, D. (2016). Systemic approach to supply chain management through the viable system model and the theory of constraints. *Production Planning & Control*, 27(5), 421-430. <https://doi.org/10.1080/09537287.2015.1132349>
- Qrunfleh, S., & Tarafdar, M. (2013). Lean and agile supply chain strategies and supply chain responsiveness: The role of strategic supplier partnership and postponement. *Supply Chain Management: An International Journal*, 18(6), 571-582. <https://doi.org/10.1108/scm-01-2013-0015>
- Raheman, A., Afza, T., Qayyum, A., & Bodla, M. A. (2010). Working capital management and corporate performance of manufacturing sector in Pakistan. *International Research Journal of Finance and Economics*, 47(1), 156-169.
- Signé, L. (2018). The potential of manufacturing and industrialization in Africa: Trends, opportunities, and strategies. *African Growth Initiative*, 2(1), 1-32.
- Sinaga, O., Nurfarina, A., Iskandar, A. D., Mozammel, S., & Rosita, A. (2019). The role of HR practices in enhancing firm supply chain performance. *International Journal of Supply Chain Management*, 8(2), 95.
- Sitienei, E., & Mema, F. (2015). The effect of inventory management on profitability of cement manufacturing companies in Kenya: A case study of listed cement manufacturing companies in Kenya. *International Journal of Management and Commerce Innovations*, 3(2), 111-119.
- Snoeck, A., & Winkenbach, M. (2020). The value of physical distribution flexibility in serving dense and uncertain urban markets. *Transportation Research Part A: Policy and Practice*, 136, 151-177. <https://doi.org/10.1016/j.tra.2020.02.011>
- Soares Aharonovitz, M. C., Vidal Vieira, J. G., & Suyama, S. S. (2018). How logistics performance is affected by supply chain relationships. *The International Journal of Logistics Management*, 29(1), 284-307. <https://doi.org/10.1108/ijlm-09-2016-0204>

- Sritharan, V. (2019). Inventory management practices impact on gross profit margin: A study on beverage, food and tobacco sector listed companies of Sri Lanka. In (pp. 31). Berlin, Germany.
- Takim, S. A. (2014). Optimization of effective inventory control and management in manufacturing industries: Case study of Flour Mills Company Calabar, Nigeria. *Journal of Emerging Trends in Engineering and Applied Sciences*, 5(4), 265-276.
- Ulutaş, A., & Karaköy, Ç. (2019). An analysis of the logistics performance index of EU countries with an integrated MCDM model. *Economics and Business Review*, 5(4), 49-69. <https://doi.org/10.18559/ebr.2019.4.3>
- Wambua, B. J., Okibo, W. B., Nyang'au, A., & Ondieki, S. M. (2015). Effects of inventory Warehousing systems on the financial performance of seventh day adventist institutions: A case of adventist book centers (ABC), Kenya. *International Journal of Business and Management*, 10(4), 259-264. <https://doi.org/10.5539/ijbm.v10n4p259>
- Wangrow, D. B., & Schloemer, H. (2019). Managerial discretion. *Oxford Bibliographies Online: Management*, 1(1), 1-5.
- Zaid, A., Sleimi, M., & Alaqra, N. (2021). Environmental logistic management, stakeholders pressures and sustainable performance. *Journal of University of Shanghai for Science and Technology*, 23(1), 391-396. <https://doi.org/10.51201/jusst12577>
- Zakaria, K. M., Nawawi, A., & Salin, A. S. A. P. (2016). Internal controls and fraud – empirical evidence from oil and gas company. *Journal of Financial Crime*, 23(4), 1154-1168. <https://doi.org/10.1108/JFC-04-2016-0021>
- Zhang, R. (2021). Business strategy, stock price informativeness, and analyst coverage efficiency. *Review of Financial Economics*, 39(1), 27-50. <https://doi.org/10.1002/rfe.1101>
- Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business research methods*: Cengage Learning.