World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

Check for updates

Effect of logistics on the performance of transportation Firms in Enugu State Nigeria

Udoka Helen Chukwu [1], Ugochukwu Remigius Ihezie [2] and Chinedu Anthony Umeh [3,*]

[1] *Department of Political science, Enugu State University of Science and Technology (ESUT). Nigeria.*
[2] *Department of Social Science (Economic Unit), Federal Polytechnic Nekede Owerri. Nigeria.*
[3] *Department of Economics, Enugu State University of Science and Technology, (ESUT) Nigeria.*

World Journal of Advanced Research and Reviews, 2024, 22(01), 1784–1796

Publication history: Received on 04 March 2024; revised on 24 April 2024; accepted on 26 April 2024

Article DOI: https://doi.org/10.30574/wjarr.2024.22.1.1278

Abstract

The study examined the effect of logistics on the performance of transportation firms in Enugu State Nigeria. Specifically, the study sought to; examine the effect of logistics demand planning on safety delivery of transportation firms and evaluate the effect of storage and material handling on rapid response of transportation firms in Enugu State. The sample size of 400 respondents was drawn from population of 1,052 staffs of the selected indigenous transportation companies in Enugu State namely: ABC Transport, Peace Mass Transit, Young Shall Grow and Enugu State Transport Company. The data analytical technique was single regression. The empirical results show that logistics demand planning has significant effect on safety delivery of transportation firms in Enugu State (t-statistic; 6.445; P-value; 0.000 < Sig-value; 0.05); and storage and material handling has significant effect on rapid response of transportation firms in Enugu State (t-statistic; 11.226; P-value; 0.000 < Sig-value; 0.05) The study recommended that management of transportation firms should increase investment on infrastructure of transportation for spare parts inventory within vehicle repair workshop.

Keywords: Logistics demand planning; Storage and material handling; Safety delivery of transportation firms; Rapid response of transportation firms

1. Introduction

The pivotal roles of logistics firms in economic growth and development have been acknowledged by scholars, professionals and researchers globally. Research has shown that logistics industry has a considerable share in Gross Domestic Product (GDP) of the US, Europe and Asia. The volatility of the business environment, intense competition and improvements in technology has introduced dramatic changes to the logistics management. Globalization and severe competition of supply chains has forced transportation firms to look for better logistics methods to remain competitive. Firms need to make solid inventory network connections that empower them to control their market directions by reacting to fast changes in clients' worth and rival moves for them to obtain prevalent business execution. According to Rahman and Jamiu, (2022), typical fundamentals of logistic activities include customer services, inventory control, transportation and ordering. These can give companies competitive advantages. Ogbeide and Isokpan, (2022) noted that logistic management practices provide an avenue for integrating activities in the supply chain aiming at realizing a sustained competitive advantage. The process entails formulation of ways and means through which products and service reach the firm as well as the consumer. In today's operational environment, transportation firms are faced with challenges of responding to the dynamic demands from customers and the heightened competition amongst firms. This has prompted the firms to adopt ways in which to improve quality of services delivery, reduce operation costs as well as adopt technologically friendly environment that will promote transition of goods that fits the prevailing demands. Akintokunbo and Odage, (2021) notes that majority of the transportation firms have capitalized on promoting supply chain activities to add value to their customers. This is made effective by capitalizing on the adoption of effective logistic

* Corresponding author: Umeh Anthony Chinedu

management approaches in the supply chain operations of the firms. Adedugba, (2021) posits that transport management has been one of the main components of logistic management practice that majority of firms have heavily invested. Adoption of transport management practices aims at optimizing the process of supply chain in the most cost-effective way that helps a firm capture its competitive edge. The process of controlling, securing and managing goods movement to the firm by supplier and from the firm to the consumers has enabled majority of firms save on transportation costs which significantly contributes to performances of transportation firms.

Logistics management has to do with acquiring the sufficient resources at the right quantity, place, price, time and it covers of both inbound and outbound activities. Inbound logistics relates to incoming materials while, outbound logistics are activities performed after production up to and including after-sales services (Adesunkanmi, Emmanuel & Nurain, 2022). The main aim of developing an effective logistics management strategy is to enhance the customer experience and achieve organizational objectives. It has become imperative for companies to invest in logistics management technology for gaining a competitive advantage in the market. Understanding the goals of logistics is an important aspect to create visibility across the supply chain operations.

1.1. Statement of the Problem

Logistics management is known to be an integral part of the supply chain as it includes activities like planning and managing the transportation of goods from the point of origin to their final destination. It is an integral part of supply chain management (SCM) that consists of product packaging, materials handling, warehousing, inventory, and so on. In the contemporary world, managing logistics is an effective process to create and enforce consistency in the organization's profitability (Gudeta & Barani, 2021).

The inability of Nigerians to devise a better transportation system has been a detraction of the growth of the economic, social and political sectors of the economy. Prominent among the problems includes travelling, lateness to work, movement of agricultural products, goods and services from area of production to area of utilization (Abdul, Iortimbir, Oladipo & Olota, 2019). In Nigeria, the need for an effective transport system becomes more obvious if taken into consideration the analysis of the country and the need to disperse development move.

Inability to adopt adequate logistic management could result to customers' dissatisfaction. Achieving customer satisfaction is the key objective of every company, that is, if total profit for a period is to be achieved (Amin & Shahwan, 2020). This cannot be achieved if the logistic activities in an establishment is faced with some problems such as: delay in delivery of goods, Improper handling of materials resulting in damage of goods, lack of qualified personnel, inadequate transportation system in the organization and improper maintenance of transporting system causing breakdown leading to late delivery. Furthermore, logistic management is bedeviled by many problems in Nigeria. These include many bad roads which have affected road transportation management, high cost of spare parts which makes it difficult for the management of transport companies to procure high quality spare parts and diversion of fund meant for procurement of spare parts. Moreover, the fluctuating nature of the price of petroleum products has equally affected logistic management adversely.

1.2. Objectives of the Study

The main objective of this study is to examine effect of logistics on the performance of transportation firms in Enugu State Nigeria. The specific objectives of this study are to:

- Examine the effect of logistics demand planning on safety delivery of transportation firms in Enugu State.
- Evaluate the effect of storage and material handling on rapid response of transportation firms in Enugu State.

1.3. Research Questions

- This study seeks to provide answers to the following research questions.
- What is the effect of logistics demand planning on safety delivery of transportation firms in Enugu State?
- What is the effect of storage and material handling on rapid response of transportation firms in Enugu State?

1.4. Significance of the Study

The outcome of this study is beneficial and relevant to the management of transportation companies, employees and scholar and researchers.

Findings from this study provide relevance to the transportation companies in Enugu State for decision making in choosing effective logistics labour regulation and cargo capacity development.

The findings of this study would benefit management of transportation company in Enugu because the documentation of how the practice of logistic inbound and outbound practices is carried out in the companies, the critique of the practice and the documentation of the challenges will give impetus to the companies to devise better ways of practicing the effective logistics management practices. The recommends given would guide them in strengthening the logistics management practice in such organizations.

The outcome of this study will equally be useful to scholars and researchers, it would serve as reference materials that are reserve in libraries and shelves for further academic research. The study empirical findings are capable of adding new insights to present knowledge in the field.

2. Conceptual Literature

2.1. Logistics

According to the New Oxford American Dictionary, logistics management refers to the detailed coordination of a complex operation involving many people, facilities, or supplies. The Oxford Dictionary online views logistics management as the detailed organization and implementation of a complex operation. For Council of Supply Chain Management Professionals, logistics management refers to part of supply chain management that plans, implements, and controls the efficient, effective, forward and reverse flow and storage of goods, services and related information, between the point of origin and the point of consumption in order to meet customers' requirements (Mao, Xing & Zhang, 2018). Logistics management is customer- oriented operations management as it includes all the functions required for distribution of goods. Logistics management usually involves the integration of information flow, material handling, production, packaging, inventory, transportation, warehousing, and often security. The complexity of logistics can be modeled, analyzed, visualized, and optimized by dedicated simulation software (Montoya-Torres, Muñoz-Villamizar & Mejia-Argueta, 2021).

2.2. Performance of Transportation Firms

The concept of firm performance has received various interpretations over the years. Some look at the firm performance to mean the development of share prices, while others viewed it in terms of profitability (Ngamvichaikit, 2017). A firm's marketing performance indicates how productive its marketing activities are with regards to its marketing goals (Ristovska, Kozuharov & Petkovski, 2017), which is influenced by the firm's characteristics, approach, internal and external environment, resources and other qualities/characteristics of the shareholders and management of the firms (Takwi & Mavis, 2020). The most notable performance measures of a firm are financial and non-financial measures (Torabizadeh, Yusof, Ma'aram & Shaharoun, 2020), and in strategic management research, firm performance is frequently used as a dependent variable (Wasike & Juma, 2020; Adebayo & Aworemi, 2021). Performance in this sense means a business parameter that defines the size, strength, activity, pro-activeness, competitive aggressiveness, autonomy and success of an organization (Oyesiku, Somuyiwa & Oduwolu, 2019).

2.3. Contextual Literature

2.3.1. Logistics demand planning and safety delivery

Logistics demand planning is a major component of the supply chain that can eliminate the insufficient or improper supply of goods. It involves activities like warehousing, material handling, and storage for managing the logistics functions effectively. Similarly, goal is to analyze historical data, statistical forecasting, and overall product lifecycle for staying in front of market shifts (Ajah, Okolo, Oranusi, Obikeze & Okoro, 2020).

In logistics, the purpose of order processing management is to make sure that every machine and workspace receives the right product at the right time in a suitable quantity and quality (Edim & Inyang, 2022). It is not transporting itself, which is concerned but rationalizing and monitoring the operation by introducing value activities and removing non-value-adding activities (Umar, 2019). Thus, customer response and capital efficiency can only be accomplished by order processing logistics. The more responsive the supply chain and logistics management, the more reliable and up-to-date information about consumer purchasing behavior is relevant. Customer preferences are conveyed as instructions in most supply chains. Nevertheless, such orders cover anything from the original issuance, shipping, invoicing, or the selection of the order to handling the customer's needs (Adeitana, Aigbavboab & Olufemi, 2021).

2.4. Storage and material handling and Rapid Response

Material handling, as the name itself suggests, refers to the process involving moving, controlling, protecting, and storing materials, such as goods, items etc. for manufacture, disposal, distribution or even for consumption (Omoush, 2022). The process of material handling is very crucial, as the contents should be handled with extreme care in order to keep them fortified from any damage, up-keeping their quality and condition. In a nutshell, material handling holds a crucial importance in outlining an efficient logistics, and warehouse operations (Adesunkanmi, Emmanuel & Nurain, 2022). Material handling is an important part of the supply chain. It encompasses inventory management and control of the movement, storage, and protection of products and materials throughout manufacturing, warehousing, distribution, and disposal. It includes diverse equipment types and storage systems—like single level or multi-level storage—and conveyor belt systems (Gudeta & Barani, 2021).

Material handling includes four dimensions: movement, time, quantity, and space. Material handling provides movement of products from receiving to shipping, length of time products remain in storage, amount of product that fits into an allotted space, and actual amount of available space are the areas in which material handling can improve efficiency (Abdul, Iortimbir, Oladipo & Olota, 2019). This logistics process includes various equipment that's manual, automated, and semi-automated. Equipment might include forklifts, trailers, pallets, hand trucks, tugger trains, and more. It makes more operational sense to factor in the materials handling logistics earlier—not later—in the process of starting, expanding, or moving your business. Material handling is integral to projects that include building or renovating plants and facilities, launching new products, improving workstations, and streamlining or reducing forklift traffic (Amin & Shahwan, 2020).

2.5. Theoretical Literature

2.5.1. Transaction Cost Theory

Early studies of transaction cost theory, as described in the work of and others, paid little attention to the internal functioning of the organization (Adedugba, 2021). Pitelis and Wahl 1998, as cited in Akintokunbo and Odage, (2021) further expanded the theory of transaction costs by highlighting the role of transaction costs in promoting vertical and organizational trust. Such elements of the transaction cost theory are evidence supporting the role of supply chain management within organizations. This theory is relevant to the Supply Chain Management Study as it explains how the industry can reduce the transaction costs associated with the distribution of products and the procurement of materials. Firms with lower transaction costs are therefore in a position to perform better in terms of supply chain management.

Ristovska, Kzuharov and Petkovski, (2017) study of supply management makes a valuable contribution to understanding sourcing and predicting the likely success of some supply chain arrangements with focus on firm boundaries. Basically, it is based on two central assumptions regarding human behaviour; these being, opportunism" and "bounded rationality. Opportunism, offering incomplete and/or inaccurate information during both the negotiation of and implementation of economic transactions while on bounded rationality, individuals tend to be rational merely in intent rather than being rational in the absolute sense due to the imperfections inherent in humans' creation, and therefore, in their ability to rationalize. Transaction cost theory saw transactions broadly as transfers of goods or services across interfaces, and argued that when transaction costs were high, internalizing the transaction within a hierarchy was the appropriate decision. Consequently, customers would prefer conventional method of shopping over online shopping if the cost of actualizing the later poses any form of difficulties or extra charges to them.

2.6. Empirical Literature

Adelwini, Lomatey and Opare, (2023) conducted a study to investigate the effects of logistics management on organizational performance in Ghanaian roofing sheet manufacturing companies. Specifically, the study sought to determine how inventory management, warehouse management, transportation management, physical distribution and information flow management affects the organizational performance. The method of data analysis was 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. 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.

Odunjo, (2022) examined the impact of logistic inbound and outbound operations on organizational performance in Dangote Cement Industries. Specifically, the study sought to; identify the key inbound and outbound logistics practices at Dangote cement industry in Nigerian and interrogate the impact of the key inbound and outbound logistics practices on organizational performance at Dangote cement industry in Nigeria. A total of 96 respondents were used for the study, ranging from senior, junior to management staff. Descriptive Statistics, Ordinary Least Square and Pearson Moment correlation techniques were employed. Findings revealed that logistic inbound and outbound operations positively and significantly affect organizational performance with ($\beta = 0.308$, $\rho < 0.01$ and $\beta = 0.281$, $\rho < 0.01$) respectively. Also, positive and significant relationship exists between logistic inbound operations and organizational performance ($r = 0.403^{**}$, $\rho < 0.01$) and also between logistic outbound operations and organizational performance ($r = 0.409^{**}$, $\rho < 0.01$). The study recommended that companies should encourage modern logistics operation techniques in terms of transportation, inventory and warehousing and also adopt up to date inventory management system so as to avoid issues relating to overstocking and stock out during production.

Ogbeide and Isokpan, (2022) examined the impact of logistics cost on the financial performance of quoted manufacturing firms in Nigeria using panel secondary data from the year 2015 to 2019. Specifically, the study investigates how the cost of ordering raw material, cost of processing orders, cost of holding inventory (warehouse) and cost of delivery orders (finished products) influence the performance of quoted manufacturing firms in Nigeria. Data were collected from 10 (ten) of the sample quoted manufacturing firms within the period of the year 2015 to 2019 financial year, making 50 observations. The data were subjected to a panel regression method with fixed and random effects. From the analysis, it was discovered that the cost of ordering raw material and cost of holding inventory (warehouse) had significant negative relationship with the performance of quoted manufacturing firms in Nigeria, while the cost of processing orders and cost of delivery orders had no significant relationship with the performance of quoted manufacturing firms in Nigeria. The study recommended that management of the concerned manufacturing firms should comprehensively address costs of ordering raw materials and costs of holding inventory (warehouse) by sourcing raw material in local market except such raw materials are not available locally (Nigeria).

Adeitana, Aigbavboab and Olufemi, (2021) examined influence of information flow on logistics management in the industry 4.0 Era. Specifically, the study sought to evaluate the influence of negotiating better contracts, better product tracking, better quality logistics information flow, expanded network on logistics management in the industry. The methodology used in this study includes; the quantitative methodology, a mean item score, exploratory factor analysis, normality test, and Man-Whitney test. Findings revealed negotiating better contracts, better product tracking, better quality logistics information flow, expanded network, and enhanced information transfer as the top five effect of information flow on logistics management in Nigeria. It is recommended that Nigerian companies engaging in logistics activities need to adopt industry 4.0 technologies to aid effective and new information flow in their logistics management processes. Finally, the growth of logistics firm and its ability to compete depend on effective information flow.

Gudeta and Barani, (2021) conducted a study to examine the effect of logistics management on organizational performance at Wonji/Shoa sugar factory in Ethiopia. The specific objectives of the study were to examine transportation, inventory, and warehouse management on organizational performance. The population under consideration was employees of Sugar Factory working under facility management and material planning and inventory management. Data analysis was employed using descriptive statistics specifically mean and standard deviation; and inferential statistics namely Pearson correlation coefficient and multiple regression analysis and then presented in tables. The finding of study implies that transportation, inventory, and warehouse management had positive and statistically significant effect on organizational performance. The study recommends, since the results shows that there is significant effect of logistics activities on organizational performance, the management of the organization should incorporate those activities under the study in all aspects of a factory since this constitutes to improve the performance of the factory.

Adedugba, (2021) examined the relationship between logistics operations, and sustainable performance of selected textile manufacturing firms in Lagos State, Nigeria. Specifically, the study sought to ascertain influence of transportation management, inventory management, information management and material handling on sustainable performance. The data analytical technique was correlation analysis. The findings further revealed that logistic philosophies (just in time, just in case, lean and agile philosophy) moderates the relationship between logistic operations (transportation management, inventory management, information management and material handling) and sustainable performance (economic performance, innovative performance, social performance, and environmental performance). The results of the operational research findings revealed an optimal output to meet the goal of minimising the cost of delivery for the textile manufacturing firms at an optimal course via transportation linear model such as minimum cost technique and

modified distribution method (MODI). The study recommends a continuous improvement in transportation management practices via transportation linear models in other to enhance and sustain economic performance.

Ajah, Okolo, Oranusi, Obikeze and Okoro, (2020) examined effective transportation and warehousing as critical elements of physical distribution and their effects on the price of agricultural products in Enugu State, Nigeria. The study sought to determine the effect of transportation on the price of agricultural products in Aninri Local Government Area of Enugu State and also to ascertain the nature of the relationship between warehousing and price of agricultural products in Aninri Local Government Area. The population is comprised of two hundred and ten farmers in Aninri Local Government Area. Out of 210 copies of the questionnaire that were distributed, 190 copies were returned, while 20 copies were not returned. The hypotheses were tested using Pearson product moment correlation coefficient and simple linear regression statistical tools. The findings indicated that transportation had a significant positive influence on the price of agricultural products in Aninri Local Government Area ($r = 0.928$; $t = 44.531$; $p < 0.05$). Also, it was revealed that there was a significant positive relationship between warehousing and the price of agricultural products in Aninri Local Government Area ($r = .913$, $p < .05$). The study recommended that farmers should adopt backward integration in order to minimize the transportation cost that will positively affect the prices of agricultural products.

Umar, (2019) examined the role of logistics in manufacturing firms' performance in some states in Northern Nigeria. Specifically, the study sought to: examine the effect of inbound logistics on manufacturing firm's performance and evaluate the effect of outbound logistics on manufacturing firm's performance. A firm-level survey was conducted in a cross-sectional examination of members of the Manufacturers Association of Nigeria (MAN), with a sample of 144 firms. The study was underpinned by the resource-based theory, and data was analyzed using multiple regression analysis through the partial least squares structural equation modeling (PLS-SEM). It was discovered that both inbound and outbound logistics have positive relationships with performance. However, the relationship between outbound logistics and performance was not significant. The findings implies that managers of manufacturing firms cannot entirely rely on the contributions of logistics to enhance performance. It was therefore recommended that management in the manufacturing sector could find ways of improving those outbound activities they perform; contemplate involving drivers, such as information technology to boost performance; and consider outsourcing those outbound activities.

Ristovska, Kzuharov and Petkovski, (2017) conducted a study to examine the impact of logistics management practices on company's performance. Specifically, the study sought to analyze the impact of company's logistics management including transportation, warehousing, packaging, inventory and information management to the efficiency and effectiveness. The empirical research is conducted on a sample of eighty examinees from eighty different companies in the Republic of Macedonia. The general hypothesis is fully validated and proven by the survey results. Adequate inventory, storage, warehousing, transport and information management are key targets for logistics managers in order to reduce the overall costs of the company. Findings include the confirmation of the necessity of logistics managers to optimally manage all logistics activities in order to gain increased business efficiency, customer satisfaction and competitiveness. The study suggested that management should adopt backward integration in order to minimize transportation cost that will positively affect price of products. They should also build warehouses for the storage of products as their products move from the warehouse, it regulate the price of products.

2.7. Literature Gaps

Most extant studies on this aspect, both in the developed and developing countries have looked on either the effect of inbound practices on the performance of the organizational (Odunjo, 2022) or effect of outbound logistics practices on organizational performance (Edim & Inyang 2022). None of the studies have been able to determine the effect of logistic management practices on performance of transportation in Enugu State that a gap which this research intends to fill so as to guide the policy makers.

3. Methodology

The research design was descriptive survey method. Study Area was Enugu State Nigeria. The sample size of 400 respondents were drawn from population of 1,052 staffs of the selected indigenous transportation companies in Enugu State namely: ABC Transport, Peace Mass Transit, Young Shall Grow and Enugu State Transport Company. The choice for only staff of the organization was owing to the nature of this study and due to accessibility and availability of data. The study used structured questionnaire to obtain data. Research questions of the study were answered using mean score and standard deviation. The hypotheses stated will be tested using single regression analysis. Methods of data presentation was table. Statistical Package for Social Science (SPSS) is computer Application Software was used for the data analysis.

4. Results

Table 1 Comprehensive Demographic distribution of the Respondents

Title	Frequency	Percentage
Questionnaire Distributed	400	100%
Returned Questionnaire	358	90%
Not Returned Questionnaire	42	10%
Gender		
Female Male	213 145	59.5% 40.5%
Age Bracket		
20-30 Years 31-40 Years 41-50 Years 51Years – above	153 111 66 28	42.7% 31.0% 18.4% 7.8%
Marital Status		
Married Single Widow/widower Divorce	223 125 7 3	62.3% 34.9% 1.9% 0.8%
Educational Qualification		
HND/B.sc MBA/M.sc Ph.D	230 125 3	64.2% 34.9% 1.10%

Sources: Field Survey, 2023

Four hundred (400) copies of questionnaire were designed and distributed to the respondents. Out of the 400 Questionnaires distributed, 358 (90%) were completed and returned while 42 (10%) were not returned. Therefore, 90 percent respondents were a good representation. The table showed the respondents profile in frequency and percentage distribution of gender, age bracket, marital status and educational qualification..

4.1. Data Analysis

4.1.1. Question One:What is the effect of logistics demand planning on safety delivery of transportation firms in Enugu State?

Table 2 Mean rating of responses of respondents on what is the effect of logistics demand planning on safety delivery of transportation firms in Enugu State.

S/N	Question Items	VGE (5)	GE (4)	ME (3)	LE 2)	VLE (1)	Total	Mean	SD
1	Logistics management allows organizations to evaluate and forecast the demand for goods and services and also maintain a balance between demand and supply.	900 180 50%	400 100 30%	144 48 13%	46 23 6%	7 7 1%	1497 358 100%	4.18	0.0030
2	Demand planning helps to make more realistic decisions and avoid an imbalance in stock.	630 126	632 158	192 64	40 20	10 10	1504 358	4.20	0.0030

		35%	44%	18%	5%	2%	100%		
3	Logistics management provides optimal level of stock that reduce costs, optimize resources and increase profits	1000 200 59%	404 101 28%	135 45 13%	18 9 2%	3 3 0.8%	1560 358 100%	4.36	0.0033
4	Demand planning prevents failures in stock control and product losses thereby resulting in more efficient operations and productivity gains.	950 190 53%	444 111 31%	105 35 9%	24 12 3%	10 10 2%	1533 358 100%	4.28	0.0032
	Grand Mean							4.255	0.0031

Source: Field Survey, 2023

This table showed the opinion of respondents on what is the effect of logistics demand planning on safety delivery of transportation firms in Enugu State. The respondents are in agreement with all the items. The study thereby revealed that logistics demand planning has significant effect on safety delivery of transportation firms in Enugu State since logistics management provides optimal level of stock that reduce costs, optimize resources and increase profits (The grand mean 4.255 was greater than the cutoff point 3).

4.1.2. Question Two: What is the effect of storage and material handling on rapid response of transportation firms in Enugu State?

Table 3 Mean rating of responses of respondents on what is the effect of storage and material handling on rapid response of transportation firms in Enugu State.

S/N	Question Items	VGE (5)	GE (4)	ME (3)	LE (2)	VLE (1)	Total	Mean	SD
1	Material handling allows transport firms to have the necessary stock in smaller spaces where possible, reduce time spent on internal operations	630 126 35%	632 158 44%	192 64 18%	40 20 5%	10 10 2%	1504 358 100%	4.20	0.0030
2	Material handling ensures that customers receive their shipments on time and undamaged and increase customer base through customer referrals.	580 116 32%	632 158 44%	222 74 21%	26 13 3%	17 17 2%	1477 358 100%	4.13	0.0029
3	Material handling system facilitates proper product movement throughout the warehouse and entire supply chain cuts down on service time	900 180 50%	400 100 30%	144 48 13%	46 23 6%	7 7 1%	1497 358 100%	4.18	0.0030
4	Material handling equipment allows safety delivery of products and decreases product damage.	985 197 55%	416 104 29%	111 37 10%	24 12 3%	8 8 2%	1544 358 100%	4.31	0.0032
	Grand Mean							4.205	0.0030

Source: Field Survey, 2023

This table showed the opinion of respondents on what is the effect of storage and material handling on rapid response of transportation firms in Enugu State. The respondents are in agreement with all the items. The study thereby revealed that storage and material handling has significant effect on rapid response of transportation firms in Enugu State since material handling equipment allows safety delivery of products and decreases product damage (The grand me 4.205 was greater than the cutoff point 3).

4.2. Test of Hypotheses

The two hypotheses were formulated for this study and will be tested and a decision taken is based on the rule below.

Decision rule: Reject Hi if P-value > 0.01

4.2.1. Hypothesis One

H_2 = Logistics demand planning has no significant effect on safety delivery of transportation firms in Enugu State.

Table 4 Single Regression Results

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.931[a]	0.866	0.865	0.26055
a. Predictors: (Constant), Logistic demand planning				

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	57.077	1	57.077	18.604	0.000[b]
	Residual	1095.276	357	3.068		
	Total	1152.353	358			
a. Dependent Variable: Safety delivery of transportation firms						
b. Predictors: (Constant), Logistic demand planning						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.614	0.089		18.111	0.000
	Logistic demand planning	0.529	0.082	0.931	6.446	0.000
a. Dependent Variable: Safety delivery of transportation firms						

In testing this hypothesis, logistic demand planning was regressed against safety delivery of transportation firms. The result of the single-regression analysis showed the model to examine the effect of logistics demand planning on safety delivery of transportation firms in Enugu State.

4.2.2. Safety delivery of transportation firms = 1.614 + 0.529 Logistic demand planning

The empirical result showed that the coefficient of logistic demand planning has positive effect on safety delivery of transportation firms; it means that logistic demand planning has positive and direct effect on safety delivery of transportation firms. The results of the t – statistics denoted that the coefficient of logistic demand planning was statistically significance. This is because observed values of t – statistics (6.446) was greater than its P-values (0.000). The results of the F – statistical test showed that the overall regression of the hypothesis two was statistically significance. This was because observed value of the F – statistics (18.604) was great than its P-value (0.000). Again, our empirical result showed that the Pearson product moment correlation analysis (r) was 0.931. The strength of relationship between the two variables was high. However, we rejected the null hypothesis and concluded that logistics demand planning has positive and significant effect on safety delivery of transportation firms in Enugu State.

4.3. Test of Hypothesis Two

H_2 = Storage and material handling has no significant effect on rapid response of transportation firms in Enugu State.

Table 5 Single Regression Result

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.931[a]	0.866	0.865	0.26055
a. Predictors: (Constant), Storage and material handling				

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	43.789	1	43.789	9.184	0.000[b]
	Residual	1702.176	357	4.768		
	Total	1745.965	358			
a. Dependent Variable: Rapid response of transportation firms						
b. Predictors: (Constant), Storage and material handling						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.418	0.075		5.568	0.000
	Storage and material handling	0.201	0.017	0.969	11.826	0.000
a. Dependent Variable: Rapid response of transportation firms						

In testing this hypothesis, storage and material handling was regressed against rapid response of transportation firms. The result of the single-regression analysis showed the model to evaluate the effect of storage and material handling on rapid response of transportation firms in Enugu State.

4.3.1. Rapid response of transportation = 0.418 + 0.201 Storage response of transportation firms

The empirical result showed that the coefficient of storage and material handling positive effect on rapid response of transportation firms; it means that storage and material handling has positive and direct effect on rapid response of transportation firms. The results of the t – statistics denoted that the coefficient of storage and material handling was statistically significance. This was because observed values of t – statistics (11.826) was greater than its P-values (0.000). The results of the F – statistical test showed that the overall regression of the hypothesis three was statistically significance. This was because observed value of the F – statistics (9.184) was greater than its P-value (0.000). Again, our empirical result showed that the Pearson product moment correlation analysis (r) was 0.931. The strength of relationship between the two variables was high. However, we rejected the null hypothesis and concluded that storage and material handling has significant effect on rapid response of transportation firms in Enugu State.

5. Discussion of Findings

5.1. Effect of logistics demand planning on safety delivery of transportation firms in Enugu State.

The findings of the study revealed that logistics demand planning has significant effect on safety delivery of transportation firms in Enugu State since logistics management provides optimal level of stock that reduce costs, optimize resources and increase profits. The outcome of the study is in line with the study of Adelwini, Lomatey and Opare, (2023) that conducted a study to investigate the effects of logistics management on organizational performance in Ghanaian roofing sheet manufacturing companies. Specifically, the study sought to determine how inventory

management, warehouse management, transportation management, physical distribution and information flow management affects the organizational performance. The method of data analysis was 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.

5.2. Effect of storage and material handling on rapid response of transportation firms in Enugu State.

The findings of the study revealed that storage and material handling has significant effect on rapid response of transportation firms in Enugu State since material handling equipment allows safety delivery of products and decreases product damage. The outcome of the study is in contrast with the study of Edim and Inyang, (2022) that conducted a study to investigate the relationship between logistics management and marketing performance of small and medium-sized manufacturing firms. It aimed to assess the influence of order processing, transportation, inventory and warehouse management on the marketing performance of small and medium-sized manufacturing firms. As a cross-sectional study, primary data were obtained from 216 operators and personnel of small and medium-sized manufacturing firms using a structured questionnaire. The hypotheses developed for the study were tested using multiple linear regression. Consequently, the study revealed that order processing management, transportation management, inventory management and warehouse management had significant positive influences on the marketing performance of small and medium-sized manufacturing firms. Therefore, the study concluded that logistics management has a significant positive influence on marketing performance in the context of small and medium-sized manufacturing firms.

5.3. Findings

The following are the major findings of the study:

- The findings of the study revealed that logistics demand planning has significant effect on safety delivery of transportation firms in Enugu State since logistics management provides optimal level of stock that reduce costs, optimize resources and increase profits (t-statistic; 6.445; P-value; 0.000 < Sig-value; 0.05).
- The findings of the study revealed that storage and material handling has significant effect on rapid response of transportation firms in Enugu State since material handling equipment allows safety delivery of products and decreases product damage (t-statistic; 11.226; P-value; 0.000 < Sig-value; 0.05).

6. Conclusion

The study concluded that logistics has positive and significant effect on the performance of transportation firms in Enugu State Nigeria. 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. 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 spare parts, as well as increase overall cost effectiveness, market share, and lead time, all of which will improve performance.

Recommendations

Based on the findings of this study, the following recommendations were made.

- Management of transportation firms should increase investment on infrastructure of transportation for spare parts inventory within vehicle repair workshop. Management of transportation companies should procure high quality spare parts as it has a positive effect on customers' loyalty.
- Management of transportation firms should give due attention in proper implementation logistics activities for efficient delivery of transportation, better warehouse management and inventory management. Management of transportation companies should provide standard fleet as it has a significant relationship with perceived value.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Abdul, F. A., Iortimbir, A. I., Oladipo, G. T. & Olota, O. O. (2019). Impact of logistics management on organizational performance (A case study of Dangote Flour Mills Plc, Nigeria). *Journal of Sustainable Development in Africa, 21*(1), 36-49

[2] Adebayo, I. T. and Aworemi, J. R. (2021) Transport Management Practices and Firms' Performance in Nigeria; *Proceedings of the International Conference on Industrial Engineering and Operations Management Rome, Italy*; 2 (3); 2-5.

[3] Adedugba, A. T. (2021) Logistics operations and sustainable performance of selected textile manufacturing firms in Lagos State, Nigeria; *International Review of Management and Business Research, 3*(2), 7-14.

[4] Adeitana, D. A. Aigbavboab, C. and Olufemi, S. B. (2021) Influence of Information Flow on Logistics Management in the Industry 4.0 Era; *International Journal of Supply and Operations Management:* 8 (1); 29-38.

[5] Adelwini, B. B.; Lomatey, I T. and Opare, F. A. (2023) Investigating the effects of logistics management on organizational performance: New evidence from the manufacturing industry; *Journal of Accounting, Business and Finance Research*: 16 (1); 1-11.

[6] Adesunkanmi, S. O., Emmanuel, O. I., & Nurain, S. A. (2022). Effect of Logistics Outsourcing on Operational Performance of the Selected Manufacturing Companies in Southwestern Nigeria. *Open Journal of Business and Management,* 10, 3485-3499.

[7] Akintokunbo, O. O. and Odage, A. F. (2021) Logistics Management and Operations Performance of Oil and Gas Supply Chain: A Review of Literature; *Asian Journal of Social Science and Management Technology* 3 (6) 12-29.

[8] Ajah, B.N., Okolo, V. O. Oranusi, I.N. Obikeze, C.O. and Okoro, D. P. (2020) Effective transportation and warehousing as critical elements of physical distribution and their effects on the price of agricultural products in Enugu State, Nigeria. *International Research Journal of Management and Commerce;* 7 (6); 20-29.

[9] Amin, H. M., & Shahwan, T. M. (2020). Logistics management requirements and logistics performance efficiency: The role of logistics management practices-evidence from Egypt. *International Journal of Logistics Systems and Management, 35*(1), 1-27.

[10] Edim E.J. & Inyang B.I. (2022), Logistics Management and Marketing Performance of Small and Medium-Sized Manufacturing Firms. *International Journal of Entrepreneurship and Business Innovation* 5(1), 1-15.

[11] Gudeta, C. and Barani, K. (2021) The effect of logistics management on organizational performance at Wonji/Shoa sugar factory in Ethiopia; *Gobal Scientific Journal*: 9 (5); 86-92.

[12] Mao, J., Xing, H., & Zhang, X. (2018). Design of an intelligent warehouse management system. *Wireless Personal Communications,* International Journal of Entrepreneurship and Business Innovation *102*(2); 55-67.

[13] Montoya-Torres, J. R., Muñoz-Villamizar, A., & Mejia-Argueta, C. (2021). Mapping research in logistics and supply chain management during COVID-19 pandemic. *International Journal of Logistics Research and Applications*, 1-21.

[14] Ngamvichaikit, A. (2017). The competency development of multimodal transportation management for logistics professionals in Thailand. *International Journal of Trade, Economics and Finance, 8*(1), 88-103.

[15] Odunjo, F. O. (2022) Impact of logistic inbound and outbound operations in organizational performance at Dangote Cement Industries; *International Journal of Academic Information Systems Research;* 5 (6): 1-11.

[16] Ogbeide, D.O. and Isokpan, R.E. (2022) Logistics cost and financial performance of selected quoted manufacturing firms in Nigeria; *International Review of Management and Business Research, 3*(3), 7-14.

[17] Omoush, M. M. (2022). The impact of the practices of logistic management on operational performance: A field study of road transport companies [Special issue]. *Journal of Governance & Regulation, 11*(4), 237–245.

[18] Oyesiku, O., Somuyiwa, A.O. and Oduwolu, A.O. (2019) Analysis of Transport and Logistics Education Regulations and Economic Development in Nigeria; *World Conference on Transport Research;* 12 (4); 26-30.

[19] Rahman, M. and Jamiu, N. A. (2022) Evaluation of Logistics Management and Performance of Micro E-Businesses in Ilorin Metropolis; Journal of Industrial and Business Management; 3 (2); 23-31.

[20] Ristovska, N., Kozuharov, S. & Petkovski, V. (2017). The Impact of logistics management practices on company's performance. *International Journal of Academic Research in Accounting, Finance and Management Sciences, 7*(1), 245-252

[21] Torabizadeh, M., Yusof, N. M., Ma'aram, A., & Shaharoun, A. M. (2020). Identifying sustainable warehouse management system indicators and proposing new weighting methods. *Journal of Cleaner Production, 248*, 119190.

[22] Umar, A. M. (2019) Logistics Management and the Performance of Manufacturing Firms in Selected States of Northern Nigeria; *International Journal of Engineering and Management Research*; 9 (1); 23-29.

[23] Wasike, E. R. & Juma, D. (2020). Influence of logistics management practices on the logistic performance of humanitarian organizations in Kakamega County, Kenya. *International Journal of Scientific and Research Publications, 10*(9), 97-109