INFLUENCE OF COST AND TIME OF TRANSPORTATION ON BUSINESS PERFORMANCE OF MULTINATIONAL ORGANISATIONS IN NIGERIA

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Abstract. The goal of this study is to demonstrate how transportation costs and time affect multinational business organisations by assessing how freight clearance variables (cost and time) and inland transport factors (cost and distance) affect the financial performance (sales costs and turnover) of multinational organisations in Lagos and Ogun states, Nigeria. The study utilised a questionnaire survey for primary data collection, while secondary data was sourced from the annual reports of the sampled firms. The study focuses on eight manufacturing organisations selected from listed companies between 2010 and 2019 that regularly transport goods via the maritime mode of transport. The study employs SPSS to perform multiple regressions on the eight manufacturing organisations and finds that freight clearance variables (cost and time) have a negative impact on sales costs between 2010 and 2019, while inland transport factors (cost and distance) have a positive effect. Furthermore, the research demonstrates that whereas freight clearance variables (cost and time) have negative effects on turnover, inland transport variables (cost and distance) have positive effects. The study indicates that minimising freight clearance costs and time could significantly enhance the performance of Nigeria's multinational business organisations. Similarly, reducing inland transport costs and adjusting port-business time can significantly improve Nigerian businesses' performance.

Keywords: Seaport-clearance, transportation, costs and time, business organisation, performance, multinational

Introduction

Multinational businesses primarily produce high-quality products that meet customer needs and wants, generating revenue and profit for the organisation. Multinational businesses operate through key operations such as production planning, scheduling, supply chain management, inventory management, and quality control. The supply chain function manages the movement of goods, services, and information from raw materials to end customers. This involves procurement, packaging, transportation, warehousing, and storage to ensure the efficient flow of goods, services, and information. Al-Haddad et al. (2021) assert that effective supply chain management enhances business competitiveness, reduces costs, and improves customer satisfaction by ensuring the right product quantity, place, price, and time are available.

Freight transportation is a crucial component of supply chain management, encompassing inventory, production, distribution, marketing, and delivery for businesses. Freight transportation is a crucial aspect of the supply chain, connecting manufacturers, suppliers, and consumers, thereby enhancing the overall efficiency and effectiveness of the industry. Freight transportation ensures timely delivery of components, raw materials, and finished goods, aiding inventory management and providing excellent customer service by ensuring timely and satisfactory delivery. Freight transportation is the primary source of company logistics costs, accounting for over two-thirds of all logistics costs (Emeghara, 1998). The literature highlights the significant impact of high transport costs and time. High transport costs have led to decreased competitiveness, profitability, market reach, customer satisfaction, and economic growth (Goldsby et al., 2014; Uzonwanne et al., 2020; Adebayo & Aworemi, 2021). Given the above-described negative consequences of high transportation expenses on business performance, it is imperative to mitigate the negative effects of ineffective transport operations on the performance of businesses in Nigeria, where the business environment is not favourable (Igwe et al., 2013).

Studies on transport management show that performance was greatly impacted by the Nigerian economic environment (Igwe et al., 2013; Adebayo & Aworemi, 2021). The poor state of Nigeria's transportation infrastructure makes it unsuitable for its rapid economic development and growth (Igwe et al., 2013). Inadequate

investment and poor management are the main issues facing the transportation sector, which has resulted in a significant infrastructure deficit. Additionally, an excessive reliance on road transportation has resulted from the failure to simultaneously develop other forms of transit. The road infrastructure is strained by ineffective rail and inland water transportation, which speeds up road deterioration and increases freight transportation costs (Financial Times, 2020). For instance, Wigmore Trading (2024) estimates that transporting a 40-foot container costs over 700,000 Naira while moving a 20-foot container from Lagos seaports to another part of Lagos costs roughly 500,000 Naira. Transporting containers by road from Lagos to northern regions costs between 900,000 and 1,000,000 Naira. Given the advantages they offer over other forms of transportation, including the capacity to move greater loads over longer distances, rail and inland water transport could potentially cut these costs (Akintayo, 2010). Consequently, companies that frequently import containers may experience a sharp drop in business performance due to transportation-related operating costs, highlighting the need to understand the relationship between transportation-related costs and company performance in Nigeria. Thus, this study emphasises how crucial it is for businesses to comprehend how freight transportation-related costs affect their operations to make well-informed strategic choices.

Numerous studies have demonstrated a correlation between transport and business performance. Based on Emeghara (1998), an effective transportation infrastructure is one of the most important components of successful product marketing. According to Ogwu and Agu (2016), effective transportation networks offer several advantages and opportunities, both social and economic. Therefore, opportunities like quicker access to markets, incentives for new investments, lower business operating costs, and on-time product delivery are made possible by efficient transportation, including the seaport-hinterland network.

Uzonwanne et al. (2020) investigated the impact of transportation expenses on consumer goods pricing in the state of Anambra. The results show that the cost of consumable products in Anambra state, Nigeria, is continuously rising due to many factors, including bad road conditions, high transportation costs, high motor part prices, and high gasoline prices. Using firm revenue as a stand-in for enterprise performance, Tuong et al. (2019) conducted empirical research in the Cuu Long Delta of Vietnam to examine the impact of road infrastructure on business performance. The study showed a positive correlation between road infrastructure and business performance.

The scope and geographic areas of the study on the relationship between transportation costs and business performance in Nigeria are constrained. Because of their varied operations and distinctive locations, multinational business organisations in Nigeria must use tailored ways to cut costs, particularly transportation. In the meanwhile, experts—among them, Dr Vincent Nwani, an economist and former Director of Research and Advocacy at the Lagos Chamber of Commerce and Industry—have expressed concern in the Punch Newspaper of June 17, 2024, that the exit of multinational corporations has resulted in a five-year decline in Nigeria's output of 94 trillion Naira. In 2020, over 10 companies stopped operations, according to a more detailed analysis. In 2021, over 20 companies stopped operations. In 2022, 15 known companies left, while over 10 companies left in 2023. In the first six months of 2024, five major companies have departed. The trend is accelerated by the negative impacts of unfavourable business environments, including transportation-related issues (Igwe et al., 2013). The question here focuses on how Nigerian multinational businesses can mitigate the negative impacts of unfavourable business environments, including transport-related issues. The goal of this study, therefore, is to demonstrate how freight clearance variables (cost and time) and inland transport factors (cost and distance) affect the financial performance (sales costs and turnover) of multinational organisations in Lagos and Ogun states, Nigeria.

The paper has five sections. The authors provide background information and motivational sources in the introduction. The second section examines the correlation between transport costs and time and multinational businesses, focusing on clearance costs, inland transit costs, and inland distance. Section three describes the methodology. Section 4 shows the results. Section 5 presents the conclusion and suggestions.

2. Literature Review

2.1 Relationship between Freight Clearance and Multinational Business Organizations Performance.

Research on freight clearance and inland transport performance in multinational organisations has significantly enhanced local and global knowledge. Anton (2013) examined the time it took for customs to be cleared and the number of imports and found that an average 10-day delay in customs clearance reduced imports by 1.6%. This

finding implies a connection between customs clearance time and imported inputs, even though other aspects of a firm's operations, such as sales growth, turnover, and cost of sales, can also be examined in relation to customs clearance time.

Similarly, Carballo et al. (2014) investigated the effect of port-of-entry disruptions brought on by clearance processes on firm-level importation in Peru in their study. The results of regression models suggest that the cost of a single day of delay rises by roughly 0.7% for small firms and about 0.9% for major enterprises. According to the findings, the clearance process and businesses' productivity are related. The research conducted abroad lacks specific case studies on the impact of customs procedure-specific delays on firm-level imports and other aspects of businesses' operations.

In the same vein, the effects of customs delays on enterprises' exports were assessed by Martincus et al. (2015). The study used a special dataset that includes accurate data on the actual time it took for each transaction to clear customs. It includes all export transactions from Uruguay between 2002 and 2011. Conditionally random cargo distribution to different validation channels and risk-based control procedures were utilised in the study to account for any fluctuation in these waiting times. The study indicates that delays negatively impact businesses' exports, with additional effects on sales to recent customers, a finding similar to Anton's (2013) research.

Nguyen et al. (2021) investigate the factors that encourage and hinder the adoption of e-customs in Vietnam, a developing country with a low level of technological sophistication and evaluate the impact of e-customs on business performance. The survey was completed by managers of companies in five Vietnamese provinces and cities that are major players in international trade. The data was analysed using structural equation modelling (SEM). The findings show that while compatibility and ease of use are the two barriers, national culture and relative advantages are the main motivators. Additionally, the study demonstrated that using e-customs enhanced Vietnamese businesses' performance. This study is limited in scope and is being carried out overseas.

Al-Haddad et al. (2021) and Oni et al. (2024) are among the recent and relevant studies. Al-Haddad et al. (2021) used a qualitative research approach to identify the elements influencing supply chain performance in Jeddah port. The study found that the business was impacted by increased lead times, product availability, and a lower level of customer service when shipments were not cleared within a specific time frame. Oni et al. (2024) investigated how multimodal hinterland transportation and customs logistics affected shippers' business performance in Nigeria. Custom duties assessment duration and Form M processing negatively influenced turnover, cost of sales, and profit, according to the study using the Vector Error Correction Model. Variations of 10% result in impacts of 0.15%, 0.17%, and 0.095%, respectively.

2.2 Relationship between Inland Transportation and Multinational Businesses Performance

Stephen and Ukpere's (2011) study found that the hinterland transport system in importing nations affects port turnaround time, resource utilisation, and efficiency. They analysed 19,296 vehicles and hourly vessel traffic statistics using vessel reports and wharf records. The study revealed that excessive reliance on road transportation led to the under-use of port facilities, resulting in congestion, long turnaround times, and poor port performance.

Ubogu (2011) studied Nigeria's feasibility of combining rail-road freight transportation, finding that merging rail and road could reduce costs by 44.2% and 93.7% on the western and eastern wings of Lagos and Port Harcourt ports, respectively. The study found a strong correlation between freight intramodality and efficient commodities transportation in the hinterland, suggesting further research is needed to understand the relationship between these factors.

Kotut and Mugambi (2012) examined the impact of inland operations and transport linkages on Mombasa port's efficiency. They found that inefficient northern corridors led to slow cargo reception, lengthy truck turnaround times, and excessive port duration. The study focused on shippers' business and found mutual benefits between the hinterland and the seaport. Alamoush's (2016) study investigated the relationship between seaport efficiency and hinterland transport using data from the Jordanian port of Aqaba. The study found a positive correlation between port efficiency and hinterland transports, with vehicle turnaround times contrasting with dry goods terminal performance indicators. The study used various tests and regressions.

Sefiani et al.'s (2016) study on the impact of location on the success of small to medium-sized enterprises in Tangier, involving semi-structured interviews with selected owners and managers, found that location significantly influences the performance of SMEs in the region. Uzonwanne et al.'s (2020) study reveals that transportation expenses in Anambra, Nigeria, are causing a continuous increase in the cost of consumable products. Tuong et al.'s

(2019) research in Vietnam found a positive correlation between road infrastructure and business performance, using firm revenue as a measure of enterprise performance.

The literature on the correlation between transportation costs, time, and business performance, especially in Nigeria, is limited in its coverage of specific industries and key performance indicators. The study examines the influence of freight clearance costs, time, inland transport costs, and distance on the sales cost and turnover of multinational businesses in Lagos and Ogun States, Nigeria.

3. Methodology

3.1. Theoretical Framework

3.1.1. Logistics Cost Theory

This paper is based on the Logistics Cost Theory, also known as the Total Logistics Cost Concept. The idea behind the logistics costs theory is that a business's logistics expenses, including transportation costs, inventory carrying costs, handling and storage costs, order processing and documentation costs and loss and damage costs, are major factors. Since logistics costs comprise a sizable portion of total business expenses, the logistics costs theory contends that controlling and improving them can greatly improve company performance. Donald J. Bowersox first introduced the theory in the 1960s, and it has since been widely accepted and applied in logistics and supply chain management. Integrating logistics operations with other corporate tasks, like marketing and production, is crucial, according to Bowersox's (1969) study on logistics management. Given that logistics costs, such as time, distance, inland transportation, and freight clearance, are a component of the logistics costs of multinational companies, these costs can substantially affect their financial performance, influencing turnover and other important metrics. Thus, the study considers the Logistics Cost Theory the most appropriate theory for the investigation. It proposes a relationship between the sales cost and turnover of multinational corporations in Lagos and Ogun States, Nigeria, and freight clearing costs, time, inland transport costs, and distance.

3.2. Population and Sample Size of the Study

This paper focuses on Nigerian multinational manufacturers of consumer goods. The study collected data from businesses in Nigeria's major industrial estates, which include Ikeja, Apapa, Agbara, Ota, Ilupeju, Oregun, and Ikorodu/Sagamu. These zones represent more than 75% of Nigeria's manufacturing investments (Field Services; Manufacturer Associations of Nigeria-MAN, 2020). The study used both primary and secondary sources of information. Secondary data was extracted from the annual reports of the selected companies, while primary data was obtained through a questionnaire survey. The population of the paper comprises eight multinational manufacturing businesses purposefully selected from listed companies between 2010 and 2019 that regularly transport goods via a maritime mode of transport. Both descriptive and inferential statistics were applied to the data analysis.

This paper analysed the impact of transportation costs and time on Multinational business performance in Nigeria using both dependent and independent variables. The independent variables are transportation costs and time, while the dependent variable is Multinational Businesses' performance. The paper utilised freight clearance cost, clearance time, inland transit cost, and distance as proxy variables for freight clearance and inland transport variables and sales cost and turnover as proxy variables for Multinational Businesses' performance (Holzner and Peci, 2009).

Using SPSS for multiple regressions, the study sought to ascertain the proportion of the change in the dependent variable that the independent variable might account for. The theoretical review suggests a functional connection between transport-related costs and time and Multinational business performance.

Model Specification

$$MBP = a + b_1 (CC) + b_2 (CT) + b_3 (ITC) + b_4 (ID) + e$$

Where:

MBP =Multinational Businesses' Performance
a = Constant of the model
b_1-b_4 = Coefficients of the model
CC = Clearance Cost
CT = Clearance Time
ITC = Inland Transport Cost
ID = Inland Distance in relation to the seaport
e= error term representing factors other than those specified in the model

4. Results

This section of the article shows the estimation results of how time variables and transportation costs affect the performance of multinational businesses in Nigeria. The study provided the results of descriptive statistics, model summary, and analysis of variance following the regression coefficient summary.

4.1. Effect of freight variables (clearance costs, time) and inland transport variables (costs and distance) on Multinational Businesses' Cost of Sales.

The report in Table 1 shows that the consumer goods' cost of sales has a yearly average of ₦61,685,239,169 (approx.), clearance cost has a yearly average of ₦569,250, clearance time has an average of 87 hours per clearance, the inland transport cost has a yearly average of ₦323,630,000, while the inland location has an average of 73.250km.

Table 1: Descriptive Statistics[a]

	Mean	Std. Deviation	N
CostOfSales	61685239169.18	29448867040.150	80
ClearCost	569.25	486.615	80
ClearTime	87.00	26.833	80
TransportCost	323.63	219.355	80
Distance	73.2500	13.95064	80

a. Business = Consumer Goods

The model summary, as shown in Table 2, revealed that the combined predictors of intermodal freight clearance processes and inland transport have a strong positive association ($r = 0.572$) with consumer goods' cost of sales, and it accounts for about 32.7% ($r^2 = 0.327$) in the total variation of consumer goods' cost of sales.

Table 2. Model Summary[a]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.572[b]	0.327	0.291	24796949910.489

a. Business = Consumer Goods
b. Predictors: (Constant), Distance, TransportCost, ClearCost, ClearTime

The report of the analysis of variance is shown in Table 3. The result shows that the model significantly ($p < 0.001$) assesses the effect of the joint predictors of cargo clearance processes and hinterland transport on consumer goods businesses' cost of sales.

Table 3. Analysis of Variance[a,b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2239497146117 7385000000.00 0	4	5598742865294 346000000.000	9.105	0.000[c]
	Residual	4611665436474 7940000000.00 0	75	6148887248633 05900000.000		

Total	6851162582592 5320000000.00 0	79

a. Business = Consumer Goods
b. Dependent Variable: CostOfSales
c. Predictors: (Constant), Distance, TransportCost, ClearCost, ClearTime

Regarding the Regression Coefficients shown in Table 4, a summary of regression coefficients shows that only the clearance cost variable does not significantly contribute ($p = 0.318, ns$) to the overall model. The standardised regression coefficients further indicate that the clearance process variables (cost and time) both have negative effects ($\beta = -0.104$ & $\beta = -0.519$, respectively) on cost of sales, while the hinterland transport variables (cost and distance) both have positive effects ($\beta = 0.526$ & $\beta = 0.424$, respectively) on the cost of sales.

Table 4. Regression Coefficients[a,b]

Model		Unstandardised Coefficients		Standardised Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	26491193730.530	15395356593.901		1.721	0.089
	ClearCost	-6270373.364	6241015.985	-0.104	-1.005	0.318
	ClearTime	-569839732.431	127496163.760	-0.519	-4.469	0.000
	TransportCost	70556465.780	14571272.204	0.526	4.842	0.000
	Distance	894269419.548	235050549.192	0.424	3.805	0.000

a. Business = Consumer Goods
b. Dependent Variable: CostOfSales

4.2 Effect of Freight Variables (clearance costs, time), Inland transport Variables (costs and distance) on Multinational Businesses' Turnover.

Table 5 reports show that the consumer goods' turnover has a yearly average of ₦92,778,223,933 (approx.), clearance cost has a yearly average of ₦569,250, clearance time has an average of 87 hours per clearance, the inland transport cost has a yearly average of ₦323,630,000, while the inland location has an average of 73.25km.

Table 5. Descriptive Statistics.

	Mean	Std. Deviation	N
Turnover	92778223933.58	57048461892.646	80
ClearCost	569.25	486.615	80
ClearTime	87.00	26.833	80
TransportCost	323.63	219.355	80
Distance	73.2500	13.95064	80

a. Business = Consumer Goods

Table 6 shows that the combined predictors of inland transportation and freight clearance processes have a significant positive association (r=0.571) with consumer goods turnover, accounting for roughly 32.6% (r^2=0.326) of the overall variation in consumer goods turnover.

Table 6. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.571[b]	0.326	0.290	48056864627.142

a. Business = Consumer Goods
b. Predictors: (Constant), Distance, TransportCost, ClearCost, ClearTime

The result of the analysis of variance in Table 7 shows that the model significantly ($p < 0.001$) assesses the effect of the joint predictors of freight clearance processes and hinterland transportation consumer goods businesses' turnover.

Table 7 Analysis of Variance[a,b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	838979655066642 30000000.000	4	209744913766660 58000000.000	9.082	0.000[c]

Residual	173209667834357230000000.000	75	230946223779142 9600000.000
Total	257107633341021470000000.000	79	

a. Business = Consumer Goods
b. Dependent Variable: Turnover
c. Predictors: (Constant), Distance, TransportCost, ClearCost, ClearTime

According to Table 8's summary of regression coefficients, the clearing cost variable is the only one that significantly contributes to the entire model (p=0.308, ns). The standardised regression coefficients further indicate that the clearance process variables (cost and time) both have negative effects ($\beta = -0.106$ & $\beta = -0.463$, respectively) on turnover, while the hinterland transport variables (cost and distance) both have positive effects ($\beta = 0.499$ & $\beta = 0.495$, respectively) on turnover.

Table 8 Coefficients[a,b]

Model		Unstandardised Coefficients		Standardised Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-4933136630.712	29836434335.286		-0.165	0.869
	ClearCost	-12408349.939	12095183.537	-0.106	-1.026	0.308
	ClearTime	-984133659.121	247089497.072	-0.463	-3.983	0.000
	TransportCost	129690981.488	28239346.302	0.499	4.593	0.000
	Distance	2026244200.110	455531525.604	0.495	4.448	0.000

a. Business = Consumer Goods
b. Dependent Variable: Turnover

Conclusions

This study examines the influence of freight clearance costs, time, inland transport costs, and distance on the sales cost and turnover of multinational businesses in Lagos and Ogun States, Nigeria. The results of the studies show that freight clearance variables negatively influence sales costs, while inland transport variables have a positive effect. Additionally, the study demonstrates that the variables of inland transportation (cost and distance) have a positive impact on turnover, whereas the variables of freight clearance (cost and time) have a negative effect. The study indicates that reducing freight clearance costs and time could significantly enhance Nigeria's business performance. This paper recommends reducing inland transport costs and adjusting port-business time to improve Nigerian businesses' performance significantly.

1. The application of technology can significantly decrease the costs and time associated with freight clearance processing.
2. Multinational businesses are advised to devise strategies to mitigate the impact of clearance costs and time on their operations.

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Author Contributions

B.G.O. significantly contributed to the design, conception, data collection, analysis, and interpretation. He also wrote the manuscript's draft. T.M.D. and R.N.A. aided the data design, analysis, and interpretation. A.O.A. and O.D.O. critically reviewed the manuscript for significant intellectual substance.