Analyzing the Impact of Logistics Efficiency in Nigerian Seaports on Global Trade Competitiveness

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Abstract: The performance of Nigeria in global competitiveness ranking shows that it faces logistical challenges in trade. Consequently, the purpose of this paper was to analyze Nigerian seaports' logistics efficiency in relation to trade strategy for global competitiveness. The paper assessed Nigeria's global trade competitiveness by analyzing the processing of various seaport clearance sub-systems, including Form M, Pre-Arrival Assessment Report (PAAR), Assessment of Duty (AD), Payment of Duty (PD), Examination (E), Custom Release (CR), and Delivery (D).The paper used a questionnaire survey to gather data on 23 Nigerian manufacturing firms listed on the NSE between 2010 and 2019 that regularly import cargo via Lagos seaports. Regression analysis conducted with SPSS showed that the cost of seaport clearance, which measured Nigeria's global trade competitiveness has a high positive association (r=0.575) with the Form M number of agencies involved having a statistically significant influence (p=0.042)among other variables. It appears that the average cost of seaport clearance increases by ₦ 119,878 for each extra Form M agency involved.The results above make it abundantly evident that Nigeria's competitiveness in global trade is impacted by seaport logistics, particularly with regard to the clearing system. Therefore, one way to increase Nigeria's competitiveness is through effective seaport logistics. Effective seaport

logistics can lower trade costs, making Nigerian goods competitive on the global market and vice versa.

Keywords: Logistics**,** seaports efficiency, trade, policy, global competitiveness.

Introduction

Logistics refers to the process of planning, coordinating, and executing the movement and storage of goods, products, and resources from one place to another. It involves the management of the flow of goods information, and resources from the point of origin to the point of consumption. Logistics activities include transportation, warehousing, inventory management, packaging, supply chain management, and freight forwarding. Freight forwarding essentially include route planning, carrier selection, cargo or material handling, customs clearance insurance and risk management, and documentation and compliance. The literature emphasizes the importance of efficient logistics systems at both corporate and national levels. Filip, Mićić, and Stanišić (2023) argued that the efficient development of national transport and logistics systems accelerates the growth of related industries and sectors. Similarly, flexibility, timeliness, completeness, integrity, and security were emphasized by Chornopyska and Bolibrukh (2020) as critical logistical elements, particularly during times of crisis and economic downturn. Therefore, as a link between many sectors, suppliers, and consumers, enhancing the logistics system can offer equal opportunities for the growth of each particular industry and supply chain player. Thus, reducing logistics costs can positively impact each particular industry as well as a country's international competitiveness.

Following that over 80% of global trades in goods are transported through seaports (UNCTAD, 2022), the seaport plays a crucial role in logistics and supply chain management for businesses and nations whose major activities depend on it. In Nigeria, this role is of greater importance because the Nigerian Bureau of Statistics (NBS, 2023) reported that maritime transport (via seaports) accounted for 99.23% of total exports in the country. The air transport sector accounted for 0.30% of the total, followed by road transport at 0.20% and other transport at 0.26%.To enhance global competitiveness, Nigerian seaports could be strategically focused on improving their logistical efficiency.

The World Bank's Logistics Performance Index (LPI) provides a comprehensive framework for evaluating a nation's competitiveness by assessing its trade logistics performance through six measures. The six logistics elements include scheduling ease, traceability, quality of services, efficiency, efficient customs, availability of commerce and transport infrastructure,

and percentage of on-time deliveries. The 2023 World Bank's LPI study on Africa Continent ranked South Africa 19th globally, scoring 3.4%, with Botswana and Egypt joint 57th, each scoring 3.1% out of a maximum of 5.Next after Botswana was the Benin Republic, whose seaports are preferred by many Nigerian importers because of their logistical advantages; Namibia came in at number 66th, followed by Rwanda at number 73th, and Djibouti at number 79th.Nigeria ranks 88th in the World Bank global logistics performance index, behind South Africa, Egypt, and Benin Republic. Congo Democratic Republic, Guinea Bissau, Mali, and Nigeria each scored 2.6%.

Further analysis contained in the World Bank (2023) LPI report revealed that Nigeria achieved a score of 2.6% in customs clearance, 2.4% in logistics infrastructure, 2.5% on international shipments, 2.3% in logistics competence and quality, 3.1% in timeliness, and 2.7% in tracking and trading.The poor performance of Nigeria in 2023 underscores the need for a thorough analysis of logistics efficiency in Nigerian seaports. Nigeria faces logistical challenges in trade, especially at seaports, with a 2.6 out of 5 overall performances and a 90th out of 139 counties customs clearance position. Nigeria, like South Africa, Botswana, and Egypt, must develop a strategy to enhance its competitiveness within the African continent. The strategic option of examining the influence of logistics efficiency in Nigerian seaports on global trade competitiveness could be beneficial. The literature suggests a link between logistics and global competitiveness, but the relationship between logistics efficiency in Nigerian seaports on global trade competitiveness remains unclear (Chornopyska and Bolibrukh, 2020;Filip, Mićić, and Stanišić, 2023). This paper analyses the impact of Nigerian seaports' logistics efficiency on their global competitiveness, focusing on the seaport clearance system components and their effectiveness.

This study is organized as follows: following the introduction, section two presents a review of the literature and the findings of pertinent studies on the relationship between seaport logistics and national competitiveness. Section three provided a detailed explanation of the research methodology and data used. Section four had the empirical findings and discussion, while Section Five has the conclusion and suggestions for future research and policymakers.

Literature Review

Conceptual Review

The Law of Mongolia on Customs defines seaport clearance as the formalities of importing goods, including filing a declaration, issuing a permit, and paying customs duties and taxes.
Wilson (2018) defines customs clearance for imported goods as declaring goods and value to Customs Authority for registration, levy/duty payment, and security, involving required documents and physical examinations. Juneja (2019) defines customs clearance as the preparation and submission of necessary documents for imports or exports, including inspections, assessments, duty payments, cargo delivery, purchase orders, supplier invoices, bills of entry, bills of lading, packing lists, and certificates of origin. Seaport clearance involves various activities like inspections, levies payment, documentation, examination,

permit issuing, and cargo delivery. Thus, seaport clearance is a complex system involving multiple interconnected subsystems.

Empirical Review

The seaport clearance literature analyzes the clearance system to identify the key factors influencing the cost of clearance. Most studies use cost as an indicator to measure seaport clearance process and time of clearance (Verwaal and Donkers, 2001;Carballo, Graziano, Schaur and Volpe-Martincus, 2014; Sirika and Gizaw, 2016).Previous studies have demonstrated that delay time significantly impacts the cost of seaport clearance. A 10-day delay in seaport clearing of imported goods can reduce imports by 1.6%, with Ukraine experiencing a 4.1% reduction (Anton, 2013). Customs-related transaction costs hinder international trade activities, with delays increasing costs for small firms by 0.7% and large firms by 0.9% (Carballo et al., 2014).

Sigey (2010) and Kwoli (2012) found that integrating electronic procedures and automation in seaport customs processes improves customs service, skills, and system governance. It also improves border efficiency, while reducing of transit time and cost of private business (Nicholas, (2017). Shepa, (2013) and Onogwu's (2018), analysis reveals challenges in efficient cargo clearance, including lengthy procedures, corruption, lack of transparency, automation, and insufficient use of ICT. Efficient cargo clearance faces challenges such as ICT, manual processing, government agency involvement, unlawful checks, additional checks, and lack of synergy between stakeholders and physical examination (Owoyemi 2018).

Moreover, it was discovered that the Single-Window system adoption decreased the transaction costs associated with clearing products at the port (Rhodalyn, 2018). According to Kabui, Gakobo, and Mwaura (2019), single-window systems also boost cargo clearance efficiency at the port of Mombasa by having a favorable impact on shipping procedures, pre-clearance, and customs goods declaration processes. The following elements about the difficulties encountered during the Single Window System's deployment were found: a deficiency in government backing, insufficient coordination amongst stakeholders, and opposition to change among people and organizations (Abeywickrama, and Wickramaarachchi, 2015).
The literature does not, however, clearly explain how specific seaport clearance elements—such as steps involved, agencies, paperwork, and method of operation—affect the total cost of clearance at Nigerian seaports. The goal of this paper therefore, is to comprehend how logistics efficiency of Nigerian seaports affects its global competitiveness by focusing onvarious components of the seaport clearance system and the effectiveness of seaport clearance.

Methodology

Data Description and Sources

This study employed a survey research design. The study's data was gathered through a questionnaire survey of manufacturing firms listed on the Nigerian Stock Exchange (NSE) between 2010 and 2019. The study population consisted of 23 firms, including consumer goods, healthcare, and industrial goods. These companies regularly import cargoes via Lagos seaports and are required to submit a minimum of 20 import declarations annually. The questionnaire was designed to gather general information about respondents' age, educational qualifications, area of operations, and work experience. Other data includes the average container clearance rate, cost, procedure steps, agencies involved, documents, and mode of operations (electronic or manual).The study examines the impact of seaport logistics efficiency, specifically the seaport clearance system, on trade competitiveness, focusing on seven key aspects. The study indicates that enhancing competitiveness can be achieved by reducing trade costs.

The study investigated the impact of seaport logistics on Nigeria's global trade competitiveness, considering both dependent and independent variables. The dependent variable is Nigeria's global trade competitiveness, while the independent variable is seaports' logistics efficiency. The paper utilized seaport clearance procedures as a measure of logistics in seaports and seaport clearance costs as a measure of Nigeria's global trade competitiveness (Delloite, 2017).

For the analysis, multiple regressions model was used. This implies that certain factors help to explain cost of seaport clearance in Nigeria seaports. It can therefore be conceptualized that there is a set of variables $x_1, x_2, x_3 \ldots xn$ which can be used to explain the cost of seaports clearance in Nigeria seaports. This may be mathematically stated as:

$$Y = f(x_1, x_2, x_3 \ldots\ldots xn \ldots\ldots \quad (1)$$

This can be transformed using the multiple regression equation thus:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 \ldots xbnxn + e \ldots\ldots (2)$$

Where Y represents the dependent variable, that is the Seaports Clearance Cost, a represents constant, b_1, b_2, b_3,…bn represents the intercept, x_1, x_2, $x_3 \ldots xn$ represents the independent variables and e = error term representing the unexplained variables. The multiple regression model is a useful statistical tool for finding the contribution of independent variables to dependent variables. The statistical tool produces a coefficient of determination which is a measure of the total contribution of the explanatory variables to the dependent variable. The equation results provide a basis for predicting the value of dependent variable from two or more independent variables. For the purpose of this study, the multiple regressions is operationalized as follows:

$$SCC = F (FM, PAAR, AD, PD, E, CR, D,) \ldots\ldots (3)$$

The dependent variable is the seaport clearance cost(SCC), while the independent variables are the processes used for seaport clearance(FM, PAAR, AD, PD, E, CR, and D).This article examines how Nigeria's seaports' logistics affect its ability to compete in international trade. It focuses on the seaport clearance process, which is made up of seven subsystems: Form M

(FM), processing of the Pre-Arrival Assessment Report (PAAR), Assessment of Duty (AD), Payment of Duty (PD), Examination (E), Custom Release (CR), and Delivery (D).Consequently, there are seven models. Equation 4 refers to the first subsystem, also known as FM processing.

SCC = a +b1 +FMNS +b2FMNA +b3 FMND ……(4)

where FM stands for Form M, NS for the number of stages for FM, NA for the number of agencies for FM, and ND for the number of documents for FM. SCC is the seaport clearance cost. As seen in equation 5-10, the symbols NS, NA, and ND stand for the number of steps, agencies, and documents that are shared by all of the process's subsystems. Equations 5–10, therefore, are used to process the Pre-Arrival Assessment Report (PAAR), Assessment of Duty (AD), Payment of Duty (PD), Examination (E), Custom Release (CR), and Delivery (D), respectively.

SCC = a +b1 +PAARNS + b2PAARNA +b3PAARND……..……(5)

SCC = a + b1 +ADNS +b2ADNA +b3ADND……(6)

SCC = a + b1 +PDNS +b2PDNA + b3PDND……..……(7)

SCC = a + b1 +ENS + b2ENA + b3END……(8)

SCC = a + b1 +CRNS +b2CRNA + b3CRND……(9)

SCC = a + b1+DNS + b2DNA +b3 DND…… (10)

Results and Discussion

4.1Relationship between seaports clearance system and Seaports Clearance Costs

This section of the study presents the results and discussion of the study. The section is divided into seven parts based on the seven models that were formulated. The paper investigates the impact of seaport clearance process on the cost of seaport clearance at seven sub-systems (Section 4.1 – Section 4.7), using a SPSS analysis. The summary includes descriptive statistics, model analysis, variance analysis, and coefficient analysis.

4.1. 1 Relationship between Form M sub-system and Seaports Clearance Costs

The Form M sub-system examined the relationship between clearance process and clearance costs, focusing on four elements: number of steps, agencies engaged, number of documents involved, and mode of operation. The analysis results are presented in Tables 4.1.1-4.1. 4.

Table 4.1.1 Descriptive Statistics

	Mean	Std. Deviation	N

Avg. Cost of Clearance ('000) btw 2010 – 2019	673.7273	299.20182	22
Form_M step numbers	3.2727	.45584	22
Form_M agencies involved	3.7273	1.31590	22
Form_M documents involved	3.9091	2.09100	22
Form_M electronic mode of operation	1.00	.000	22
Form_M manual mode of operation	.09	.294	22

Source: SPSS, (2023)

Table 4.1.1 reveals that Form M involves 3 steps, 4 agencies, 4 documents, 100% electronic operation, and 9% manual mode of operation. This implies that importers are required to perform three primary activities in this sub-system, which are overseen by four government agencies. The activities will necessitate four documents and all are conducted electronically. The paper aims to correlate various logistics elements such as steps, agencies, documents, and mode of operation with the total cost of seaport clearance. The same analysis was done across all seven logistics sub-systems that comprise the seaport clearance system.

Table 4.1.2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.639[a]	.408	.269	255.79444

a. Predictors: (Constant), Form_M manual mode of operation, Form_M documents involved, Form_M step numbers, Form_M agencies involved

Table 4.1.2 reveals a positive association $(r = 0.639)$ between Form M and seaports clearance cost, accounting for 40.8% $(r^2 = 0.408)$of variations in container clearance costs. Furthermore, Table 4.1.3 reveals a statistically significant relationship (p=0.052≈0.05) between Form M and the clearance cost of containers.

Table 4.1.3 Analysis of Variance

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	767632.813	4	191908.203	2.933	.052[b]
	Residual	1112323.551	17	65430.797		
	Total	1879956.364	21			

a. Dependent Variable: Mean Cost of Clearance ('000)

b. Predictors: (Constant), Form_M manual mode of operation, Form_M documents involved, Form_M step numbers, Form_M agencies involved

Table 4.1.4 Coefficients

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Correlations		
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
(Constant)	-220.060	540.154		-.407	.689	-1359.685	919.565			
Form_M step numbers	134.988	133.550	.206	1.011	.326	-146.778	416.754	.128	.238	.189
Form_M agencies involved	119.878	54.455	.527	2.201	.042	4.987	234.768	.575	.471	.411
Form_M documents involved	5.144	31.385	.036	.164	.872	-61.071	71.360	.262	.040	.031
Form_M manual mode of operation	-164.092	220.283	-.161	-.745	.466	-628.849	300.665	-.430	-.178	-.139

a. Dependent Variable: Mean Cost of Clearance ('000)
Source: SPSS

As shown in Table 4.2.4's paper results, the only variable that significantly affects the cost of seaport clearance with a high positive connection (r=0.575) is the Form M number of agencies involved (p=0.042).The average cost of seaport clearance appears to increase by ₦ 119,878 for every additional Form M agency involved. This indicates that the high cost of clearance is traceable to the Form M agency involved.

Relationship between Pre-Arrival Assessment Report (PAAR) sub-system and Seaports Clearance Costs

Four elements related to seaport clearance costs were examined: number of steps, number of agencies, number of documents involved, and mode of operation under the PAAR sub-system. The analysis results are presented in Tables 4.2.1-4.2.4

Table 4.2.1 Descriptive Statistics

Descriptive Statistics

	Mean	Std. Deviation	N
Avg. Cost of Clearance ('000)	673.7273	299.20182	22
PAAR step numbers	3.1364	.56023	22
PAAR agencies involved	3.2273	1.54093	22
PAAR documents involved	6.3182	2.35809	22
PAAR electronic mode of operation	1.00	.000	22
PAAR manual mode of operation	.09	.294	22

Table 4.2.1 shows PAAR involves 3 steps, 3 agencies, 100% electronic use, with a total of 6 documents needed.

Table 4.2.2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.762[a]	.581	.482	215.35248

a. Predictors: (Constant), PAAR manual mode of operation, PAAR agencies involved, PAAR documents involved, PAAR step numbers

Based on the reports on Table 4.4.2, PAAR accounts for approximately 58.1% (r^2=0.581) of the variance in seaport clearance costs and has a high positive association (r=0.762) with seaport clearance costs.

Table 4.2.3 Analysis of Variance

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1091552.633	4	272888.158	5.884	.004[b]
	Residual	788403.731	17	46376.690		
	Total	1879956.364	21			

a. Dependent Variable: Mean Cost of Clearance ('000)

b. Predictors: (Constant), PAAR manual mode of operation, PAAR agencies involved, PAAR documents involved, PAAR step numbers

Table 4.2.3's reports indicate that there is a statistically significant correlation (p=0.004) between PAAR and container clearance costs.

Table 4.2.4 Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	1167.117	326.682		3.573	.002	477.878	1856.355			
	PAAR step numbers	-279.628	99.225	-.524	-2.818	.012	-488.975	-70.282	-.518	-.564	-.443
	PAAR agencies involved	-16.606	31.945	-.086	-.520	.610	-84.003	50.791	.116	-.125	-.082
	PAAR documents involved	74.912	22.712	.590	3.298	.004	26.995	122.829	.256	.625	.518
	PAAR manual mode of operation	-396.996	190.919	-.390	-2.079	.053	-799.800	5.809	-.430	-.450	-.327

a. Dependent Variable: Mean Cost of Clearance ('000)

As can be seen from Table 4.2.4, only variables that significantly affect the cost of seaport clearance are the PAAR number of steps and number of documents involved (p=0.012 and p=0.004, respectively). The number of steps has a strong negative correlation (r=-0.564), while the number of documents required has a weak/mild positive correlation (r=0.256).

Effect of Customs Duty Assessment on Seaports Clearance Costs

Four elements related to seaport clearance costs were examined: number of steps, number of agencies, number of documents involved, and mode of operation under the Customs Duty Assessment sub-system. The analysis results are presented in Tables 4.3.1- 4.3.4.

Table 4.3.1Descriptive Statistics

	Mean	Std. Deviation	N
Mean Cost of Clearance ('000)	673.7273	299.20182	22
Custom duty ass. step numbers	2.1364	.77432	22
Custom duty ass. agencies involved	1.9545	.95005	22
Custom duty ass. documents involved	3.9091	2.89349	22
Custom duty ass. electronic mode of operations	.95	.213	22
Custom duty ass. manual mode of operation	.14	.351	22

Table 4.3.1 reveals that the average process for assessing customs duties consists of two steps, two agencies; four (approximately) documents required, 95% electronic mode of operation, and 14% manual mode of operation.

Table 4.3.2Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.596[a]	.355	.153	275.28384

a. Predictors: (Constant), Custom duty ass. manual mode of operation, Custom duty ass. documents involved, Custom duty ass. step numbers, Custom duty ass. agencies involved, Custom duty ass. electronic mode of operations.

Table 4.3,1 provides the model summary report. The cost of seaport clearance is positively correlated (r=0.596) with the assessment of customs duties, and this association appears to explain only approximately 35.5% (r^2=0.355) of the variability in seaport clearing costs.

Table 4.3.3 Analysis of Variance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	667457.326	5	133491.465	1.762	.178[b]
	Residual	1212499.038	16	75781.190		
	Total	1879956.364	21			

a. Dependent Variable: Mean Cost of Clearance ('000)

b. Predictors: (Constant), Custom duty ass. manual mode of operation, Custom duty ass. documents involved, Custom duty ass. step numbers, Custom duty ass. agencies involved, Custom duty ass. electronic mode of operations

In the analysis of variance as shown in Table 4.3.3,customs duty assessment has no statistically significant relationship $(p = 0.178)$ within its variables with clearance cost of containers.

Table 4.3.4: Regression Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	797.297	363.726		2.192	.044	26.232	1568.361			
	Custom duty ass. step numbers	-85.034	89.137	-.220	-.954	.354	-273.995	103.927	-.288	-.232	-.192
	Custom duty ass. agencies involved	111.678	81.016	.355	1.378	.187	-60.069	283.425	.076	.326	.277
	Custom duty ass. documents involved	23.061	24.664	.223	.935	.364	-29.224	75.346	.127	.228	.188
	Custom duty ass. electronic mode of operations	-194.228	413.182	-.138	-.470	.645	-1070.135	681.680	.174	-.117	-.094
	Custom duty ass. manual mode of operation	-476.185	234.363	-.559	-2.032	.059	-973.012	20.643	-.466	-.453	-.408

a. Dependent Variable: Mean Cost of Clearance ('000)

The Report on Table 4.3.4 revealed that none of the Customs duty assessment variables has a statistically significant effect on the cost of container clearance.

Relationship between Customs Duty Payment and Seaports Clearance Costs

Four variables—the number of steps, the number of agencies involved, the number of documents involved, and the method of operation—were investigated in relation to the seaport clearance costs under the Customs Duty Payment sub-system. The analysis's conclusions are shown in Tables 4.4.1–4.4.

Table 4.4.1 Descriptive Statistics

	Mean	Std. Deviation	N
Avg. Cost of Clearance ('000)	672.2609	292.40728	23
Custom duty pay. step numbers	2.2609	.86431	23
Custom duty pay. agencies involved	2.0435	.76742	23
Custom duty pay. documents involved	2.5652	1.27301	23
Custom duty pay. electronic mode of operation	1.00	.000	23

Custom duty pay. manual mode of operation	.09	.288	23

Report on Table 4.4.1showed that customs duty payment has an average of 2 (approx.) steps involved, 2 (approx.) agencies involved, 3 (approx.) documents needed, 100% use of electronic mode of operations and the manual mode of operation is only used 9% of the time.

Table 4.4.2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.484[a]	.234	.064	282.88630

a. Predictors: (Constant), Custom duty pay. manual mode of operation, Custom duty pay. agencies involved, Custom duty pay, documents involved, Custom duty pay. step numbers

In Table 4.4.2, the Report showed that customs duty assessment has a mild positive correlation $(r = 0.484)$ with container clearance cost, and it seems to account for just as little as 23.4% $(r^2 = 0.234)$ of the variations in the cost of container clearance.

Table 4.4.3 Analysis of Variance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	440600.583	4	110150.146	1.376	.281[b]
	Residual	1440443.852	18	80024.658		
	Total	1881044.435	22			

a. Dependent Variable: Mean Cost of Clearance ('000)

b. Predictors: (Constant), Custom duty pay. manual mode of operation, Custom duty pay. agencies involved, Custom duty pay. documents involved, Custom duty pay. step numbers.

As shown in Table 4.4.3, there is no statistically significant correlation (p=0.281) between the variables of customs duty payment and seaport clearing costs.

Table 4.4.4 Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	520.619	349.747		1.489	.154	-214.172	1255.409			
	Custom duty pay. step numbers	94.763	99.162	.280	.956	.352	-113.570	303.095	-.098	.220	.197
	Custom duty pay. agencies involved	6.891	92.251	.018	.075	.941	-186.922	200.704	-.219	.018	.015

Custom duty pay. documents involved	-9.695	66.549	-.042	-.146	.886	-149.510	130.119	-.346	-.034	-.030
Custom duty pay. manual mode of operation	-595.865	372.685	-.587	-1.599	.127	-1378.846	187.117	-.428	-.353	-.330

a. Dependent Variable: Mean Cost of Clearance ('000)

Based on the results in Table 4.4.4, the cost of container clearance is not statistically impacted by any of the variables related to customs duty payment.

Relationship between Examination and Seaports Clearance Costs

Regarding Examination as a sub-system of the seaport clearance system, four variables—the number of steps, the number of agencies involved, the number of documents involved, and the method of operation—were investigated in relation to the seaport clearance costs. The analysis's conclusions are shown in Tables 4.5.1– 4.5.4

Table 4.5.1Descriptive Statistics

	Mean	Std. Deviation	N
Avg. Cost of Clearance ('000)	672.2609	292.40728	23
Exam. step numbers	3.3913	1.03305	23
Exam. agencies involved	6.3478	2.55145	23
Exam. documents involved	7.565	3.6160	23
Exam. electronic mode of operation	.35	.487	23
Exam. manual mode of operation	.74	.449	23

Report on Table 4.5.1 showed that Examination has an average of 3 steps involved, 6 agencies involved, 8 documents needed, only 35% use of electronic mode of operations and the manual mode of operation is used 74% of the time.

Table 4.5.2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.626[a]	.392	.214	259.31808

a. Predictors: (Constant), Exam. manual mode of operation, Exam. agencies involved, Exam. step numbers, Exam. electronic mode of operation, Exam. documents involved

Model summary as indicated in Table 4.5.2, revealed that examination has a positive correlation $(r = 0.626)$ with seaport clearance cost, and it seems to account for about 39.2% $(r^2 = 0.392)$ of the variations in the cost of container clearance.

Table 4.5.3 Analysis of Variance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	737864.678	5	147572.936	2.195	.103[b]
	Residual	1143179.757	17	67245.868		
	Total	1881044.435	22			

a. Dependent Variable: Mean Cost of Clearance ('000)

b. Predictors: (Constant), Exam. manual mode of operation, Exam. agencies involved, Exam. step numbers, Exam. electronic mode of operation, Exam. documents involved

Reports in Table 4.5.3 showed that examination has no statistically significant relationship $(p = 0.281)$ within its variables with clearance cost of seaports.

Table 4.5.4 Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	351.348	339.449		1.035	.315	-364.828	1067.523			
	Exam. step numbers	-51.011	59.995	-.180	-.850	.407	-177.589	75.566	-.227	-.202	-.161
	Exam. agencies involved	86.667	40.838	.756	2.122	.049	.507	172.826	.533	.458	.401
	Exam. documents involved	-29.741	31.236	-.368	-.952	.354	-95.643	36.160	.320	-.225	-.180
	Exam. electronic mode of operation	201.966	222.360	.336	.908	.376	-267.173	671.105	.175	.215	.172
	Exam. manual mode of operation	133.284	230.426	.205	.578	.571	-352.871	619.440	.037	.139	.109

a. Dependent Variable: Mean Cost of Clearance ('000)

From the result in Table 4.5.4, only the number agencies involved in examination has a statistically significant effect $(p = 0.049)$ on the cost of seaport clearance with a positive correlation$(r = 0.533)$

Relationship between Customs Release and Seaport Clearance Cost

As a sub-system of the seaport clearance system, four variables—the number of steps, the number of agencies involved, the number of documents involved, and the method of operation—were investigated in relation to the seaport clearance costs. The analysis's conclusions are shown in Tables 4.6.1– 4.6.4

Table 4.6.1Descriptive Statistics

	Mean	Std. Deviation	N
Mean Cost of Clearance ('000)	672.2609	292.40728	23
Custom release step numbers	3.1739	1.33662	23
Custom release agencies involved	4.4348	2.95152	23
Custom release documents involved	6.5652	3.02754	23
Custom release electronic mode of operation	.70	.470	23

Custom release manual mode of operation	.52	.511	23

Based on the reports in Table 4.6.1, customs release has an average of 3 steps involved, 4 agencies involved, 7 documents needed, 70% use of electronic mode of operations and the manual mode of operation is only used 52% of the time.

Table 4.6.2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.587[a]	.345	.152	269.24381

a. Predictors: (Constant), Custom release manual mode of operation, Custom release documents involved, Custom release step numbers, Custom release agencies involved, Custom release electronic mode of operation.

As shown in Table 4.6.2, customs release has a positive correlation $(r = 0.587)$ with seaport clearance cost, and it seems to account for about 34.5% $(r^2 = 0.345)$ of the variations in the cost of container clearance.

Table 4.6.3 Analysis of Variance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	648676.563	5	129735.313	1.790	.169[b]
	Residual	1232367.872	17	72492.228		
	Total	1881044.435	22			

a. Dependent Variable: Mean Cost of Clearance ('000)

b. Predictors: (Constant), Custom release manual mode of operation, Custom release documents involved, Custom release step numbers, Custom release agencies involved, Custom release electronic mode of operation.

Regarding the analysis of variance report in Table 4.6.3, there is no statistically significant correlation (p=0.169) between the variables of customs release and seaport clearing costs.

Table 4.6.4 Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	683.748	267.282		2.558	.020	119.831	1247.664			

Custom release step numbers	45.549	46.644	.208	.977	.342	-52.861	143.960	.380	.230	.192
Custom release agencies involved	42.330	25.626	.427	1.652	.117	-11.735	96.395	.109	.372	.324
Custom release documents involved	-22.740	22.463	-.235	-1.012	.326	-70.133	24.652	-.075	-.238	-.199
Custom release electronic mode of operation	-48.273	163.116	-.078	-.296	.771	-392.417	295.872	.301	-.072	-.058
Custom release manual mode of operation	-308.402	168.046	-.539	-1.835	.084	-662.949	46.145	-.418	-.407	-.360

a. Dependent Variable: Mean Cost of Clearance ('000)

From Table 4.6.4's results, there is no statistically significant correlation between the cost of container clearance and any of the customs release variables.

Relationship between Delivery and Seaport Clearance Cost.

Four variables—the number of steps, the number of agencies involved, the number of documents involved, and the method of operation—were investigated in relation to the seaport clearance costs. The analysis's conclusions are shown in Tables 4.7.1– 4.7.4

Table 4.7.1Descriptive Statistics

	Mean	Std. Deviation	N
Mean Cost of Clearance ('000)	672.2609	292.40728	23
Delivery step numbers	3.0435	.87792	23
Delivery agencies involved	4.8696	3.50719	23
Delivery documents involved	6.5217	3.76430	23
Delivery electronic mode of operation	.65	.487	23
Delivery manual mode of operation	.74	.449	23

Table 4.7.1 reported that delivery as a sub-system, has an average of 3 steps involved, 5 agencies involved, 7 documents needed, 65% use of electronic mode of operations and the manual mode of operation is only used 74% of the time.

Table 4.7.2Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.669[a]	.448	.286	247.13148

a. Predictors: (Constant), Delivery manual mode of operation, Delivery documents involved, Delivery step numbers, Delivery agencies involved, Delivery electronic mode of operation

As shown in Table 4.7.2, delivery has a positive correlation $(r = 0.669)$ with seaport clearance cost, and it seems to account for 44.8% $(r^2 = 0.448)$ of the variations in the cost of seaport clearance.

Table 4.7.3 Analysis of Variance

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	842786.953	5	168557.391	2.760	.053[b]
	Residual	1038257.481	17	61073.969		
	Total	1881044.435	22			

a. Dependent Variable: Mean Cost of Clearance ('000)

b. Predictors: (Constant), Delivery manual mode of operation, Delivery documents involved, Delivery step numbers, Delivery agencies involved, Delivery electronic mode of operation

Reports of analysis of variance as shown in Table 4.7.3 revealed that delivery has a statistically significant relationship $(p = 0.053)$ within its variables with clearance cost of containers.

Table 4.7.4 Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	975.798	299.382		3.259	.005	344.156	1607.440			
	Delivery step numbers	-182.608	67.667	-.548	-2.699	.015	-325.372	-39.844	-.409	-.548	-.486
	Delivery agencies involved	-44.250	19.803	-.531	-2.235	.039	-86.030	-2.469	-.079	-.476	-.403
	Delivery documents involved	42.388	15.895	.546	2.667	.016	8.852	75.924	.301	.543	.481
	Delivery electronic mode of operation	154.826	146.148	.258	1.059	.304	-153.520	463.172	.129	.249	.191
	Delivery manual mode of operation	122.150	148.148	.188	.825	.421	-190.414	434.714	-.085	.196	.149

a. Dependent Variable: Mean Cost of Clearance ('000)

As to reports in Table 4.7.4, the average cost of seaport clearance is statistically significantly impacted by the number of steps, agencies, and documents involved in the delivery process.

Conclusion and Recommendations

Conclusion

This study analyzed the Nigerian seaports' logistics efficiency in relation to trade strategy for global competitiveness. The study analysed strategy for global competitiveness with emphasis on seaport clearance sub-systems, such as Form M, Pre-Arrival Assessment Report (PAAR), Assessment of Duty (AD), Payment of Duty (PD), Examination (E), Custom Release (CR), and Delivery (D).The paper reveals that the average cost of seaport clearance increases by ₦ 119,878 for every additional Form M agency involved. The study found that the cost of seaport clearance is significantly influenced by the PAAR number of steps and the number of documents involved.

Additionally, the investigation discovered that the cost of seaport clearance is only statistically impacted by the number of agencies involved in the examination. Similar to this, the number of steps, agencies, and papers involved in the delivery process has a statistically significant impact on the cost of seaport clearance. This study reveals that the cost of seaport clearance varies across seven subsystems due to the number of steps, agencies, and papers involved. In contrast to earlier research, it examined the particular subsystem and its impact on clearance efficiency. By implication, Nigeria's competitiveness in global trade is impacted by seaport logistics, particularly with regard to the clearing system. Trade expenses can be reduced by efficient seaport logistics, increasing the competitiveness of Nigerian products on the international market and vice versa. Therefore, efficient seaport logistics are one strategy to boost Nigeria's competitiveness.

Recommendations

This paper proposes the following recommendations

i. The goal should be to automate the seaport clearance system to streamline operations and reduce the need for tasks, agencies, and documents.
ii. Policies should prioritize trade facilitation over revenue generation
iii. Nigeria should establish a robust national logistics strategy.
iv. The provision of sufficient logistics infrastructure is crucial for efficient and effective operations.
v. The proposal involves the establishment of logistics institutions for research and development.

References

Abeywickrama, M. H. and Wickramaaractchi, W.A.D.N, (2015). Study on the challenges of implementing single window concept to facilitate trade in SriLanka: A freight forwarder perspective, *Journal of Economics, Business and Management*, 3, 883-888.

Agbesi, K., (2013). The impact of ICT on the clearing of goods at Ghana ports: A case study of Tema and Takoradi ports. *Natural and Applied Sciences* (4), 3, 87-95. Retrieved from www.savap.org.pk.

Anton, V. (2013). Customs obstacles and decision to import, Master Degree Thesis submitted at Kyiv School of Economics. Retrieved from Download/Vorush-final.pdf.

Carballo, J., Graziano, A., Schaur, G., and Volpe-Martincus, (2014).The heterogeneous costs of port- of-enrtry delays. Inter- American Development Bank. Retrieved from http://www.iadb,org.

Chornopyska, N., Bolibrukh, L. (2020) "The Influence of the COVID-19 Crisis on the Formation of Logistics Quality", *Intellectualization of logistics and Supply Chain Management*, 2(0), 88–98.

Delloitte, (2017). Public private partnership as an anchor for diversifying the Nigeria economy Lagos Container Terminals Concession as a Case Study. Retrieved from https://www2delloitte.com

Filip Ž. Bugarčić, Vladimir Mićić, Nenad Stanišić (2023). The role of logistics in economic growth and global competitiveness.*Zb. rad. Ekon. fak. Rij*. 41(2), 499-520

Law of Mongolia on Customs (1996). Customs clearance definition. Customs 1996 (1).pdf. Retrieved from www.lawinsider.com

Juneja, P. (2019). Customs clearance-meaning, scope and documentation, management study guide.Retrieved from www. Managementstudy.com/customs-clearance.htm

Kabiu, B.N., Gakobo, T., and Mwaura, P. (2019).Effect of single window system procedures on cargo clearance efficiency in Kenya; A case for Mombasa port, *European Journal of Business and Management*, 11, 94-108.

Kwalia, O.K. (2012). Impact of adoption of customs electronic procedures by clearing and forwarding agents in Nairobi. An MBA research work, submitted to the school of Business, University of Nairobi.

Nicholas, M. (2017).Effect of cargo tracking system on cross-border trade between Kenyan and Uganda. A research Project, submitted for the award of Masters in Business Administration, University of Nairobi.

National Bureau of Statistics (NBS), (2023). Foreign Trade statistics, retrieved from wwwnigerianstat.gov.ng

Onogwu, D.J. (2018). Corruption and efficiency of customs clearance process in selected countries, review of public administration and management, 257.Doi;10.4172/2315-7844.1000257.

Owoyemi, O. (2018). Nigeria: Trade facilitation in West Africa, challenges and opportunities. Retrieved from www.mondaq,com/Nigeria/X/765394/international+trade+investment/trade.

Rhodalyn, D. (2018). Assessing the impact of national single window on the competiveness of Ghana's maritime sector, A Dissertation, submitted for the award of Master of Science at World Maritime University.

Shepa, M.C. (2013.) Assessment of the challenges behind the ineffective Customs clearance of goods at seaport.The case study of Medical Stores Department Dar es Salaam. A Masters of Tanzania Retrieved from Downloads/FINAL_REPORT_MSUKA.pdf.

Sigey, K. J. (2010). The impact of automation as a structured change strategy on customs clearance procedures at Kenya Revenue Authority. A research Project submitted for the Award of Degree of Master of Business Administration, University of Nairobi.

Sirika, D. D. and Gizaw, T. K. (2016). Effects of procrastination on customs clearance cost: the case of Kality Customs Branch in Ethiopia. *International Affairs and Global Strategy*.(48). Retrieved from www.iiste.org.

United Nations Conference on Trade and Development, (2022). Review of maritime transport. https://unctad.org>publication/

Verwaal, E., and Donkers, B., (2003). Customs-related transaction costs, firm size and international trade intensity, *Small Business Economics*, 21 (3), 257-271.

Wilson, J. (2018), Custom clearance procedure: import in Nigeria, Retrieved from Vagmon e-grup& Logistics Ltd, www, clearing and forwardingnigeria.com/custom-clearanceprocedure/amp.

World Bank, (2023) Logistics Performance Index LPI. Retrieved from https://www.worldbank.org>news