Port Reforms and Concession: A Study of Apapa and Tin Can Island Seaports

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https://doi.org/10.61090/aksujacog.2023.026

Abstract
This research looked at the impact of port reforms and concessions on the management of ports in Nigeria, using Apapa and Tin Can Island Seaports as case studies. The study's goal was to ascertain if the concessions at these ports had improved port infrastructure as well as decreased ship waiting time. The research was explained using the New Public Management Theory, which promotes the notion of developing a performance-oriented culture in a decentralised public sector. The survey research was used for the study, and this guided the use of a standardised questionnaire to gather information from the research participants. Hard data from the Nigerian Ports Authority supplemented this. Even though they cannot be compared to international best practices, the study's results indicated that there have been advances in the level of turnaround time for oceangoing vessels, the level of cargo throughput, and the berth occupancy rate. As a result of this discovery, it was suggested, among others, that the government work with the concessionaires to increase infrastructure spending so that it is simple to enter and exit the port facilities. Additionally, steps should be taken to lessen the presence of MDAs and other security personnel at the ports.

Keywords: Concession, ports, public sector, management, reforms

Introduction
Geographically, Nigeria is a maritime country with a large population and plenty of coastal resources. The country has an advantage over other maritime and African countries because of these benefits. They have also transformed the Nigerian ports into maritime hubs. The seaport is essential to Nigeria's economy since it makes virtually all of the nation's imports and exports possible and functions as a centre for both land-based and marine transit. The importance of the seaports is shown in the fact that the bulk of imports and exports from Nigeria occur by sea. According to Oni (2007), Nigerian ports get 60% of all imports into West and Central Africa.

The amount and terms of Nigeria's international commerce, as well as its ability to grow its economy as a developing nation, are greatly impacted by its seaports (Oghojafor *et al*., 2012). Seaports are crucial to a nation's economy in addition to acting as major entrance points. Following the sales of hydrocarbons, Nigerian ports are the nation's second-largest source of revenue (NPA, 2015). As a consequence, Nigeria's ports' growth and development are essential to the country's overall development.

Beyond preserving law and order and safeguarding lives and property, every government also has a responsibility to ensure that purposeful actions are taken to promote society's overall development. The government uses the instrumentality of public policy as one of its instruments. Nigeria's federal government began the privatisation of public firms as part of its development strategy to ensure the nation received the best of international best practices.

In one form or another, privatisation has been a policy, and it first appeared as concessionaries when it came to the country's port administration. Before 2006, there were numerous issues with port management in Nigeria, including a lack of basic and standard port infrastructure, illegal fees and extortion, the presence of numerous government agencies at the ports, excessive ship delays, and difficulties conducting business there.

It is also important to note that artificial obstacles such as a lack of cargo handling equipment, exorbitant equipment rental fees charged by the Nigerian Ports Authority, excessive fees, and a difficult working environment, are stifling Nigeria's growth ambitions and deterring investors from pursuing trade and investment opportunities. Economic activity can only expand and flourish in a way that is feasible if economies work to foster a friendly and inviting environment. Unfortunately, excessive and arbitrary fees, unfavourable investment conditions, and growing inefficiencies continue to pose problems for the clients of Nigerian maritime ports. This is evidenced by the assertion by Amiwero (2020) that the gridlock on the port access roads and the cost of entering and leaving the port for trailers led to an almost 500 per cent increase in port costs. This, he said, is different from transport costs, demurrage on containers to shipping companies, rent to terminal operators, loaded containers that consume deposit of containers and incur additional demurrage, and empty containers not being able to access the ports. In Apapa, he alleged that an average of N140,000 to N155,000 is collected for a 20-feet container truck, while an average of N215,000 to N250,000 is collected for a 40-feet trailer before entering the port. He noted that the return of 20-feet and 40-feet empty containers to holding bays cost about N50,000 to N65,000 and N80,000 to N100, 000 respectively, while the transfer from Tin Can Island port to bonded warehouse cost between N330,000 and N400,000, depending on the location.

According to Amiwero (2020), the transportation of containers from Tin Can Island Port within Lagos, for instance, to Ladipo costs about N750,000; to Alaba, about N700,000; to Ijora, about N550,000; and to Trade Fair, about N700, 000 per trip. It is a similar experience to move cargo from Apapa ports to various locations in Lagos. An SBM intelligence report cited in Amiwero (2020) has also shown that it is more expensive to ship goods from the European Union to Nigeria and clear, compared to what is obtained in Ghana and South Africa. Further findings revealed that in Nigeria, about $457 is paid as terminal charges, and $374 for shipping charges, while local transport from the port to a warehouse is in the range of $2050. In Tema Port, Ghana, the terminal charge is $280, the shipping charge is $321 and local transport from port to warehouse is about $285, while in Durban Harbour, South Africa, the terminal charge is $180, the shipping charge is $274 and local transport from the port to a warehouse is $208. Meanwhile, the breakdown of scanners that facilitate the inspection of goods, which is now done manually, also constitutes delays, contributing to high costs and the destruction of unstuffed goods. A port source said scanning/Customs examination of a 20ft container now costs about N28,000 and N41,000 for a 40ft container. The Nigerian port is still the entry point to the global economy, and its activities have a variable impact on how much it costs to do business there.

For both the government and port users, all of these resulted in a loss of income and profits. This prompted the government at the time to start handing over control of ports to various concessionaires to make conducting business easier by using the finest personnel and equipment. The truth is that some of the problems that led to the privatisation of certain ports, such as the growth in tonnage, have been resolved, while others, like the delay in cargo clearance, theft, and insufficient infrastructure, among others, are still unresolved.

Various performance indicators, such as turnaround time, berth occupancy rate, ship waiting time, level of cargo throughput, cost of clearing cargo, and automation of clearing process, among others, are used around the world to gauge the success of port operations and administration (Mogbojuri et al., 2023; Nwaogbe, et al., 2020; Mbanefo, 2020; Maneno, 2019).

These indicators all affect how effective and efficient a port is. According to the terms of the agreement granting the concession, one of the following concession terms—BOT (Build, Own and Transfer), BOOT (Build, Own, Operate and Transfer), or BOO (Build, Own and Operate)—must be in effect for the management of the port to achieve the aforementioned performance indicators.

There have been several studies (Mekwa & Salleh, 2020; Olufemi, et al., 2021) on port performance after concessions, but none has looked at how concessions have affected the management of Nigeria's Apapa and Tin Can Island seaports. Additionally, there are few empirical studies (Okpomo, 2021; Nze & Onyemechi, 2018; Michael, 2019) on post-concession port performance that take into account the equipment used for cargo handling as well as the regular operation of Apapa and Tin Can Island seaports by accepted international standards. The current research was conducted to examine the influence that port concessions have had on the operation of the seaports at Apapa and Tin Can Island.

Research Questions

The following research questions guided the study:

i. What is the impact of port concession on the development of port infrastructure in Apapa and Tin Can Island Seaports?

ii. How has the concession of ports in Nigeria shortened ship waiting time in Apapa and Tin Can Island Seaports?

Objectives of the Study

i. To assess the influence of port concession on the development of port infrastructure in Apapa and Tin Can Island Seaports.

ii. To find out whether or not the concession of ports in Nigeria has shortened ship waiting time in Apapa and Tin Can Island Seaports.

Research Hypotheses

The following hypotheses were formulated to guide the study

HR1 Ports concession is likely to bring about the development of port infrastructure in Apapa and Tin Can Island Seaports.

HR2 Concession of ports in Nigeria has tended to shorten ship waiting time in Apapa and Tin Can Island Seaports.

Theoretical Framework

The New Public Management (NPM) Theory, advanced by Osborne & Gaebler in 1992, serves as the foundation for this research. According to Osborne & Gaebler (1992), in the formulation of this theory, the government should act as a catalyst by emphasising adherence to ethics, transparency, equality, fairness, responsibility, and accountability. It should also emphasise participation, responsiveness to citizens' needs, and efficiency in the management of public resources. Instead of focusing just on providing services, the government should work to mobilise the public sector, commercial sector, volunteer sector, and non-governmental sector to address social challenges. Therefore, rather than rowing, the government should be steering.

Government-owned by the people: The government should support and enable individuals, families, and communities to address their issues. Therefore, the government should decentralise the administration of several services. A competitive government should encourage rivalry among service providers. This boosts efficiency while cutting costs. The government should be motivated by its missions rather than by laws and regulations. It entails changing a government that is focused on rules into one that is focused on goals. A government that seeks results: The government should promote goal attainment and mission-focused

initiatives. Customer-driven Government: The public should be treated like a customer by the government. It ought to prioritise client delight above bureaucracy. It entails giving customers options, asking about their opinions, making services easy, and letting them recommend improvements. Government with initiative: The focus should be on revenue generation rather than expenditure. It should focus its efforts on resource mobilisation by using fees, business funds saved, and other means. A government that anticipates problems is better off identifying them before they arise than trying to fix them after they do. The government should transfer power from higher to lower levels via decentralisation. This promotes proactive planning and collaboration.

A government that is focused on the market: Instead of using bureaucratic methods, the government should use market mechanisms. It should restructure markets in addition to using command and control to accomplish its objectives. It should use market forces to accelerate transformation. According to Osborne & Gaebler (1992), the NPM theory aims to promote a performance-oriented culture with the following characteristics in a decentralised public sector:

a. paying attention to outcomes in terms of effectiveness, efficiency, and service quality;
b. the use of decentralised management to replace highly centralised, hierarchical systems, allowing service companies to be located closer to the point of delivery and facilitating faster feedback;
c. flexibility to look for less expensive alternatives to direct public service and regulation;
d. a commitment to efficiency in directly offered public services and
e. enhancement of strategic capabilities at the core to efficiently and cost-effectively steer the whole process.

Making governments more effective is a key emphasis of the New Public Management (NPM) philosophy (Kaboolian, 1998). According to Savoie (2006), the theory suggests alterations to make governments more effective and responsive by utilising techniques from the private sector and fostering market conditions for the provision of services. Furthermore, according to Osborne (2006), the NPM theory assumes that the adoption of private sector practises would increase the effectiveness and efficiency of public services and; that private managerial techniques are superior to those used in public administration.

The New Public Management (NPM), if properly managed, has the potential to turn around the nation's economic woes in the Apapa and Tin Can Island Seaports Complex, which are landlord ports owned by the government. To this end, the emphasis placed by this theory is that effectiveness and efficiency are possible if the principles advanced by the proponents of this branch of the New Public Management Theory are applied in the operations and management of the port, which has the potential to produce income for the government and contribute to economic development if the services that ought to be provided to the public are current and in line with best global practises.

The New Public Management (NPM) theory is highly relevant to research on port reforms and concessions in Nigeria. NPM is a management approach that emphasizes the use of private-sector techniques and practices in the public sector to improve efficiency, effectiveness, and accountability. This theory has been widely adopted in the reform of public sector organizations, including ports, around the world. In the context of port reforms and concession in Nigeria, NPM can provide valuable insights into the potential benefits and challenges of introducing private sector involvement in the management and operation of ports. The theory emphasizes the importance of performance-based management, competition, and customer orientation, which are all critical factors in the successful reform and concession of ports.

Research on port reforms and concessions in Nigeria can draw on NPM principles to assess the potential impact of introducing private sector participation in port management. This

could include examining the potential for increased efficiency and effectiveness in port operations, as well as the potential challenges related to accountability and transparency in the context of private sector involvement. Overall, the NPM theory is highly relevant to this research on port reforms and concession in Nigeria as it provides a comprehensive framework for understanding and evaluating the potential impact of introducing private sector involvement in port management, as well as guiding the design and implementation of successful reform initiatives.

Review of Related Literature

Concession

Ndikom (2006) asserts that concession agreements are designed to attract investors, which would then result in the supply of cutting-edge cargo handling facilities and machinery, increasing operational effectiveness at the ports. Anagor (2014) notes that the outsourcing of port operations to private companies in Nigeria resulted in a significant level of improvement, increased spending on terminal infrastructure and cargo handling equipment, a 250% increase in cargo throughput over the previous eight years, and a recovery of importers' confidence. Public firms that need to be turned into private ones must already exist for privatisation to take place. There is a case to be made for private ownership, management, or control over public ownership.

Concessions, according to Mundhe (2008), are preferred when public authorities are unable to maintain facilities bought with taxpayer money. For instance, Kruk (2008) notes that concession was used in Nigerian ports to increase productivity and efficiency. This was done in two ways, according to Razak (2005), first, to encourage greater private sector participation; and second, to enhance the operational and management capabilities of the ports (Abdullahi, 2014). According to Awam (2014), where concession is chosen as a reform strategy (regardless of the available options or models), the goal is to increase efficiency, productivity, and management capability; decrease the financial burden on the public sector; increase revenue generation; improve service delivery for users; and transfer specialised port management tasks to the private sector.

Review of Empirical Studies

In their research on the Apapa port complex in Lagos, Celik & Umar (2020) looked at the effect of public-private partnerships on the operation of Nigerian seaports. According to the author, marine operations are unquestionably becoming the backbone of industrialised, growing, and developing economies since they are crucial for both domestic and international commerce. In mature and emerging economies alike, ports are often either publicly owned and operated or privately owned and run. Publicly owned and privately run are examples of hybrid ownership and operation regimes. The landlord-port system was the reform strategy chosen by the Nigerian government. Under this system, the government, through the Nigerian Ports Authority (NPA), retains ownership of the infrastructure, while contracting out management and operations to the private sector with investment requirements for a period ranging from 10 to 25 years. The private terminal operator will have a greater financial commitment the longer the tenor. Under the direction of a governing body, the Nigerian ports are divided into western and eastern ports. The average berth occupancy, average turnaround time, and cargo security at the Apapa Port Complex are the three key indices of port management and operations that are the subject of this empirical research. The efficiency of port services in Nigeria has been enhanced as a result of the reform, it has been noted.

Onwuegbuchunam (2020) examined port deregulation and productivity in Nigeria. In a deregulated port environment, the author looked at the welfare of port users after private sector involvement. The application of the Nigerian port terminal concession strategy was examined

as a case study. According to the study's results, there was considerable productivity (technological) changes in each of the three reform stages that were investigated, i.e., the pre-reform, reform, and post-reform periods. In the post-concession reform period, which lasted from 2009 to 2013, the changes were more obvious. Efficiency changes and technological efficiency changes were the causes of these changes. Additionally, it was shown that the ports in Nigeria's western region had more dramatic productivity development than the ports in other regions. However, these ports—Apapa, Container Terminal, Tin Can Island, and Ro-Ro Port, made up more than 60% of all ports evaluated.

Olufemi et al., (2021) conducted a study on the development of Port Infrastructure and Service Quality in Nigerian Ports from 2000 to 2019, with a focus on how port infrastructure and service quality have developed in Nigerian ports. Their goal was to investigate the association between service quality of ship turnaround time and average time at berth and the quality of the port infrastructure index. They achieved this by using the ordinary least squares (OLS) regression analysis method based on secondary data obtained from the Nigerian Ports Authority Abstract Statistics and the World Economic Forum on the quality of port infrastructure index, ship turnaround time, and average time spent at berth. According to the estimated OLS findings, the service quality at Nigerian ports is negatively and significantly correlated with both ship turnaround time and the average time spent at berth.

Bello et al., (2021) researched the impact of reforms on port performance in the Lagos Port Complex in Nigeria. The research used stratified sampling as its sampling method. Both descriptive and inferential statistics were used. Inferential statistics were employed to examine the impact of port changes on cargo clearance, while descriptive statistics were used to analyse ship traffic, cargo throughput, and infrastructure provision. The result revealed an increase in ship traffic, dredging equipment, access channel upgrades, and cargo handling equipment. Additionally, cargo clearance was impacted by port reform, with $r = 0.749$. This led to the conclusion that cargo clearance and port reform had a substantial correlation.

Oluwagbenga (2021) conducted a study on the post-concession review of terminal operators' performance. To assess concessionaires' performance in the post-concession period, the author looked at terminal operators at the Tin Can Island port. The personnel at the Tin Can Island Port Complex provided both primary and secondary data for this research. The Taro Yamane formula was used to pick 324 respondents via the stratified sample approach. It was determined that the advanced handling equipment employed enhanced the storage area's operations. Additionally, there will be a delay in operations if the employed equipment is outdated or broken. This will reduce the garden storage capacity's efficiency and performance.

Oruwari (2021) examined the factors causing port congestion in Nigeria, using the Lagos-Apapa Port as a case study. The researcher found many reasons contributing to port congestion while conducting this analysis. The four major categories of documentation processes, physical infrastructure, organisational elements, port operations, and management have been used to conceptualise the twenty-four variables that contribute to port congestion in Nigeria. Experts in the area selected these four elements based on their relative relevance utilising the analytical hierarchy process (AHP). The experts or respondents (31 of them) who regularly do business at the port provided pairwise comparisons of the selected parameters.

Ship-to-shore (STS) handling equipment is unavoidable in port operations, according to Mogbojuri et al., (2023), in their research on ship-to-ship (STS) handling equipment and vessel turnaround time in the eastern ports of Nigeria. Because of this, ship-to-shore (STS) handling operations are hampered by insufficient accommodations for STS handling equipment. Therefore, it is important to assess how ship-to-shore (STS) handling technology affects the turnaround time of vessels in the eastern ports of Nigeria. In this study, a survey research design was used. There is a substantial correlation between ship-to-shore (STS) handling equipment and vessel turnaround time, as shown by the result, which indicated that

the F ratio, which is 467.622, was statistically significant at a p-value of 0.00, which is less than 0.05. According to the research, improvements in ship-to-shore (STS) handling machinery would hasten vessel turnaround at the port.

Methodology

This survey research design that involved the utilization of a structured questionaire for the gathering of data from the research participants was employed for this study. The participants in the study are employees of the Nigerian Ports Authority, the Nigerian Maritime Administration and Safety Agency (NIMASA), the Nigerian Customs Service (NCS), the Nigeria Police Force (NPF), the Directorate of State Security (DSS), the Standard Organisation of Nigeria (SON), the National Agency for Food and Drug Administration and Control (NAFDAC), other port users who conduct business at the port, and concessionaires/terminal operators in Apapa and Tin Can Islan.

The population of the research is described numerically as follows:

NPA	-	517
NIMASA	-	153
NCS	-	17
NPF	-	18
ABTL	-	82
ENLC	-	71
GDNL	-	76
APMTL	-	72
JPS	-	69
TCIC	-	62
PCHS	-	73
FSL	-	67
DSS	-	11
SON	-	09
NAFDAC	-	05
TOTAL	-	1,302

Source: Nigerian Ports Authority (2022)

The purposive (expert) sampling methods and stratified random sampling were both employed in this investigation. Researchers often use stratified random sampling when attempting to assess data from several strata or subgroups. It enables them to swiftly acquire a research sample that most accurately mirrors the whole population under investigation. The purposive (expert) sampling technique, on the other hand, is always used when the researcher wants to target respondents who are relevant to the study at hand because of their expertise and capacity to provide information that would help the researcher draw helpful, unbiased conclusions. In either event, the researcher had the flexibility to ask research subjects who had the necessary expertise and knowledge about the study for information using any of the two approaches.

The Krejcie and Morgan (1970) table for calculating sample size was used to calculate the sample size. According to Krejcie and Morgan's (1970) sample size calculation table, the sample size to be employed for this investigation is 297. While the secondary data were gathered from books, government white papers, periodicals, journals, unpublished research works, as well as other documentary and online sources, the primary data were gathered via the survey's administered questionnaire that was modelled on a four-point Likert scale with the choices: strongly agree (SA), agree (AG), disagree (DA), and severely disagree (SD). The research questionnaire was submitted to the supervisor for thorough vetting and his input to

guarantee that it had a high degree of accuracy in measuring what it was designed to measure. For the reliability of the instrument, twenty respondents who were not a part of the main research were given twenty (20) copies of the questionnaire. After applying Cronbach's alpha reliability analysis to the collected data, a reliability coefficient of 0.89 was discovered.

For analysis, simple linear regression, tabular displays, and frequency counts were used to assess the data that were obtained for this research. All field data were analysed using frequency counts, although basic linear regression analysis was employed to test the null hypotheses at a level of significance of 0.5. The Statistical Package for Social Science (version 25.0) was used to do this. The decision rule that stipulates that the researcher should reject the null hypothesis if t computed is more than (>) t crucial served as the basis for this form of regression's approved or rejected criteria. According to this decision rule, the independent variable has a substantial influence on the dependent variable when the p-value is less than (<) 0.05, but not when the p-value is larger than (>) 0.05.

Data Presentation and Analysis

It is important to highlight that out of 297 copies of the questionnaire that were distributed to the study participants, 248 copies that makeup 83.5% return rate were successfully recovered.

Analysis of Responses from the Research Participants

Table 1: Research Participant Responses on Concession Policy

S/N	SA	AG	DA	SD	Total
1.	79	81	51	37	248
2.	87	72	47	42	248
3.	77	83	43	45	248
4	84	81	42	41	248
5	79	83	56	30	248

Source: Author's Field Survey Compilation (2023).

Interpretation of Research Participants' Responses on Port Concession Policy

According to the data acquired from the field survey, a whopping 31.8% of the research participants supported private sector investment as part of port improvements. According to the replies, 32.7% of the participants in the study agreed, whereas 20.6% and 14.9% disagreed and strongly disagreed, respectively. Additionally, it was found that while 19.0% and 16.9% also disagreed and strongly disagreed on this matter, 35.1% and 29.0% of the research participants strongly agreed and agreed that investments by private companies could result in increased cargo handling facilities and productivity at the ports. When asked whether they thought that the efficient execution of these port rules would result in good improvements in operations, the study participants responded as follows: 31.1% strongly agreed, 33.5% agreed, 17.3% disagreed, and 18.1% very disagreed. As a result, 33.9% of the study's participants strongly agreed that stakeholder comments are taken into account when port management and the management of cargo handling facilities are being conducted. 32.7% of survey participants agreed, 16.9% disagreed, and 16.5% strongly disagreed with this. Changes in government policies have a substantial influence on the operations of Apapa and Tin Can Island Seaports, according to 31.8% of study participants who strongly agreed with this statement, 33.5% who agreed, 22.6% who disagreed, and 12.1% who severely disagreed.

Table 2: Research Participant Responses on Port infrastructure

S/N	SA	AG	DA	SD	Total
6.	81	79	37	51	248
7.	69	67	61	51	248
8.	47	42	87	72	248
9.	43	45	77	83	248
10.	81	84	42	41	248
11.	83	79	30	56	248
12.	88	78	49	33	248

Source: Author's Field Survey Compilation (2023).

Interpretation of Research Participants' Responses on Port Infrastructure

The majority of research participants—32.7%—agreed that they had the necessary equipment to conduct port operations at Apapa and Tin Can Island Seaports based on the information acquired from the field survey. According to the replies, 31.8% of the participants in the study agreed, whereas 14.9% and 20.6% disagreed and strongly disagreed, respectively. Additionally, it was found that the port infrastructure at Apapa Tin Can Island Seaports can effectively compete with other ports in the region of West Africa, according to 27.8% of the research participants who strongly agreed, 27.0% who agreed and strongly agreed, and 24.6% and 20.6% of the research participants who disagreed and strongly disagreed, respectively. Additionally, it was discovered that 19.0% of the research participants strongly agreed, 16.9% agreed and strongly agreed, 35.1% disagreed, and 29.0% strongly disagreed that the use of outdated plants and equipment sometimes causes cargo handling operations at ports to be slow. When asked whether the facilities for cargo discharge and loading are often insufficient and this hinders port operation, 17.3%, 18.1%, 31.1%, and 33.5% of the study participants strongly agreed, agreed, disagreed, and strongly disagreed respectively. Due to the restricted capacity of transit sheds, cargo warehouses, and open storage, congestion sometimes occurs, according to 32.7% of study participants who strongly agreed with this statement. 33.9% of survey participants agreed, 16.9% disagreed, and 16.5% strongly disagreed with this. According to the responses, delays in cargo handling operations are a result of time-consuming procedures in getting facilities ready for operation, with 33.5% of research participants strongly agreeing, 31.8% agreeing, 12.1% disagreeing, and the remaining 22.6% strongly disagreeing. According to the responses to the last item for this variable, 35.4% of the research participants strongly agreed; 31.5% agreed; 19.8% disagreed; and 13.3% strongly disagreed that the poor implementation of government policies on cargo facilitation at the ports is the cause of delays in cargo handling operations.

Table 3: Research Participant Responses on ship waiting Time (Turnaround Time)

S/N	SA	AG	DA	SD	Total
13.	77	83	43	45	248
24.	42	41	81	84	248
15.	79	83	56	30	248
16.	72	87	42	47	248

Source: Author's Field Survey Compilation (2023).

Interpretation of Research Participants' Responses on Ship Waiting Time (Turnaround Time)

According to the field study's results, 31.1% highly agreed, 33.5% agreed, and 17.3% disputed that the turnaround time of ships has improved as a result of recent port improvements at Apapa Tin Can Island Seaports, while 18.1% strongly disagreed. In light of this, 16.9% strongly

agreed, 16.5% agreed, 32.7% disagreed, and 33.9% strongly disagreed that the amount of turnaround time reduction at Apapa Tin Can Island Seaports is consistent with international best practices. The responses also revealed that there are some measures of operational effectiveness and efficiency in Nigerian ports since the concessionaires took over the port, with 31.8% of research participants strongly agreeing, 33.5% agreeing, 22.6% disagreeing, and 12.1% strongly disagreeing. Additionally, it was discovered that 16.9% and 19.0% of the study participants disagreed and strongly disagreed on the topic of whether the berth occupancy rate has increased since the involvement of private investors in port operations, respectively.

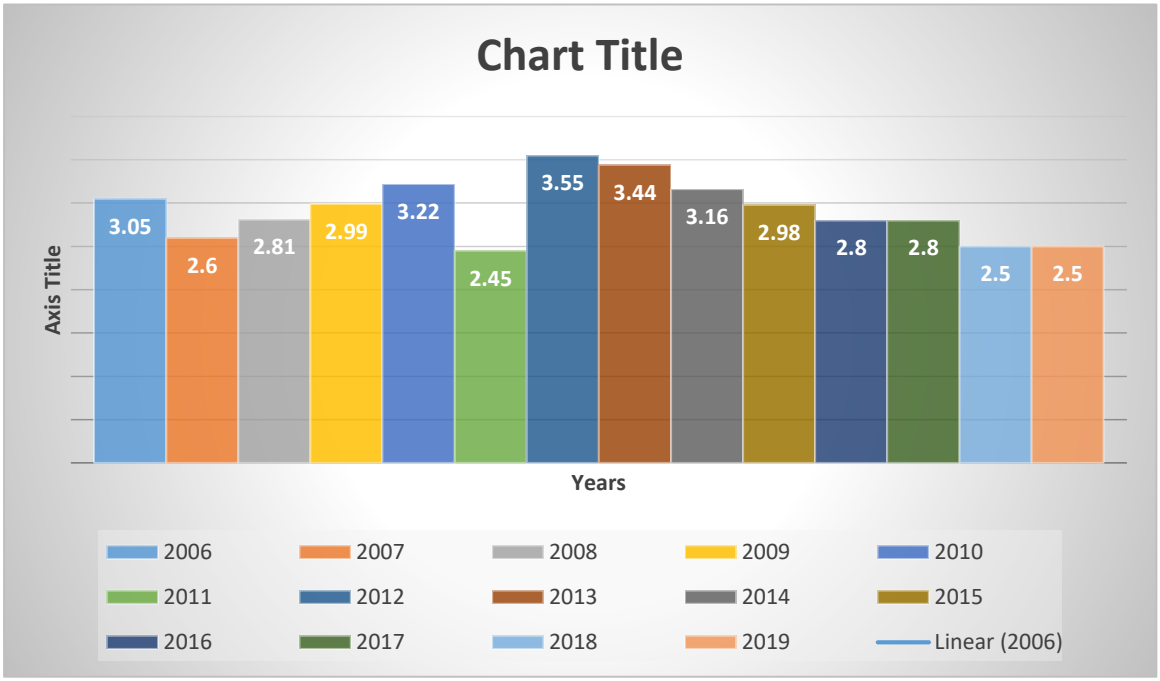


Figure 1: Trend of Index of Quality of Port Infrastructure
Source: Olufemi *et al*., (2021)

Quality of Port Infrastructure Index

The quality of port infrastructure index represents an assessment of the quality of port facilities in a given country based on data from the World Economic Forum (WEF) data. Thus, quality of port infrastructure index data from 2000-2019 was obtained from the World Economic Forum (WEF) and it serves as an independent variable in the study which measures port infrastructural development in Nigerian ports. Meanwhile, in analyzing the trend, the index of quality of port infrastructure ranges between 0 and 3.55. In the year 2006, the index of quality of port infrastructure stood at 3.05 but declined slightly to 2.69 in 2007. But for the next five years (i.e. from 2008 and 2012), the index of quality of port infrastructure increased progressively and got to its peak of 3.55 in 2012. After the peak period in 2012, the index of quality of port infrastructure declined steadily between 2013 and 2019. Except for the year 2018 which was 2.50, the rate of decrease never got below the first phase of decrease which coincided with the period of 2007. Thus, it can be inferred that the index of quality of port infrastructure improved to some extent after the port concession in 2006. The bar chart in Figure 1 presents a graphical illustration of the trend in the index of quality of port infrastructure between the years 2006 and 2019 (Olufemi et al., 2021).

Nigerian Seaport Performance from 2011 to 2021

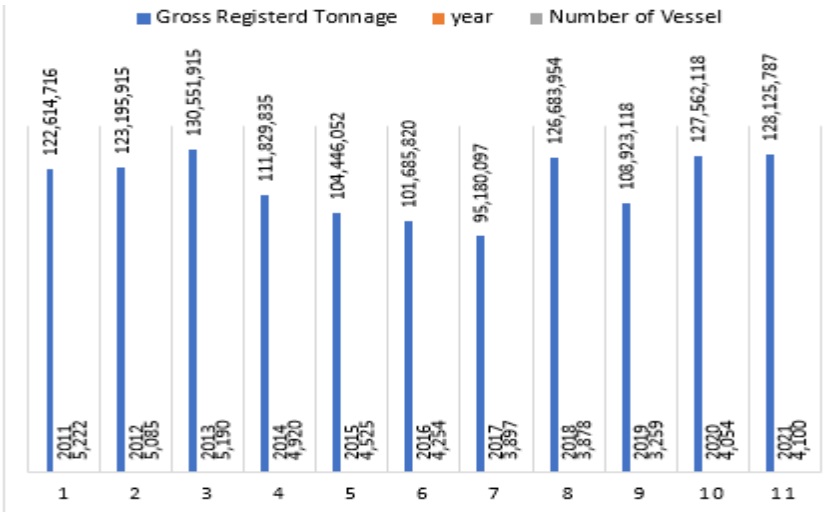
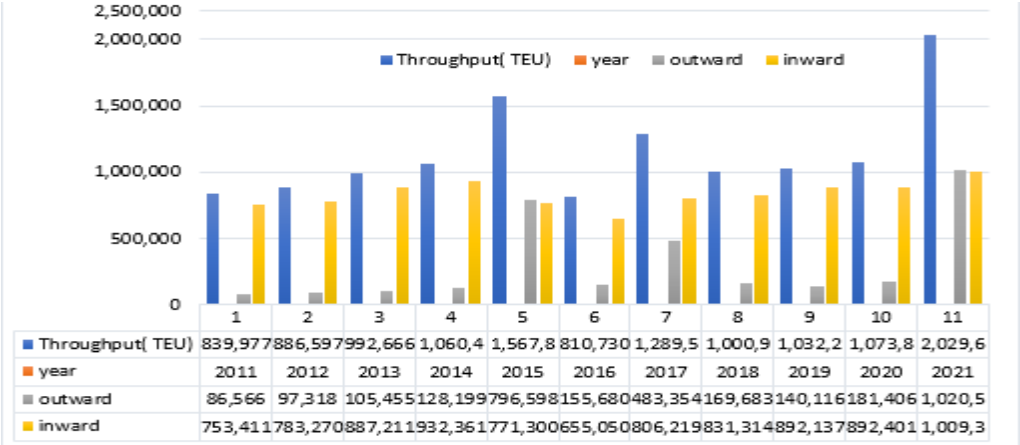


Figure 2: The Data on Nigerian Seaports Vessel Traffic from 2011 to 2021
Source: Nigerian Ports Authority (2022)



	1	2	3	4	5	6	7	8	9	10	11
Throughput(TEU)	839,977	886,597	992,666	1,060,4	1,567,8	810,730	1,289,5	1,000,9	1,032,2	1,073,8	2,029,6
year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
outward	86,566	97,318	105,455	128,199	796,598	155,680	483,354	169,683	140,116	181,406	1,020,5
inward	753,411	783,270	887,211	932,361	771,300	655,050	806,219	831,314	892,137	892,401	1,009,3

Figure 3: The Data on Nigerian Seaports Container Traffic from 2011 to 2021
Source: Nigerian Ports Authority Website (2022)

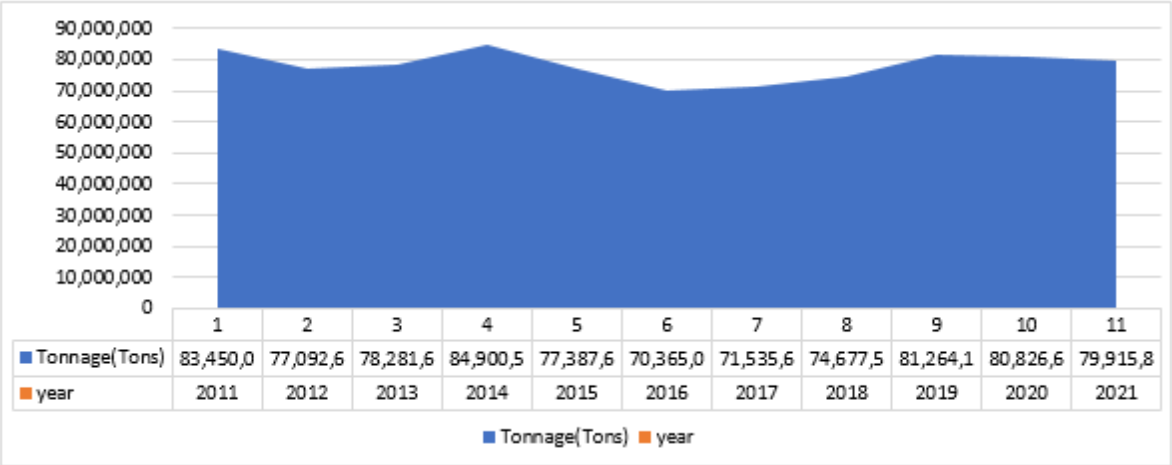


Figure 4: The Data on Nigerian Seaports Cargo Throughput from 2011 to 2021
Source: Nigerian Ports Authority Website (2022)

In 2017, more than 558 million metric tonnes were moved via Europe's 40,000-kilometer network of inland waterways (Obeta, 2014). As seen in Figures 3 and 4, respectively, Nigeria's seaports received a total of 4,298 and 72,358,342 vessels and commodities in 2017 (according to the Nigeria Port Authority website). The authors pointed out that to convey goods to the hinterland and produce money for the country, the inland waterways ports needed to take advantage of the massive influx of ships and cargoes at the Nigerian seaport. Figure 2 shows the port vessel traffic in Nigeria from 2011 to 2021. Figure 3 displays the container traffic at Nigerian seaports from 2011 to 2021. The seaport cargo is shown in Figure 4 from 2011 to 2021.

Test of Hypotheses
The hypotheses for this study are hereby restated in their null and research forms for testing:

Test of Hypothesis 1:
H_O: Port concession does not have any significant influence on the development of port infrastructure in Apapa and Tin Can Island Seaports.
H_A: Port concession has a significant influence on the development of port infrastructure in Apapa and Tin Can Island Seaports.
Table 4: Regression analysis for the influence of port concession on the development of port infrastructure in Apapa and Tin Can Island Seaports

Groups	N	β	R Square	df	t calculated	t critical	P value	Decision
Port concession				1				
	248	0.368	.135	246	16.730	1.96	.000	H_O: rejected
Development of port infrastructure				247				

β = regression coefficient
Source: Author's field survey compilation (2023)

Interpretation of regression result: The first hypothesis' regression output table shows the impact of port concessions on the growth of port infrastructure at Apapa and Tin Can Island Seaports. According to the coefficient of determination (r-square), port concessions only

accounted for 13.5% of the overall variance in the development of the port infrastructure at Apapa and Tin Can Island Seaports. The regression analysis's findings also showed that port concessions significantly influenced the growth of the port infrastructure at Apapa and Tin Can Island Seaports (= 0.368, t computed =16.730, t tabulated =1.96, p 0.05). Therefore, the null hypothesis which states that port concession does not have any significant influence on the development of port infrastructure in Apapa and Tin Can Island Seaports is rejected.

Test of Hypothesis 2:

H_O: The concession of ports in Nigeria does not have a significant influence on the shortening of ship waiting time in Apapa and Tin Can Island Seaports.

H_A: The concession of ports in Nigeria has a significant influence on the shortening of ship waiting time in Apapa and Tin Can Island Seaports.

Table 5: Regression analysis for the influence of concession of port on the shortening of ship waiting time in Apapa and Tin Can Island Seaports

Group	N	β	R Square	df	t calculated	t critical	P value	Decision
Concession of port				1				
	248	0.424	.180	246	7.578	1.96	.000	H_O: rejected
Shortening of ship waiting time				247				

β = regression coefficient

Source: Field Survey (2023).

Interpretation: The impact of port concessions on the reduction of ship waiting times at Apapa and Tin Can Island Seaports is seen in the regression output table for hypothesis two. According to the coefficient of determination (r-square), the concession of ports only accounted for 18.0% of the entire variance in the reduction of ship waiting times at Apapa and Tin Can Island Seaports. The regression analysis's findings also showed that port concessions had a substantial favourable impact on reducing ship waiting times at Apapa and Tin Can Island Seaports (= 0.424, t computed =7.578, t tabulated =1.96, p 0.05). Therefore, the null hypothesis which states that the concession of ports in Nigeria does not have a significant influence on the shortening of ship waiting time in Apapa and Tin Can Island Seaports, is rejected.

Discussion of Findings

The results of the first hypothesis demonstrated how Nigerian port concessions impacted the development of the port infrastructure at Apapa and Tin Can Island Seaports. This discovery is supported by research carried out by Onwuegbuchunam (2020) whose study showed that there was considerable productivity (technical) improvements after the concession of seaports. In the post-concession reform period where the years 2009 to 2013 were considered, the changes were more obvious. Efficiency changes and technological efficiency changes were the causes of these changes. Additionally, it was shown that ports in Nigeria's western region had more dramatic productivity development than ports in other regions. It is important to highlight that the relative efficiency improvements brought about by the concession changes cannot be seen as broadly spread as only ports with Western origins performed well.

The results of this study are in line with those of Oluwagbenga (2021), whose investigation into the effectiveness of terminal operators in Tincan Island Port, Lagos, during

the post-concession period resulted in the finding that the use of sophisticated handling equipment enhances storage area operations.

According to the results of the second hypothesis, Nigerian port concessions have a considerable impact on the reduction of ship waiting times at Apapa and Tin Can Island Seaports. This result is consistent with that of Ndikom (2013) whose research led to the findings that there is a strong correlation between government policies and shipping operations, piracy activities, and the profitability of shipping lines, and that having enough cargo handling equipment results in faster turnaround times for ships at seaports.

According to the findings, the concession of Nigerian ports has greatly increased the average berth occupancy and average turnaround time of the boats calling at Nigerian ports, which is in line with an earlier result by Omoke et al., (2015). The work of Celik & Umar (2020), whose research on the influence of public-private partnerships on the performance of Nigerian seaports revealed that the concession policy led to an improvement in ship turnaround times, provided another conclusion that concurred with the findings of this study. More specifically, compared to the pre-concession age when ships used to stay weeks rather than days as is now experienced, the number of days spent on the port for the withdrawal of commodities from the port has substantially reduced, and process automation systems are improving. The authors contend that this is due to the individual terminal owners' investments in physical and operational port infrastructure that facilitate ship loading and unloading.

Conclusion

The results of this research have shown that there has been a drop in the rate of berth occupancy as well as an improvement in the level of turnaround time for oceangoing boats throughout the years under consideration. This shows that the 2006 changes were successful. The current port performance indicators available in Apapa and Tin Can Island Seaports do not yet meet international standards, and as a result, do not hold up over time when compared to what is available in other ports around the world. This does not, however, imply that there is no room for further improvement.

The poor condition of the terrain via which they reach the facilities is a constant problem for port customers that utilise these ports, and the administrators are doing little to address it. This implies that port users continue to spend a lot of money paying demurrage, which is terrible for business. This explains why conducting business at Nigerian ports is considered as being highly difficult. While it is said that the rating for ease of doing business has increased, this does not correspond to what is happening daily in Apapa and Tin Can Island Seaports. The heft of goods and disappeared containers provide them with another everyday problem. This has resulted in significant losses for port customers who utilise these facilities daily for business.

Recommendations

Based on the study's results, the following recommendations have been made:

i. The government should continue its concession strategy, but with a stronger focus on the adoption of automation technologies that will allow the use of information and communication technology to streamline port administration and operations.
ii. Even though the infrastructure development at the two ports has improved, there is still much to be done in terms of the road and rail infrastructure there. For instance, compared to the Apapa port, the Tin Can Island port requires greater investment in the building of infrastructure. This will make it simple to enter and exit the facilities.
iii. According to the study, statistical analysis has indicated that ship waiting times have decreased; it does not necessarily suggest that they can compete with ports in industrialised economies. This suggests that we are unable to compete with international best practices.

Therefore, it is advised that the government implement a strategy to purposefully reduce port congestion by diverting some of these enterprises to other ports.

iv. As is the case in other neighbouring countries of the West African region, such as Benin and Ghana, the number of MDAs and other security agencies, the patrol of ports for clearance and charges should be drastically reduced. This is based on the careful observation of what is happening in the ports.

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