

PORT CONCESSION AND ECONOMIC GROWTH IN NIGERIA

John Kolade Obamiro

Lagos State University, Nigeria

Olajide Idowu Okunbanjo

Lagos State University, Nigeria

Adeyemi Nurudeen Salau

Lagos State University, Nigeria

Received: December 27, 2025 Accepted: July 14, 2026 Online Published: January 1, 2027

Abstract

Every government in the globe wants to achieve economic growth irrespective of the environmental challenges. The Nigerian economy is faced with different macroeconomic issues that are connected to the exportation and importation through the ports. Thus, the study examined port concession and economic growth in Nigeria. Ex-post facto research design was employed. The study used secondary data collected from 1995 to 2005 and 2006 to 2024 on the variables of concern from National Bureau of Statistics (NBS) and Central Bank of Nigeria. The study made use of econometric techniques-Chow test. The findings showed port congestion variables (cargo throughput, gross registered tonnage, ship traffic volume) have significant effect on economic growth before the concession era. The findings also indicated that only cargo throughput has a significant effect on economic growth during the post concession era. The study concluded that cargo throughput is the most effective port operations that has a significant contribution to the Nigerian economic growth during the pre-concession and post concession. Thus, the study recommended there is a need for the provision of resources and policy formation for proper functioning of the port operations to enhance economic growth in Nigeria. The findings will be useful for the government and Nigeria Port Authority on how to improve the operations of the ports towards achieving its purpose of being privatised.

Keywords: Port concession; Cargo throughput; Gross registered tonnage; Ship traffic volume; Economic growth.

1. Introduction

One of the concerns of every government across the globe is to achieve economic growth. Government through its agencies make efforts to ensure the economy experiences growth which is reflected in the Gross Domestic Product (GDP). Therefore, economic growth is important because it represents the performance of a nation's economy. An economy does not exist in a vacuum; there are several sectors, industries (existing and new industries), businesses of different sizes among others that aid economic growth, which ports are parts of. Port is an element of foreign trading that enhances economic growth and its sustainability (Adegboye & Ogede, 2026; Adegboyega, Oladeji, Folorunso, & Olofin, 2024).

Ports serve as crucial channel in foreign trading chain in the globe (Kingdom, Mogbojuri & Ojo, 2021; Dugiel & Latoszek, 2018). According to Kingdom, Mogbojuri and Ojo (2021), port serve as a crucial channel in foreign trading chain in the globe. Ndikom (2006) asserted that ports represent the gateway for an economy to trade with others. Ports open the way for international trading and have a contribution in enhancing globalisation (Salisu & Raji, 2017). Njoku and Olisa (2021) pointed that ports embody clusters of activities which include cargo handling, cargo and logistics transfer product that facilitate importation and exportation. In the view of Kingdom (2017), ports are the businesses and principal channels for physical foreign trade. Port serves as a channel for the interaction of land and sea modes whereby a transition in the modes is effectively handled for continuous logistics of the cargoes across the shores of nations. This implies that Nigerian economy could be reached through the Ports.

The Nigerian ports commenced its operations in the 19th century. According to Osadume and Uzoma (2020), the arrival of the 21st century marked the reorganization of Nigerian ports. This led to the categorization of the port era into pre-concession era and post-concession era (Edih, Igemohia & Faghawari, 2022). The pre-concession era was the period Nigerian government has total control on the ownership and management of the ports through its agencies-Nigerian Port Authority (NPA) as well as the Federal Ministry of Transport. This era was not without its challenges which resulted in the port being concessioned (Ahmodu, Okeudo, Ejem & Declan, 2021). In the year 2006, the operations of Nigerian ports were concessioned by the Government while the ownership still rests on the government. Lawal, Nwolozi, Eleyi and Nwabueze (2021) stated that provision of electricity, marine service as well as facilities maintenance in the ports rest on the Nigerian government.

Omoke, Diugwu, Nwaogbe, Ibe and Ekpe (2015) expressed that port concession is the policy and/or measures to enhance port efficiency, effectiveness and productivity. This is because the ports will experience revitalisation and strengths in the operational and functional processes (Kingdom et al., 2021; Olukoju 2020; Benson, & Adekemi, 2018). Olomi and Chukwuemeka (2021) expressed that the concession of ports creates a friendly platform for port users, investors and port personnels. In the opinions of Abiodun (2021); Onwuegbuchunam (2018), stated that port concession creates ways for granting the private individuals the right to own and/or manage the ports activities wholly or partially.

According to Bousquet and Fayard (2015), private individuals were granted the right under the concession arrangement. The arrangement allows the building, funding, owning, improving, upgrading, and/or maintaining the ports to be done by private individuals. Abiodun (2021) pointed that the Nigerian government was seen not to have the technical competence on how to drive the port operations in a way that it will reflect significant

contribution in the growth of the economy and this led to granting the private sector the concessional right. According to Olufemi, Nkechi, Ejem and Dike (2021), the expectation, after the right has been granted a comprehensive solution to the challenges facing Nigerian ports, which could result in economic growth for Nigeria.

1.1 Statement of the Problem

Concession as an element of privatisation is believed to bring efficiency and effectiveness in the port operations. Salisu and Raji (2017) mentioned that ports concession is expected to improve productivity and fosters competitions among the six ports in Nigeria. Anagor (2014) is of the opinion that Nigeria ports operations have experienced improvement in several aspects such as cargo throughput, infrastructure, cargo handling equipment, reduction in vessels time wasting among others and this has boosted the confidence of importers. Isijola (2023) argued that concession of Nigerian ports has not been totally addressed and gave solutions to the abnormalities that pose as challenges in the ports' operations. This is reflected in the number of ships that wait to berth due to the long queue, large volume containers' loads as well as the waiting cargoes for evacuation. Also, the nature of the roads to access the ports seems not to be in good conditions and this leads to vehicular gridlock at the entrances of ports, and results in the congestion (Oyetundun, 2022; Mogbojuri, 2021; Ahmodu, et al., 2021).

Olufemi et al. (2021) narrated that the Nigerian ports still encounter high tariffs, cargo clearance delay, high operational costs among others which affect the operational efficiency and effectiveness of the ports. Onwuegbuchunam (2020) added that there are lots of unethical practices after port concession which is summed to be elements of corruption on the part of the port personnels. All these have made the port to experience loss of revenue or revenue linkages, capacity underutilization and poor international image. According to Njoku, Nwachukwu and Olisa (2021), the ports capacity has been overstretched leading to port congestion and high of cost cargo transportation. This results in low contributions of the ports to the growth of Nigerian economy (Isijiola, 2023; Onwuegbuchunam, 2020). Thus, there is an evident of instability in the Nigerian economic performance showing in the macroeconomic issues. This has made researchers to explore activities of the ports in solving economic problems

The studies of Umoh (2023); Isijiola (2023); Osadume, and University, (2020); Onyema, Obinna, Emenyonu and Emeghara (2015); Omoke et al (2015); Anyingang and Udoka (2012) reported an appropriate significant level of port activities since the concessions in Nigeria. However, Omoke et al (2018); Oghojafor et al (2012) asserted that the concession of Nigerian ports has not achieved its purposes. Relatively, Oyeduntan (2022) demonstrated mixed reactions among the activities of the Nigerian ports.

In line with the aforementioned, economic growth is a germane issue for Nigerian government and the activities of Nigerian ports cannot be shoved away in today's importation and exportation activities. Based on this, the study intends to investigate port concession and economic growth of Nigeria. The study captured cargo throughput, ship traffic volume and gross registered tonnage as they contribute to the Nigerian economic growth. which is lacking in most literature

2. Literature Review

2.1. Conceptual Review

2.1.1 Economic Growth

Economic growth could be seen as the improvement in the aggregate goods and services produced in an economy in a particular year. Ikpechukwu, Olowolagba and Olisa (2020) expressed economic growth as the increase in the per capita income of a nation. According to Asuquo, Emefiele, Olugbemi, and Ita (2020), economic growth is an increase in real gross domestic product (GDP) accruing over some time period. It could be ascertained via calculating the growth rate of economic activities quarterly (3-Month period) or yearly. Thus, economic growth implies the rise in the macro and micro economic activities in all aspects of an economy (Fasanaya, 2013). One of the crucial factors that can aid in achieving economic growth is international trade which ports is the instrument.

2.1.2 Port Concession

A port could be viewed as a platform that offer provision of services and facilities for the turnaround of ship. It is a means for loading and offloading of cargo from the ships. Oyewole (2019) expressed that ports serve as interfaces for different transportation modes. Ports are multifunctional markets where cargos are sorted and transported to the appropriate destinations. According to Enebeli and Njoku (2024), it is an on-shore location that contains harbors for ships to land and to convey cargo to their various destination. Ports are located in areas that will be easier to access land and to navigate the water for commercial purposes which signifies port operations.

In the opinion of Sampson (2020), the operations of ports are what the ports do which include handling of cargo, transport service for port passengers, cargo loading and unloading, haulage as well as warehousing services. Abiodun (2021) mentioned that port operations include dock space allocation, provision of port facilities, scheduling vessels arrival among others. The operations of the port determine its effectiveness and efficiency. This calls for its privatisation, hence, concession.

Concession is an arrangement that allows the government to grant private entities the right to funding, building, owning, upgrading, maintaining and/or operating the business ports (Abang & Ologunwa, 2023; Bousquet & Fayard, 2015). Oghojafor, Kuye and Alaneme, (2012) viewed concession as the agreement to lease the port terminals to private sector as well as the ports re-organization. Concession is an agreement as well as a policy that is meant to attract investors for the running of the Nigerian ports (Umoh, 2023). It is the outsourcing of ports to the private sector (Anagor, 2014).

Umoh (2023) asserted that concession of ports occurs when the public authorities are found to be ineffective and inefficient in the management of port operations. Concession could be partial and wholly. The agreements could either be a total ownership as well as the port management. However, when it is partial, it means the public authority(ies) is in charge of ownership and control while the private entities handle the operations of the ports. The partial concession is what is regarded as private sector participation (PSP) or Public private partnership (PPP). Port concession is a contract between the government and the private sector on the transfer of the right to operate the Nigerian ports to the private sector (Enebeli & Njoku, 2024; Anyaoha & Uangbaoje, 2018).

Isijiola (2023) pointed that concessions relieve the government from operational risks attached to port operations and maintain the ownership of the ports in Nigeria. Awam

(2014) stated that concession of port is an element of reform strategy for sound efficiency, effectiveness, improve management capability, relief in government financial burden, improvement in revenue generation among others. Thus, Isijiola (2023) asserted the cargo throughput, gross registered tonnage and ship turnaround, cargo handling among others are parts of the operations of Nigerian ports. In line with the objectives of the study, the study focuses on cargo through, gross registered tonnage and ship turnaround, as crucial measures for port operations in Nigeria.

Cargo Throughput: According to Isijiola (2023), cargo throughput is referred to as the quantity of goods or cargo that is handled at a terminal for a particular period of time which is one year. Obasi (2022) asserted that cargo throughput covers cargo output which provides the details on the volume of task that has been completed at a time or period of time.

Ship Traffic Volume: Ship traffic volume refers to the total number of vessels that pass through the ports in Nigeria. Monday, Emenike and Ibe (2021) pointed that ship traffic volume is reflected in the ship service time at birth and waiting time of the ship. Umoh (2023) expressed that the shorter the time for ship turnaround, the more advantageous it is for the operators of the ship.

Gross Registered Tonnage: This is the total internal volume of ships in Nigeria expressed in tons. Gross registered tonnage uses the total permanently enclosed capacity of the vessel as its basis for volume. It aids in ascertaining the fees to be paid for docking, canal transiting, and similar purposes which are dependent on the vessels size. The measurement of gross tonnage is based on the directives of the regulatory authority and the law of the land.

2.2. Theoretical Review

2.2.1. Property Right Theory

Grossman and Hart (1986) championed the theory of property rights and it was later expanded by Hart and Moore (1990). The theory proposes that the transfer of property rights from public to private investors is an investment that will result in better efficiencies and effectiveness (De Soto, 1993). The theory explains that the missing ingredient for the development of ports in a developing country like Nigeria is the transfer of property right of the ports in terms of ownership as well as management. Therefore, property right theory stresses on the concessional arrangement between the Nigerian government and private sector on the ports. The theory explains that concession as a form of privatisation gives an assurance that the investment will result in success and it is secured (Umoh, 2023). It is expected as pointed by the theory, that the government's roles must be clearly specified and centered on establishing the right as well as the protection of the right so that the private sector can work freely to make the ports more efficient and effective.

2.2.2. Principal Agent Theory

Principal-agent theory was expanded in the year 1987 by Sappington and Stiglitz. The concession of ports creates a platform for a principal-agent relationship when it is a partial

concessional arrangement (Cavaliere & Scabrosetti, 2008). Principal-agent theory covers a contractual relationship in which an individual or entity called the principal, gives another individual or entity called agent, the right to transact a specific business or administrative act on their behalf.

The principal-agent describes the role in standardising the behaviour of the government and ensuring proper exercise of the administrative power for efficiency and effectiveness purposes. In the case of concession, the private entity is the agent while the principal is the government. The government in Nigeria retains the ownership of the ports while the internal processes or operations of the ports are handled by the private sector on behalf of the government. The government entrusts the private sector to make some decisions on how the operations of the Nigerian ports will be conducted. This is what make principal-agent theory more relevant to the objectives of the study.

2.3. Empirical Review

Mbachu, Ndikom, Nze and Nwokedi (2024) evaluated post concession from the logistics angle. The secondary data revealed that Lagos has the highest days ship delay than other ports in Nigeria. The study did not capture pre concessional period and economic growth was not the problem variable. Abang and Ologunwa (2024) assessed the perception Nigerian ports users since the commencement of concession and reported that the infrastructure in the ports has been adequate and improved. However, the authors' only captured the operations of the port as understood by the users without seeing the economy of Nigeria is being affected. Relatively, Enebeli and Njoku (2024) appraised the legal aspect of port concession and its reforms and showed that there as improvement in cargo throughput and port infrastructure. This demonstrated that economic growth is not the problem variable of the study unlike the current study. It is evidenced that most these studies reviewed above did not focus on the performance of Nigeria economy as far as port concession is concerned.

Similarly, the study of Nwokedi, Ezemba, Nwolozi and Nwokodi (2020) investigated cargo throughput and Nigerian performance of seaports but the performance of Nigerian economy. The study focused on privatised ports- Apapa, Port-Harcourt, Onne, Warri and Calabar. The study used secondary data and arithmetic series modelling to conclude that there is an improvement in the performance of the privatised ports in Nigeria. However, recent developments were not captured in Nigerian ports.

Oyeduntan (2022) only focused on the cargo throughput in his study on cargo throughput and the maritime sector in Nigeria before and after the concession period from 1996 to 2016 and data were collected from primary source. The regression results showed that the gross domestic product of the Nigerian maritime sector is affected by the volume of cargo that comes in and out of the ports. Also, cargo throughput has a significant contribution to Nigerian GDP before and after concession. The data collected were not extended to the year 2022 which the current study intends to cover as well as other variables relating to port operation after the concession.

Monday et al (2021) studied the performance of cargo throughput in Nigeria and concluded that there is an improved cargo throughput in the Eastern Ports. Ucheh (2020) revealed that cargo management and efficiency of ports is positively and significantly related to cargo management in a Nigerian Southern region. Okeke (2022) used simple regression analysis to reveal port concession influenced super-infrastructure and ship turn-around time significantly and positively. Thus, these studies- Okeke (2022); Monday et al

(2021); Ucheh (2020) did not capture economic performance if the whole economy in Nigeria felt the impact of privatising the sea ports

In the study of Abiodun (2021) on concession of ports and development of labour in Nigeria. The descriptive statistics analysis indicated that the labour developmental level is low aftermath of ports concession. Secondary data were not adopted in these studies and the whole Nigerian ports were not covered; only a port of the 6 ports in Nigeria. How cargo handling equipment has been influencing the efficiency in cargo delivery in Nigerian ports was conducted by Okoroafor (2020). The regression results showed that cargo handling equipment determines the improvement the efficient delivery of cargo in Nigerian Ports. The study did not use port activities after they have been concessioned. The problem was not seen as economic growth

The Arithmetic progression model (APM) was used by Lawal et al (2021) on container trade growth of privatized seaports in Nigeria maritime industry. It was found that there is a significant increase in container throughput in the pattern of container shipments. The study was limited to secondary in 2019 and other important variables were not captured which the current extended to as well as the period. Similarly, the study of Aruwei and Eko-Raphaels (2022) employed autoregressive distance lag approach to examine congestion of port as it adds to the enhancement of the Nigerian economy. Findings showed that there is a positive but insignificant relationship between port congestion measures and real gross domestic product at the long run. However, there is negative but significant relationship in the short run. This is also similar to the findings of Ahmodu, Okeudo and Ejem (2021). Thus, a mixed result was arrived at and this demand conducting further study to clarify if similar or dissimilar results will be arrived at.

Using chi-square analysis to posit that there was a positive and significant relationship among port operations in the post-concession era, which implies that the level of port efficiency is affected by private ownership of seaport (Edih et al, 2022; Anyaoha & Uangbaoje, 2018; Irinyemi & Olorunfemi, 2018; Moses, Dotun & Matthew, 2017). These studies did not use secondary data which made their findings to be derived from subjective opinion of the respondents as economic performance was not part of the studies' focus.

Additionally, inferential statistics were not adopted in the study on cargo throughput and revenue of Lagos ports by Buhari, Ndikom and Nwokedi (2017) showed that there is a significant effect of cargo-throughput on port-revenue for a period 15 years. This study did not cover the recent happenings in the Nigerian ports as well as other components of port operation since the concessional period. Salisu and Raji (2017) analysed seaport productivity before and after the concession arrangement of the Nigerian ports using students' 't' test to reveal that the ports experienced positive changes in terms of performance in the infrastructural development and efficiencies after the concession periods than before concession periods. Despite focusing on the pre and post concession of the port, the study did not cover all the ports in Nigeria; economic performance was not captured and recent developments in the ports were not considered.

Omoke et al (2017) demonstrated mixed results between port operations and Nigerian gross domestic product. It was demonstrated gross registered tonnage of the vessels added positive value as well as significant value to the gross domestic product (GDP). Relatively, cargo throughput and vessel traffic have a direct influence on the GDP however, they do not determine paramount to the GDP. There is a need for further clarifications on the functional relationship between port operations and Nigerian economy. Osadume and

University (2020) also reported similar mixed results and this calls for further study which this current study intends to affirm.

Kingdom et al (2022) focused on Lagos port complex in studying reforms in Nigerian port and demonstrated that there is a strength of connectivity between port reform and cargo clearance. The study did not cover other ports in Nigeria and secondary data was not utilised. Njoku and Ibe (2021) examined how Nigeria ports has been performing since being concession. Using data analysis envelop, it was shown that a fluctuation existed in cargo movement during pre-concession but improvement in the cargo throughput and ship turnaround. However, the birth occupancy has not changed. Economic performance was not part of the objective to be achieved and secondary data was not used.

3. Methodology

The study utilised ex post-facto research design and this is based on the ground that the data for the study are already made by a constituted authority which makes hard to be manipulated. The variables for the study were repeatedly measured at regular intervals over a period of time. This research design has been used by Monday et al. (2021); Emeghara et al., (2018); Salisu and Raji (2017) among others. The period that the study covered were divided into-1995 to 2005 and the concessional period from 2006 to 2024. The study employed Chow test to ascertain existence of structural break before grouping the pre and post periods of the break. This test is appropriate to ascertain the statistical difference of the regression coefficients of the models between the pre-structural and post structural break. It aids to identify the significant change in the functional relationship between the dependent and independent variables.

The study collected data on the ship traffic volume, cargo throughput and gross registered tonnage as parts of the important operations of Nigerian port from the National Bureau of Statistics (NBS), Central Bank of Nigeria and from various journals. Thus, secondary source of data collection was adopted because the study was quantitative in nature. In order to achieve the objectives of this study, the study adapted the model of Nwaogbe et al (2016) on port management and economic growth.

The model for the study is therefore stated as:

$$GDP = f(CTP, STV, GRT) \dots\dots\dots(1)$$

$$GDP_{it} = \beta_0 + \sum_{i=1}^k \eta_i CTP_{it} + u_t \dots\dots\dots(2)$$

$$GDP_{it} = \beta_0 + \sum_{i=1}^k \eta_i STV_{it} + u_t \dots\dots\dots(3)$$

$$GDP_{it} = \beta_0 + \sum_{i=1}^k \eta_i GRT_{it} + u_t \dots\dots\dots(4)$$

$$GDP_{it} = \beta_0 + \sum_{i=1}^k \eta_i CTP_{it} + \sum_{i=0}^l \psi_{ij} STV_{it} + \sum_{i=0}^m \gamma_{ij} GRT_{it} + u_t \dots \dots \dots (5)$$

Where:

GDP= Gross Domestic Product;

CTP= Cargo Throughput;

STV= Ship Traffic Volume

GRT=Gross Registered Tonnage;

B₀ = the constant of the equation;

β₁- β₃ = the coefficient of the independent variable;

μ = the stochastic value.

The model specified for the study was estimated using econometric techniques. The unit root test was used to test the stationarity of the data in order to avoid spurious regression and Augmented Dickey Fuller (ADF) was employed to ascertain the unit root values of the variables if the data are stationary. The study made use of Chow test to indicate the structural break which is the concessional period. The study employed regression analysis that was split into two-pre-concession period and post concession period.

4. Results and Discussion

4.1. Test for Stationarity

Test for stationarity was conducted using the Augment Dickey-Fuller (ADF) test. The results are shown in the table below:

Table 1 – Summary of the Unit Root Test for the Variables

Variables	ADF	P-value	Critical Test Value	Order of Integration
RGDP	-3.9846	0.010	-3.0989	I(0)
Cargo Throughput	-6.0561	0.000	-3.0810	I(1)
Gross Registered Tonnage	-3.7877	0.012	-3.0810	I(1)
Ship Traffic Volume	-4.7754	0.006	-3.7912	I(1)

Source: Authors' Computation

Table 1 presented the results of the Augmented Dickey-Fuller (ADF) unit root test. The findings indicated that Real Gross Domestic Product (RGDP) is stationary at level, I(0), as the ADF statistic (-3.9846) exceeded the critical value (-3.0989) in absolute terms and the p-value (0.0104) is less than 0.05. Cargo Throughput and Gross Registered Tonnage were found to be non-stationary at level but became stationary after first difference, indicating that they are integrated of order one, I(1). The result for Ship Traffic Volume should be re-examined because the reported ADF statistic and p-value appear inconsistent. This implied that the variables exhibit a mixture of I(0) and I(1) orders of integration. Due to the objective of the study, real GDP was retained because it is suitable

for the estimation technique in achieving the objective of the study as well as the dependent variable.

4.2. Test of Hypotheses

Table 2 – Chow Test and Regression for CTP and GDP

	β	f-statistic	p-value	R^2
Chow Test		175.230	0.000	
CTP→GDP (Pre-structural Break)	1.389	107.642	0.000	0.923
CTP→GDP (Post-Structural Break)	8.373	28.620	0.001	0.627

Source: Authors' Computation

Table 2 showed the Chow test of the functional relationship between cargo throughput (CTP) and gross domestic product (GDP) as well as the effect of CTP on GDP before and after the existence of a structural break. The findings indicated that there is a structural break between cargo throughput and gross domestic product during the period the covered (pre and post structural break) as the $p=0.000$ which is less than 0.05 significant level with a stronger f-statistic value of 175.230. The assumption that there is no structural break is rejected. Based on the results of the chow test, it is important to conduct the influence before the structural break which is from 1999 to 2005 and the influence after the structural break which is from 2006 to 2024. This split is necessary so as to enhance the fitness of the model and reducing the error of specification as well as improving the explanatory power which is r-square (Chow, 1960). Therefore, the study further regressed the influence of cargo throughput on gross domestic product before and after the structural break.

It is revealed that cargo throughput ($\beta=1.389$; $p<0.05$) has a positive and significant effect on gross domestic product from 1995 to 2005 which marked the period before the structural break. This implies that an increase in the unit of cargo throughput leads to gross domestic product by 1.389. Also, the f-statistic value of 107.642 showed how strong the model is fit to achieve the objective of the study. The coefficient of determination R^2 signifies that 92.3% of the changes in the gross domestic product before the structural break is accounted by cargo throughput.

The findings further demonstrated that there is a significant influence of cargo throughput ($\beta=8.373$; $p<0.05$) on gross domestic product from 2006 to 2024 that signified the post structural break. It means that a change in the cargo throughput will push the gross domestic product to increase by 8.373. The f-statistic value of 28.620 is considerably large to show the fitness of the model in achieving the objective of the study. Also, the coefficient of determination R^2 showed that cargo throughput accounted for 62.7% of the variations that occur in the gross domestic product from 2006 to 2024 post structural break period.

Table 3 – Chow Test and Regression for GRT and GDP

	β	f-statistic	p-value	R^2
Chow Test		215.46	0.000	
GRT→GDP (Pre-structural Break)	2.626	65.41	0.000	0.879
GRT→GDP (Post-Structural Break)	0.388	0.283	0.602	0.016

Source: Authors' Computation

Table 3 showed the Chow test of the functional relationship between gross tonnage registered (GRT) and gross domestic product (GDP) before and after the structural break. The chow test revealed that there is a structural break between the gross registered tonnage and gross domestic product with f-statistic of 215.46 and p-value of 0.000 for the period under review; thereby, rejecting the assumption that there is no structural break. It is important to conduct the influence before the structural break which is from 1999 to 2005 and the influence after the structural break which is from 2006 to 2024. This split is necessary so as to enhance the fitness of the model and reducing the error of specification as well as improving the explanatory power which is r-square (Chow, 1960). This structural break demands the need for regression to be run to establish the influence of gross tonnage registered on gross domestic product before and after the structural break periods

The regression before the structural break demonstrated that gross tonnage registered ($\beta=2.626$; $p=0.000<0.05$) has a positive and significant effect on gross domestic product. This shows that a rise in the gross tonnage registered leads to a rise in the gross domestic product by 2.626. The f-statistic value of 65.412 showed that the model is fit for the study. The coefficient of determination R^2 indicated that gross registered tonnage accounted for 87.9% of the changes that occur in the gross domestic product from 1999-2005 that marked the pre-structural break.

It is further revealed that gross registered tonnage ($\beta=3.388$; $p=0.602>0.05$) has a positive but insignificant effect on gross domestic product for the post-structural break from 2006 to 2024. Yet, a unit change in gross tonnage registered still raises the gross domestic product by 0.388 but does not determine gross domestic product since the structural break. The f-statistic value 0.283 revealed that the model is fit for the conduct of this study. Also, the coefficient of determination R^2 showed that gross domestic product accounted for 62.7% variations that occurred in the gross domestic product from 2006 to 2024 post structural break period.

Table 4 – Chow Test and Regression for STV and GDP

	β	f-statistic	p-value	R^2
Chow Test		574.16	0.000	
STV→GDP (Pre-structural Break)	4.138	23.21	0.001	0.71
STV→GDP (Post-Structural Break)	-7.547	3.07	0.097	0.13

Source: Authors' Computation

Table 4 showed the chow test of the functional relationship between ship traffic volume (STV) before and after the structural break. The chow test revealed that there is a structural break between the ship traffic volume with f-statistic of 574.16 and p-value of 0.000 for the period under review; thereby, rejecting the assumption that there is no structural break. This structural break demands the need for regression to be run to establish the influence of ship traffic volume on gross domestic product before and after the structural break periods

The regression before the structural break demonstrated that ship traffic volume ($\beta=4.138$; $p=0.000<0.05$) has a positive and significant effect on gross domestic product. This shows that a rise in the ship traffic volume leads to a rise in the gross domestic product by 4.138. The f-statistic value of 23.21 showed that the model is fit for the study. The

coefficient of determination R^2 indicated that ship traffic volume accounts for 72.1% of the changes that occur in the gross domestic product from 1999-2005 which marked the pre-structural break.

It is further revealed that ship traffic volume ($\beta=-7.547$; $p=0.097>0.05$) has a negative and insignificant effect on gross domestic product for the post-structural break period from 2006 to 2024. A unit change in gross tonnage registered results in decline in the gross domestic product by -7.547. This negative influence predicts the gross domestic product after the structural break. The f-statistic value 3.07 revealed that the model is fairly fit for the conduct of this study. Also, the coefficient of determination R^2 showed that gross domestic product accounted for 15.3% variations that occurs in the gross domestic product from 2006 to 2024 post structural break period.

Table 5 – Chow Test and Regression for Port Concession and Economic Growth

	β	f-statistic	p-value	R^2
Chow Test		173.730	0.000	
Combined Effect (Pre-structural Break):		42.181	0.000	0.925
CTP→GDP (Pre-structural Break)	1.439		0.019	
GRT→GDP (Pre-structural Break)	0.970		0.281	
STV→GDP (Pre-structural Break)	-1.915		0.148	
Combined Effect (Post-structural Break):		8.536	0.001	0.631
CTP→GDP (Post-structural Break)	8.086		0.001	
GRT→GDP (Post-structural Break)	0.040		0.995	
STV→GDP (Post-Structural Break)	-1.210		0.733	

Source: Authors' Computation

Table 5 showed the chow test and the combined effect of port concession indicators on economic growth for the period of pre-structural break (1995 to 2005) and post-structural break (2006 to 2024). The findings revealed that chow test has f-statistic of 173.730 with p-value of 0.000 which signifies the existence of structural break from 1995 to 2024. Based on this, the findings of pre-structural break period from 1995 to 2006 showed that the port concession indicators (cargo throughput, gross tonnage registered and ship traffic volume) has f-statistic value of 42.181 which represents that the model is fit for the study and the port concession has a significant influence of the gross domestic product as the p value is < 0.05 . The multiple co-efficient of determination $Adj R^2$ showed that port concession indicators explain 92.5% of the changes that occur in the gross domestic product. This shows a high explanatory power. Cargo throughput ($\beta=1.439$; $p=0.019<0.05$) has a positive and significant influence on gross domestic product before the structural break when combined with others indicators. A unit change in cargo throughput results rises the gross domestic product by 1.439. Gross registered tonnage ($\beta=0.970$; $p=0.281>0.05$) has a positive but insignificant influence on gross domestic product when combined with other indicators before the structural break. A unit change in gross tonnage registered results an increase in the gross domestic product by 0.970. Ship traffic volume ($\beta=-1.915$; $p=0.148>0.05$) has a negative and insignificant influence on gross domestic product before the structural break when combined with other indicators. A unit change in ship traffic volume causes the gross domestic product to decline -1.915.

Similarly, the findings on the combined effect of port concession indicators on the gross domestic product indicated that cargo throughput, gross registered tonnage and ship traffic volume jointly explained the variations that occur in the gross domestic product by 63.1% after the structural break from 2006 to 2024. The f-statistic value of 8.536 revealed that the model is fit and the alternative hypothesis is accepted. Also, the joint effect revealed that cargo throughput ($\beta=8.086$; $p=0.001<0.05$) has a positive and significant influence on gross domestic product after the structural break. Gross registered tonnage ($\beta=0.040$; $p=0.995>0.05$) has a positive but insignificant effect on gross domestic product after the structural break period. However, ship traffic volume ($\beta=-1.210$; $p=0.733>0.05$) has a negative and insignificant influence on gross domestic product when combined with others indicators after the structural break period.

4.3. Diagnostic Test

The study conducted post estimation test for the variables and post-structural break period from 2006 to 2024 was focused because that was the beginning of port concession in Nigeria which is the objective of the current study. The diagnostic test conducted are Breusch-Godfrey Serial Correlation LM Test, Breusch-Pagan-Godfrey Heteroskedasticity Test, and Ramsey RESET Specification Test.

Table 6 – Diagnostic Test for CTP and GDP

	F-statistic	Obs*R-squared
Serial Correlation Test	0.3354(0.720)	0.8134(0.666)
Heteroskedasticity Test	1.9802(0.218)	2.5674 (0.110)
Ramsey Test	0.0237(0.880)	

Source: Authors' Computation

Table 6 showed the diagnostic test for cargo throughput (CTP) and gross domestic product (GDP) after the structural break period (2006-2024) using Breusch-Godfrey for the serial correlation, Breusch-Pagan Godfrey for heteroskedasticity and Ramsey test.

The serial correlation results revealed the f-statistic value of 0.3354 with p-value of 0.720 which is greater than 0.05% significance level. The Obs*R-squared has a serial correlation value of 0.8134 with 0.666 as the p-value greater 0.05 level of significance. These implied that there is no serial correlation among the residuals of the model. There is independent distribution of the error terms over time which imply absence of autocorrelation and unbiased standard errors and estimated coefficients

The heteroskedasticity was tested using Breusch-Pagan-Godfrey. The findings showed that the f-statistic a p-value of 0.218), and Obs*R-squared has a p-value of 0.110, which are both greater than the 0.05 significance level. Thus, there is absence of heteroskedaticity. The result implies that the variance of the error terms is constant and the model does not suffer from heteroskedasticity problem. The Ramsey test was conducted to show appropriate specification of the model. It is shown that p-value for the F-statistic is 0.880, which is greater than the 0.05 significance level. This implies that there is correctness in the model specification and no element of functional form misspecification.

Table 7 – Diagnostic Test for GRT and GDP

	F-statistic	Obs*R-squared
Serial Correlation Test	0.2875 (0.754)	0.7014(0.704)
Heteroskedasticity Test	1.3735(0.212)	2.3541 (0.178)
Ramsey Test	0.8764(0.449)	

Source: Authors' Computation

Table 7 showed the diagnostic test for gross registered tonnage (GRT) and gross domestic product (GDP) after the structural break period (2006-2024) using Breusch-Godfrey for the serial correlation, Breusch-Pagan Godfrey for heteroskedasticity and Ramsey test.

The serial correlation results revealed the f-statistic value of 0.2875 with p-value of 0.754 which is greater than 0.05% significance level. The Obs*R-squared has a serial correlation value of 0.7014 with 0.704 as the p-value greater 0.05 level of significance. These results implied that there is no serial correlation among the residuals of the model. There is independent distribution of the error terms over time which imply absence of autocorrelation and unbiased standard errors and estimated coefficients

The heteroskedasticity was tested using Breusch-Pagan-Godfrey. The findings showed that the f-statistic has a p-value of 0.212, and Obs*R-squared has a p-value of 0.178, which are both greater than the 0.05 significance level. Thus, there is absence of heteroskedasticity. The result implies that the variance of the error terms is constant and the model does not suffer from heteroskedasticity problem. The Ramsey test was conducted to show appropriate specification of the model. It is shown that p-value for the F-statistic is 0.449, which is greater than the 0.05 significance level. This implies that there is correctness in the model specification and no element of functional form misspecification. These post estimation results show that there is no violation of regression assumption in the model

Table 8 – Diagnostic Test for STV and GDP

	F-statistic	Obs*R-squared
Serial Correlation Test	0.1419 (0.869)	0.3529(0.592)
Heteroskedasticity Test	0.2615(0.616)	0.2878 (0.178)
Ramsey Test	2.064785 (0.170)	

Source: Authors' Computation

The diagnostic tests conducted on the regression model between Ship Traffic Volume (STV) and Gross Domestic Product (GDP) were carried out to ascertain the validity and reliability of the estimated model in table 8. The Serial Correlation test revealed p-values of 0.869 for the F-statistic and 0.592 for the Obs*R-squared, which are greater than the 0.05 significance level. Thus, absence of serial correlation in the model. The heteroskedasticity test showed p-values of 0.616 for the F-statistic and 0.178 for the Obs*R-squared which both greater than the 0.05 significance level. This indicated that the variance of the error terms remains constant across observations, therefore, no presence heteroskedasticity model.

Similarly, the Ramsey test showed f-statistic p-value of 0.170, which is greater than the 0.05 threshold. This result confirms that the model is correctly specified and does not

suffer from omitted variable bias or incorrect functional form. These results indicated that regression assumptions were not violated.

Table 9 – Diagnostic Test for Port Concession and Economic Growth

	F-statistic	Obs*R-squared
Serial Correlation Test	0.3116(0.738)	0.8691(0.648)
Heteroskedasticity Test	2.7570(0.079)	6.7529 (0.080)
Ramsey Test	2.2722(0.154)	

Source: Authors' Computation

Table 9 showed the diagnostic tests conducted on the regression model for the combined effect of port concession (cargo throughput, gross registered tonnage and ship traffic volume) indicators on Gross Domestic Product (GDP). The serial correlation test showed that f-statistic has a p-value of 0.738 and Obs*R-squared has a p-value of 0.648; both p-values are greater than the 0.05 level of significance. This means that no serial correlation in the model. The heteroskedasticity test revealed p-value of 0.079 for the F-statistic and 0.080 for the Obs*R-squared indicating there is no heteroskedasticity which shows that the variance of the error terms is constant and the model does not suffer from heteroskedasticity problem. Also, the ramsey test showed that f-statistic p-value of 0.154 greater than 0.05 significant level indicating that the model does not suffer from omitted variable bias. These results demonstrated that the model is statistically appropriate for inference.

4.4. Discussion of Findings

The findings showed concession of Nigerian ports is an important predictor to the growth of the economy. It is revealed that port concession indicators (cargo throughput, gross registered tonnage and ship traffic volume) significantly influenced Nigeria's economic growth with different magnitude and direction. The results showed that different relationship and influence existed between the components of port concession and gross domestic product of Nigeria during the pre-concession (pre-structural break from 1995 to 2005) and post concessional (2006 to 2024). As indicated by the Chow test, there is an existence of structural break which is because of the privatisation of the Nigerian ports that occurred in the year 2006 and results in the division of the study into pre-concession and post-concession eras. This suggests that the introduction of port concession brought significant changes in the operational dynamics of the Nigerian maritime industry and its contribution to economic growth.

The findings on cargo throughput showed a positive and significant influence on the gross domestic product at both before and after the structural break. The effect is much stronger in the post-structural break period than the pre-structural break period. The findings demonstrated that more volume of goods are being handled in Nigerian seaports which slightly aids in the economic growth in the country This is shown in the sharp increase in the coefficient values from pre-concession to post concession. This implies that concession of ports in Nigeria experience significant improvement in the areas of cargo. It shows that the amount of goods handled, the rate and volume at which goods are moved in the Nigerian ports have increased from the period of concession to 2024 thereby

contributing more effectively to economic growth after the reforms. The findings aligned with the studies of Mbachu et al (2024) who found high frequency of cargo handling after concession; Abang and Ologunwa (2024) confirmed that expansion of the port infrastructure since concession aids in handling large cargo. The studies of Enebeli and Njoku (2024); Oyeduntan (2022); Monday et al (2021) Nwokedi et al (2020); Okoroafor (2020). However, the studies of Aruwei and Eko-Raphaels (2022); Ahmodu, Okeudo and Ejem (2021) demonstrated contrary results of influence of cargo throughput on the gross domestic product.

The findings on gross registered tonnage revealed that GRT had a positive and significant effect on GDP before the structural break but became positive and insignificant after the structural break. This outcome suggests that vessel registration activities and vessel capacities in Nigerian contributed meaningfully to economic growth during the pre-concession era, but their contribution weakened considerably after the port reforms. The insignificant post-concession effect could be attributed to reduced emphasis on local vessel registration, weak maritime policies, inadequate indigenous shipping participation, or the dominance of foreign vessels in Nigerian maritime trade.

The findings do not correspond with previous studies that capture gross registered tonnage of Nigerian ports. These findings include Lawal et al (2021); Anyaoha and Uangbaoje (2018); Irinyemi and Olorunfemi (2018); Igbodo (2018); Olaogbebikan et al (2014) among others. However, the findings of Emeghara et al. (2018); Salisu and Raji (2017); Ogbojafor et al (2012) are in line with the position that gross registered tonnage has no significant contribution to Nigerian economy.

Ship traffic volume is reflected in the ship service time at birth and waiting time of the ship. The result for ship traffic volume showed a positive and significant effect on GDP before the structural break, but a negative and insignificant relationship after the structural break. It is revealed that ship service time and waiting time are well managed before the change in policy of ownership. This finding indicates that prior to the reforms, increases in ship traffic volume contributed positively to economic activities and GDP growth. However, after the structural break, the relationship became weak and negative, suggesting that increased ship traffic did not translate into proportional economic gains in the post-concession era. This may be due to port congestion, inefficiencies in logistics management, inadequate intermodal transportation systems, delays in cargo clearance, or the inability of port infrastructure to effectively accommodate increasing vessel traffic. The negative coefficient further implies that growth in ship traffic volume alone does not guarantee economic growth unless accompanied by efficient port operations, cargo evacuation systems, and supportive maritime infrastructure. The findings for the post structural break align with the studies of Aruwei and Eko-Raphaels (2022) Ahmodu et al. (2021). However, the findings of Okeke (2022); Lawal et al (2021); Omoke et al (2017) are contrary to the current study findings

The combined regression findings demonstrated that port concession indicators jointly exerted a significant influence on GDP both before and after the structural break. The explanatory power of the model remained high in both periods, although it experienced a sharp decline in after the structural break. This decline may suggest that other macroeconomic variables outside port activities increasingly influenced economic growth during the post-concession era. Nonetheless, cargo throughput remained the only consistently significant predictor of GDP when all indicators were combined. This

reinforces the strategic importance of cargo movement and port operational efficiency in driving economic performance in Nigeria.

The findings further imply that port concession reforms achieved partial success in improving the contribution of the maritime sector to economic growth. Specifically, the reforms significantly enhanced cargo throughput performance, which translated into increased GDP growth. However, the reforms did not significantly improve the contributions of gross registered tonnage and ship traffic volume to economic growth. This suggests that despite improvements in port operations, structural challenges such as inadequate maritime policies, poor shipping development strategies, infrastructural deficiencies, and weak integration between port operations and the broader economy still persist. The findings corroborate with the studies of Abang and Ologunwa (2024); Enebeli and Njoku (2024); Okeke (2022); Aruwei and Eko-Raphaels (2022); Njoku and Ibe (2021); Ahmodu et al (2021). However, the findings disagree with the studies of Mbachu et al. (2024); Abiodun (2021) among others.

The findings do not strictly align with the assumptions of property right theory. The assumptions of property right theory that public properties are transferred to private ownership for the purpose of achieving efficiencies and effectiveness. The findings show that only cargo throughput is efficient since the ports have been concessioned and also, before the concession. Gross registered tonnage and ship traffic volume were only efficient before the concession unlike after the concession. Therefore, the theory believes the operations of the Nigerian ports should experience improvement since taking by the private but the reverse is partially the case in contributing to the economic growth.

5. Conclusion and Recommendations

The study investigated port concession and economic growth in Nigeria. It was established the structural break represent the concession period, necessitating separate regression estimation for the periods before after the concession. The findings showed that there are mixed reactions of the port operations on the growth of Nigerian economy before and after concession. The individual effect of the variables showed that

Before the concession of the port, all the indicators-cargo throughput, gross registered tonnage and ship traffic volume have a significant influence on the growth of the Nigerian economy. It is only cargo throughput that has both a positive and significant effect on gross domestic product when combined with other indicators (gross registered tonnage and ship traffic volume). After the concession, cargo throughput has a significant influence on gross domestic product while gross registered tonnage and ship traffic volume do not have significant effect. Therefore, the study concluded that port operation is highly effective to achieve economic growth during the pre-concession era than post concessional era.

Based on the aforementioned, the study recommended that:

- i. The Nigerian Port Authority (NPA) should provide necessary supports in terms of resources that will facilitate more cargo throughput to enhance trade activities and economic growth. This implies the NPA should prioritise cargo throughput policies and investment
- ii. The management of the NPA needs to formulate policies that will make the gross registered tonnage to be effective and efficient towards influencing the economic growth. This could be done through improvement of the port infrastructure such as

the channel depth, 21st century berthing facilities to contain and attract larger vessel operations.

- iii. The management of the NPA needs to address the operational inefficiencies that is reflected in the ship traffic volume which affect its input in the Nigerian economy after port concession. There is a need to create a platform such as improving the turnaround time of the vessels, waiting line reduction as well as the adoption of digitalization approaches in reducing traffic volume that will ensure free flow of ships in the port.
- iv. There is a need for the government and management of the Nigerian ports to engage in periodically review and evaluate of the agreement and policies of port concession policies to meet current challenges for effective functioning of the port to result in economic growth.

6. Implications of the Study

The findings of the study will have implications for the Nigerian Port Authority (NPA), the government, prospective researcher(s), and the public. The findings will enable the management of the Nigerian Port Authority to ascertain the results of their policies on the operations of the port since being concessioned. It will help the management of NPA to adjust and readjust its policies and its effective implementation. The study will enlighten the users of the Nigerian Port Authority (NPA) on the performance of the ports after concession. The government will benefit from the findings of the study. It will help the government to be aware of how the concession of the ports is improving the activities and operations of the ports. It will help the government to have an insight into the performance of the port activities since it has been privatised. It could also help the revenue to generate more revenue through the port activities. The findings of the study will be useful to prospective researchers. It will serve as a platform for further or future studies to be built on the concept and practices of port activities in Nigeria and outside Nigeria. Finally, the study will educate the members of the public on the performance of Nigerians since the government concessioned the ports.

The study is constraint with the availability of data to the year 2025. As the time of carrying out this study, 2025 data were not available since the democratic change in government. However, the study suggested that further researchers on the subject matter should extend the period to cover 2025. Also, corruption index, and/or institutional quality as control variables could be employed by future studies on the subject matter. Primary data could employ to seek the opinions of Nigerian ports users on the activities of the ports since the concession period. A comparative analysis could be done by future studies on pre and post concession of seaports in Nigeria.

Acknowledgements

This research study was funded by TETFUND Institution-Based Research Fund and this is appreciated by the authors.

References

1. Abang, O., & Ologunwa O. P. (2023). Post concession and users' perceptions of seaports in Nigeria. *International Journal of Research and Innovation in Social Science*, 7(12), 45-62 <https://dx.doi.org/10.47772/IJRISS.2023.7012045>.
2. Abiodun, S. (2021). Concession of Ports and Its Impacts on Labour Development. *International Journal of Research Publication and Reviews*, 2(7), 1895-1902.
3. Adegboyega, S.B., & Ogede, J.S. (2026). Levelraging on sustainable economic development: Do financial inflows matters. *International Journal of Economic Behaviour*, 16, 79-99.
4. Adegboyega, S.B., Oladeji, S.I., Folorunso, B.A., & Olofin, O.P. (2024). New insight from cross-sectional autoregressive distribution lag on the interconnectedness among financial development, financial inflows and economic growth in Sub-Sahara Africa. *International Journal of Economic Behaviour*, 14, 95-114.
5. Ahmodu, K. O., Okeudo, G.N., Ejem, E.A., & Declan, D.N. (2021) Development of port infrastructure and service quality in Nigerian Ports. *Journal of Research in Humanities and Social Science*, 9(6) 25-32
6. Anagor, U., *The gains and challenges of port concession in Nigeria*, in *BusinessDay*. 2014: Lagos, Nigeria.
7. Anyaoha, O., & Uangbaoje, A.A. (2018). Port concession and efficiency in Nigeria: A study of Calabar Port. *Researchjournali's Journal of Sociology*, 6(10), 1-7.
8. Aponjolosun, M.O., Ojo D., & Sam, M.W. (2019). Post effects evaluation of port concession on dockworkers in Nigeria. *Journal of Humanities and Social Science*, 22(7), 53-58
9. Aruwei, P., & Melvin U. Eko-Raphaels 2022). Impact of port congestion on Nigeria Economic Growth: An ARDL Approach. *International Journal of Innovative Finance and Economics Research* 10(1), 29-35.
10. Asuquo E., Emefiele C., Olugbemi K. O., & Ita R. I. (2020). Money supply, inflation and economic growth in Nigeria. *International Journal of Banking and Finance Research*, 6(2), 40-51.
11. Awam, I. (2024). *Analysis of the impact of concession on port operations: A focus on Nigerian seaports*. M.Sc Transport Management, Federal University of Technology, Owerri.
12. Benson, I.A., & Adekemi, O.D. (2018). The roles of private ports operators on economic development in Nigeria; case study of Apapa Bulk Terminal", *Direct Research Journal of Social Science and Educational Studies*, 5(3), 16-22.
13. Bousquet, F., & Fayard, A. (2015). *Road infrastructure concession practice in Europe: A report based on document on analysis of highway concessions in Europe*. Available from: www.rru.worldbank.org/documents/toolkits/highways/pdf/25.pdf.
14. Buhari, S.O., Ndikom, O.B., Nwokedi, T.C. (2017). An assessment of the relationship among cargo-throughput, vessel turnaround time and port-revenue in Nigeria. (A study of Lagos port complex). *Journal of Advance Research in Business, Management and Accounting*, 3(7), 63-74.
15. Cavaliere, A., & Scabrosetti, S. (2008). Privatization and efficiency: From principals and agents to political economy. *Journal of Economic Surveys*, 22(4), 685 710.
16. Chow, G. C. (1960). Tests of equality between sets of coefficients in two linear regressions. *Econometrica*, 28(3), 591–605.
17. De Soto, H. (1993). The missing ingredient. *The Economist*, 328(7828), 8-10.

18. Dugiel, W., & Latoszek, E. (2018). Electronic trade in the world organization-difficulties in negotiating an agreement. *International Journal of Economic Behavior*, 8(1), 133-143.
19. Edih, U., Igemohia, F. & Faghawari, N. (2022). The effect of optimal port operations on global maritime transportation: a study of selected ports in Nigeria. *Journal of Money and Business*, 2(2), 173-185.
20. Enebeli, V.N., Njoku, D.C. (2024). A legal appraisal of port concession and impact of port reforms in Nigeria. *Journal of Research in Humanities and Social Science*, 12(2), 06-24.
21. Ikpechukwu N., Olowolagba L.y., & Olisa, B. S. (2020). Appraisal of shipping trade influence on economic growth in Nigeria. *Civil and Environmental Research*, 12(1), 29-38.
22. Irinyemi, A.B., & Olorunfemi, D.A. (2018). Ports and its impact on the development of cargo movement in Nigeria. *African Journal of Economics and Sustainable Development* 2(3), 36-44.
23. Isijiola, A.M. (2023). *Port operations and economic growth in Nigeria: Empirical analysis from post concession*. DBA Thesis, Lagos State University, Ojo.
24. Kingdom, B. (2017). Assessment of seaports post-concession infrastructure maintenance and development in Nigeria. *The International Journal of Management*, 6(3) 11-17.
25. Kingdom, B., Mogbojuri, O., & Ojo, O.G.(). Impact of reforms on port performance in Lagos port complex, Nigeria. *Journal of Scientific and Industrial Research*, 5(2), 50-66.
26. Lawal, L.A., Nwolozi, C.N., Eleyi, E., & Nwabueze, E. (2021) Assessment of container trade growth of privatized seaports and improved terminal operations in Nigeria maritime industry. *Journal of Emerging Technologies and Innovative Research*, 5, 615-635.
27. Mbachu, J.C.; Ndikom, O.B.; Nze, I.C., & Nwokedi, T.C (2024). Evaluation of logistics performance of Nigerian ports in the post privatisation regime. *Greener Journal of Business and Management Studies*, 12(1), 38-52.
28. Monday E. I., Ibe C.C., & Emenike G.C (2021). Cargo throughput performance in Eastern Nigerian Ports. *World Journal of Innovative Research*, 10(6), 09-12.
29. Ndikom, O. (2006). *The essentials of the Port Reforms: The Nigerian Experience*. Lagos: Bumico Publishers.
30. Njoku, I., & Ibe, C. (2021). The impact of concession regime on the performance of Nigerian seaports. *International Journal of Scientific Research in Multidisciplinary Studies*, 7(10), 34-49.
31. Njoku, I., Nwachukwu, T.C., & Olisa, B.S. (2021). Port infrastructural development and the Nigerian economy. *International Journal of Scientific Research*, 7(11), 01-12.
32. Nwaogbe O.R., Diugwu, I.A., Muhammed, M., Omoke, V., & Gidado S.U (2016): Project infrastructure management and economic growth: the impact of seaport concessioning on Nigeria's economic growth (a focus on Delta port). *International Journal of Business and Applied Social Science*, 2(4), 25-36.
33. Nwokedi, T.C., Ezembu, C., Nwolozi, A., & Nwokedi, C. (2020). Determining benchmarks for cargo throughput performances of privatized seaports in Nigeria *Macro Management & Public Policies*, 2(1), 6-16
34. Obasi, C.C. (2022). Assessment of the impact of cargo throughput on port productivity in Warri Seaport, Delta State, Nigeria. *Annal Review Research*, 7(3), 55-71. <https://doi.org/10.19080/arr.2022.07.555714>.

35. Oghojafor B. E. A., Kuye O. L., & Alaneme G. C. (2012). Concession as a strategic tool for ports efficiency: An assessment of the Nigerian Ports. *American Journal of Business and Management*, 1(4), 214-222.
36. Okeke, A. F. (2022); Port concession and ship turnaround time in Nigerian ports. *International Economic and Business Management*, 3(3) 42-49.
37. Okoroafor, P.U. (2020). Cargo handling equipment and efficient cargo delivery in Nigerian ports. *International Journal of Business & Entrepreneurship Research*, 13(2), 26-42.
38. Olomi, P. O., & Chukwuemeka, E.,(). Port Privatization and Performance in Nigerian seaports in Rivers State, Nigeria. *Journal of Strategic and Internet Business*, 6, 1994-2004.
39. Olufemi, A.K., Nkechi, O.G., Ejem, A E., & Dike, D.N. (2021). Development of port infrastructure and service quality in Nigerian Ports. *Journal of Research in Humanities and Social Science* ,9(6), 25-32.
40. Olukoju, A. (2020). African seaports and development in historical perspective. *International Journal of Maritime History*, 32(1), 185–200.
41. Omoke, V., Diugwu, I.A., Nwaogbe, O.R., Ibe, C.C., & Ekpe, D.A. (2015). Infrastructure financing and management: The impact of concession on the operations and performance of Nigerian Seaports. *Journal of Behavioural Economics, Finance, Entrepreneurship, Accounting and Transport*, 3(2), 65-70.
42. Omoke, V., Aturu, A.C., Nwaogbe, O.R., Ajiboye, A.O., & Diugwu, I. (2018). *Analysis of the impact of port operations on Nigeria economy: A focus on Apapa Seaport*. Availableat: <http://repository.futmina.edu.ng:8080/jspui/handle/123456789/7641>.
43. Onwuegbuchunam, D. E. (2018). Assessing port governance, devolution and terminal performance in Nigeria. *Logistics*, 2(6), 53-61.
44. Osadume, R.C., & Edih, U.O. (2020). Port revenue performance and economic: the Nigerian Ports Authority experience, 2010-2019. *Logi- Scientific Journal of Transport and Logistics*, 11(2), 1-11.
45. Osadume, R.C., & Uzoma, E.O. (2020). Port revenue performance and economic: the Nigerian Ports Authority experience, 2010-2019. *Scientific Journal of Transport and Logistics*, 11(2), 1-11.
46. Oyeduntan, K.P. (2022). Cargo throughput and Nigeria maritime GDP in the pre-concession and post-concession era. *International Journal of Research in Commerce and Management Studies*, 4(2): 62-76.
47. Oyewole, F.O. (2021). Technology adoption and performance of Nigerian ports. *Journal of Strategic and Internet Business*, 4(2), 714-746.
48. Salisu, U.O., & Raji, B.A. (2017). Analysis of seaports productivity in pre and post concession periods in Nigeria: A study of Apapa Port. *Transport & Logistics: the International Journal*, 17(42), 62-71.
49. Sampson, O. J. (2020). Cargo insurance services and sea port operational efficiency in Nigeria. *International Journal of Business & Entrepreneurship Research*, 13(2), 52-71.
50. Sappington, D., & Stiglitz, J.E. (1987). *Information and regulation*. In public regulation: New Perspectives on Institutions and Policies, ed. E. Bailey, Cambridge, Mass.: MIT Press.

51. Ucheh, M. D. (2020). The effect of cargo management on efficiency of ports in South-South Geo-political Zone of Nigeria. *International Journal of Management Sciences*, 8(1), 191–106.
52. Umoh G. T. (2023). Port reforms and concession: A study of Apapa and Tin Can Island seaports. *Journal of Administration and Corporate Governance*, 3(3), 160-176. <https://doi.org/10.61090/aksujacog.2023.026>.