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AN ASSESSMENT OF THE INFLUENCE OF EXTERNAL SECTOR DYNAMICS ON MARITIME SECTOR PERFORMANCE IN NIGERIA (1995 – 2023)

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Abstract

This study examines the impact of external sector dynamics on maritime sector performance in Nigeria from 1995 to 2023. Anchored in the Balance of Payments (BOP) Theory, the research employs a multiple regression model using OLS to analyze the influence of key external factors, including trade integration, oil price fluctuations and external debt on maritime transport contribution to GDP (MPI). Secondary data from the Central Bank of Nigeria (CBN), the World Bank, and the Nigerian Ports Authority (NPA) form the basis of the analysis. The findings reveal that trade integration exerts a statistically significant positive effect on maritime sector performance, with a coefficient of 823.6140 and a p-value of 0.0000, indicating that increased international trade enhances port operations and shipping activities. Conversely, oil price fluctuations negatively impact the sector, with a coefficient of -1.360770 ($p = 0.0490$), reflecting the rising operational costs associated with higher fuel prices. External debt also exhibits a negative and statistically significant relationship with MPI, suggesting that excessive borrowing may constrain government investment in maritime infrastructure. The study concludes that external sector factors play a critical role in shaping Nigeria's maritime industry, with trade integration emerging as a key driver of growth, while oil price volatility and external debt present notable challenges. Based on these findings, the study recommends policy measures to strengthen trade integration, explore alternative energy sources for maritime operations, and adopt sustainable debt management strategies to foster a resilient and efficient maritime sector.

Keywords: External Sector, Maritime Performance, Trade Integration, Oil Price, External Debt.

1.0 INTRODUCTION

It is a well-known fact that more than 90% of international trade relies on maritime transport, and the economic prosperity of nations is strongly inclined on the performance of maritime trade in the global marketplace (Oyeduntan, 2022). This underscores the importance of the maritime sector in facilitating global trade (Osadume and University, 2020). The Nigerian maritime sector encompasses a diverse array of activities, including shipping, port operations, offshore oil and gas exploration, fisheries, and maritime tourism. However, this study will focus on maritime transport (Seifegha, Ndalu and Okene, 2022).

Obviously, due to globalization, the performance of the maritime sector is intricately linked to the dynamics of the external sector, which encompasses (foreign trade dynamics e.g trade openness, global economic trends e.g oil price fluctuation, exchange rate volatility external debt and foreign direct investment (FDI)) which can significantly impact the efficiency, competitiveness, and contribution to it's economic growth (Okene, 2024) and Akpan (2023). Among these variables, trade openness, which indicates extent to which a country integrates into the global economy through trade plays a crucial role in determining the free flow of exports and imports, has a profound effect on the maritime sector in Nigeria. Rodrigue and Notteboom (2013) argue that increase in trade openness drives demand for shipping services, port operations, and logistics which directly influences maritime transport volumes, necessitating efficient port infrastructure and shipping networks.

Also, high levels of external debt can lead to increased debt servicing obligations, diverting resources away from essential sectors such as infrastructure development and maintenance in the maritime sector. Furthermore, oil prices constitute a significant external sector variable with profound implications for Nigeria's economy. Moreover, oil price movements influence investment decisions in the energy sector, which in turn affect demand for maritime transport services, particularly for the shipment of crude oil and petroleum products.

Despite the growing body of literature on Nigeria's maritime sector, few studies have explored the nexus between external sector variables and maritime transport in Nigeria. For instance, Okene, Ibenta and Nwanna, (2023) examined the impact of exchange rate volatility on shipping trade

performance, highlighting the importance of exchange rate stability for sustaining maritime trade flows. Similarly, Osadume and Edih, (2021) investigated the relationship between external debt dynamics and the Nigerian transport sector. Additionally, Akpan (2022) analyzed the effects of fuel price fluctuations on shipping industry performance in Nigeria. While these studies have provided valuable understanding into specific aspects of the relationship between external sector variables and maritime transport, there remains a need for comprehensive research that integrates multiple external factors and assesses their collective impact on the Nigeria's maritime industry. Against this backdrop, this study seeks to address the gap in existing literature by examining the holistic impact of external sector variables (trade openness, external debt dynamics, and oil prices) on maritime sector performance in Nigeria.

Statement of the Problem

The maritime sector is very imperative to Nigeria's economic growth and development, it serves as a major gateway for international trade and commerce. This study will focus on the effects external sector dynamics like (foreign trade dynamics – such trade openness and global economic trends – such as oil price fluctuation) on the maritime transport. It is a well-known fact that more than 90% of international trade relies on maritime transport, and the economic prosperity of nations is strongly inclined on the performance of maritime trade in the global marketplace (Oyeduntan, 2022). Despite its strategic importance, the Nigerian maritime transport sector faces numerous challenges that hinder its optimal performance. These challenges range from infrastructural deficiencies and operational inefficiencies to regulatory bottlenecks and external economic shocks. Among the external factors that significantly affect maritime transport in Nigeria are trade openness, fluctuations in oil prices, escalating and external debt burdens.

Trade openness drives demand for shipping services, port operations, and logistics which directly influences maritime transport volumes, necessitating efficient port infrastructure and shipping networks. Exchange rate fluctuations can affect the cost of imports and exports, influencing the competitiveness of Nigerian goods in the international market. Additionally, external debt levels can impact government spending and investment in infrastructure, including maritime transport facilities. Furthermore, Nigeria's heavy reliance on oil exports makes the economy vulnerable to

fluctuations in global oil prices, which can have ripple effects on various sectors, including maritime transport.

Given the critical role of maritime transport in Nigeria's economy and the significance of external sector variables in shaping macroeconomic conditions, there is a compelling need to investigate the relationship between these factors. Several studies have explored the nexus between external sector variables and maritime transport in Nigeria, albeit with varying emphases and methodologies. For instance, Okene, Ibenta and Nwanna, 2023 examined the impact of exchange rate volatility on shipping trade performance, highlighting the importance of exchange rate stability for sustaining maritime trade flows. Similarly, Osadume and Edih, 2021; investigated the relationship between external debt dynamics and the Nigerian transport sector. Additionally, Akpan, 2022 analyzed the effects of fuel price fluctuations on shipping industry performance in Nigeria, underscoring the interconnectedness between energy markets and maritime logistics.

While these studies have provided valuable insights into specific aspects of the relationship between external sector variables and maritime transport, there remains a need for comprehensive research that integrates multiple external factors and assesses their collective impact on the Nigeria's maritime industry. Against this backdrop, this study seeks to address the gap in existing literature by examining the holistic impact of external sector variables like (foreign trade dynamics – such trade openness and global economic trends – such as oil price fluctuation) on maritime sector performance in Nigeria. This research is significant to the following groups for several reasons, researchers, policy makers, industrial stakeholders and developing economies.

Objectives of the study

The main objective of this study is to examine the Influence of External Sector Variables on Maritime Sector Performance in Nigeria from 1995 to 2022.

Specifically, the study aims to;

i. Examine the effect of trade integration on maritime sector performance in Nigeria.
ii. Ascertain the effect of oil price fluctuation on maritime sector performance in Nigeria.
iii. Assess the effect of external debt on maritime sector performance in Nigeria.

Scope of the Study

This research focuses on the Nigerian maritime sector and its interaction with selected external sector variables, namely trade openness, external debt, and oil prices. The study covers the period from 1995 to 2023. The data used for this study were sourced from Nigerian Port Authority (NPA), Central Bank of Nigeria (CBN) and World Bank (WDI).

2.0 LITERATURE REVIEW

2.1 Conceptual Review

Concept of the Nigerian Maritime Sector

The maritime industry contributes significantly to Nigeria's GDP through port activities, maritime services, and related industries. It facilitates trade both domestically and internationally, supporting industries such as oil and gas, agriculture, and manufacturing. The maritime transport is a subsect of the maritime industry. Maritime transport refers to the transportation of goods by sea, a practice that is the oldest and most significant mode of international trade, responsible for over 90% of global trade by volume (Oyeduntan, 2022). As a sub-sector of the maritime industry, maritime transport encompasses various components such as ports, shipping, shipbuilding, and maritime services (Nwanosike, 2014). Maritime transport offers low-cost and large-scale services in international trade (Jung, 2011, cited in Edih, Igemohia, and Faghawari, 2022). The economics of maritime transport examines the factors influencing the supply and demand for seaborne transport, as well as the costs associated with shipping goods by sea. One of the main factors affecting demand for seaborne transportation is the volume of international trade, which has increased alongside the growth of the global economy (Seifegha, Ndalu and Okene, 2023).

Nigeria, being one of Africa's leading oil producers, derives a substantial portion of its revenue from oil exports. The shipping industry plays a pivotal role in transporting crude oil and petroleum products. The Nigerian Maritime Administration and Safety Agency (NIMASA) oversees and regulates this sector, particularly in oil and gas shipping.

The sector faces challenges such as inadequate infrastructure, inefficient port operations, security concerns in waterways, and regulatory issues (Okene, Ibenta and nwanna, 2023). These factors can hinder efficiency, increase costs, and affect competitiveness. The Nigerian government has implemented various reforms and initiatives to improve the sector's efficiency and attractiveness to investors. These include port privatization, regulatory reforms, and infrastructure development projects. Nigeria's maritime sector plays a crucial role in facilitating international trade, handling imports and exports of goods such as crude oil, agricultural products, manufactured goods, and consumer goods.

Concept of External Sector Dynamics

External sector dynamics encompass global economic forces that influence a nation's trade, investment, and economic policies, these variables are crucial for understanding a nation's international trade and overall economic relationships. Some common external sector variables include: foreign exchange reserves, exchange rates, external debt, foreign direct investment and foreign portfolio investments.

In the field of economics and international trade, the external sector refers to the interactions of a country's economy with the rest of the world. It encompasses all transactions between a country and foreign entities, including trade in goods and services, international investment flows (both inward and outward), and financial transactions such as borrowing and lending with foreign entities (Ogbonna, Ibenta and Adigwe, 2018).

The external sector is a very significant segment of every developing and developed economy in the world, the importance of the external sector lies in the fact that every nation engages in international trade and the external sector measures the performance of an economy with respect to the rest of the world (Fazal and Shah, 2016). The sector comprises of mostly the external reserves, external debt, exchange rate, foreign direct investment and balance of trade, oil price; they play key roles on economic growth of a nation (Ogbonna, Ibenta and Adigwe, 2018). Onyemaechi (2013) indicated that the features of Nigeria‘s external sector have remained basically the same since independence, he found out that the external sector is characterized by the dominance of a single export commodity, the crude oil.

In this study, examining the external sector would involve understanding how factors like

1. Trade,
2. External debt dynamics and
3. Oil price movements,

impact Nigeria's maritime industry. This analysis helps in assessing the vulnerabilities, strengths, and overall performance of Nigeria's maritime sector within the framework of its international economic interactions.

Concept of Trade Openness

Trade openness or trade integration, which is the extent to which a country integrates into the global economy through trade has been a critical concern to many African countries. Indeed, more opened economies allow for enhanced international trade and integration with international markets (Osei et al., 2019). Trade openness is a key driver of progress, skill transfer and productivity in many countries. Khalid (2016) provided information on various aspects of the importance of trade openness to economic growth, income distribution, government spending and the environment. Increased degree of trade openness drives demand for shipping services, port operations, and logistics.

Trade integration/liberalisation, also referred to as trade openness, directly influences maritime transport volumes, highlighting the necessity for efficient port infrastructure and shipping networks (Ojo and Okene, 2024). In Nigeria, trade openness has produced mixed outcomes; it has enhanced opportunities for the maritime sector by increasing cargo throughput and vessel traffic, yet inadequate infrastructure and regulatory bottlenecks have constrained the sector's capacity to fully leverage these opportunities (Adeniran, 2017). Nigeria's trade liberalisation policies in the early 2000s resulted in a significant increase in import activities, thereby elevating the demand for port services. The absence of adequate investments in port infrastructure has led to congestion and inefficiencies (Omoke, 2018).

Concept of External debt

Adepoju, Salau, and Obayelu, (2007) asserted that external debt refers to the total amount of money that a country owes to foreign creditors, these creditors can include foreign governments, international financial institutions (such as the International Monetary Fund or World Bank), and private sector lenders (like international banks and bondholders). External debt is incurred through various means, such as loans, bonds, or credit facilities.

The external debt is typically denominated in currencies other than that of the debtor nation. External debt encompasses short-term liabilities, such as trade debts, which mature within one to two years or are settled within the fiscal year in which the transaction occurs.

External debt is different from public debt, public debt is a wider concept that embraces external debt as defined above plus domestic debts, which are owed by the government of a country to residents of that country. Hence, External debt can be seen as the foreign exchange component of public debt (Okororie, 2008). According to Siddique, Selvanathan and Selvanathan (2015), external debt is a vital source of finance mainly used to supplement the domestic sources of funds for supporting development and other needs of a country.

Concept of Oil price

Oil price refers to the cost per barrel of crude oil, which is a major indicator of the market value of this essential energy commodity (Akinlo, (2012). It is determined by a variety of factors including supply and demand dynamics, geopolitical events, production levels by major oil-producing countries (such as those in OPEC), technological advancements, and market speculation Ikue, et al (2020). Oil prices are typically quoted in U.S. dollars and can fluctuate significantly over time, influencing global economic conditions, inflation rates, and the performance of related sectors, such as transportation, manufacturing, and particularly the maritime industry

The Nigerian economy has long been intricately linked to fluctuations in global oil prices, given its significant dependence on oil exports as a primary source of revenue. The volatility and trends in oil prices have profound implications for various sectors, including the maritime industry. Since

the discovery of oil in Nigeria in 1956, the country has experienced various phases of economic growth and challenges influenced by oil price fluctuations.

In line with Ikue, et al (2020): Akinlo, (2012) and Kilian, (2006), the following factors cause changes in the crude-oil price:

1. Global Demand and Supply: Oil prices are determined by the balance between global demand and supply. Economic activities, industrial demand, and technological advancements affect global oil consumption, while geopolitical events, production levels, and natural disasters impact supply
2. Geopolitical Tensions: Conflicts in oil-producing regions, sanctions, and political instability can disrupt supply chains, causing oil prices to spike.
3. OPEC Decisions: The Organization of the Petroleum Exporting Countries (OPEC) plays a significant role in regulating oil prices by adjusting production levels among member countries, including Nigeria.
4. Exchange Rates: Since oil is traded globally in US dollars, fluctuations in exchange rates can affect oil prices. A stronger dollar generally leads to lower oil prices and vice versa.

Thus volatilities in crude-oil prices are drawn from three major sources, demand shocks, supply shocks, and industrial action that affects production, (Kilian, 2006). The outcome of these shocks contributes significantly to financial and human capital development; fiscal and monetary policy outcomes and directly impact economic growth and thus the maritime sector of the oil producing states (Rentschler, 2013 and Baffes et al., 2015).

Impact of Oil Price Fluctuations on Nigeria

High oil prices can lead to increased revenue, foreign exchange reserves, and investment in infrastructure and development projects. Conversely, low oil prices can result in budget deficits, reduced government spending, and economic contraction.

Higher prices enable greater public expenditure on social programs, subsidies, and infrastructure development. Lower prices necessitate austerity measures, borrowing, and restructuring of fiscal policies.

High prices improve debt servicing capacity, while low prices can lead to increased borrowing and debt sustainability issues. Increased oil revenues contribute significantly to Nigeria's foreign exchange reserves, influencing the stability of the Nigerian Naira. Oil price drops can lead to currency depreciation and inflationary pressures.

External Debt and Maritime Transport Sector Performance

External debt refers to the total amount of debt that a country owes to foreign creditors. In Nigeria, external debt has been a significant factor influencing economic policies and development strategies. The management of external debt plays a crucial role in shaping macroeconomic stability, fiscal policy decisions, and overall economic growth prospects (Ogbonna, Ibenta and Adigwe, 2018).

Nigeria's external debt profile has evolved significantly over the past decades, influenced by various factors such as global economic conditions, domestic policy choices, and commodity price fluctuations, particularly in relation to oil revenues (Adam, 2003). The country has experienced fluctuations in its external debt levels, often correlated with shifts in borrowing patterns, debt restructuring initiatives, and efforts to manage debt sustainability (World Bank, 2020).

Studies highlight that high levels of external debt can strain fiscal resources, leading to budgetary constraints on infrastructure investment and maintenance in crucial sectors like maritime. This situation can adversely affect port efficiency, maintenance, and capacity expansion efforts, thereby impacting overall sector performance (Ajayi and Oke, 2012).

Moreover, the terms of external debt, including interest rates and repayment schedules, can affect Nigeria's macroeconomic stability, exchange rate fluctuations, and overall economic environment, all of which indirectly influence maritime sector performance. Research underscores the importance of prudent debt management strategies to mitigate these impacts and ensure sustainable economic growth conducive to economic growth and thus maritime development (Berasaluce and Romero, 2017).

Oil Price and Maritime Transport Sector Performance

Oil prices play a pivotal role in shaping economic conditions in Nigeria, a country heavily reliant on petroleum exports. The volatility and fluctuations in global oil prices significantly influence various sectors, including the maritime industry, due to its direct impact on government revenues, foreign exchange earnings, and overall economic stability (Ikue, Amabuike, Denwi, Mohammed and Musa, 2021). Nigeria, as one of the largest oil producers in Africa, has experienced profound economic effects from fluctuations in oil prices. High oil prices generally correlate with increased government revenues, which can lead to expanded investments in infrastructure, including port facilities and maritime services (Aliyu & Elijah, 2020). Conversely, periods of low oil prices constrain fiscal budgets and limit investment capacities, potentially affecting the development and maintenance of maritime infrastructure critical for trade and shipping activities ((Akinlo, (2012).

Furthermore, the dependence on oil revenues exposes Nigeria's economy to external shocks, making it vulnerable to global oil price volatility (Olayinka & Olayiwola, 2017). This vulnerability underscores the need for robust policy frameworks that mitigate the adverse impacts of oil price fluctuations on the maritime sector, ensuring sustainable growth and resilience in the face of economic uncertainties.

In essence, understanding the dynamics of oil prices is crucial for assessing their implications on Nigeria's maritime sector, highlighting the interconnectedness between global energy markets and domestic maritime infrastructure development.

2.2 Theoretical Frame work

This study adopts the Balance of Payments (BOP) Theory as its anchor. The BOP theory explains the relationship between a country’s external sector dynamics—such as trade balance, foreign exchange reserves, capital flows, and exchange rate fluctuations—and its overall economic performance, including the maritime sector. According to Krugman and Obstfeld (2003), the balance of payments reflects all economic transactions between residents of a country and the rest of the world, influencing trade policies, shipping activities, and port operations. When a nation experiences a trade surplus, maritime activities expand due to increased cargo volumes and

shipping demand. Conversely, trade deficits and foreign exchange constraints can negatively impact port throughput, vessel calls, and logistics efficiency (World Bank, 2020).

In the Nigerian context, fluctuations in oil export earnings, exchange rate volatility, and foreign direct investment inflows have directly impacted the maritime sector by influencing shipping costs, port efficiency, and infrastructure investment (Olaniyi & Adepoju, 2019).

2.3 Empirical Review

Abinabo and Abubakar (2024) examined the relationship between trade openness and economic growth in Nigeria. Their findings show that trade openness positively and significantly influences economic growth, while imports have a negative but statistically significant effect. The study concludes that Nigeria's economy has gained from international trade and recommends further liberalization of trade to allow more foreign goods into the country.

A study by Osadume and Uzoma (2020) employed Granger causality and ARDL bounds testing to examine the relationship between maritime trade and economic development in Nigeria. The findings revealed that maritime trade, proxied by trade openness, had a significant effect on economic development, as measured by the Human Development Index (HDI). The study concluded that there exists a bi-directional causal relationship and significant co-integration between maritime trade and economic development.

Peter and Olivier (2006) investigated the impact of trade and diversification on growth in Nigeria. Their results show that the impact of trade policy on productivity and investment is critical, and greater openness is generally associated with higher productivity, larger investment, and stronger growth.

Chimobi (2010) investigated the causal relationship among financial development, trade openness and economic growth in Nigeria and discovered that trade openness and financial developments have causal impact on economic growth in Nigeria. Conversely, growth has causal impact on trade and financial development, implying support for growth-led trade but no support for trade-led growth.

Udeh, Ugwu, and Onwuka (2016) worked on External Debt and Economic Growth: The Nigeria Experience and attempted to ascertain the impact of external debt on economic growth in Nigeria between 1980 to 2013. They found that external debt had a positive relationship with GDP in the short run but a negative relationship in the long run. Additionally, external debt service payments had a negative relationship with GDP, while the exchange rate had a positive relationship with it.

Anochie and Ude (2015) investigated Nigerian's Management of the External Debt and used the OLS regression method to investigate the management of Nigeria's external debt from 1981 to 2014 and discovered that it posed several challenges that hindered economic growth and development.

Emerenini and Nnanna (2015) analyzed the effectiveness of external debt on economic growth in Nigeria from 1981 to 2012. Using Engle & Grenger Cointegration and Ordinary Least Square (OLS), the study found that rising external debt stock inhibits the pace of economic growth by increasing the cost of servicing beyond the debt sustainability limit, while external debt servicing was not found to impair economic growth.

Peng, Zhu, Guo, and Chen (2018) conducted a study on the risk spillover of international crude oil to China's firms. Their findings revealed that the impact of crude oil price varies across industries, with a positive relationship between oil price and market returns, especially during bearish market conditions. They also emphasized the importance of considering industry-specific features when assessing the impact of oil price volatility.

Utilizing data spanning over twenty years, Aggarwal, Akhigbe, and Mohanty (2012) delved into the effects of oil price shocks on transportation firm asset prices and the uncovered a negative relationship between oil price shocks and the returns of transportation sector firms.

In another study, Hassan and Zaman (2012) investigated the effect of oil prices on the trade balance in Pakistan. Their objective was to examine the impact of rising oil prices on Pakistan's trade balance using an ARDL approach. The study also explored the causal relationship between trade balance and oil price shocks in the context of Pakistan from 1975 to 2010. The results indicated a significant negative relationship among oil prices, exchange rate, and trade balance in Pakistan.

Specifically, a 1% increase in oil prices and exchange rate led to a decrease in the trade balance by 0.382% and 0.342%, respectively.

2.4 Gap in Knowledge

Our empirical reviews show the existence of current literatures on the effects of external sector dynamics such as trade policies, exchange rates, and global economic trends on national economies. There is little empirical research concentrating on their particular impact on the maritime sector, especially in developing economies like Nigeria. This study intends to close this gap in research by giving a thorough evaluation of how external sector dynamics have affected the performance of Nigeria's marine industry, therefore revealing policy recommendations for sustainable sector development in the sector.

3.0 MATERIALS AND METHOD

Research Design

This research used ex post facto research design to investigate the influence of external sector on the maritime sector performance in Nigeria. This research design is the framework that describes the categories of data to be collected, the data sources, and the data collecting technique. A good design ensures that the data acquired is aligned with the study objectives and that the data is collected in the most precise manner possible (Osadume, Okeneand Ikuhor, 2024).

Population of the Study

The population of the study involves the entire Nigeria Shipping Industry for the period 1995 to 2022.

Method and Sources of Data Collection

The data for this study was sourced through the secondary means of data collection. Time series data for the period 1995 to 2023 were collected from Central Bank of Nigeria (CBN) Statistical Bulletin, the World Bank’s data base and the annual operational statistics of the Nigerian Ports Authority (NPA).

Model Specification

The study adopted the model used by (Ogbonna, Ibenta and Adigwe, 2018) in equation (3.6.1) with some modifications and derived the functional equation and model specified in equations (3.6.2) and (3.6.3) respectively. The data for the study will be analysed using the model in equation (3.6.3).

log GDPt = α0 + α1logExRevt + α2logExDebtt + α3logExRt + α4logFDIt + α5logTIt + Ut……3.6.1 (Ogbonna, Ibenta and Adigwe, 2018)

Where:

GDP = Gross Domestic Products.
ExDebt = External Debt.
ExRev= External Reserve.
ExR = Exchange Rate.
FDI= Foreign Direct Investments.
TI = Trade Integration

MPI = f (TradInt, OilP, ExtDeb, CTP, ExtRes) ……,,,,….3.6.1

Above models in their econometric form are indicated below:

MPI = $\beta 0 + \beta_1$TradInt + β_2OilP + β_3ExtDeb + β_4CTP + β_3ExtRes μ…….....,,.….3.6.2

Where:

MPI = Maritime Transport Contribution to Gross Domestic Product
CTP = Cargo Throughput
TradInt = Trade Integration
OilP = Oil Price
ExtDeb = External Debt
ExtRes = External Reserve

Definition of Variables

This study examines how external sector dynamics influence the maritime sector performance in Nigeria from 1995 to 2023. The dependent variable (MPI - Maritime Transport Contribution to

GDP) reflects the performance of the maritime sector. The independent variables include both macroeconomic and external sector factors:

CTP (Cargo Throughput - Maritime Performance Index) – Measures overall maritime sector efficiency.

TradInt (Trade Integration) – Captures the extent of Nigeria's participation in global trade.
Formula: Trade Integration = [(Exports + Imports) / GDP] × 100

OilP (Oil Price) – Represents global oil price fluctuations, which significantly affect Nigeria's economy.

ExtDeb (External Debt) – Shows the level of Nigeria's external borrowing and its economic implications.

ExtRes (External Reserves) – Indicates Nigeria's foreign currency reserves, which support trade stability.

Oil price: It refers to the market value of a barrel of oil.

External debt: An external debt is a debt incurred by the borrowing country and repayable in the foreign currency of the lender country or institution (Onoh, 2007).

Estimation Techniques

The empirical analysis was conducted as follows:

Descriptive Statistics and Stationarity Tests were conducted to summarize the characteristics of the variables (mean, median, standard deviation, etc.) and to check for the stationarity of the time series data respectively. Thereafter, we estimated the coefficients of the model and assess the statistical significance of the relationship between the variables. Finally, diagnostic Tests were carried out to check for heteroscedasticity and autocorrelation. Data used in this study were analyzed using E-Views 12.0 software.

Apriori Expectation

The study expected a positive and statistically significant relationship between trade integrationand cargo throughput; suggesting that higher trade integration leads to increased maritime sector performance. Meanwhile, negative and statistically significant relationship is expected between cargo throughput and oil price as well as external debt.

4.0 Data and Discussion.

Data used for this study are available on requests. They were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin, the World Bank's data base and the annual operational statistics of the Nigerian Ports Authority (NPA).

Preliminary/Diagnostics Tests

The preliminary tests conducted to determine the suitability of the variables/model in this research work involved: Descriptive Statistics, Stationarity test. Meanwhile diagnostic test include Breusch-Godfrey Serial Correlation Test, Heteroskedasticity Test and Cusum Of Squares Test.

Descriptive Statistics.

Table 1: Descriptive Statistics

	MPI	TradInt	OilP	ExtDeb	CTP	ExtRes
Mean	179.2986	0.199552	56.47170	22610.22	57155451	327347.4
Median	152.4042	0.184207	54.08583	27228.78	65192919	390963.4
Maximum	417.5167	0.410547	109.4500	59237.76	99015400	701674.6
Minimum	82.56567	0.087568	12.28000	3487.881	13273053	25895.59
Std. Dev.	79.54462	0.089288	31.14677	14523.59	25878818	195958.7
Skewness	1.402334	0.795179	0.259398	0.307273	-0.255918	-0.203946
Kurtosis	4.316604	2.693506	1.852234	2.526907	1.865960	1.754133
Jarque-Bera	11.59952	3.169671	1.917039	0.726792	1.870529	2.076594
Probability	0.003028	0.204982	0.383460	0.695311	0.392482	0.354057
Sum	5199.660	5.787007	1637.679	655696.3	1.66E+09	9493076.
Sum Sq. Dev.	177165.7	0.223227	27163.40	5.91E+09	1.88E+16	1.08E+12
Observations	29	29	29	29	29	29

Source: Author's E-views 12-0 computation

The mean values indicate average trends, with MPI averaging 179.3, while OilP and ExtDeb have means of 56.47 and 22,610.22, respectively. The standard deviations show variability, with CTP and ExtRes displaying the highest dispersion. MPI is positively skewed (1.40), indicating a rightward tail, while CTP and ExtRes are negatively skewed. Kurtosis values suggest that MPI has a peaked distribution, while others are relatively normal. The Jarque-Bera test indicates MPI deviates from normality (p = 0.003), while other variables are approximately normal.

Table 2: Unit Root Output

Variable	ADF-Test Statistics	t-statistics @ 5%	Probability	Order of Integration
CTP	-6.5725	-2.9919	0.0000	1(1)
TradInt	-3.5826	-2.9810	0.0135	1(0)
OilP	-4.9131	-2.9919	0.0006	1(1)
ExtDeb	-2.0459	-1.9550	0.0412	1(1)
ExtRes	-3.5962	-2.9762	0.0127	1(1)
MPI	-2.5429	-1.9550	0-0133	1(0)

Source: Author's E-views 12-0 computation

Table 3: Breusch-Godfrey Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	1.779689	Prob. F(2,21)	0.1932
Obs*R-squared	4.202954	Prob. Chi-Square(2)	0.1223

Source: Author's E-views 12-0 computation

The Breusch-Godfrey Serial Correlation LM Test evaluates the presence of serial correlation in a time series up to two lags. The F-statistic of 1.779689 with a p-value of 0.1932 suggests no significant serial correlation at 5% significance level. Additionally, the Obs*R-squared statistic of 4.202954 with a p-value of 0.1223 also supports the null hypothesis of no serial correlation. Therefore, the results indicate that there is no evidence of serial correlation in the data at the tested lags.

Table 4: Heteroskedasticity Test

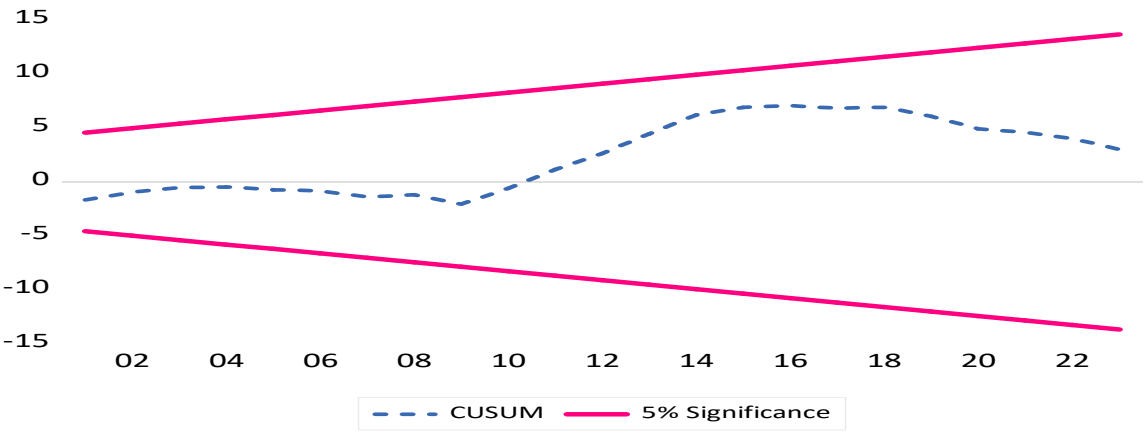
Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.650959	Prob. F(5,23)	0.6637
Obs*R-squared	3.595119	Prob. Chi-Square(5)	0.6090
Scaled explained SS	5.713355	Prob. Chi-Square(5)	0.3351

Source: Author's E-views 12-0 computation

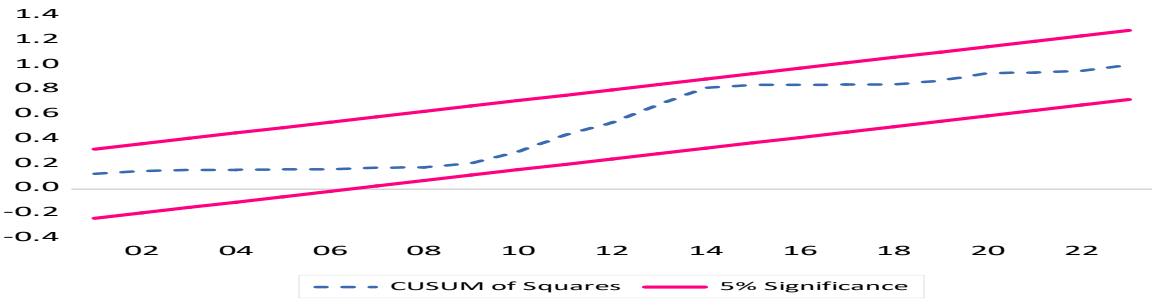
The Breusch-Pagan-Godfrey heteroskedasticity test results suggest that the null hypothesis of homoskedasticity cannot be rejected. The F-statistic of 0.6509 with a p-value of 0.6637 indicates no significant evidence of heteroskedasticity. Similarly, the Obs*R-squared (3.5951) and the Scaled explained SS (5.7134) have p-values of 0.6090 and 0.3351, respectively, which further support the null hypothesis. Therefore, the model's error variance appears to be constant, implying no heteroskedasticity in the data.

Figure 1: CUSUM Test



Source: Author's E-views 12-0 computation

Figure 2: CUSUM of Squares Test



Source: Author's E-views 12-0 computation

Both CUSUM and CUSUM of Squares tests are critical for ensuring that a regression model remains stable over time. The blue dotted lines fall within the red lines for both the CUSUM and CUSUM of Squares tests indicating that our model is fitted and stable.

4.1 Hypothesis Testing

Table 5: Least Square Regression Report

Dependent Variable: MPI				
Method: Least Squares				
Date: 02/07/25 Time: 10:39				
Sample: 1995 2023				
Included observations: 29				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TradInt	823.6140	131.6641	6.255416	0.0000
OilP	-1.360770	0.654776	-2.078220	0.0490
ExtDeb	-0.002068	0.000892	-2.318376	0.0297
CTP	2.56E-06	9.71E-07	2.635086	0.0148
ExtRes	-0.000242	0.000119	-2.026005	0.0545
C	71.57545	44.71884	1.600566	0.1231

Source: Author's E-views 12-0 computation. (See appendix 1)

Test of Hypothesis One

$H0_1$: The effect of trade integration on maritime sector performance in Nigeria is not significant.

Decision Criteria: If, p-value < 0.05, then variable is significant: Reject $H0_1$

p-value > 0.05, then variable is not significant: Accept $H0_1$

Table 5 shows that trade integration (TradInt) has a positive β coefficient of 823.6140 and p-value of 0.0000. This indicates that trade integration (TradInt) has a significant positive relationship with maritime sector performance proxied by maritime sector contribution to GDP (MPI).

Test of Hypothesis Two

$H0_2$: The effect of oil price fluctuation on maritime sector performance in Nigeria is not significant.

Decision Criteria: If, p-value < 0.05, then variable is significant: Reject $H0_1$

p-value > 0.05, then variable is not significant: Accept $H0_1$

Table 5 shows that oil price fluctuation (OilP) has a negative β coefficient of -1.360770 and p-value of 0.0490. This indicates that oil price fluctuation (OilP) has a significant negative relationship with maritime sector performance proxied by maritime sector contribution to GDP (MPI).

Test of Hypothesis Three

$H0_1$: The effect of external debt on maritime sector performance in Nigeria is not significant.

Decision Criteria: If, p-value < 0.05, then variable is significant: Reject $H0_1$

p-value > 0.05, then variable is not significant: Accept $H0_1$

Table 5 shows that external debt (ExtDeb) has a negative β coefficient of -0.002068 and p-value of 0.0297. This indicates that external debt (ExtDeb) has a significant negative relationship with maritime sector performance proxied by maritime sector contribution to GDP (MPI).

4.2 Discussion of Findings

The regression results provide evidence on the relationship between external sector dynamics and maritime sector performance in Nigeria. Trade Integration (TradInt) exhibits a strong positive and statistically significant influence on MPI, with a coefficient of 823.6140 and a p-value of 0.0000. This result suggests that higher trade integration significantly boosts maritime sector performance, possibly due to increased international trade activities facilitating port operations and shipping activities. On the other hand, Oil Price Fluctuation (OilP) has a negative and statistically significant impact on MPI at the 5% level ($p = 0.0490$). The negative coefficient of -1.360770 implies that an increase in oil prices adversely affects the maritime sector. This could be attributed to increased operational costs for shipping and port activities, leading to reduced profitability and efficiency in the sector.

Also, External Debt (ExtDeb) also negatively affects MPI, with a coefficient of -0.002068 and a p-value of 0.0297, indicating statistical significance at the 5% level. The result suggests that rising external debt burdens may limit government investments in maritime infrastructure and reduce the sector's capacity for expansion.

5.0 Conclusion

This study assesses the influence of external sector dynamics on maritime sector performance in Nigeria from 1995 to 2023. The findings reveal that trade integration positively drives maritime performance whereas external debt and oil prices exert negative impacts. The overall model demonstrates a strong explanatory power, reinforcing the importance of external economic factors in shaping the maritime industry's growth and efficiency.

The implications of these findings underscore the need for strategic policy measures to enhance trade integration while mitigating the adverse effects of external debt and fluctuating oil prices on maritime performance.

Recommendations

1. The government should strengthen policies that promote trade integration, such as trade agreements, port modernization, and streamlined customs processes to maximize the positive impact on maritime performance.
2. Policymakers should adopt fuel subsidy schemes or alternative energy sources for maritime operations to cushion the sector against oil price fluctuations.
3. Authorities should implement sustainable debt management strategies to prevent excessive borrowing that could stifle investments in maritime infrastructure.

Further Research: Future studies should incorporate additional external variables, such as exchange rate volatility and foreign direct investment, to deepen the understanding of external sector influences on maritime performance.

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