



Maritime business performance, economic diversification and real gross domestic product growth in emerging economies: A study of the Nigerian maritime transportation sector.

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ABSTRACT

This study examined maritime business performance, economic diversification and real gross domestic product growth in emerging economies: the Nigerian maritime transportation sector. Its main objective is to examine whether maritime trade is a viable option for economic diversification in Nigeria. Specific purposes are, one, to ascertain the effect of maritime trade on real gross domestic product, GDP, growth in Nigeria, 2008-2021 and two, to recommend measures for the strategic positioning of the maritime sector as one of the major sources of national income generation and a driver of the Nigerian economy. The study used secondary data collected from published bulletins of Nigeria Ports Authority, NPA, National Bureau of Statistics, NBS and Central Bank of Nigeria, CBN. The secondary time series data on port performance for 2008-2021, were analyzed using least square regression analysis and the Engle-Granger Co-integration to test the financial variables at 5% level of significance. The study is anchored on modern investment portfolios model for deciding the appropriate investment options based on comparative advantage analysis and/or expected economic returns vis-a-vis the inherent risks. Findings revealed that there is a positive and significant relationship between total revenue and gross domestic product growth for period of assessment. Also discovered are several challenges militating against maritime transportation business in Nigeria such as infrastructural deficit and lack of investments. It therefore, means that the maritime transportation sector will improve the GDP of the Nigerian economy if the challenges are addressed and the sector is repositioned for optimal performance. The paper recommends that Government should develop a trade liberalization policy towards increasing private participation in the maritime sector and create enabling business environment by providing the required infrastructures.

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1. Introduction.

It has become necessary to x-ray and understand global economic dynamics, causes of economic downturns, and devise measures that would help stabilize and sustain vulnerable economies

in all trade cycles arising from business variabilities and cross-country uncertainties like the recent advent of Covid19 pandemic. Such economic uncertainties have grave impact mono-product economies. The term 'mono-product economy' is a catch phrase used to describe economies that are considered vulnerable or susceptible to economic fluctuations, downturns, recession and sudden shocks (i.e. global pandemics) especially where the uncertainties or pandemics directly affect such singular/major source of national revenue. Both national and global economies are largely dictated by the happenings (demand - supply dynamics) in the international market due to the effect or drivers of globalization. The world as a 'global-small-village'

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is made possible by the actions of information, telecommunications and transportation services available to majority of the human population (Hill, 2009; Edih, et al. 2022). Therefore, it is arguable that a monolithic economy is highly predisposed to various macro-economic challenges and threats such as, massive unemployment, massive imports, poverty and hunger, incessant borrowings, huge indebtedness, global economic uncertainties and consequential social vices.

In other words, a mono-product economy can be described as a nation utilizing a singular source or resource for generating national revenue amongst other untapped, undiscovered or rather forgotten resources. It may represent a state of affairs where critical natural and technological resources are either untapped or under-utilized. The level of resource utilization determines the standard of living of the people in a given nation. More so, countries are classified as developed or emerging countries based on the level or amount of resources explored, utilized and maximized for the benefit of nationhood and ensuring national security (Edih et al., 2022a). Security or human security is key to national sustainability because it is a public good which can be partly sustained by economic diversification policies and programmes.

On the other hand, a diversified economy is almost insulated from both internal shocks (civil unrest, civil war) and external shocks (global economic pandemic-covid'19). It is believed to experience relative security and peace than a country dependent on one product/trade as a source of income. Security in this context is multi-dimensional; economic, social, and political security. National Human Development Report, NHDR, (2015) considers human security as a new paradigm for studying vulnerabilities in the global space or economy. Considerations on security have transcended the purchase of military wares to investments in productive ventures, human capital and community growth and development. Economic diversification is a deliberate plan or policy action of government to create several and sustainable productive investments that will produce revenues for sponsoring national budget (policies, programmes and projects). It also encompasses practical measures of creating enabling business environment and templates for both local and foreign investors and investments.

Economic diversification can be considered as synonymous to the creation of multiple investment portfolios in the private sector as a massive employment policy and plan. It is crystal clear that, economic diversification is key to growth and development of every nation. Diversification of an economy involves reviving, resuscitating dead or moribund sectors and such sectors having comparative advantage are energized to function optimally, for example ; agricultural, mining, manufacturing, oil and gas, service delivery sectors (maritime trade, hospitality and tourism, entertainment industry, etc.) are viable and sustainable. A diversified economy could therefore be explained to mean a direct opposite of a mono-product economy.

In this research, effort is geared towards establishing the nexus (whether positive or negative) existing between maritime business performance and diversification and GDP growth in Nigeria. It has been established that maritime businesses have grown exponentially in recent years according to studies. Mar-

itime countries especially developed nations (China, Singapore, Britain, America, etc.) have harnessed the investments/opportunities in the sector to their advantage. Maritime services across the world account for about ninety percent (90%) of transportation needs and carriage by sea or seaborne trade volume is more than sixty percent (60%) of the total gross domestic product, GDP of sixteen(16) independent nations of ECOWAS (Economic Community for West African States) (Peretomode, 2014; Edih et al., 2022a). Studies also show that over eighty percent (80%) of trade are seaborne and seventy-five (75%) of total global trade or global supply chain was transported by ships in 2008(UNCTAD, 2015; Ziaul & Hans-Joachim, 2018; Jung, 2011). It is established in UNCTAD (2015), that the gross domestic products (GDP) of maritime countries have significantly improved by increase in ports operations and growth in the volume of merchandise trade. According to (Jung, 2011), ports are gateways to global maritime transport and advance growth of local economies.

Shipping operation is a catalyst to socio-economic growth of maritime nations (countries that are doing maritime business) and such activities have shown positive effect on their national income (Omoke et al., 2019). The positive relationship that exists between investment in seaports development and economic growth is re-emphasized by the modified neoclassical growth or the theory of endogenous development theory (Edih et al., 2022a). Such significant correlation between maritime trade, and super structures and economic growth was also affirmed in (Sjafrizal, 2008). Peretomode (2014) observed in Holland, UK, Italy, Belgium and European Union maritime region, combined GDP is made up by forty percent (40%) from port's operations.

In 2021, the contributions of maritime services to the GDP of India were 28.1%, China had 9.7%, Russia was 5.9%, Brazil, 2.8%, South Africa, 1.3% while Nigeria was 0. 15%. Despite the cogent fact that, there are eight major and ancillary ports and jetties across the coastal area in Nigeria (Lagos Port Complex, Tincan Island Port, Port Harcourt Old Port, Federal Ocean Terminal, Onne; Warri , Calabar, Koko Ports and Lagos Container Port) (Okerefe, 2018), the contributions of maritime services to the Nigerian GDP growth is abysmally low(0.15%). This lack-luster performance from Nigerian ports presupposes some characteristics challenges that are inherent to port administration in emerging economies. Ekpo (2012) had identified some challenges be-devilling optimal port performance in Nigeria and these include lack of capital, poor incentives for investment and dearth in ports infrastructures.

More so, the outbreak of Covid'19 pandemic has worsened the appreciable narratives of maritime operations both in global and national economies at varying degrees. The coronavirus disease (covid'19) became a global emergency and pandemic on 11 March 2020 (Lin et al., 2020). Based on the contagious and deadly posture of the virus, governments and WHO rolled out measures to prevent its spread, like lockdown, movement restrictions, closure of international and local borders (air, land and sea) , closure of markets and schools. The resultant negative effects of these containing measures on both international and national economies were monumental. Ozturk and Turan (2020) reported that sea travels were hampered and disrupted

by the outbreak of covid'19. A repeat of such epidemic is inevitable hence understanding global economic dynamics is paramount in the 21st century of progressive globalization.

According to Lowe (2021) and Susan et al., (2020), closure of Australia International borders disallowed firms from hiring foreign workers, causing a negative impact on labor force. Also, Verikios (2020) agreed that the 2019 pandemic resulted to a reduction in domestic and international tourism and business travels including carriage by sea. The author provided statistics to support his assertion. In 2020.2, the GDP of China and Korea recover to 6.3% and 2.8% below the baseline while Australia's GDP depressed by 19%. The biggest economic contractions experienced in 2020.2 were observed in the US (-35%), UK (-34%), France (-32%), Germany (-31%), Canada (-29%), Japan (-21%), Rest of EU (-29%) and Singapore (-27%). Prosertek (2020) identified some challenges that affected maritime transport during covid'19 such as, damage to cargoes due to delays, breakdown of machineries, and safety risks. It was predicted by International Labour Organization, ILO in 2020, that, 24.7million jobs would be lost due to the pandemic. Also, OECD (Organization of Economic Community and Development) has warned that the consequences of the coronavirus disease would be worse than the 2008 financial crisis causing economies to slide into economic recession (BBC News, 2020; Panayides, 2019). However, developed nations were able to inject economic stimulus package to revive and stabilize their economies but, emerging economies were seeking for interventions from international communities. It was a big blow to global economy but a bigger blow to developing nations or mono-product economies. This is a justification for encouraging diversification policies in such emerging mono-product economies of the world.

The United Nations, UN (2021) has projected that global maritime trade would grow by 3.5% yearly and carriage of goods by sea would jump up to 11 billion tons. Also, it has been observed that Nigeria is endowed with natural resource (coastal waterways) for global maritime business. There is therefore, a great need to harness the potential gains in the maritime industry by strategically positioning the maritime sector as one of the major options for economic diversification. More so, from the studies reviewed, none considered the maritime sector as a viable investment portfolio option to be maximized by Nigerian government. There was no study on nexus between economic diversification and investment portfolios in the maritime sector. However, options like agriculture, mining and manufacturing have been covered. Hence, this study examined maritime business performance, economic diversification, and real gross domestic product growth in emerging economies: a study of the Nigerian maritime transportation sector.

The major objective of the study is to examine whether the maritime sector is a viable option for economic diversification and the specific purposes are to assess the effect of maritime trade on real gross domestic product growth in Nigeria, 2008-2021 and to recommend measures for the strategic positioning of the maritime sector as one of major options for economic diversification in Nigeria. Thus, the singular hypothesis is there is no positive and significant relationship between investments

in the maritime sector and gross domestic product growth in Nigeria. The outcome(s) of the study would assist or present a clear compass to the government and private investors in the formulation of policies on economic diversification and capture potential investment portfolios in the maritime sector.

2. Literature Review.

The study reviewed related literature in three perspectives, namely, conceptual review, empirical studies and theoretical framework.

2.1. Conceptual review.

The following concepts were discussed, economic diversification, real gross domestic product growth, investment portfolios in the maritime sector and challenges in the Nigerian maritime industry.

2.1.1. Economic Diversification and Economic growth.

Economic stability and sustainability are the backbone of a healthy nation. Stability or sustainability of an economy certainly rest on several but connecting factors among whom is economic diversification. Others are internal democracy (invariably, the political economy), good governance, human capital development, balance of trade factor, technological advancement, bilateral relations with international communities, social capital investment, creation of opportunities for citizens and non-citizens, etc. All these identified factors are intricably tied to the level of economic diversification of the economy (a pool of productive investment portfolios that are managed by the government and private persons for the good of the State). Akram (n.d) identified foreign direct investment, FDI, viable institutions and infrastructures as the basic bedrock for economic diversification

Economic diversification represents a shift towards varied structures of domestic production and trade. A creative and purposeful measure, policy or programme geared towards improving national productivity, creating jobs and a sustainable template for reducing poverty growth in a nation. Freire (2019) holds the view that economic diversification is basic for poorer and developing nations to create jobs and enhance economic growth. An understanding of the correlations among diversification, investment portfolios, growth and development could be of great interest to governments or policy makers of both the developed climes and emerging economies. It stresses that countries with many capabilities produce variety of goods and are more diversified. It is also argued that diversification is path dependent and we say, it is capability-dependent too. Freire concludes that diversification affects structural dynamics and does not take specific pattern but changes the economic structure by adding new economic and productive sectors.

Akram (n.d) insist that economic diversification is necessary for long term economic growth. It has been established that vibrant economies earn large share of their GDP in the manufacturing and service sectors (the maritime service sector inclusive). However, when an economy relies only on incomes

from agriculture and mining, the long term economic growth is challenged due to commodity prices volatility and allocation inefficiencies, therefore making productivity to become slower than other sectors. This challenge is prevalent in resource dependent countries. Economies relying on the extractive sector to generate foreign exchange and fund its budget are regarded as underperforming nations. It is argued that abundant resource deposits in a nation may hurt economic stability, crowds out the manufacturing sector, causes civil unrest and undermine democratic institutions. This notion may not be right to a large extent because natural resource by itself cannot foment any trouble, neither mischief, but the people, and corrupt government do. Akram categorized diversification into two categories; economic and export diversification. Ordinarily, abundance of natural resources should provide better platforms for economic diversification but export diversification measures seem to encounter or face some difficulties in resource-dependent countries.

Diversification has also been described as a process of making an economy to become more diverse in terms of goods and services. It involves a deliberate plan to reduce overdependence on a narrow economic base. 'Nigeria beyond oil' is deliberate plan to shift and look beyond the proceeds from oil and gas. Economic diversification typifies a structural and technical movement from extractive production towards manufacturing and non-resource sectors. Therefore, diversification connotes the policy instrument for industrialization. The current debate borders on two competing strategies for industrialization; imports substitution industrialization and export promotion industrialization. It boils down on the potential to expand and develop capacity that can favourably compete with developed economies. The gap between developed economies and resource rich countries is in terms of product sophistication, managing investment portfolios and economic diversification (Akram, n.d). Bridging this wide gap is the unending struggle for developing nations but remains the competition gap favourable to advanced economies of the world.

2.1.2. Real Gross Domestic Product, (GDP).

A steady change in the long-run due to increase in the rate of savings represents economic growth. It is considered as a process of raising income level in developed countries but deemed to be a major problem in emerging economies (Osadime & Edih, 2021; Jhingan, 2008). According to Jhingan (2008), economic growth is determined by two factors, namely, the economic and non-economic factors. Economic factors include natural resources, human resources, capital, enterprise, technology, etc., while the non-economic factors are social institutions, political economy, and moral values. Both economic and non-economic conditions must be put into appropriate productive use by the central government to facilitate GDP growth. It is the increase in production that is referred to as GDP growth or economic growth. Economic growth is essentially proxy by GDP as a measure for growth.

Agbada (2013 as cited in Osiegbu et al., 2014) describes gross domestic product, (GDP) as the quantity of goods and services produced in a country at a given period of time. Such

goods may be totally consumed or used for producing other goods. It also means the total value of all goods and services produced in a country for a period, usually a year. It is the popular measure of the output of a country. The official market value for final goods and services produced, and GDP as the major indicator of economic growth and the living standard of the people. On a global scale, the GDP of countries differentiates rich and viable countries from the poor and unstable nations or economies. A negative GDP indicates an economy that is sliding into recession, hunger and poverty.

Real gross domestic product is a deflated GDP. That means, a current GDP minus inflationary rate. It is hard to find or ascertain the real GDP growth of a country because of the unascertainable mixture of inflationary trend at any point in time. The computed GDP of any nation is therefore a proximate value. It could be summarized that when the GDP of a country is positive, it portends a growing economy, increase in wealth creation activities and opportunities for more investments.

2.1.3. Investment Portfolios and Prospects in the Maritime Sector.

There are multiple investment portfolios in the maritime sector. Maritime business or trade encompasses many different acts of trade; designing, constructing, manufacturing, acquiring, operating, supplying and maintaining vessels and managing shipping lines (Edih et al., 2022a ; Ekpo, 2012). Maritime services are inclusive of port operations. In fact, ports are the hub and anchor of maritime transportation business and the activities in the ports are varied; dry docking, coastal shipping services, trawler services, terminals and jetties infrastructures, offshore construction, and fabrication, supply boats to offshore oil fields, and crew boats. Other activities in port operations or maritime trade are, tug boat and anchor handling, diving support vessels, cables and pipe laying vessels, barges and house boats activities, dredging services, tourism services, pilotage and towage services, supply of water, and fuel to vessels at anchorage mooring buoy, industrial areas and warehousing offices, and general port development (Edih et al., 2022a; Peretomode, 2014).

On the scale of estimates, there are over 100,000 sets of investment opportunities ranging from service providers to main investors in shipping and other port operations in the maritime industry. Their positive multiplier effects on one another in creating additional jobs and opportunities will be stretching over a million investment portfolios. In addition, port management is enhanced by standard ports facilities and services, standard berth, cargo handling, cargo storage facility, data computerization, fire service, and security services (Okerefe, 2018). Growth in merchandise has positive effects on port operations and GDP, and effective port operation is a booster to the GDP of maritime nations (UNCTAD, 2015; Ziaul & Hans-Joachim, 2018). Oceans have been considered gateway to global maritime services and Nigeria is blessed with abundance of coastal water resources. Despite, the vast opportunities in the maritime transportation and trade, the Nigerian government has not adequately realize the need to harness its fortune to raise revenues and provide numerous investment portfolios for the private actors (both

foreign and indigenous investors).

2.1.4. *Challenges Confronting the Prospects in the Maritime Sector in Nigeria.*

Every business opportunity presents surmountable challenges such that the prospects and investment portfolios in the Nigerian maritime sector are confronted with numerous challenges. Some of these onerous challenges have been identified in literature. Elem (2008) and Edih et al., (2022a), contend that port development is a scheme for creating different investment portfolios and these investments opportunities are avenues for generating revenues and employments for Nigerians and the government. The investment portfolios identified by (Elem, 2008) are dry docking, ship repairs and maintenance, coastal shipping services, terminals and jetties infrastructures, offshore construction and fabrication amongst others.

In Omoke et al., (2019), port congestion, poor computerization of data, reduction in port calls, high container dwell time, high turnaround time for vessels and trucks, and inadequate facilities were identified challenges. Ekpo(2012) also mentioned some similar problems truncating effective and efficient operations in the Nigerian port system, such as, lack of capital, poor incentives for investments, lack of integrated transport system, and inadequate shipping management skills. In Benson and Adekemi (2018), paucity of infrastructure was a major challenge. Nigerian port system is affected by lack of super structures and notably lack of funding from government.

Edih et al.,(2022a) also identified, insecurity in the waterways, government unceasing interference, public corruption, non implementation of professional and international maritime convention rules and standards (international maritime ethics). We can add that, improper application of public private partnership, (PPP) arrangements is another factor confronting the smooth operations of the Nigerian port system. The issue of shallow draught is preventing bigger ships from docking at the ports causing a reduction in port calls. Majority of the ports are in a state of moribund, non-functional and nonexistent. It may be assumed that government has forgotten about these ports, forgotten about the investment opportunities they would have provided for foreign and local investors, or forgotten about the revenues that would have been generated to the national treasury. Another dimension of the vicissitude of problems is the deliberate political manipulation in location of ports and total abandonment of some ports in some parts of the country. For over two decades, the Warri and Koko Ports have stopped functioning while old Port Harcourt and Onne ports are doing rickety operations leading to abysmal performance.

In Nigeria, there are two major Rivers, notably, the River Niger and River Benue which would have facilitated maritime transportation to and from the sea/ocean but for their shallow draught. Several calls have been made on the Federal Government to address the issue of dredging the two rivers to add economic value to the country. Also, in the bid to grow capacity in terms of human capital development especially for maritime sector, two maritime institutions were established by the Federal government of Nigeria but disappointedly, both are in a

state of despair of funding and infrastructures. The two institutions are Nigeria Maritime University, Okerenkoko and Maritime Academy, Oron. The need to reposition them to actualize their core mandate cannot be over-emphasized.

2.2. *Empirical studies.*

Edih et al., (2022a) examined the prospects and challenges of maritime business in Nigeria and identified poor funding and infrastructural dearth as some of the challenges hampering effective and efficient performance of the Nigerian ports. Everett (2007) and Robinson (2008) studies had earlier mentioned capacity of port, port's congestion, demurrage, competition, low level of investment, and management deficit as inhibiting factors to port operations and performance. It thus, recommends the option of public private partnership to raise the capital required to build adequate maritime infrastructures. The study also considers the two maritime institutions (Maritime Academy, Oron, and Nigeria Maritime University, Okerenkoko) as key to maritime research, and training of manpower for the maritime industry and therefore, must be funded and equipped to discharge their mandates.

Osadume and University (2020) study on port revenue performance and economic growth was anchored on the neoclassical growth theory which emphasis propels economic growth by the combination of endogenous factors (government policies, fiscal, monetary policies, etc.) and exogenous actors (technical, capital, and labour). The secondary time series data used for the study were analyzed using the ordinary least square regression and the Engle-Granger Co-integration to test the variables at a 5% level of significance. Findings showed that total revenue to gross registered tonnage had a positive and significant effect on economic growth. This result was in line with the studies of (Tongzon & Heng, 2005; Obioma et al., 2016) which assert that ports are catalysts, as well as gateways to economic prosperity. Banerjee (2009) study employed panel data regression on transportation infrastructure and economic growth revealed that, transportation network positively impact on per capita income growth rate across all sectors of the Chinese economy.

Akram (n.d) sees economic diversification as a vital economic growth in the long run and vibrant economies generate large share of their GDP in manufacturing and service sectors. A plethora of political, institutional and economic conditions affect the level of and rate of diversification in a country, which means that physical, policy, macro-economic and institutional variables influence the process of economic diversification. The study also found that the level of economic and export diversification is significantly lower in resource-rich countries than advanced economies. The need for infrastructural development and building strong institutions were emphasized. It was noticed that the impact of negative inflow of foreign exchange hinders export diversification. The study therefore, suggested that government should fight corruption and put necessary measures to foster economic diversification.

Esu and Udonwa (2015) suggest that the Nigerian government should encourage industrialization of the non-oil real sector by diversifying the economy. Using the error connection mechanism (ECM), results showed that Nigeria's economy could

grow by tapping from the untapped trade or business potentials in both short run and long run. The study provided some solutions for achieving industrialization, creation of necessary infrastructure, opening investment opportunities through modern technology, provide a conducive environment (macro-economic, political, social environments), ensuring zero tolerance to corruption and insecurity.

2.3. Theoretical framework.

The study is anchored on investment theory because it buttresses and incorporates the idea of economic diversification. Economic diversification and investment theory explain similar if not singular philosophy of economic or business expansion based on comparative advantage analysis. It focuses on the need to explore diverse economic units or investment opportunities that will generate revenues to the governments or the entrepreneurs.

2.3.1. Modern (Investment) Portfolio Theory.

Investment portfolio is a collective construct for a combination of possible investment options and decisions open to investors (or government). Modern Portfolio theory, (MPT) provides a range of investment portfolios that maximize expected returns to investors. The assumption in this model is that investors do not like taking risk, without positive returns, hence the need to investigate viable investment opportunities is very necessary.

Modern portfolio theory is considered as a policy for diversification of an economy to absorb sudden economic shock like the ravaging covid'19 pandemic. In this modern age, no country can survive being a mono-product economy because such country will remain dependent on imports, borrowings and foreign aids and will slide into deep economic recession during global emergency or shock. Diversified economy guards against uncertainties or serves as a shield to the economy and investors by maximizing gains from the various functional sectors of the economy and minimizes risks. Iyiola et al., (2012) see MPT as a financial tool for allocating scarce resources to viable sectors or investment units. It is therefore, a useful planning instrument for both the government and investors in the private sector.

3. Data and Methods.

The study employed ex-post factor research design with reference to the use of secondary data to assess the level of performance of the Nigerian ports. These data were collected from the Nigeria Ports Authority, National Bureau of Statistics and Central Bank of Nigeria. The secondary time series data obtained were analyzed using the ordinary least square regression and the Engle-Granger Co-integration to test the variables at a 5% level of significance.

3.1. Sample of Study.

The sample of the study represents the financial output from the eight ports in Nigeria which are under the official supervision and coordination of the Nigeria Ports Authority, NPA and Nigeria Maritime Administration and Safety Agency, NIMASA

3.2. Definition of Variables.

Gross Domestic Product, GDP:

It represents the measurement for economic growth in a country for a given period of time. In this study, the time for assessment is 2008-2021.

Gross Registered Tonnage, GRT:

GRT means the record of internal volume or internal capacity of ships or water going vessels used for classifying commercial vessels in maritime transport.

Total Tonnage of Cargo Handled or Ports Throughput:

Port throughput measures the amount of cargo or number of vessels the port authority handles for a period of time.

3.3. Model Specification.

Adopting the performance metrics and other crucial variables (World Bank, 1993 as cited in Osadume & University, 2020), the following variables were used for the study; income / expenditure per GRT which is transformed to Total Revenue / expenditure divided by Total GRT/or NRT of shipping, Operating Surplus per ton of cargo handled is measured by Operating Surplus divided by Total Tonnage of cargo handled or Port Throughput and the Rate of Return on Turnover is measured by Operating Surplus divided by Operating Income. Therefore, GDP is a function of total revenue to gross registered tonnage, operating surplus to total tonnage of throughput and operating surplus to operating revenues of the ports under consideration. The models below are formulated in line with the study of Osadume and University (2020) and specified in a functional form.

$$GDP = f(TRGRT, OSTP, OSOR) \quad (1)$$

$$TRGDP = f(TRGRT, OSTP, OSOR) \quad (2)$$

The econometric linear expression of the above model (1&2) gives multiple regression equations (3&4) presented as follows;

$$GDP = a_0 + a_1 TRGRT_t + a_2 OSTP_t + a_3 OSOR_t + e_t \quad (3)$$

$$TRGDP = a_0 + a_1 TRGRT_t + a_2 OSTP_t + a_3 OSOR_t + e_t \quad (4)$$

where;

- GDP is gross domestic product as the dependent variable.
- TRGDP is total revenue to gross domestic product as dependent variable.
- TRGRT is total revenue to gross registered tonnage as independent variable.

- OSTP is operating surplus to total tonnage ports throughput as independent variable.
- OSOR is operating surplus to operating revenue of as independent variable.
- a_0 is the intercept.
- e_t is the stochastic error term.
- t is the time trend.
- $a_0, a_1, a_2, a_3 > 0$ as a priori expectation.

3.4. A Priori Expectation.

We expect a positive and significant relationship between investments in the maritime sector and Gross Domestic Product growth of the Nigerian economy for the period, 2008–2021.

4. Results and Discussion.

Analysis of the secondary time series data was demonstrated in this section.

4.1. Results.

Table 1: Data showing Ports Performance, 2008–2021.

Yr.	Amt. realized (TR, Million)	Amt. Exp. (TE, Million)	Amt. Remitted (OS, Million)	GDP (Contrib. Millions)	GRT (million)	Throughput (Million)
2008	90,100	87,050	3,050	295,630	66,2414	42,394336
2009	98,250	94,120	4,130	301,540	75,8481	56,656,142
2010	101,050	95,030	6,020	339,848	106,6896	76,744,727
2011	115,020	105,140	9,880	374,099	122,6147	83,461,697
2012	136,010	125,200	10,810	405,441	129,5069	77,104738
2013	157,310	144,140	13,170	514,966	138,6722	78,281634
2014	172,800	154,770	18,030	568,499	156,0714	84,951927
2015	177,200	158,780	18,430	481,066	144,6152	77,387638
2016	182,420	158,550	23,870	404,650	139,4065	70,819092
2017	265,600	255,290	10,310	375,745	137,4802	71,903266
2018	270,560	245,910	24,650	398,186	128,6718	73,175127
2019	277,680	248,960	28,720	446,543	131,8975	74,698136
2020	201,360	190,150	11,210	391,010	125,4876	70,245813
2021	223,010	201,090	21,920	401,020	127,5643	69,316715

Source: Nigeria Port Authority, National Bureau of Statistics and Central Bank of Nigeria Bulletins.

Table 2: Data on Port's Performance, 2008–2021.

Yr.	OSTP	TRGRT	OSOR	TRGDP
2008	71.944	1,360.179	0.03385	0.30477
2009	72.896	1,295.352	0.04203	0.32583
2010	78.442	947.140	0.05957	0.29734
2011	118.378	938.060	0.08590	0.30746
2012	140.199	1050.214	0.08590	0.33546
2013	168.239	1134.402	0.07948	0.30548
2014	212.238	1107.186	0.08372	0.30396
2015	238.152	1225.321	0.10434	0.36835
2016	337.056	1304.547	0.13085	0.45081
2017	143.387	1931.915	0.03882	0.70686
2018	336.863	2120.714	0.09111	0.67948
2019	384.481	2105.271	0.10343	0.62184
2020	159.582	1,604.621	0.0557	0.51497
2021	316.229	1,748.216	0.0983	0.55611

Source: Author's computation, 2022.

4.1.1. Stationarity Tests.

Table 3: Stationarity Statistics.

Variables	ADF t-statistics	Critical value @ 5%	p-value	Level of integration
TRGDP	-3.3665	-2.0063	0.0050	1(2)
TRGRT	-3.6094	-2.0063	0.0034	1(2)
OSTP	-3.8539	-2.0212	0.0030	1(2)
OSOR	-2.9196	-2.0440	0.0130	1(2)

Source: Author's computation, 2022.

4.1.2. Heteroskedasticity Tests.

Table 4: Heteroskedasticity Test (Heteroskedasticity Test; ARCH).

F-statistic	0.156761	Prob. F (1,4)	0.7124
Obs* R-Squared	0.226273	Prob. Chi-Square (1)	0.6343

Source: Author's computation, 2022.

4.1.3. Regression Tests.

Table 5: Regression Tests Results (Dependent Variables: TRGDP).

Method: Least Squares				
Variable	Coefficient	State Error	t-statistic	Prob.
C	0.191756	0.042043	4.560948	0.0198
TRGRT (1)	0.000248	4.9805	4.974443	0.0156
OSTP (-1)	0.000216	0.000253	0.855946	0.4549
OSOR	-2.053840	0.304135	-6.753058	0.0066
R-Squared	0.390857	Mean dependent var		0.396911
Adj. R-Squared	0.381713	S.D dependent var		0.146382
F-statistic	108.3680	Durbin-Watson stat		1.924644
Prob (F-Statistic)	0.001480			

Source: Author's computation, 2022.

4.1.4. Co-integration Tests.

Table 6: Engle-Granger Co-integration.

Co-integration Test-Engle –Granger		
Specification: TRGDP TRGRT (1) OSTP (-1) OSOR C		
Co-integrating equation deterministic; C		
Null hypothesis: series are not co-integrated.		
	Value	Prob*
Engle – Granger tau-statistic	- 2.621741	0.6639
Engle – Granger Z-statistic	- 6.334353	0.4058

Source: Author's computation, 2022.

4.2. Discussion.

The focal objective of this study is to ascertain the effect of maritime business performance on economic diversification and real GDP growth in the maritime transport sector of the Nigerian economy. Based on this singular purpose, relevant maritime variables (data) were imputed into the model, analysed in six tables and results discussed as follows:

Table 1 above relates to the raw data showing the inflow and outflow of revenues (in millions) realized, expenditures, amount remitted to national treasury, yearly contributions to GDP computations and throughput in the Nigerian ports for the period of assessment. These figures indicate a steady increase in yearly inflows, outflows, contribution to GDP as well as the throughputs.

While **Table 2** shows the computations derived from data in **Table 1** to arrive at the yearly value for OSTP (operating surplus divided by total tonnage per ton), TRGRT (total revenue divided by total gross registered tonnage), and OSOR (operating surplus divided by operating revenue). These results define the level of financial performance in the ports during the period of assessment, 2008 to 2021. It shows TRGDP, revenue contribution of 30.47%, 32.58%, 29.73% to GDP in 2008, 2009 and 2010 respectively. The revenue contribution to GDP stood between 30% - 45% for 2008 to 2017 which helped to cushion the negative effect of the economic recession in 2017/2018 fiscal years while revenue contributions from the maritime transport sector hovered between 51%-70% for 2018 to 2021 fiscal years as driver of economic activities in Nigeria. It could be seen that covid'19 pandemic reduced revenue contributions to GDP in 2021/2022.

The OSOR (operating surplus to total revenue) had a t-statistic value of -6.75531 and a p-value of 0.0066 that is negative, however, had statistically significant effect on Total Revenue to Gross Domestic Product growth since the p-value is also below 5%. The Operating Surplus to Total Tonnage Port Throughput, OSTP (-1) at lag 1, had a t-statistic value of 0.8559 and a p-value of 0.4549. It is an indication of a positive but statistically not significant at the chosen 5% level since the p-value is greater than 0.05.

Table 3 indicates the test which requires the variables in the time series model to assume a stationary point at given level and their p-value must be significant at the chosen level. The required Stationarity is deemed attained when the test results are most negative and greater than the critical value of the level of significance. Therefore, results from table 3 showed that, the variables used for the analysis were stationary at order 2 because the ADF statistics for the variables were more negative than the critical values at a 5% level of significance.

Table 4 indicates this test is carried out when the variance of errors is not constant in order to treat the presence of Heteroskedasticity if found. The treatment method used in this study was the ARCH Test (Autoregressive Conditionally Heteroskedastic). In this case, the null hypothesis states that, there is no Heteroskedasticity if the p-value is greater than the significant level (Brooks & Cullinane, 2006). Based on the results found in Table 4, the null hypothesis is accepted since the p-value is greater than the 5% level of significance. Therefore, there no trace of Heteroskedasticity.

In **Table 5**, TRGRT (1) at led 1 had a t-statistic value of 4.9744 and a p-value of 0.0156 which demonstrates a positive effect on Total Revenue to Gross Domestic Product growth. This impact is statistically significant at the 5% because the p-value is behind 0.05. Based on this result, we reject the null hypothesis and accept the affirmative hypothesis which states

that, there is a positive and significant relationship between investments in maritime transportation sector and economic diversification and GDP growth in Nigeria. Also, investment in maritime transport sector accounted for the positive change in GDP growth for the period as demonstrated by the adjusted R-square figure (0.381713) which resulted to 38.2% change in GDP growth. The Durbin- Waston statistics which is 1.9246 stands between the range of 1.5 and 2.5 meaning the data used for the analysis were free from autocorrelation. Since the p-value of the F-statistics (0.00148) is less than 0.05, shows that at least one of the independent variables (TRGRT, OSTP, OSOR) is a significant predictor of the dependent variable (GDP).

The Engle-Granger Co-integration Tests results in **Table 6** showed that, there is no Co-integration between the dependent variable (TRGDP) and the independent variables; TRGRT, OSOR and OSTP at the 0.05 level of significance. This is because the Engle-Granger tau-statistic and Engle-Granger z-statistic demonstrated an insignificant effect of independent variables on the dependent variable at 0.6639 and 0.4058, respectively.

These results simply mean that, a 1% increase in Total Revenue to Gross Registered Tonnage will lead to a 0.00248% increase in Total Revenue to Gross Domestic Product growth. Since the coefficient of the future level of Total Revenue to Gross Registered Tonnage is positive at the 5% level of significance, TRGRT will have a positive and significant effect on Gross Domestic Product growth in the short run in Nigeria.

Implications on Economic diversification and Investments in the maritime sector

Based on the findings from the data analysis, the two major situations or effects could be inferred.

1. The 1% increase in total revenue to gross registered tonnage is a positive indication that the maritime sector is viable for more investments. It also portrays that, the existing ports in Nigeria should be effectively managed to achieve optimal performance and there are opportunities or open doors for establishing more ports, terminals, dockyards, etc. There could be investments in dredging waterways (Rivers Niger and Benue) to enhance maritime transport services.

Other investment portfolios identified in Elem, (2008) are dry docking, ship repairs and maintenance, coastal shipping services, terminals and jetties infrastructures, offshore construction and fabrication amongst others. The theory of Modern Portfolio provides a foundation for understanding economic diversification and investments opportunities that will attract high returns to investors. The vast investment portfolios in the maritime transport business would be worthwhile for developing economies having such natural advantage in coastal areas.

The positive impact of TRGRT and OSOR on TRGDP supports the findings of Osadume and University (2020) as well as Omoke et al, (2019), that the port's operations are catalyst to revenue growth and diversified investments. It has also been suggested that the non-oil sector of the Nigerian economy is viable option for investment and diversification (Esu & Udonwa, 2015) and Akram (n.d) reveals that economic diversification propels GDP growth and development.

2. The lack of co-integration among the studied variables presuppose that there are operational weaknesses or inefficiencies (i.e, political interferences, corruption, inadequate reforms, etc.) hampering the quality-of-service delivery in Nigerian ports. In Benson and Adekemi (2018), paucity of infrastructure was a major challenge. Nigerian port system is affected by lack of super structures and notably lack of funding from government.

Since the research revealed no co-integration between TR-GRT, OSTP and OSOR on GDP growth (TRGDP), government and policy makers should raise the standard of service delivery in the Nigerian port system to achieve optimal performance level by implementing relevant reforms in the maritime sector, curtail political interferences (bureaucratic bottlenecks) , avoid financial impropriety (financial recklessness) and policy sumersault.

Conclusions.

The study examined the effect of maritime business performance on economic diversification and real gross domestic product growth in emerging economies: the Nigerian maritime transportation sector. The main objective of this research is to ascertain whether the maritime transportation sector is a viable option for economic diversification and productive investment choice. It was discovered from the study that; the maritime transportation sector and gross domestic product growth have a positive and significant relationship. Therefore, the maritime transportation sector provides a fertile business environment, fosters an elaborate Investment opportunities for economic diversification, and creates vast employment opportunities and improve economic growth of nations engaged in maritime trade.

Based on this result, the following suggestions will help the Nigerian government and other stakeholders in formulating the required policies and programmes on investing in the maritime transportation sector in Nigeria;

1. Government should address the teething problems affecting optimal performance in the maritime transportation sector by providing the required/enabling business environment through infrastructural development. The existing port's facilities are decaying and functioning at abysmally low capacity.

2. Government should also enhance its policy on trade and investment liberalization to foster more private sector participation, particularly in the maritime sector. This will attract more foreign direct investment, FDI, and the maritime transport sector will generate millions of tangible jobs to the teeming unemployed army in the country.

3. The two maritime institutions (the Nigeria Maritime University, Okerenkoko and the Maritime Academic, Oron) must be positioned, equipped and funded to achieve their core mandates of training manpower for the industry, and maritime research. There should be a special and undisturbed funding source set outside for these institutions so that the usual hue and cry for funding will not become another debacle to effective and efficient performance.

4. The dredging of the two major Rivers, Niger and Benue Rivers will gulp a whopping sum of billions of dollars and a ma-

jor project that must be carried out by the Nigerian government because of their key role in maritime transportation and effective ports operations in the country. The need to partner with developed countries, China, America and others in this regard would be encouraging in sourcing for technologies, capacity and huge loans with long term pay back duration is paramount.

5. Generally, a country with the intention to grow and develop her economy must not politick with such vision. Therefore, growing the maritime transportation sector for economic prosperity should be devoid of bureaucratic bottlenecks, ethnic and religious politics (the bane of most developing nations).

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