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Assessment of the Impact of Ocean Transport on Nigerian Economy: Error Correction Term Approach

Richard C. Osadume[1,*], Pani Yakubu Tanko[2], Tunde Jimoh Abraham[3]

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ABSTRACT

This study examined the impact of Ocean Transport on the Nigerian Economy. The main objective of the study is to ascertain the effect of Ocean transportation on the Nigerian economy as an emerging market. The study evaluated the effect of sea trade captured by export and import business on the economy of Nigeria proxy by ratio of import to gdp and ratio of export to gross domestic product, and cargo throughput and gross registered tonnage and also, the effect of Seaport performance on the Nigeria economy using secondary data from the Nigeria Port Authority, the Central Bank of Nigeria and the World Bank. The work further utilized empirical exploration of other scholar's work. The variables of interests were tested at the 0.05 significance level using selected econometric methods such as ordinary least square and Error Correction Model. The findings revealed a statistical significance between Ocean transportation and the Nigerian Economy, and concludes that Ocean Transportation significantly contributes to the gross domestic product of the Nigerian economy as an emerging market with a speed of convergence of 140.66% from the short-term period to the long-term period. The study recommends amongst others, the provision of key modern port infrastructures including dredging of the seaports to improve the Nigerian port performance and enhance revenue generation.

1. Introduction.

Ocean transport is also referred to as fluvial transport or Seaborne transport. It is the conveyance of people (passengers) or goods (cargo) via waterways. It involves a number of interrelated and interconnected activities such as pilotage, towage, provision of berth, stevedoring, maintenance of navigable channels, etc. (Badejo, 2001).

Ocean transport is done by boat, ship, sailboat or barge, over oceans, and lakes, through canals or along rivers. Ocean shipping may be for commerce, recreation or for military purposes. Ocean transport is made possible because of the oceans and seas bordering continents and countries, and rivers running through vast spaces of land.

Ocean transport is vital for suitable trade and development as the world relies on a safe, secure and efficient international shipping industry. It is an important part of the blue economy which has huge potential to enhance growth and improve people's lives while focusing on many if the UN sustainable development goals (Eto' 2019). According to Eto (2019), Ocean transport is the backbone of the increasingly globalized economy and the international trade system. It is largely simulated and sustained by demand for cargoes. Over 96%of the transportation of Nigeria's external trade is by Ocean transport.

Ocean transport has been described as the combination of shipping, port operations and all of the several services that provide support to roads and rail access necessary to link ports to the hinterland they serve. Ocean /ship transport involves the process of moving people, goods etc. by barge, boat ship or sailboat over a sea, ocean, lake, canal or river. This is frequently

[1]Dept. Maritime Economics & Finance. Nigeria Maritime University. Okerenkoko, Delta State. Email: dr.rcosadume@gmail.com.
[2]Dept. Maritime Mgt. & Administration. Institute of Maritime Studies, UNILAG. Akoka, Lagos. Email: yakspani@yahoo.com.
[3]Dept. Maritime Mgt. & Administration. Institute of Maritime Studies, UNILAG. Akoka, Lagos. Email: ozaviirenyi@yahoo.com.
*Corresponding author: Richard C. Osadume. E-mail: dr.rcosadume@gmail.com.

undertaken for purposes of commerce, recreation or military objectives.

Ocean transportation is vital to the effective performance of any country's economy and a pivotal part of a nation's transport infrastructure. Absence of it, could lead to a landlocked situation of countries such as Nigeria, leading to economic stagnancy.

Ocean transportation constitutes the cheapest mode of transportation over a long distance compared with rail and road in the ratio 1:3:6 respectively. This explains why shipping accounts for the transportation of over 95% of the world trade in terms of volume. Water or Ocean transport has disadvantage when material delivery is time-critical. The upsurge in demand for Ocean transport services has been the catalyst for innovation in ship building technology, port management, tanker operations, terminal operation etc. containerization revolutionized Ocean transport starting in 1970s. when cargo is carried in more than one mode, it is inter-modal or co-modal.

The main objective of the study is to assess the impact of Ocean transport on the Nigerian economy. The study will evaluate the effect of sea-trade captured by export and import trade on the Nigeria economy, proxy by ratio of import and ratio of export to gross domestic product, gross tonnage, cargo throughput and also, the effect of Seaport performance on the Nigeria economy. The research question shall include - i) What is the effect of Sea trade captured by export and import on the Nigerian economy; ii) Is there a correlation between Sea port performance and the Nigerian economy? The hypothesis will be in the null form, that is - i) there is no significant effect of sea-trade on the Nigerian economy and also, ii) there is no significant correlation between Sea port performance and the Nigerian economy. The study will be divided into five sections, namely - 1. Introduction, 2. Literature Review, 3. Research Methodology, 4. Data Analysis and 5. Conclusion and Recommendations.

2. Literature Review.

In this section, the paper considers key concepts, theories supporting Ocean transportation and some current empirical reviews;

2.1. Conceptual Review.

a) Key Attributes of Ocean Transport.

Faith (2019), believes that the attributes of Ocean transport, which can also be applied to different modes of transportation are:

1. Ocean transport is an essential derivative demand;
2. Ocean transport is demand responsive;
3. The Ocean transport sector is capital intensive and labour intensive
4. Global economy influences the Ocean industry especially because it affects the trade pattern of national economics;
5. Ocean transportation is very open to technological innovations, efficiencies and changes;
6. Structural support and logistics are vital and very essential in order to achieve an efficient Ocean transport system.

b) Conditions that Boost Ocean transport.

According to Asghar (2019), the growth in transnational trade with removal of trade barriers (trade liberalization), have made developing countries to concentrate more on the improvement of their infrastructure, like roads, airports and seaports which can play a more pivotal role in the developments of the economy.

Asghar (2019) notes that apart from product storage, coupled with the capacity to move large shipments, these have placed the shipping industry in a very advantageous position presently. But, the development of shipping industry in a country also depends on its population density, economic advancement and many other interrelated conditions, like port and refueling (bunkering) capacities.

1. *Bunkering Services in Nigeria.*
   Bunkering services is a process or an act whereby a duly licensed operator provides fuels, water, and lubricants for marine vessels on request. Oil bunkering therefore means the act or process of supplying a ship with fuel. Ships no longer use coal for firing their engines, rather they use thermal fuel oil. Where the coal was stored for use to fire the engine was called a bunker.
   According to Eto (2019), even though Nigeria is positioned to service any ship coming to Nigeria or transiting to other parts of the world, the country is yet to key into this opportunity as seen from ships coming to Nigeria going to neighbouring countries to refuel. The untapped bunker market is extremely large; Lagos ports alone attracts about 75% of the Ocean traffic in Nigeria, while 60% of the Ocean traffic in west African sub region is generated by Nigeria. The oil bunker need of these traffic has remained untapped.

2. *Why Ships Are Not Inclined to Receive Bunker Supplies from Nigeria Seaports.*
   Eto (2019) identified the following factors as being responsible for ships not inclined to receiving bunker supplies from Nigeria seaports:

   - Non-availability of the products owing to the fact that Nigeria is import-oriented, bunkering primarily is dependent on residue fuel, a by-product after the crude oil has been refined for petroleum products.
   - Ships do not like to come to Nigeria to bunker because of the high port cost and related charges
   - The bottle neck of getting task force approval before ships can leave the port.

   The biggest component of money required to run a ship is spent on bunker fuel. Decline in bunker price means a significant impact on the bottom line of a shipping company.

3. *Reasons for the Declining Share of Nigeria's Shipping Tonnage.*
The shipping in Nigeria is facing significant Ocean infrastructure decay and poor regulatory capability. There are also several international regulations on operations of ships which our operators are finding difficult to comply with. Some such regulations include the international convention for the prevention of pollution from ships, convention on the international regulation for preventing collisions at sea, international ship and port facility Security code, and international safety management code.
Domestically, there are several acts that regulate the shipping industry. However, the enforcement of these acts has been most challenging.
Reasons for the declining share of Nigeria's shipping tonnage in the country's overseas trade include:

   - Poor ship turnaround owing to port congestions;
   - Poor hinterland connectivity due to uncoordinated inland transport system.
   - The increasing size and sophistication of ships and port facilities require heavy capital investments and
   - Lagos port infrastructure alone is insufficient to handle trade flow effectively.

4. *Importance and Significance of Ocean Transport in Globalization.*
60% of global petroleum products is transported by ships while international shipping carries over 0%of the world trade.
According to Kumar and Hoffmann (2019), together with telecommunication, trade liberalization and improvements in international standards, the increased efficacy of port and shipping services (Ocean transport) has made it ever easier to buy and sell merchandise goods, raw materials and components everywhere in the world. Ocean transport is largely stimulated and sustained by demand for cargoes. In the case of Nigeria, it is used to be agricultural produce, but now it is wet cargo (petroleum products). Therefore, whether for oil export or non-oil export, Ocean transport is vital as a means of conveying exports to international market.
According to the International Centre for trade and sustainable Development (ICSTD), about 90% of world trade (by volume and 70% (by value) is carried by Ocean transport. Ocean transport enables the movements of thousands of shipments to travel through seas and oceans in ships. This is with the result that Ocean trade involves ships carrying large shipments. Trading through Ocean transport helps to minimize the total costs of the business of transportation because it is a cheaper medium.
With over 80 % of global trade transported by sea, Ocean shipping is the life blood of today's highly integrated world economy.
Ugwu (2008), international shipping carries over 90% of world trade. 80% of Nigeria's export is made up of crude oil and it is seaborne. In th 1960s/70s Nigeria's export was mainly agro-based, constituting 86.5%.it was equally seaborne. In the case of Nigeria, it used to be agricultural produce, but now it is wet cargo (petroleum products). Therefore for oil export or non-oil export, Ocean transport is vital as a means of conveying exports to international market.
The upsurge in demand for Ocean transport has been the catalyst for innovation in ship building technology, port management, tanker operations etc. According to Jonah (2010), this encouraged the FGN to embark on the development of Ocean technology through the establishment of the following primary agencies:

   - The Ocean Academy of Nigeria, Oron;
   - National Institute of Oceanography & Marine Research (NIOMR)
   - Rivers State University of Science & Technology, Port Harcourt;
   - Federal University of Technology, Owerri;
   - Nigerian Institute for Transport Technology (NITT), Zaria;
   - Nigeria Maritime University, Okerenkoko.

Other agencies that contribute to the development of marine technology in Nigeria are the Nigerian Navy through the Naval Engineering College in Sapele, numerous training programmes abroad and the NPA (Jonah 2010; Ugwu, 2008).

5. *Benefits of Ocean Transport*
Ocean transport is essential for any country in different aspects and for several reasons. Focusing on it with the aim of developing its potential has lots of benefits for a country.

Transport.
The sole purpose of Ocean transport from ancient times was to convey people from one point to the other across the water. People can travel around the world in ships with minimal risks. In early times, transport in ships was scary and not convenient because it took a long time to arrive the final destination.
The eco-friendly nature of Ocean transport has been hailed as one of its greatest advantages. As the industry researches on fuel efficiency of ships and lower carbon emission, there will be an increase in the demand for Ocean transport due to lesser harmful to the environment.

Trading.
Trading is one of the chief applications of Ocean transport. Tens of thousands of shipments crisscross seas and oceans regularly. All the world super power and industrialized countries are reliant on Ocean transport for conducting their trade. Ocean nations that have exclusive ownership of trade routes derive the most benefit out of Ocean transport. The most appealing aspect of using

Ocean transport for trade is that ocean-going vessels can carry large shipments conveniently.

Employment.
From arranging for haulage from hinterland to the seaport, to loading of stock in the ships and to steering the ships, there are several employment opportunities at every stage of the supply chain. The use of the wider spectrum of activities connected to Ocean transport results in the creation of multiple jobs. Another example of how Ocean transport creates employment opportunities is the services of waiters, music players, and many other personnel on board a cruise ship for conducting tourism via Ocean transport.
The ocean going vessel itself is a complex pieces of mechanism put together with numerous equipment that require the expertise of professionals to operate. For instance, there are numerous valves fixed to different parts of a ship that are always prone to the risk of leaking. Therefore, trained workers are required to be on standby to operate these valves efficiently. Nevertheless, it is wise to procure from a reputed globe valve supplier because it can save the pain that comes from the inconvenience.
Against this background therefore, the effective support for the use of Ocean transport by the government, can be a great boost in the fight to the eradicate unemployment.

Tourism.
The evolution of travelling through ship over time has led to the conversion of Ocean transport from being mere necessity to luxury with the introduction of the modern ship designs and state-of-the-art facilities. People can now travel around the globe with ease on cruise ships and ferries. These cruise ships come with all the trappings of an ideal medium for tourism transportation. Facilities are fitted into these modern cruise ships to allow for the reception of television programmes, and carry out certain activities, such as entertainment and the provision of refreshment and do so much more on a cruise ships.
Ocean transport has been recognized as a great medium for tourism, which can play a critical role in the development of an economy. Diverse countries around the world are generating great amounts of revenue from tourism through Ocean transport.

International relations.
One of the importance of Ocean transport is that it enhances the building of good international relations. Arising from the huge scope of Ocean transport are the many parties that are interested in being a part of it varied aspects. If a country is therefore linked with busy Ocean routes, it would turn out to be a hub of trade and commercial activities in the region. Every country on have different economic and strategic interest stemming from their association with Ocean transport either directly or indirectly. Based on these reasons, if the innumerable opportunities associated with Ocean transport are sufficiently explored, it can play a key role in establishing relations with different countries.

Economic influence.
The benefits derivable from Ocean transport are not limited to trade only. Ocean transport has a tremendous impact on the overall national economy. Numerous industries are directly or indirectly related to the diverse activities involved in Ocean transport. For example, the shipping industry is directly impacted by the magnitude of the multifarious activities of Ocean transport. Diverse or multinational business entities hire Ocean freight forwarders to transport their shipments thereby attracting a great investment opportunities. The countries that accord priority attention to Ocean transport derive immense returns from operations connected to it.

The Erosive Foreign Shipping Companies Against Nigeria's Ocean Transport Business.
The enormous role that the Ocean sector could have played towards tapping its potential is reveled in the light of Nigeria's oil Terminal such as Bonny, Escravous and Forcados hosting oil tankers of various sizes, to exclusion of indigenous operators. Rather, it is foreign shipping companies that are raking in all the mouth-watering gains. Crude oil has since displaced agriculture as Nigeria's economy mainstay accounting, for about 85% of Nigeria's total income. Undeniably, Ocean transport has provided employment opportunity for a reasonable number of Nigerians in various Ocean related occupation. It has also partly provided the impetus for the spate of urbanization and industrialization of the nation as well as providing the platform to boost Nigerian's trade and commercial relation with the outside world.
A Ocean nation without fail must be security conscious to avoid being vulnerable to external aggression and attacks from the seas. Therefore, Ocean transport has made it possible for the nation to establish a naval force, whose professionalism makes to it a force to reckon in West and Central and sub-religion.

Role of Ocean Transport in National Development.
Adam Smith recognized in 1776 that shipping is one of the strong catalyst for socioeconomic development when he said that " A business working in a country without a link to the outside world can never achieve high levels of efficiency because its small market will limit the degree of specialization".
Today, globalization can be fast-track by Ocean shipping, particularly with the advent of containerization. This was capture succinctly when an anonymous author said "container shipping could lay calm to being the world's first truly global industry". In other words, container shipping could be regarded as the foremost industry that oils the will of global economy, because it connect countries, regional market, business and people, enabling to buy and sell on an unprecedented scale.

Shipping has led to phenomenal growth in world merchandise trade as demonstrated by the value of total world export, which increased from US$6,454 billion in 2002 to US$40,393 billion in 2005 representing an increase of 64 percent (OECD, 2019).

Globally nations have become increasingly nurtured by trade links. International trade is highly dependent on shipping with over 90% of world trade and 94% of developing countries trade by volume transported by ocean shipping (Frankel, 1989).

Igbokwe (2001), noted that the importance of Ocean to the Nigeria economy can be identified in the following areas: (i) Transportation (ii) Facilitation of trade and commerce (iii) Revenue generalization and availability of finance (iv) Promotion of tourism (v) Development of related economic activities (vi) Employment of job opportunities (vii) Enhancement of industrial growth and development (viii) Institutional development.

6. *Emerging Market Issues in International Ocean Transport for Nigeria.*

Over 80% of Nigeria's is made of crude oil and it is a seaborne. In the 1960s/70s, Nigeria's export was mainly agro-based, constituting 86.5% of Nigeria's export. It was equally seaborne.

Future Challenge in Ocean Transport Sector Arising from International Shipping Technological Development.

According to Garlic, et al (2014) Ocean has become substantially safer over the past decades and apparently navigation seems to be safer than ever, but additional development of shipping technologies will introduce fresh challenge that shipping industry cannot wish away.

Such challenge in shipping industry will require solution for future problems.

Advancement in Shipping Technology.

The global shipping industry is facing the major challenge of how to adapt in post oil era. Norway is working toward zero-emissions shipping.

In 2015, the world's first fully electric car and passenger ferry – the Ampere- was launched in Norway. Hybrid electric ships offer the flexibility to let engines operate at variable speeds and significantly reduce noise and vibration and emissions in port and coastal areas.

Improvement of Efficiency of Ships.

- Ship efficiency will optimize the energy management system of the ship, especially taking into consideration voyage plans, weather data, load conditions of the ship, power generation and propulsion systems.
- Advancement in shipping technology has resulted in wider scope of Ocean transport.
- Autonomous, unmanned surface ship (1) would cut the wage bill for companies (2) will be lighter, requiring less fuel and (3) will leave a smaller carbon footprint.
- Without compromising safety, security or environmental protection, IMO declared that unmanned, remote controlled surface vessels are parts of industry " evolution", and that it expect such ships to first embark on shorter voyages.

2.2. Theoretical Review.

2.2.1. Theories Supporting Ocean Transportation.

The essence of Ocean transportation is to facilitate the exchange of goods and services between nations and regions through the sea as a transport medium. Some of these supporting theories include;

1. **Theory of Comparative Advantage**: This theory advocates that countries specialize in the production of goods and services for which they have comparative advantage over others. When this happens, there tends to be exchange of products and services between these countries carried long distances across the sea.
2. **Theories of Competitive Advantage**: Countries should engage in production of items for which they have competitive advantage over others or least cost of production and import other items that they produce more expensively over others. This also necessitates transportation over the sea with its attendant benefits and costs.
3. **New Product Life Cycle theory**: Introduced by Raymond Vernon in 1960, and identifed three major cycles of production, namely - 1). New product, 2) Maturing Product and , 3) Standardized Product. It argued that product of the new product will occur completely in the home country of its innovation, and shipped to overseas country for sales and exchanges. The exchange employs ocean means of transport.
4. **Porter New Modern Theory**: Propounded in 1990, and holds that innovation and up-tooling will make the shipping sector competitive.

2.3. Empirical Review.

There are several research works by prominent scholars on the subject of Ocean Transportation and the Nigerian Economy, which have failed to arrive at a consensus on the effect of such a mode of transportation on the Nigerian economy. Some of these works are examined below;

Alari E.F (2019) studied the water transport sector of Nigeria; challenge and sustainable prospect and identified several challenges such as funding, manpower, legislation, pollution, safety etc. The study concluded suggesting some measures to boost maritime transportation in Nigeria, contending that the industry contributes positively to the Nigeria Economy.

Lloyd, Onyeabor, Nwafor, .Alozie, Nwafor, Mahakweabba and Adibe (2019), Appraised the water transportation importance to the Nigeria Economy and identified insecurity, infrastructure, inadequacy, inadequate capital for investment and maintenance of ships, poor incentives for investment, lack of indigenous carrier vessels, poor integrated water system etc as part of the many challenges of ocean transport in Nigeria.

Batrancea, Rathnaswarmy and Batrancea, (2021) Researched on the determinants of growth of 34 African economies and found out that export trade, import trade, gross capital formation and domestic savings, as well as foreign direct investments were part of the factor that contributed to the growth of African economy.

Njoku, Yomi and Sunday (2020), their study researched on the appraisal of shipping trade influence on growth of Nigerian economy from 1981-2016 using secondary data. The outcome revealed a significantly positive correlation of GDP to shipping trade with external reserves.

Ncawadi and Matekenya (2022), the study explore the impact of maritime transport financing on total trade volume in South Africa using Auto regressive distributed lag (AROL) between 1994-2019 and found a positive relationship. The study concluded that maritime sector investment is a catalyst to trade flow growth in South Africa.

NIMASA (2021). the work revealed the impact of transport system on national Economy and concluded that the transport policy will have an aggressive positive impact on the Nigeria Economy.

Sanni (2022), the study investigated the effect the blue economy will have in attracting foreign direct investment and concludes that the blue economy is beneficial in attracting foreign direct investment and foreign exchange earnings for maritime nations as well as creation of wealth and employment for the youths.

Igberi and Ogunniyi (2013) the research investigated the Nigeria Maritime Sector effect on the growth of the Nigeria Economy focusing on the industrial sector of the Economy. The study used secondary data and least square regression method and discovered a negative and insignificant relationship between maritime Transport sector of Nigeria and Economic growth.

Buhari (2013), the research work studied the seatrade business in Nigeria with focus on dry bulk and the demand service for Transport between 1960-2005. the outcome showed that maritime Transport accounted for increase demand between Nigeria -USA and Nigeria-Asia

University, Igemohia, & Faghawari (2022), the investigation studied the optimal port operations and its effect on global marine transportation using selected ports in Nigeria employing primary sources of data such as questionnaire. The outcome revealed a positive and significant relationship between port operations and maritime transportation in Nigeria.

3. Methodology.

This Paper uses ex-post factor research design methods by employing secondary data secured from the national bureau of statistics (NBS) data base.

The data collected in this work include data on import, export, cargo throughput, Gross registered tonnage and real gross domestic product from the maritime sector. The model used in this work was patterned after the research work of Igberi and Ogunniyi (2013) , which used variables such as export, import, Gross domestic growth rate, and foreign exchange. We shall as well apply this model with some moderations as below;

$$RGDP = EXPT + IMPT + FOREX \ldots\ldots\ldots\ldots \text{ eq. 1.}$$
(Igberi & Ogunniyi, 2013)

$$RGDP = a_{0+}a_1EXPT + a_2IMPT + a_3FOREX {}_{+}a_4GRT + CRPTa_5 \ldots\ldots \text{eq. 2.}$$

$$\text{Log } RGDP = LOG\,[a_{0+}a_1EXPT + a_2IMPT + a_3FOREX {}_{+}a_4GRT + CRPTa_5] + u_t \ldots\ldots \text{eq. 3.}$$

$$RGDP = a_{0+}a_1EXGDP + a_2IMGDP + a_3FOREX +a_4GDPGRT + a_5GDPCTP + u_t \ldots\ldots \text{eq. 4.}$$

Where:

RGDP = Real gross domestic Product;
EXPT = Export - EXGDP [Measured as ratio of export to GDP];
IMPT = Import - IMGDP [Measured as ratio of import to GDP];
FOREX = Foreign Exchange rate;
GRT = Gross reg. Tonnage - GDPGRT [Meas. as ratio of GRT to GDP];
CTP = Cargo Throughput - GDPCTP [Measured as ratio of CTP to GDP];
a_0 – a_5 = Parameters;
U_t = Error term;
Apriori expectation = negative and insignificant;

3.1. Analytical Tests.

The analytical test that shall be carried out will include;

1. Data descriptive tests.
2. Stationarity.
3. Simple graphical illustration.
4. Ordinary least square Test.

4. Data Presentation and Analysis.

4.1. Data Presentation.

The data in Table 1 shows that the GDP of the country has been on the increase from $95.39m in 2002 to $440.83m in 2021, and attaining its peak in 2014 with $568.50m. This shows a growing or emerging economy status. The trade data (export and import) has grown phenomenally over the period and has trickled down to the port activities of cargo throughput and gross registered tonnages, signifying growing port capacities of the Nigeria seaports. However, while the growth trend of the cargo throughput has been consistent from 36.99m in 2002 to over 80m in 2021, the gross registered tonnage has been cyclical in growth from 118.21m in 2002 to 160.91m in 2004, down to 84.31m in 2007 and finally in 2021 to 125.13m [inconsistent growth trend].

Table 1: Nigeria Trade and Port Data.

Year	GDP	Grt	Ctp	Exgdp	Imgdp	Forex	Grtgdp	Ctpgdp	Rgdp
1998	54.6	97.892193	19.325718	80.04	197.38	21.89	1.792897	0.353951	2.58
1999	59.37	94.742691	22.232936	111.27	164.17	92.34	1.595801	0.374481	0.58
2000	69.45	123.037909	28.93288	143.99	143.99	101.7	1.771604	0.416600	5.02
2001	72.8	130.013586	35.940692	118.17	187.27	111.23	1.785901	0.493691	5.92
2002	95.38582	118.21104	36.987241	23.24	16.8	120.58	1.23929364	0.38776457	15.33
2003	104.912	132.38823	39.765945	26.751	22.58	129.22	1.26189788	0.37904096	7.35
2004	136.386	160.90555	40.816947	20.254	11.64	132.89	1.17978055	0.2992752	9.25
2005	176.134	145.49586	44.952078	21.034	12.03	131.27	0.8260521	0.25521522	6.44
2006	236.104	141.45577	49.173324	29.516	13.05	128.65	0.59912483	0.20826976	6.06
2007	275.626	84.806792	57.47335	21.236	18.1	125.81	0.30768792	0.20851933	6.59
2008	339.475	89.505702	64.37275	25.67	15.13	118.57	0.26365919	0.18962442	6.76
2009	295.009	90.603611	65.775509	18.63	17.43	148.88	0.30712151	0.22296102	8.04
2010	339.848	106.6896	76.744727	25.661	17.66	150.3	0.31393329	0.22582074	8.01
2011	374.099	122.6147	83.461697	31.617	21.66	153.3	0.32776003	0.22310056	5.31
2012	405.441	120.81868	77.104738	31.547	12.99	157.5	0.29799325	0.19017499	4.23
2013	514.966	130.62806	78.281634	18.05	13	157.31	0.25366347	0.15201321	6.67
2014	568.499	148.32307	84.951927	18.435	12.45	158.55	0.26090296	0.14943197	6.31
2015	481.066	141.2507	77.387638	10.666	10.67	192.44	0.29362021	0.16086699	2.65
2016	404.65	134.06655	70.819092	9.218	11.5	253.49	0.33131484	0.1750132	-1.62
2017	375.745	130.35736	71.903266	13.172	13.18	305.79	0.34693039	0.19136187	0.81
2018	398.186	128.67181	73.175127	15.497	17.51	306.08	0.32314499	0.18377122	1.92
2019	446.543	108.92312	74.698136	14.221	19.8	306.92	0.24392527	0.16728095	2.21
2020	432.2	127.56251	80.826672	8.118	16.57	358.81	0.29514695	0.1870122	-3.4
2021	440.83	125.12579	79.915877	10.738	11.84	413.85	0.28384137	0.18128502	5.7
2022	1,082.00	161.14410	99.015400	15.82	13.15	448.90	0.1489317	0.0915115	22.09

GDP = Nigeria's Gross Domestic Product (in million US dollars), Grt = Gross registered tonnage (in million US dollars), Ctp = Cargo Throughput (in million US dollars), Exgdp = ratio of Nigeria export to gross domestic product, Imgdp = ratio of Nigeria import to gross domestic product, Forex = foreign exchange rate to US Dollar, Grtgdp= ratio of gross registered tonnage to gross domestic product, Ctpgdp= ratio of cargo throughput to gross domestic product, Rgdp = Real gross domestic product (Gdp growth rate).

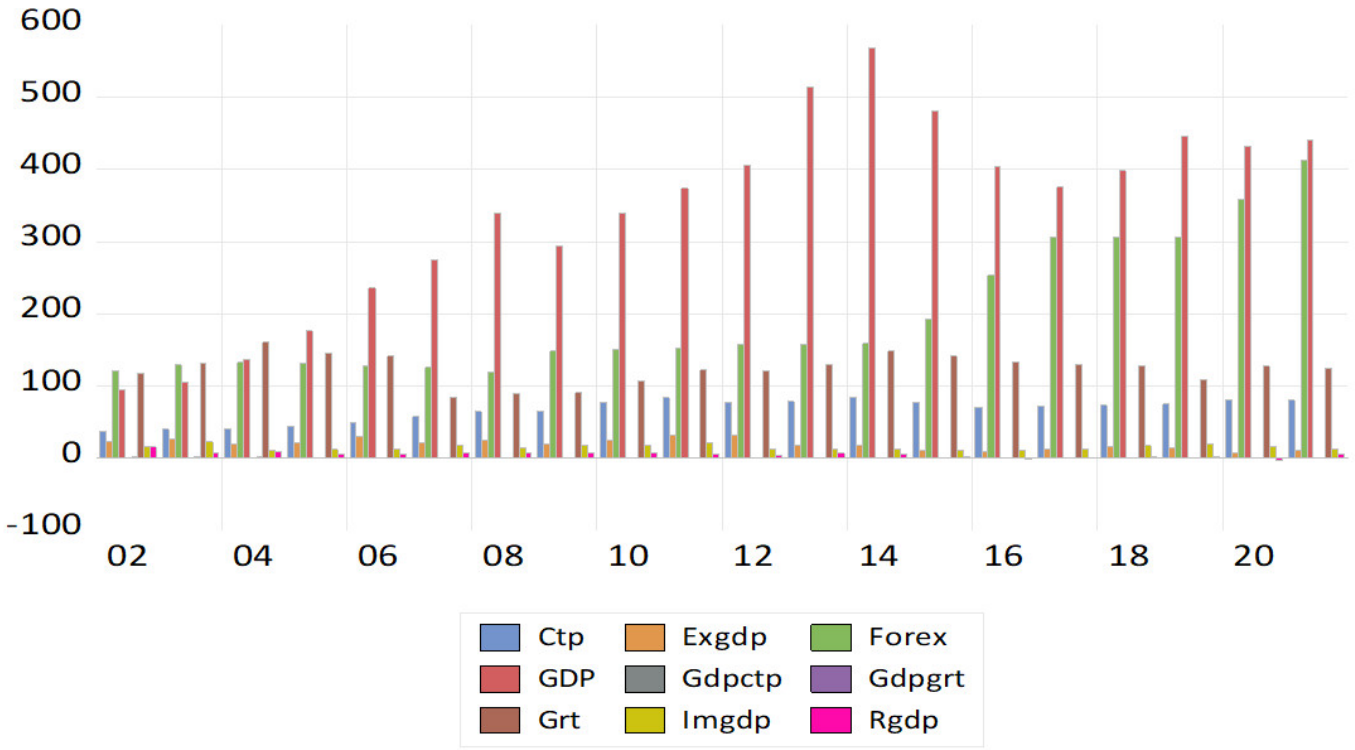
Source: World Bank Group/Central Bank of Nigeria/Nigeria Ports Authority, 2023.

Table 2: Descriptive Statistics.

	CTP	EXGDP	FOREX	GDP	GDPCTP	GDPGRT	GRT	IMGDP	RGDP
Mean	66.42938	19.66355	197.5105	342.0552	0.216890	0.477840	124.4202	15.27950	5.231000
Median	72.53920	19.44200	155.3050	374.9220	0.190768	0.310811	128.1172	14.15500	6.185000
Maximum	84.95193	31.61700	413.8500	568.4990	0.387765	1.261898	160.9056	22.58000	15.33000
Minimum	36.98724	8.118000	118.5700	95.38582	0.149432	0.243925	84.80679	10.67000	-3.400000
Std. Dev.	15.80153	7.320752	91.19238	135.2042	0.067092	0.350073	20.15739	3.558936	4.083141
Skewness	-0.737732	0.075820	1.092282	-0.440176	1.564957	1.531822	-0.459695	0.553295	0.022067
Kurtosis	2.078940	1.940659	2.803862	2.285131	4.524042	3.654170	2.647818	2.179187	3.827954
Jarque-Bera	2.521123	0.954331	4.008990	1.071715	10.09922	8.178215	0.807759	1.581897	0.572880
Probability	0.283495	0.620540	0.134728	0.585167	0.006412	0.016754	0.667725	0.453415	0.750932
Sum	1328.588	393.2710	3950.210	6841.105	4.337803	9.556795	2488.405	305.5900	104.6200
Sum Sq. Dev.	4744.080	1018.275	158005.0	347323.2	0.085526	2.328464	7720.089	240.6545	316.7688
Observations	20	20	20	20	20	20	20	20	20

Source: E-views 12 Computation of Authors.

Figure 1: Graph of Nigeria Port and Trade data.



Source: E-views 12 Computation of Authors.

4.2. Results and Discussions.

The descriptive statistics in Table 2 shows attributes of a normal distribution, the mean, median and mode are all closely dispersed with the maximum and minimum values for instance, CTP 84.95193 (maximum) and 36.98724 (minimum). The skewness is between the range of -0.7377 (CTP) and 1.5650 (GDP) while the kurtosis on the average is greater than 3, indicating leptokurtic. Most of the probabilities are not significant except gdpctp (0.006) and gdpgrt (0.016754).

The graph shows that the gdp is highest between 2014 and 2015 with about $580m, however, has grown enormously from below $100m in 2002 to over $440m in 2021. This growth has positively robbed off on the trade data mainly export and import and the port data cargo throughput and gross registered tonnage within the period under review.

About Table 3, we can said that all the variables in this study showed strong statistically significant relationships at either first or second levels of integration with p-values below the 5% level of significance.

Table 3: Stationarity Test.

Variable	Test statistics	ADF critical value @5%	Probability	Integration
CTP	-7.0546	-3.7332	0.0022	2
GRT	-3.9482	-3.6908	0.0315	1
GDP	-4.4734	-3.7105	0.0129	2
CTPGDP	-4.02254	-3.7332	0.0306	1
GRTGDP	-4.5724	-1.9628	0.0001	2
EXGDP	-5.2345	-3.6908	0.0029	1
IMGDP	-5.3753	-3.6908	0.0023	1
RGDP	-5.8208	-1.9614	0.0000	1

Source: E-views 12 Computation of Authors.

Table 4: Ordinary Least Square Regression Result.

Dependent Variable: RGDP				
Method: Least Squares				
Date: 02/15/23 Time: 10:55				
Sample (adjusted): 2002 2012				
Included observations: 11 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.245941	4.949341	0.655833	0.5409
EXGDP(9)	-0.376282	0.173851	-2.164391	0.0827
IMGDP	-0.839189	0.197865	-4.241216	0.0082
GDPCTP	185.5658	39.74978	4.668347	0.0055
GDPGRT	-19.95693	4.490729	-4.444030	0.0067
FOREX	-0.075718	0.033037	-2.291910	0.0705
R-squared	0.915051	Mean dependent var		7.579091
Adjusted R-squared	0.830102	S.D. dependent var		2.914424
S.E. of regression	1.201287	Akaike info criterion		3.507116
Sum squared resid	7.215454	Schwarz criterion		3.724150
Log likelihood	-13.28914	Hannan-Quinn criter.		3.370307
F-statistic	10.77177	Durbin-Watson stat		2.046011
Prob(F-statistic)	0.010403			

Source: E-views 12 Computation of Authors.

Table 4 shows that the represented series in the model reveals a high level of goodness of fit and its consequent ability to take on more variable with an R^2 and adjusted R^2 of 91.51% and 83.01% respectively. Similarly, with a Durbin watson of 2.046, perfectly indicates absence of auto correlation in the series and model.

Table 5: ECT Residual Stationarity Test.

Var	ADF Test Statistic	Critical Value@5%	Probability	Integration
Ect01	-3.8824	-3.6736	0.0341	I (0)

Source: E-views 12 Computation of Authors.

Table 6: Error Correction Model.

d(rgdp) c	d(grtdgp)	d(ctpgdp)	d(imgdp)	d(exgdp)	d(forex)	ect01(-1)

Source: E-views 12 Computation of Authors.

Table 7: Error Correction Table.

Dependent Variable: D(RGDP)				
Method: Least Squares				
Date: 05/21/23 Time: 22:39				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.966892	0.718785	1.345175	0.2000
D(GRTGDP)	2.105701	5.640646	0.373309	0.7145
D(CTPGDP)	53.43508	21.84986	2.445557	0.0283
D(IMGDP)	-0.084863	0.023654	-3.587614	0.0030
D(EXGDP)	-0.015595	0.038805	-0.401884	0.6938
D(FOREX)	-0.096307	0.030543	-3.153211	0.0070
ECT01(-1)	-1.406546	0.384328	-3.659756	0.0026

Source: E-views 12 Computation of Authors.

Results from tables 5 to Table 7, shows the residual tests, model and output of the error correction test, the model passed the residual tests with integration at levels. The error correction

term shows a significant probability with negative coefficient, and a convergence speed of adjustment of 140.66% from the short-run to the long-run period. Hence, there is a long-run relationship between RGDP and CTP along with import and forex.

4.3. Discussion of Findings.

The result from the test indicates a strong correlation between ratios of export and import to GDP with probabilities of 0.0827 [if we consider a 10% level of significance] and 0.0082 [for a 0.5% level of significance]. Similarly, the cargo throughput and gross registered tonnage ratios to gross domestic product of Nigeria at a 5% level of significance, reveals a statistically significant relationship with the real gross domestic product. The implication of these outcomes is that a 1% increase in ratio of export and import to GDP, for instance, will cause a 0.3763 and 0.8392 decline in gdp growth rate. While, a 1% growth in ratio of GDP to cargo throughput and gross registered tonnage, will result to a 185.57% increase and 19.96% decline respectively in real gross domestic product. The Error correction term result shows the existence of a long-run relationship between port performance measured by cargo throughput (CTP) and Ocean trade captured by imports, with a 140.66% speed of adjustment and convergence from a short-run to a long-run period. We infer that there is a long-term impact of ocean transportation business on the ntion'a economic growth with a speed of adjustment of 140.66%.

Overall, ocean transport businesses represented by volume of export, import, cargo throughput and gross registered tonnage, all have significant effect on the economic growth of Nigeria proxy by gross domestic product; and is in consonance with the findings of researchers such as Buhari (2013), Njoku et al (2020) and Sanni (2022) of a significance relationship between Ocean transportation and economic growth. This outcome, however, disagrees with the outcome in the work of Igberi and Ogunniyi (2013) of an insignificant relationship between the variables.

Conclusion and Recommendations.

This study on Ocean transportation and the Nigerian Economy: emerging countries perspectives considered the various key concepts, theories of trade and empirical review of similar earlier works on subject, with their outcomes inconclusive on subject. Over 70% of Nigeria land mass is covered by water and over 90% of her foreign trade with other nations are consummated via the waterways, comprising of export trades, import trades, cargo throughput's and gross registered tonnages, among other variables. The benefits and challenges of Ocean transportation were considered in details in the literature search and found to include but not limited to generation of employment and global value chain, provision of foreign exchange earnings, tourism, international relations, Globalization etc, while a major challenge of the sector remains dearth of infrastructures on and off-shores of the country. The literature equally, identified some emerging issues affecting the development of Nigerian Ocean transport business, which include - Poor technological development of the sector, Inefficient ships, Sea criminality including kidnap, sea robbery and maritime piracy; Climate change issues,

The earlier enumerated variables were subject to some simple econometric and statistical tests to ascertain whether a relationship exists between the variables and the Nigerian economy measured by her gross domestic product, and the result revealed convincingly a statistically significant relationship between the Ocean transportation variables and the growth of the Nigerian Economy. We, thus conclude that Ocean transportation in Nigeria has a significant correlation with the growth of the Nigerian Economy in both the short-term as well as in the long-term period.

Based on the foregoing, we recommend as follows;

1. That the government should endeavour to provide key and modern infrastructures at the Nigerian seaports, as these will improve our vessel turn-around time and volume of cargoes/ships calling at our seaports. This in-turn will increase our cargo throughput and gross registered tonnage volumes and consequently our national revenue generation.
2. That the government should provide enabling environment and legislation to make our maritime sector business friendly and attractive to both indigenous and foreign vessel business owners. E,g enabling laws to activate the use, and access to the cabottage vessel financing funds; pioneer tax status etc.
3. That the government should adequately equip and fund the waterways securities of the nation to reduce the threats and security menace at the important water paths such as the gulf of Guinea. This will encourage bigger foreign shipping vessels to patronize our ports and continental waters.

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