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Effect of Maritime Transport on Unemployment Rate in Nigeria, 1980-2023

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ABSTRACT :

The study examined the effect of maritime transport on unemployment rate in Nigeria, 1980-2023. The objectives were to: determine the effect of i) crude oil, ii) dry bulk and iii) non-oil transport on unemployment rate in Nigeria. The study adopted the ex-post factor research design. Data for the study were generated from National Bureau of statistics, central bank of Nigeria, Nigeria port authority Statistical Bulletins. The Augmented Dickey Fuller unit root test was used to test for the stationarity of the variables. Based on the outcome of the bounced co integration test result, the auto distributed lag model estimation technique was adopted for the study. The findings of study revealed that crude oil transport is useful in achieving effective and efficient economic development. The study revealed that dry bulk transports represent the most common movement models and that the dry bulk transport is divided into major bulk transport (iron ore, coal and grain) and minor bulk transport (phosphate, bauxite, soya, rice, sugar, fertilizers, metal and minerals, steel products and forest products). The study observed that dry bulk transport is very impactful in improving the economic wellbeing of people in Nigeria. Finally, the study has revealed that crude oil transport has positive and insignificant effect on unemployment rate, dry bulk transport has positive/ and significant effect on unemployment rate and non-oil transport has negative and significant effect on unemployment rate in Nigeria. The study therefore recommended that government and transportation authorities, should put in place strategic options to create an effective policy framework for effective management of indicators of maritime transport with a view to enhancing sustainable productivity and the overall transformation of the Nigerian economy. Also, government should maintain effective foreign exchange rates that encourages pragmatic maritime transport activities of crude oil transshipment, dry bulk carriage and non-oil conveyance thereby snowballing on Nigeria economy.

Keywords: Maritime Transport, Crude Oil Transport, Non-Oil Transport, Dry Bulk Transport, Unemployment Rate

INTRODUCTION

Maritime transport is an age-long transport system that has over the years been used for the movement of humans and tangible properties, especially bulky objects and liquid objects which may be too heavy or delicate for other forms of transport (Onyenucheya, 2022). Maritime transport is the mainstay of world trade and globalization. Twenty-four hours a day and all year round, ships carry cargoes to all corners of the globe. This role will continue to grow with the anticipated increase in world trade in the years to come as millions of people are expected to be lifted out of poverty through improved access to basic materials, goods and products. Maritime transport's essential role in facilitating international trade is critical to the global economy and globalization.

Maritime transport is a critical element of an economic structure, encompassing everything from shipbuilding to port development to maritime logistics services. World trade and maritime transport are, therefore, fundamental to sustaining economic development and spreading prosperity throughout the world, thereby fulfilling a critical social as well as an economic function (United Nations, 2022).

Currently, developing countries, which have typically been users of international maritime transport services and mainly loading areas for raw materials, are increasingly participating in containerized trade flows and arising as suppliers of maritime transport services, among others, shipbuilding and registration as well as terminal handling operations (UNCTAD, 2023). Maritime transport plays a critical role in Nigeria's economy due to the country's strategic geographic location along the Atlantic Ocean and its dependence on international trade. As the primary mode for moving large volumes of goods and raw materials, maritime transport connects Nigeria to global markets and supports both upstream and downstream economic activities (Odiegwu 2019).

Nigeria's maritime sector includes ports, shipping lines, inland waterways, dockyards, and shipbuilding and repair facilities. The major ports—Lagos (Apapa and Tin Can Island), Port Harcourt, Onne, Warri, and Calabar—are gateways for over 90% of Nigeria's imports and exports. Despite this, the sector has not reached its full potential in contributing to job creation and reducing unemployment (Monday et al. 2021).

Maritime transport directly employs thousands of Nigerians in port operations, customs, shipping agencies, freight forwarding, and related services. The sector also creates jobs in logistics, warehousing, inland transport, manufacturing, and the oil and gas industry ((*Odiegwu & Enyioko 2022)*. Egole (2022)

submits that small and medium-sized enterprises (SMEs) thrive around maritime activities, including boat services, coastal fishing, and trade-related businesses. Institutions like the Maritime Academy of Nigeria provide training for seafarers and marine professionals, potentially reducing youth unemployment through vocational education.

In support of this, Onyenucheya (2022) reported that the value of global shipping containers reached US$9.5 billion in 2021 and projected a value of US$15.3 billion by 2027. The predictions about the growth in international maritime transport trade will be subject to the influence of different factors such as protectionism, digitalization, e-commerce, consolidation, and climate change (UNCTAD 2023). The United Nations (2022) stated that maritime transport, through shipping operations, is the backbone of global trade and economy. International Chambers of Shipping (2020) also asserted that the shipping trade is at the center of the world economy, with a total value of US$14 trillion in 2019. Matekenya and Ncwadi (2022) established that shipping operations significantly positively impact total trade.

Without Nigeria as a foremost maritime transport activity in West Africa region would be much affected due to her major export commodities such as crude oil, cocoa, palm kernel, rubber and coffee among others. (Odiegwu 2019). Nigeria and Nigeria's investments in maritime transport have advanced retrogressively since the end of the eighties. Nigerian government's ships then which were over twenty-six were all sold to settle accumulated debts. Private sector investment in the maritime transport was also very low from the Nigerian side (Lloyd & Odiegwu 2019). The intrinsic assumption from this could be that Nigeria lacks the shipping demand output to support investment in maritime transport **(***Odiegwu & Enyioko 2022)***.**

Similarly, Michail (2020), a search for literature on shipping trade and economic development in Nigeria revealed few studies on this aspect of the maritime industry. Osadume and Okuoyibo (2020), Owoputi and Owolabi (2020), and Ekpo (2012) employed a descriptive technique to discuss maritime shipping trade and economic development in Nigeria.

Over the last decades, maritime transport management has been studied broadly and its significance to practitioners and academics has been acknowledged with a high degree of popularity. However, notwithstanding major inputs in maritime transport and economic development integration recent surveys demonstrates that countries are struggling to gain competitive advantage as a result of maritime transport integration silos (Onyenucheya, 2022).
One gap in the literature is the lack of analysis of the long-term effect of maritime transport on unemployment rate. Most studies on maritime transport and economic growth in Nigeria have focused on short-term or intermediate-term effects. Still, there is a need for more research on effect of dry bulk transport on unemployment in Nigeria. This could involve analyzing the effect of crude oil transport and non-oil transport on unemployment rate, which current research seeks to address.

Research Objectives

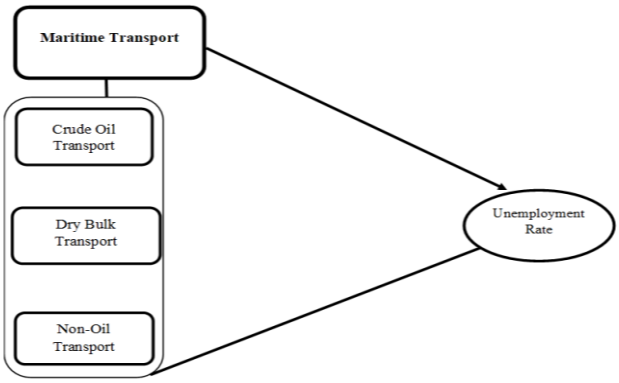
The objectives of this study include:
1). determine the effect of crude oil transport on unemployment rate in Nigeria.
2). investigate the effect of dry bulk transport on unemployment rate in Nigeria.
3). examine the effect of non-oil transport on unemployment rate in Nigeria.

Research Questions

The study is guided by the following research questions:
1). What is the effect of crude oil transport on unemployment rate in Nigeria?
2). Does Maritime dry bulk transport affect unemployment rate in Nigeria?
3). To what extent has non-oil transport affected on unemployment rate in Nigeria?

Conceptual Framework

This study seeks to evaluate the effect of maritime transport on economic development in Nigeria. In carrying out the study five dimensions of maritime transport (independent variable or predictor variable) namely crude oil transport, dry bulk transport and non-oil transport were examined. These dimensions were adopted in line with the works of Bai et al. (2021); Kramer (2022); Matekenya and Ncwadi, (2022) and Onyenucheya (2022). Also, Economic Development in Nigeria shall serve as the key dependent or criterion variable under which the measures such as Real GDP, Human Development Index and Unemployment Rate would be appraised. The study adopted part of the classification of economic development in Nigeria espoused by Owoputi and Owolabi (2020); Psaraftis (2021); UNCTAD (2023b). The imperative of the usage of these elements to measure economic development in Nigeria has become obvious as could be seen from the conceptual framework of the Study- "the effect of maritime transport and economic development in Nigeria" (see figure.1).



'igure 1: Conceptual Framework of the Effect of Maritime Transport on Unemployment Rate in Nigeria (1980-2023)

Sources: UNCTAD (2023b); Atoyebi (2022). Egole (2022); Desk Research (2024).

Research Hypotheses

This research investigates the effect of maritime transport on economic development in Nigeria. Accordingly, the following hypotheses relating to the purpose and problems of the study have been formulated and for investigation:

- $Ho_{1:}$ Crude oil transport has no significant effect on unemployment rate in Nigeria,
- $Ho_{2:}$ Dry bulk transport has no significant effect on unemployment rate in Nigeria,
- $Ho_{3:}$ Non-oil transport) has no significant effect on unemployment rate in Nigeria,

LITERATURE REVIEW

Theoretical Foundation

This study is anchored on three theoretical models. Each model introduces a unique theoretical lens. They are export-led growth theory (ELGT) and queuing theory to identify the drivers of maritime transport and examine their effects on economic development in Nigeria.

Export-Led Growth Theory

The Export-Led Growth Theory ((ELGT) suggests that increasing a country's exports can be a primary driver of economic growth. This theory posits that expanding exports stimulates the economy through various mechanisms, including increased foreign exchange earnings, enhanced resource allocation, and access to larger international markets.

The export-led growth theory (ELGT) generally asserts that there is evidence of a positive relationship between exports and economic growth and that export expansion is one of the main drivers of economic growth ((Cong *et al.,* 2020). Several changes that have taken place in development and international economics during the past 20 years are the source of evidence for a rather large body of study on the connection between trade and growth. This progress illustrates the widespread switch from internally focused tactics to strategies that promote exports. Export-led growth theory holds that increased exports accelerate the economy due to the spillover of technical innovation and various externalities (Notteboom & Haralambides (2020). As a result, the export-led growth hypothesis postulates that a rise in exports would result in gains in overall productivity and economic growth.

The export-led growth theory (ELGT) evolution began with classical economists like Adam Smith and David Ricardo, who laid the foundation. Smith argued that specialisation and division of labour, combined with trade, increased productivity and wealth. Ricardo's theory on comparative advantage advanced this thinking by postulating that attaining production efficiency is based on specialisation. By implication, countries become efficient by specialising in their most comparative advantageous sector while trading for exchanging goods where others have a comparative advantage. This classical view underpinned early theories that framed export growth as a primary economic development engine (Onyenucheya, 2022).

The fundamental argument of the export-led growth theory is that increasing exports expands market access beyond domestic boundaries, increases demand for domestic goods, enhances economies of scale, and improves overall productivity. These dynamics, in turn, promote job creation, investment, and economic expansion. Atakpa (2021) noted that exports could open opportunities for domestic producers to improve efficiency through competition and technological adaptation, often stimulated by engagement with global markets.

However, classical and neoclassical theories, such as the Solow–Swan model, offered a more limited perspective by treating technological progress as an exogenous factor. In the Solow model, long-run economic growth is driven by capital accumulation, labour growth, and an exogenous rate of technological advancement. While the model introduced a robust framework for analysing savings and investment behaviour, it failed to account for how policy, innovation, or knowledge creation might influence growth dynamics directly (Kang, 2016).

This theory links economic growth and employment to *increased exports*, which is often driven by efficient transport infrastructure like ports. *The*

application **of** the export-led growth theory in this revealed that efficient maritime transport boosts exports (oil, agricultural produce), increasing production and employment and a robust maritime sector reduces logistics costs and makes Nigerian exports more competitive, thus creating jobs in export-driven industries.

Queuing Theory (Birth-and-Death Process Theory)

In the context of queuing theory, the term birth refers to the arrival of a new customer into the queuing system, and death refers to the departure of a served customer (Hillier & Gerald, 2014). Only one birth or death may occur at a time: therefore, transitions always occur to the "next higher" or "next lower" state. The rates at which births and deaths occur are prescribed precisely by the parameters of the exponential distributions that describe the arrival and service patterns (Enyioko, 2016). The state of the system at time t ($t \geq 0$), denoted by N(t), is the number of customers in the queuing system at time t. The birth-and-death process describes probabilistically how N(t) changes as t increases. More precisely, according to Helix (2013) the assumptions of the birth-and-death process are the followings:

Assumption 1. Given N(t) = n, the current probability distribution of the remaining time until next birth (arrival) is exponential with parameter λ_n (n = 0, 1, 2…).

Assumption 2. Given N(t) = n, the current probability distribution of the remaining time until the next death (service completion) is exponential with parameter (n = 1, 2, …).

Assumption 3. The random variable of assumption 1 (the remaining time until the next birth) and random variable of assumption 2 (the remaining time until the next death) are mutually dependent.

A fundamental flaw in the birth-and-death process structure is a reliance on equilibrium between birth and death rates. This assumes the overall population shall remain constant at long run (Enyioko, 2016). The approach is based on the rate-equality principle (Medhi, 2005) or balanced population model. Rate-Equality Principle states that the rate at which a process enters a state n **(≥ 0)** equals the rate which the process leaves that state n. In other words, the rate of entering and the rate of leaving a particular state are the same for every state. Rate in = rate out principle**.** This principle implies that for any state of the system can be expressed by an equation which is called the balance equation for state n (n = 0, 1, 2…), and mean entering rate = mean leaving rate (Michail, 2020).

Conceptual Review

In this section of conceptual review, the concepts used in the study, such as maritime transport, crude oil, petroleum/gas, dry bulk, passengers, containerization, economic development in Nigeria, real gross domestic product, human development index, unemployment rate and foreign exchange rate.

Concept of Maritime Transport

Maritime transport (ocean transport) refers to the transportation of people and goods via sea routes (Onyenucheya, 2022). The Maritime transport sector consists of a national registry, flagging, and cargo handling whereas while maritime manufacturing has to do with the building of marine vessels, rig and ship repair, and includes offshore oil and gas services. Maritime transport has a system that is integrated which includes the design, construction, operation, management, servicing, and maintenance of merchant, leisure, and other ships in the service of seaborne trade. It also involves the conducting of offshore operations, port construction, shipbuilding, maritime services, and the transporting of people and cargo from point A to B by sea or via inland waterways. In addition, effective domestic demand and employment, which make a great contribution to a country's economic development (Kramer, 2022).

According to Stopford (2009) during the1960s maritime transport began, on a global scale, primarily using containers for large loads of cargo, and found these to be a useful and cost-effective cargo transportation mode over any distance by large boats or ships, and over oceans and lakes. This transport mode has since proved to be the most popular among people and companies engaged in international trade. However, while it is the least expensive and relatively environmentally friendly option, it is also the most time-consuming one. Its benefits also include transportation of large volumes of goods with low costs and the most used in modern societies.

In addition, according to Gaskell (2022), maritime transport and manufacturing in Nigeria are challenged by outdated, insufficient, and expensive infrastructure, lack of skills, limited support for market growth from public procurement, and limited support for a national ship registry or flagging of Nigeria ship which hinders growth in the industry. These challenges in the maritime sector have increased a need to be addressed because the sector is crucial in the economic development of Nigeria. Traditionally, the public sector plays a key role in financing maritime transport infrastructure, however, public sector investment is not enough to cater to the growing finance gap in maritime transport. To ensure consistent growth demand and ensure proper services delivery mobilizing public and private is necessary which also includes FDI, development aid to participate in a partnership (Elias et al., 2018).

Nigeria is a primary goods export-oriented economy. The total cost of importing foreign-produced products and delivering their agricultural produce, oil minerals, and other industrial outputs to foreign markets is impacted significantly by the transportation element. Transport is a significant trade input cost due to our distant location from the markets that we serve. There is therefore the need to strive for national transport cost efficiencies to remain globally competitive as a country. Although this validates Nigeria as a maritime trading nation, it is, however, not yet a significant ship owning or ship operating nation. It is currently a consumer of international maritime transport and hence this component represents a significant expense item for Nigeria's

international trading system. This creates an economic imbalance, which if not addressed, will continue to facilitate the loss of much-needed revenue, economic opportunities, and related jobs for Nigeria and the Nigerian maritime transport sector. The ability of Nigeria to carry its import and export trade has suffered a negative growth since the 1980s. Nigeria does not have a national shipping carrier. This sector has the potential to offer significant employment opportunities for thousands of Nigerians across the diverse expertise required in the various disciplines of the sector that include marine manufacturing and related services, seafaring, maritime law, research, marine engineering, etc (Atakpa,2021).

Currently, the maritime transport sector in Nigeria has the potential to become a high-impact sector and one which could offer a substantial contribution to addressing developmental challenges in Nigeria and fulfilling the goals of the National Development Plan (NDP). Despite its importance to the country's economic development, the maritime transport sector in Nigeria is still in the process of developing the necessary instruments and infrastructure to expand and to come to play an essential role in Nigeria's economic development. This specific development goal, the revival of the Maritime transport Sector, and the improvement of its contribution to the growth and radical transformation of the Nigerian economy. Therefore, the development of the sector which includes reviving and promoting it should be highlighted to the broader agenda of contributing towards the global competitiveness of the country as a maritime leading nation (Kang, 2016).

A review of the existing literature has shown other studies to have investigated the impact of port infrastructure and trade or economic growth and whilst other literature focus on the impact of investing on port infrastructure and international trade and economic growth and few studies that focused on marine transport and international trade (Carrasco et al., 2021). There is limited literature on marine transport in the Nigeria context and more especial that focusing on investing in maritime transport. Therefore, this study examines the impact of maritime transport financing on total trade in Nigeria using the autoregressive distributed lag (ARDL) model. In this instance, this study fills a gap in the existing literature in the sense that a large number of studies in this area used models of analysis such as structural equation modeling (SEM), Generalised Method of Moments (GMM), and pooled mean group (PMG) estimator. None of these studies have attempted the use of ARDL (Dentons, 2022).

Crude Oil Transport

The crude oil transportation system is an important support for every country in providing industrial production materials, promoting economic development and guaranteeing military security. The international transportation of crude oil is dominated by marine shipping, which, as a foundation for the large-volume and long-distance transportation, has greatly enriched international economic cooperation in crude oil resources (Kalouptsidi, 2021). Crude oil plays a critical role in all modern economies and its transportation is a vital element of the global energy supply chain (Kramer, 2022). Crude oil is a mixture of comparatively volatile liquid hydrocarbons (compounds composed mainly of hydrogen and carbon), though it also contains some nitrogen, sulfur, and oxygen. Those elements form a large variety of complex molecular structures, some of which cannot be readily identified (Newswire, 2022). Crude oil, liquid petroleum that is found accumulated in various porous rock formations in Earth's crust and is extracted for burning as fuel or for processing into chemical products.

Crude oil is a mixture of comparatively volatile liquid hydrocarbons (compounds composed mainly of hydrogen and carbon), though it also contains some nitrogen, sulfur, and oxygen. Those elements form a large variety of complex molecular structures, some of which cannot be readily identified. Regardless of variations, however, almost all crude oil ranges from 82 to 87 percent carbon by weight and 12 to 15 percent hydrogen by weight (Corbett & Winebrake, 2018). Crude oil occurs underground, at various pressures depending on depth. It can contain considerable natural gas, kept in solution by the pressure. In addition, water often flows into an oil well along with liquid crude and gas. All these fluids are collected by surface equipment for separation. Clean crude oil is sent to storage at near atmospheric pressure, usually aboveground in cylindrical steel tanks that may be as large as 30 metres (100 feet) in diameter and 10 metres (33 feet) tall. Often crude oil must be transported from widely distributed production sites to treatment plants and refineries. Overland movement is largely through pipelines. Crude from more isolated wells is collected in tank trucks and taken to pipeline terminals; there is also some transport in specially constructed railroad cars. Overseas transport is conducted in specially designed tanker ships. Tanker capacities vary from less than 100,000 barrels to more than 3,000,000 barrels (Kramer, 2022).

In Nigeria, the conventional practice for the petroleum industry is to measure capacity by volume and to use the English system of measurement. For this reason, crude oil in the United States is measured in barrels, each barrel containing 42 gallons of oil. Most other areas of the world define capacity by the weight of materials processed and record measurements in metric units; therefore, crude oil outside the United States is usually measured in metric tons. A barrel of API 30° light oil would weigh about 139 kg (306 pounds). Conversely, a metric ton of API 30° light oil would be equal to approximately 252 imperial gallons, or about 7.2 U.S. barrels (Onuoha, 2021).

Dry Bulk Transport

The dry bulk transport is divided into major bulk transport (iron ore, coal and grain) and minor bulk transport (phosphate, bauxite, soya, rice, sugar, fertilizers, metal and minerals, steel products and forest products). The three major bulk transports are the driving force behind the dry bulk movement (Stopford, 2009). Major bulk trades are still mentioned as five major bulk (iron ore, coal, grain, phosphate rock, and alumina-bauxite). The import demand of emerging developing economies, in particular China and India, remained the main driver of growth in dry bulk cargo shipments in 2014. During the year, the increase in world seaborne dry bulk shipments was estimated at 5.0 percent, as lower rate than the previous four years (Psaraftis, 2021).

The demands idea of dry bulk commodities. Most of the cargoes transported in dry bulk vessels are raw materials or semi-finished products used as input

into industrial production (IP). Over the last 10-15years, Asia relative share of dry bulk cargoes imports has increased substantially. In the Far East, Japan and South Korea have been significant importance of a variety of commodities for a longtime. More recently China has developed into the most significant importer of dry bulk commodities. Dry bulk commodity demand is relatively complex to analyze with over 40 different commodities or commodity groups included, each having arrange of different factors influencing their overall demand for transport (Elias et al., 2018).

Traditionally, however, dry bulk cargo demand has been divided into the *five "Major" bulks* (iron ore, coal, grain, bauxite/aluminum and phosphate) in addition to the *"Minor" bulks*. As inputs to steel production, fluctuations in both the iron ore and coking coal markets are strongly correlated to the steel industry, whist the remaining major bulk are related to other specific factors. Stop ford, (2009), identify the main seaborne dry bulk commodities as *iron ore and coal*. They further said that the seaborne trade in these two major bulks covers roughly 65 percent of the total dry bulk demand today. The "minor" bulks are individually small in volume but collectively they make up a significant share of world commodity trades, primary as input to industrial production. Fourteen minor dry bulks cover a wide variety of commodities, such as forest products, ferrous ore, minerals and pet coke, cement, other construction materials and salt.

Non-Oil Transport

Non-oil goods transportation simply expressed are items other than crude oil (petroleum products) that are sold in the foreign exchange market only to generate cash are conveyed to the selling points. Farm products exports construction and manufacturing exports solid mineral exports and place in the international appear to be the four primary parts of Nigeria's non-exports industry. Agricultural commodities goods produced solid minerals entertainment and vacation services and other non-oil export commodities are limitless (Onuorah 2018).

Non-oil goods transport comprises the movement of agricultural products, solid minerals, textiles, manpower, etc. to where they be sold (Rivero, 2021). Non-oil good is made up of every other thing we export from Nigeria except petroleum products. Manufacturing exports consist of textiles, beer, cocoa butter, plastic products, processed timber, tyres, soap, detergent and fabricated iron rods. Agricultural, export merchandise includes cocoa, groundnut, palm oil, cotton, rubber (natural), yam, palm products, fish and shrimps (Yohanna et al. 2019). Generally, the transportation of non-oil products is the conveyance of those commodities excluding crude oil (petroleum products), which are sold in the international market for the purpose of revenue generation.

Agriculture'sdominationofthenon-oilindustryhasresultedinthemineralsub-sectorbeingoverlooked despite the fact that it has the opportunity to be second only to petroleum in terms of revenue earnings (Joseph & Chukwuedozie 2019). The administration has found a way to deal with the growing need for economic diversification which has been informed by the monolithic economy since the 1980s which has been continually threatened by the instability in crude oil prices on the international market.

Unemployment Rate

Nigeria's unemployment rate rose to 5% in the third quarter of 2023, up from 4.2% in the previous period. The jobless rate among young people aged 15-24 rose to 8.6% from 7.2%. Unemployment in the urban areas also increased marginally to 6% from 5.9% in the previous quarter. Source: National Bureau of Statistics, Nigeria (Ibrahim, 2022). Unemployment is when people are ready, able and willing to work, but do not find work. By the International Labour Organisation definition, a person is employed when they work at least 40 hours a week (Corbett &Winebrake, 2018).. The working age is regarded as between 15 and 60. Currently, 33.3% or 23.2 million of the about 70 million people who should be working in Nigeria are out of work. An acceptable level of unemployment would be 4%-6%. The country's underemployment rate – people who work less than 20 hours a week – is also high at 22.8%. One factor is the critically poor state of the economy. The economy has not been in good shape for the past five years and first went into a recession in 2016. In 2020 in the wake of the COVID-19 pandemic it plunged into another recession – its worst in four decades. It recorded gross domestic product contraction of 3.62% in the third quarter of 2020 (Atoyebi, 2022).

There has been a lot of uncertainty, largely due to policy inconsistencies, about where people should invest. This cuts across various economic sectors. Since the current government came into power in 2015, there has been a lot of policy change with the "command and control" posture adopted in managing the economy. For instance, exchange rates were left fixed for the first year of the administration until the distortions in the market became chaotic before some form of flexibility was allowed in the determination of the exchange rate, following market forces. Also land borders were arbitrarily closed to imports, despite the huge damage it could have on the country's trade within the ECOWAS sub-region. This had a direct impact on prices of items (Egole,2022).

Meanwhile the labour supply is growing. People are graduating from higher institutions, but the demand for labour is shrinking. There are not enough jobs for young people who are leaving school. People with A levels as their highest qualification had the highest rate of unemployment with 50.7%, followed by people with first degree or higher national diploma at 40.1% (Onuoha, 2021).

Unemployment is one of the key macroeconomic indicators used to assess the health of an economy. It provides insights into labour market dynamics and the efficacy of policy interventions. Governments and policymakers alike often use unemployment rates to make informed decisions about which sectors to invest in, what types of jobs to prioritise, and which programmes to implement to address employment challenges. In April 2023, the National Bureau of Statistics (NBS) announced it was changing the way it calculates the unemployment rate in Nigeria. The NBS adopted a new methodology for computing labour statistics, aligning with the International Labour Organisation (ILO) guidelines. Under the old methodology, Nigeria's unemployment rate stood at 33.3 percent at the end of Q4 2020. However, the adoption of the new methodology drastically reduced this figure to 4.1 percent in Q1 2023 (Serra et al., 2020).

The change in how Nigeria calculates unemployment sparked significant interest and debate. On the one hand, the updated method aimed to align with

global standards, providing a more accurate picture of the labour market. Thus, the government hoped this would enhance the credibility of its data internationally. However, statisticians, economists, analysts, and policy experts criticised the new approach. They argued that it failed to capture the extent and actual level of unemployment in the country, which remains a major socio-economic challenge. Moreover, they argue that it could lead to reduced efforts in tackling unemployment issues due to the perception that the unemployment problem in Nigeria has disappeared, leading to complacency in addressing these socio-economic issues (Okoye,2021a).

Empirical Review

Maritime Transport and Unemployment Rate

Various studies have been done on the determination of relationship between economic growth and unemployment in different countries using diverse approaches and methods. Ozturk and Aktar (2009) used the Variance Decomposition and Impulse response function analysis and reported that GDP is not associated with unemployment rate in Turkey. However, Tunah (2010) used the ADF test followed by Granger causality test for determination of factors affecting unemployment and he reported a significant relationship between unemployment growth and GDP.

Furthermore, Lal etal. (2010), determined the Okun's coefficient, and checked the validity of Okun's law in some Asian countries using the time series data from 1980-2006 in which the empirical evidence revealed that Okun's law interpretation may not be applicable and valid in some Asian developing countries. Kreishan (2011) estimated the linkage between unemployment and economic growth in Jordan using Okun's law and reported that the Okun's law cannot be confirmed in the case of Jordan. Similarly, Ting and Ling (2011) aimed to validate the Okun's relationship in the case of Malaysia's economy using the first difference and gap model and found a significant relationship between GDP and unemployment.

Mosikari (2013) reported a non-significant relationship between unemployment and GDP in South Africa. Phiri's (2014) study of Southern African countries economy, covering the2000–2013 period, revealed a non-linear equilibrium between economic growth and unemployment. A momentum threshold autoregressive model was used forth is purpose. Similarly, Anderton et al. (2014) determined the Okun relationship for various GDP components of 17 Euro zone countries.
The results of panel regression showed that unemployment is linked to GDP. Furthermore, Apap and Gravino (2014) used a regression analysis and found a significant negative relationship between output and unemployment. Based on the assessment of Banda (2016), a positive relationship between GDP and unemployment was observed in South Africa. Ball et al. (2016) analyzes some explanatory variables, such as business and labor market adjustment, the contribution of services to GDP, the size of the shadow economy and as kill mismatch index as the elements of the unemployment rate. For example, according to Ball et al. (2016), the average Okun's coefficient of -0.2 was observed for the developing countries while the developed countries had the value of-0.4. The R2 value usually ranges between 0.2 and 0.3 for the developing countries, being about a half of the developed economies (Ball et al.,2016).

Padder and Mathavan (2021) in their study on Indian economy from 1990-2020, reported a non-significant relation between GDP and unemployment growth along with absence of Granger causality between the variables. Thaba et al. (2020) also reported similar results in their studies of South Africa's economy. Hjazeen et al. (2021), using the Auto regressive distributed lag approach, determined a significant relationship between the two macroeconomic variables in the economy of Jordan. Based on the above background the study hypothesizes that: Ho3: Crude oil, petroleum/gas, dry bulk, passengers and containerization have no significant effect on unemployment rate in Nigeria,

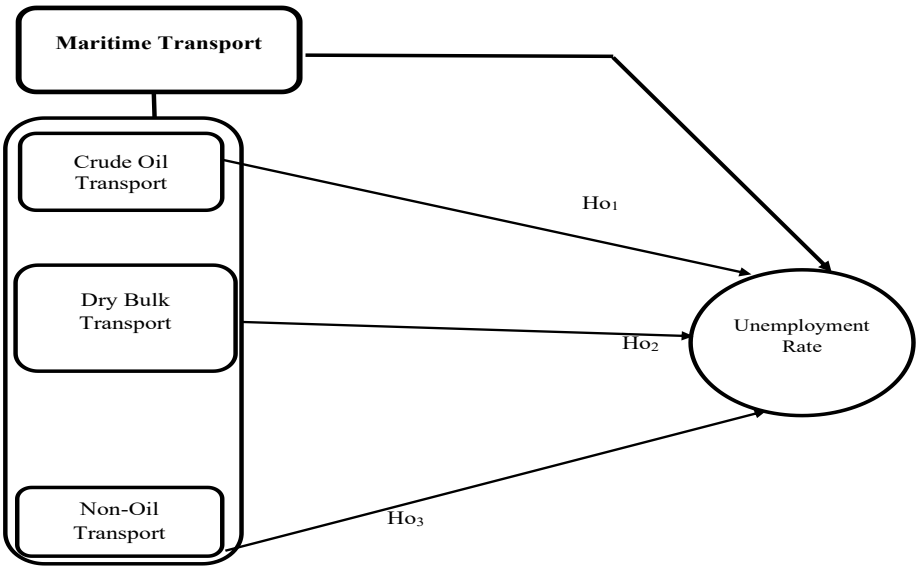


Figure 2.5: Operationalized Framework of the Effect of Maritime Transport on Unemployme Rate in Nigeria (19800-2023)

Sources: UNCTAD (2023b); Atoyebi (2022). Egole (2022); Desk Research (2025).

Summary of Literature Review and Gap in Knowledge

This literature review carried out provided a position on the conceptualization of the variables of interest – maritime transport and economic development. This vein, this research reinforces the position of maritime transport and its necessity in bridging the operational gaps in the maritime transport and economic development in Nigeria. Key insights, reflected in the review of literature in this chapter are such that identify with the significance of maritime transport and by that, its significance to the economy of Nigeria This observation emphasizes the imperatives of economic development and well-being, as being important improved trading activities and the development of related contexts or markets. Another major insight, put forward, anchored and conceptualised on the review of literature are the measures of Economic development which are conceptualized as real gross domestic product, human development index, and unemployment rate, The review of literature shows gabs in literature in certain areas and issues that are very pertinent in maritime transport and economic development. From the literature, it is revealed that maritime transport with respect to dry bulk, passengers and containerization and economic development in Nigeria proxied by human development index and unemployment rate, has not been studied extensively. One gap in the literature is the lack of analysis of the long-term effect of maritime transport on economic development. Most studies on maritime transport and economic growth in Nigeria have focused on short-term or intermediate-term effects. Still, there is a need for more research on moderating effect of foreign exchange rate on maritime transport and economic development in Nigeria to fill the knowledge gap identified in this Study.

MATERIALS AND METHODS

Research Design

Research design is the blueprint that guides the researcher in acquiring and generating necessary data for the study; so, this study adopted the ex-post facto research design which requires the usage of historical data to forecast future trends employing regression techniques. The focus of an ex-post facto research design is to effectively explain the characteristics of a population or a social phenomenon in the past (Akujuru & Enyioko, 2018; Saeed et al. 2021).

Method of Data Collection

Secondary sources of data were used as the main data collection sources in which accuracy, availability, adequacy, authority, scope, suitability and sources of data were considered for relevance (Kiabel, 2020). So, the relevant data for this study were generated from the annual reports and accounts of Nigerian Ports Authority, National Bureau of Statistics and Central Bank of Nigeria Annual Statistical Bulletins of the various years in question from their official website. The data for the study shall be from the period of 1990 – 2023.

Model Specification

$Y = bo + b_1x_1 + b_2x_2 + b_3x_3 + e$ --------- {for testing Ho_1, Ho_2 and Ho_3}

UER = f (COTR, DBTR, NOTR)

Where;

UER = Unemployment Rate

COTR = Crude Oil Transport

DBTR = Dry Bulk Transport

NOTR = Non-Oil Transport

Pre-Estimation Test: The following pre-estimation tests will be carried out in this study:

Unit not Test

Following Dickey and Fuller (1979, 1981), Levin, Lin and. Chu (2002) considered a panel extension of the null hypothesis that each individual time series in the panel contains a unit root against the alternative hypothesis that all individual series are stationary. The ADF test involves estimating the model, obtaining the test statistic, and comparing it with critical values in order to decide on the rejection of the null hypothesis or otherwise.

Cointegration Test

To empirically analyze time series using traditional methods such as ordinary least squares, an assumption is usually made: the series' means and variances are constants which are independent of time (i.e. the processes are stationary). Unit root variables (or non-stationary time series) do not meet this assumption, hence, any hypothesis tested will produce skewed, biased or misleading results.

Data Analysis Techniques

The Autoregressive Distributive Lag (ARDL) model was used as analytical technique. Researchers employ the ARDL estimator owing to its numerous benefits, including the fact that all the data series under consideration do not need to have the same order of integrations, regardless of whether the regressors have an I (0) or I (1) order of cointegration.

All these analyses were computed through the use of E-view statistical package version 10.

Post Estimation Test

The study conducted the following post estimation tests:

Normality Test: Normality tests are statistical procedures used in ascertaining whether the errors or residuals in a regression model follow a normal distribution or not.

DATA ANALYSIS AND RESULTS

Presentation of Data

Time series data on annual Unemployment Rate (UER), crude oil transport (COTR), dry bulk transport (DBTR) and non-oil transport (NOTR)for Nigeria, 1980 to 2023 used for this study are presented in Table 1:

DATA PRESENTATION AND ANALYSIS

Presentation of Data

Time series data on annual unemployment rate (UER), crude oil transport (COTR), dry bulk transport (DBTR), non-oil transport (NOTR) for Nigeria, 1980 to 2023 used for this study are presented in Table 1:

Table 1: Data on Maritime Transport and Economic Development in Nigeria (1980-2023)

YEAR	COTR	DBTR	NOTR	UER
1980	1476.170	1037	13062.60	0.35
1981	10680.50	1965.24	10748.20	0.591
1982	8003.20	2172.15	9033.40	0.598
1983	7201.20	27192.8	7143.30	0.873
1984	8840.60	2575123	7507.90	0.916
1985	11223.70	3243751	5621.80	1.095
1986	8368.50	3022148	16843.60	1.256
1987	28208.60	3121724	20400.00	1.832
1988	28435.40	3262373	29143.00	2.142
1989	55016.80	4343278	42904.40	2.210
1990	106626.50	4022218	86393.30	2.435
1991	116858.10	8553527	127817.50	3.836
1992	201383.90	9397988	129484.60	3.773
1993	213778.80	9377242	125788.20	4.095
1994	200710.20	7368492	622397.90	4.152
1995	927565.30	5022272	423775.40	4.276
1996	1286215.90	4543878	707977.40	4.127
1997	1212499.40	3002846	695634.70	4.008
1998	717786.50	4316408	670346.80	3.948
1999	1169476.90	4479593	789027.60	4.037
2000	1920900.40	6022251	1149082.10	3.991
2001	1839945.25	9553569	1245717.18	3.920
2002	1649445.83	9397988	1776089.40	3.606
2003	2993109.95	10377285	1782239.90	3.566
2004	4489472.19	10368487	2109513.27	3.507
2005	7140578.92	2335850	2531431.31	3.692
2006	7191085.64	11334417	3342983.73	3.726
2007	8110500.38	12082132	4803508.09	3.791
2008	9861834.43	11212278	4912775.80	3.791
2009	8105455.12	19116321	7117787.92	3.755
2010	11300522.12	12968497	8865778.24	3.731
2011	14323154.65	13082771	7581636.04	3.77
2012	14259990.90	10102158	8140219.13	3.768
2013	14131843.08	9693134	19334	3.71
2014	12006965.05	9651053	14245	3.878
2015	8184480.52	9170517	8814	4.106
2016	8178817.96	9704453	9418	4.52
2017	12913241.32	9818494	12243	4.885
2018	17281953.13	8729495	11729	5.119
2019	16703434.07	8887067	17338	5.206
2020	11058151.84	9971872	15278	5.633
2021	16737339.63	10873561	16921	5.264
2022	24221595.93	12182522	19918	5.3
2023	25132359.78	17873532	25871	5.4

Sources: National Bureau of Statistics (NBS) NNPC PPPRA and CBN Statistical Bulletin and World Bank Indicators (1980-2023)

Descriptive Statistics

Table 2: Summary of Descriptive Statistics of the Variables

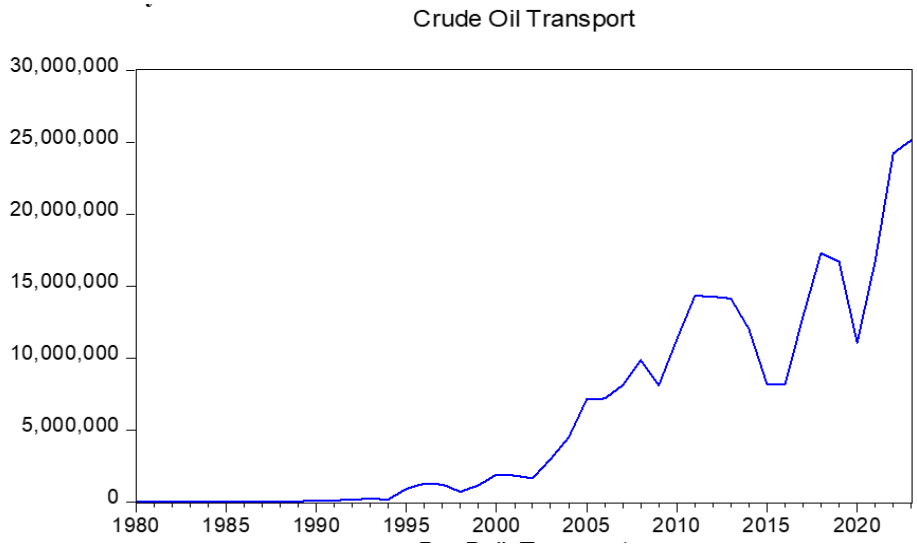
	UER	COT	DBT	NOTR
Mean	3.530341	6046739.	7644657.	1365248.
Median	3.782000	1880423.	9028792.	106090.8
Maximum	5.633000	25132360	19116321	8865778.
Minimum	0.591000	1476.170	1037.000	5621.800
Std. Dev.	1.328438	7065665.	4467845.	2421467.
Skewness	-0.842855	1.017977	0.235336	1.983175
Kurtosis	3.009446	3.110336	2.794991	5.715088
Jarque-Bera	5.209792	7.621683	0.483194	42.35666
Probability	0.073911	0.022130	0.785373	0.000000
Observations	44	44	44	44

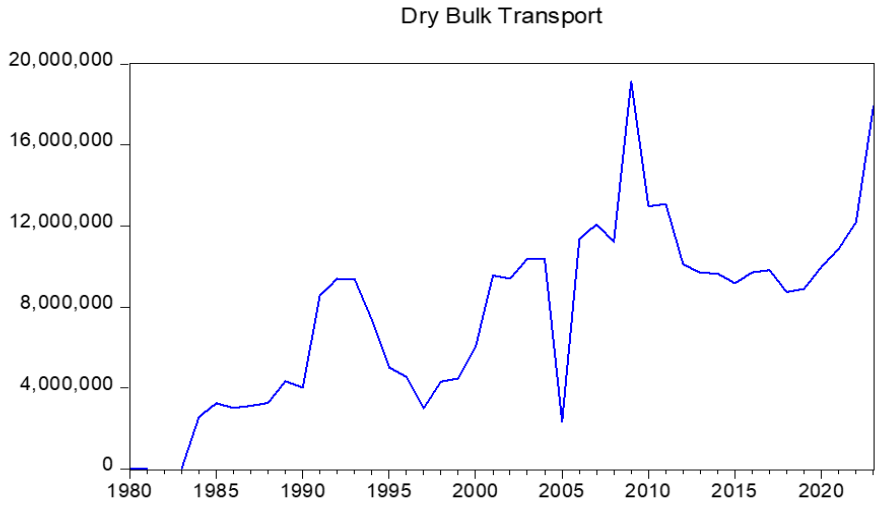
Source: Author's computation using E-views 12

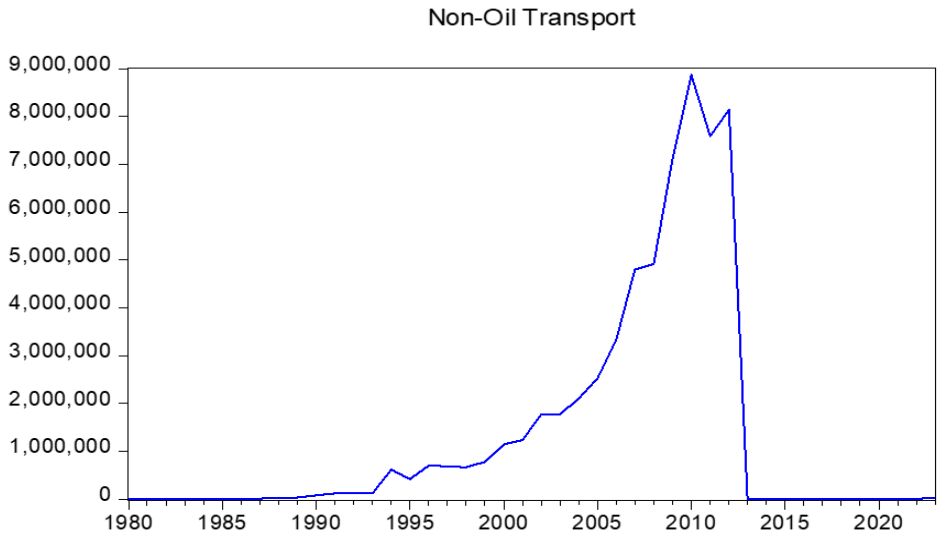
According to Table 2 results, the mean, minimum, maximum and standard deviation for the unemployment rate figures are: 3.530341, 0.591000, 5.633000 and 1.328438 respectively. The fact that the standard deviation is lower than the mean value suggests that the data is centered on the mean. In the same manner, the mean value for human development index is 0.482977, with a minimum value of 0.449000 and a maximum value of 0.548000 and a standard deviation of 0.030018, indicating that the data is convergent to it mean value because the standard deviation is lower than the mean value. In addition, the descriptive statistics for the variables show that crude oil transport, dry bulk transport, non-oil transport and foreign exchange rate are associated with mean values of 6046739, 7644657, 1365248 and 125.1900 respectively. Their standard deviations show that all the variables are dispersed around their respective mean values with the exception of dry bulk transport whose standard deviation is lower than its mean value, implying that the data is convergent to its mean.

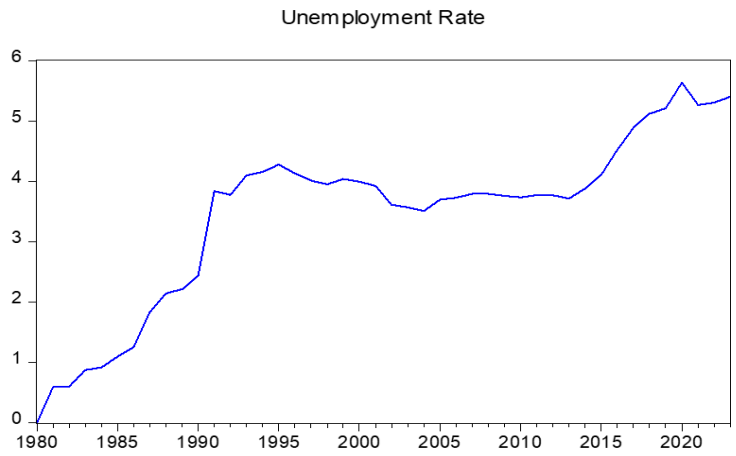
Moreover, the data of variables crude oil transport, dry bulk transport, non-oil transport and are skewed to the right of the normal distribution curve, as indicated by the fact that all of the variables' skewness values are positive whereas the data of unemployment rate is skewed to the left of the normal curve because the skewness value is negative. Additionally, the kurtosis value for unemployment rate is approximately 3 which implies that the distribution has a similar kurtosis to a normal distribution. Also, the kurtosis values for crude oil transport, non-oil transport and foreign exchange rate are all higher than 3, indicating that their curves are more peaks. On the other hand, dry bulk transport has kurtosis values below 3, which indicates that their curves are less peaked. Furthermore, the probability values of the Jarque-Bera statistics revealed that unemployment rate and dry bulk transport are normally distributed at 5 per cent level while human development index, crude oil transport, non-oil transport and foreign exchange rate are not.

Trend Analysis of the Studied Variables









Data Analysis

Unit Root Test

The cradle of a dynamic estimation starts with unit root test in order to ascertain the stationary states of the variables examined in the model, going by the random walk of time series data. Also, macroeconomic time series data by nature are prone to be non-stationary overtime (Gujarati, 2005; Koutsoyiannis, 1997). The need for stationary assessment is born out of the quest to ensure that the risk of running a spurious regression is avoided as much as possible and to guide against the loss of vital information linked to the random walk of the modeled variables (Granger & Newbold, 1976).

Hence, this study employed the Augmented Dickey-Fuller (ADF) unit root test to examine the integration order of the variables.

The result of the augmented Dickey-Fuller test of stationarity at level and first difference are presented in Table 3.

Table 3: Unit Root Test Results

Variables	ADF Level	1st_diff.	Critical Value at 5%	Decision I(d)
$loguer_t$	-4.3173	-	-2.9331	I(0)
$loghdi_t$	-0.3804	-3.7155	-3.0123	I(1)
$logfer_t$	-1.8031	-5.5624	-2.9331	I(1)
$logdbt_t$	-5.2302	-	-2.9331	I(0)
$lognotr_t$	-1.4121	-6.0808	-2.9331	I(1)

Source: Author's compilation from output of E-Views 12

The unit root test results depicted in Table 3 is based on the augmented Dickey-Fuller procedure. It was found from the test results that most of the variables which include, crude oil transport (COT) and non-oil transport (NOTR) were non-stationary in their level form. The series became stationary at first difference and integrated of order one I(1). Also, the result shows that unemployment rate and dry bulk transport were stationary at level as the ADF statistics, in absolute term, is greater than the critical value at 5 percent level of significance. The estimation of the autoregressive distributed lag (ARDL) model requires that the employed variables have mixed orders of I(0) and I(1) and this is satisfied following the confirmation of the order of integration of the variables using the augmented Dickey-Fuller approach of unit root test.

ARDL Bounds Cointegration Test

With the verification of the order of integration of the variables, the co-integration test of long run relationship was carried out. Based on the integrated properties of the variables which resulted in the use of the ARDL method of estimation, this paper employed the bounds cointegration test method to establish whether there is a co-movement between the variables in the long run. The result of the bounds test based on the f-statistics is presented in Tables 4.4.

Table 4: Bounds cointegration tests results for the models

Null hypothesis: No cointegrating relationship

	F-STATISTICS	K	Critical value Lower bound 5%	Critical value Upper bound 5%
UER	9.4884	3	3.23	4.35
UER(MOD)	8.6685	7	2.32	3.5

Source: Researcher's computation using Eviews 12

The table 4 gives the summary of the ARDL bounds test of cointegration for the model on unemployment rate (moderating effect). As advised by Pesaran et al., (2001), the study should reject the null hypothesis of no long run association between the examined variables in a situation whereby the calculated F-statistics is greater than the upper bound critical value and vice versa. The results reveal that the F-statistics for these models, specifically 14.995, 9.4884, 8.9790 and 8.6685 respectively, exceed the upper bound critical values at a 5 percent significance level. This shows that there is a strong indication of a long-run relationship between the dependent variable and the independent variables in each of these models. This, therefore, provides the empirical basis for estimating the ARDL model.

General Estimate for Model

Table 5: Summary Results of Model

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
3	.773[a]	.598	.568	.92848	.598	19.831	3	40	.000	.502

a. Predictors: (Constant), NOTR, COT, DBT

b. Dependent Variable: UER

Source: Author's compilation from output of E-Views 12

Table 5 shows that model 3 is statistically significant as the F. Statistics Change is 19.831 @p0.000 < 0.05. Also, the R^2 of 0.56.80 implies that 56.80 percent of the variations in the model are explained by the independent variables examined (crude oil transport, dry bulk transport and non-oil

transport).

Table 6: Effect of Maritime Transport on Unemployment Rate in Nigeria (Test of Hypothesis 3)

Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
3	(Constant)	1.800	.285		6.309	0.000		
	COT	5.164E-8	.000	.258	1.863	0.070	.523	1.913
	DBT	2.049E-7	.000	.659	4.258	0.000	.420	2.383
	NOTR	-1.538E-7	.000	-.264	-2.260	0.029	.739	1.354

a. Dependent Variable: UER

Source: Author's compilation from output of E-Views 12

Table 6 shows the results of the test of hypothesis 3. The result shows positive and insignificant effect of crude oil transport on unemployment rate with t- value of 1.863@ p0.070>0.05. The result additionally revealed that positive and significant effect of dry bulk transport on unemployment rate with t-value of t = 4.258@ p0.000< 0.05. Also, Table 4.5 revealed negative and significant effect of non- oil transport on unemployment rate with t-value of -2.260@ p0.029<0.05. Conclusively, the study has revealed that crude oil transport has positive and insignificant effect on unemployment rate, dry bulk transport has positive/ and significant effect on unemployment rate and non-oil transport has negative and significant effect on unemployment rate in Nigeria.

Table 7: ARDL short and long run results for the model

Dependent Variable: LHDI

Variable	**Coefficient**	**Std. Error**	**t – Stats**	**Prob.**
		Short Run Estimates		
D(LOG(COT))	0.2906	0.1108	2.6622	0.0237
D(LOG(DBT))	-0.0002	0.0980	-0.0028	0.9978
D(LOG(NOTR))	0.0028	0.0214	0.1309	0.8982
CointEq(-1)	-0.0898	0.0132	-6.7610	0.0000
Variable	**Coefficient**	**Std. Error**	**t – Stats**	**Prob.**
		Long Run Estimates		
LOG(COT)	1.8385	1.7126	1.0735	0.3060
LOG(DBT)	-6.9002	7.6837	-0.8980	0.3880
LOG(NOTR)	0.5909	0.8013	0.7374	0.4763
C	6.7498	0.9880	6.8314	0.0000
R-Squared	0.9010	Prob.(F-Stat.)	0.000373	

Source: Author's compilation from output of E-Views 12

Short Run Results

The short run results from Table 7 above revealed that crude oil transport exhibits a positive and statistically significant effect on human development index. This indicates that one percent increase in crude oil transport will raise human development index of Nigeria by 0.0293 percent. The finding conforms to a priori expectation of the study. Additionally, the results demonstrate that dry bulk transport has a negative effect on real GDP in the short run. This implies that a percent increase in dry bulk transport will lead to a decline in human development index by 0.0002 percent. The result is not consistent with the a priori expectation of the study. Furthermore, the short-run estimates reveal that non-oil transport has a positive but not statistically significant effect on human development index. This suggests that one percent increase in non-oil transport in Nigeria raises human development index by 0.0028 percent which is in conformity with the a priori expectation of the study.

Long Run Results

The long run results revealed that crude oil transport has a positive effect on human development index which corresponds with the short run outcome. Also, the findings showed that dry bulk transport has negative effect on human development index in Nigeria. This implies that a percentage increase in dry bulk transport leads to a decrease in human development index by 6.9002percent. This finding is similar to the behaviour of dry bulk transport in the short run. Furthermore, the estimated coefficient of non-oil transport shows it has a positive effect on human development index in Nigeria. This implies that one percent increases in non-oil transport increases human development index by 0.5909 percent. The coefficient of determination (R2) is estimated at 0.9010 which implies that 90 percent of the variations in human development index are explained by the independent variables examined in the model (crude oil transport, dry bulk transport and non-oil transport). This signifies that the model is a good fit.

Additionally, the probability value of the F-statistics (0.000373) indicates that the explanatory variables are collectively significant in explaining changes

in human development index. Furthermore, the error correction coefficient (-0.0898) shows that the model can adjust to long run equilibrium position at a speed of 8 percent which signifies a relatively slow adjustment process with 8 percent of short run deviations being corrected before the end of one year to attain long run equilibrium level.

Table 8: Inspection of CLRM Assumptions

Unemployment Model

Tests	**CLRM Problem**	**Test Stats.**	**Prob.**	**Decision**
Breusch-GodfreyLM	Serial Correlation	0.5335	0.4651	Serial independence
Breusch-Pagan-Godfrey	Heteroscedasticity	22.303	0.3822	Constant Variance
Jarque Bera	Normality Test	0.8035	0.6691	normally Distributed
Ramsey RESET	Model Specification	0.0644	0.8030	Model is not misspecified

Source: Author's compilation from output of E-Views 12

As presented in Table 8, the Breusch-Godfrey Serial correlation LM test result shows there is complete absence of autocorrelation in the estimated stochastic term. The test illustrated that, the chi-square statistics value is 0.0104 with a probability value of 0.9188 for model 1, 0.5335 with a probability value of 0.4651 for model 2 and 2.2997 with a probability value of 0.1294 for model 3 are greater than 0.05 significance level. Hence, the null hypothesis is accepted at 0.05 significance level. Hence, this implies that serial autocorrelation is not present in the stochastic term.

The heteroscedasticity analysis based on the Breusch-Pagan-Godfrey method demonstrated that there is no existence of heteroscedasticity in the stochastic term as the null hypothesis is upheld. The chi-square value 21.106 and probability value of 0.3310 for model 1, 22.303 and probability value of 0.3822 for model 2 and 22.181 with a probability value of 0.4491 led to the study failing to reject the null hypothesis. The Jarque-Bera Normality test results indicate that the residuals are normally distributed. Hence the null hypothesis is not rejected as the Jarque Bera test statistic values in the examined models exceed 0.05 significance level. The Ramsey's reset test result shows that there is no functional or specification error, given the F-Statistic of 0.5525 and a probability value of 0.4680 for model 1,0.0644 and 0.8030 for model 2 and 4.4658 and 0.0607 for model 3.

Discussion

This section focused on the findings from empirically investigating the effect of maritime transport on unemployment in Nigeria covering the period between 1980 -2023. The ARDL model's short- and long-run analysis offers crucial insights into how maritime transport components; crude oil transport (COT), dry bulk transport (DBT) and non-oil transport affect Nigeria's unemployment rate (UER). The empirical results were discussed to ascertain if the specified objectives of the study were successfully accomplished and also link the findings with the theoretical expectations. The findings were equally discussed in line with the stated hypotheses to ascertain if the null hypotheses are to be rejected or not.

Effects of Maritime Transport (Crude Oil, Dry Bulk and Non-Oil Transport) on Unemployment Rate in Nigeria

Unemployment is anticipated to be negatively affected by an increase in crude oil transport. The ARDL models' short-run and long-run results seem to confirm this assertion. The results showed that crude oil transport has negative effect on unemployment rate in Nigeria both in the short run and long run. It explained that one percent increase in crude oil transport will reduce unemployment rate by 0.0293 percent and 0.0234 percent in short run and long run respectively. However, the negative effect of crude oil transport on unemployment rate both in the short run and long run was found not to be statistically significant at 0.05 significance level given the probability values of 0.4365 and 0.6177 respectively. Hence, we reject the null hypothesis since the probability value is less than 0.05. Based on the short run and long run results, the study submits that crude oil transport has insignificant negative effect on unemployment rate in Nigeria.

Also, there is evidence of a positive effect of dry bulk transport on unemployment rate in the short run. This indicates that one percent increase in dry bulk transport will lead to increase in unemployment rate in Nigeria by 0.0221 which corresponds with the long run outcome. Additionally, the finding is not consistent with a priori expectation of the study. However, only the long run result was found to be statistically significant given the associated probability value of 0.0234 is less than 0.05 significant level. Hence, we reject the null and submits that dry bulk transport has positive and significant effect on unemployment rate in Nigeria.

Furthermore, the short run and long run estimated coefficient of non-oil transport revealed it has negative effect on unemployment rate in Nigeria which is consistent with a priori expectation of the study. This implies that a one percent rise in non-oil transport will lead to reduction in unemployment rate by 0.056 percent and 0.0837 percent in the short run and long run respectively. In addition, the negative effect of non-oil transport on unemployment rate was found to be statistically significant in the long run given the corresponding probability value of 0.003. Hence, we reject the null hypothesis and submit that non-oil transport has significant negative effect on unemployment in Nigeria.

Conclusion

The conclusion of this study provides all-inclusive outcomes of the study. Maritime transport has a close interrelation with the historical progression and level of economic growth of a nation. Conclusively, it is evident that: Crude oil transport has positive and insignificant effect on unemployment rate (t = 1.863 @ p0.070>0.05); dry bulk transport has positive and insignificant effect on unemployment rate (t = 4.258@ p0.000<0.05); non-oil transport has positive and insignificant effect on unemployment rate in Nigeria (t = -2.260@p0.029<0.05).

Recommendations

Based on the findings of the study and conclusions reached the following recommendations have been made:

1. Government and maritime transport owners should accentuate on skills development in maritime logistics and shipbuilding, port infrastructure investment, promotion of coastal and inland shipping and private sector involvement in maritime transport.
2. Efforts to reform the maritime sector through modernization, privatization of ports, promotion of the Blue Economy, and implementation of the Cabotage Act (2003) aim to enhance local participation and create more jobs. If well-managed, maritime transport could significantly reduce Nigeria's high unemployment rate, especially among the youth.
3. Government and transportation authorities, should put in place strategic options to create an effective policy framework for effective management of indicators of maritime transport with a view to enhancing sustainable productivity and the overall transformation of the Nigerian economy.

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