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Trade Openness and Economic Growth in Nigeria

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Abstract
This study empirically determined the effect of trade openness on economic growth in Nigeria from 1985 to 2022. The research comprised trade openness proxies including the degree of trade openness, real exchange rate, foreign direct investment, and official development assistance, while Real Gross Domestic Product was utilized as indicator economic growth. The research utilised yearly time series data obtained from the Central Bank of Nigeria (CBN) statistics bulletin and the World Development Indicators (WDI) of the World Bank. The data analysis methods utilised comprise descriptive statistics, correlation matrix, Augmented Dickey-Fuller (ADF) unit root test, bounds cointegration, and Autoregressive Distributed Lag (ARDL) approach. The ADF unit root test outcome indicated mixed stationarity across all variables. That is, a combination of [I(0)] and [I(1)]. The ARDL bounds cointegration test result indicated the presence of a long-run link among the variables. Ultimately, the ARDL estimation results indicated that trade openness and FDI exert a positive and significant effect on Real GDP in both the long run and short run. Conversely, the real exchange rate has a negative yet significant impact on Real GDP in both time frames, while official development assistance demonstrates a positive but non-significant effect on Real GDP in both the long and short run. The research concluded that trade openness substantially drives and enhances economic growth in Nigeria. The researchers proposed that the government undertake measures to promote trade facilitation by streamlining customs processes, cutting tariffs, and investing in trade-supporting infrastructure, including ports, roads, and logistics. This will enhance Nigeria's trade openness and strengthen its inclusion into the global economy.

Keywords: *Trade Openness, Economic Growth, Real Gross Domestic Product, Foreign Direct Investment, Real Exchange Rate, Official Development Assistance*

1.0 Introduction

Trade has piqued the curiosity of both economists and policymakers. Reason being, a nation's level of industrialization is strongly related to its level of commerce. International trade is seen as a development driver since it allows nations to sell their locally made products to other nations across the globe. Owing to what we know from theory, the level of economic openness determines whether or not international commerce helps spread new technologies, speeds up technological advancement, and fosters creativity. In congruent with Zahonogo (2016), emerging economies have often been pushed to adopt trade liberalization policies due to this rationale. Consequently, trade openness is the degree to which nations are able to freely interchange commodities and services across national boundaries as a result of greater economic integration. Freedom of movement of labor and money, likewise commerce and financing between these nations, binds them together. Trade openness is often understood by economists as global integration in which nations' links are characterized by free trade and the unfettered flow of money and financial activity (Echekoba, Okonkwo & Adigwe, 2015). But fundamental economists like Adam Smith and David Ricardo laid the groundwork for the idea that nations can boost global output substantially when they divide labor in congruent with absolute advantage (Smith) and comparative advantage (Ricardo). This is where the idea of trade openness nexus economic growth originates. Both industrialized and developing nations have embraced the notion of economic openness, which entails removing trade barriers entirely or partially, as a favourable and hopeful policy framework (Solomon & Tukur, 2019). It is impossible to overstate the importance of trade openness in boosting and increasing economic development. The elimination of all trade prohibitions and hurdles is necessary to achieve free trade, in congruent with Ejike, Anah, and Onwuchekwa (2015). The thinking behind this is that trade has both static and dynamic benefits that can help economies grow. These include, but are not limited to, better resource allocation, more amiable competition between countries, more investment and technology development flowing in both directions, and, of course, quicker capital accumulation and technological advancement that is occurring simultaneously. In accordance with Abinabo and Abubakar (2023), the free movement of products and services is encouraged by the openness of commerce. It is possible that non-tariff obstacles, like as quotas and regulatory requirements, may also impose such limits. Tariffs and high levies are two examples of such barriers. When a nation's trade doors are open, its citizens have the opportunity to take advantage of imported products and services that are more affordable than what they might produce at home. This is consistent with the notion of comparative cost advantage. As a further benefit, it makes it possible for developing countries like Nigeria to import capital equipment and intermediate inputs that are essential for long-term development but cannot be produced locally due to a lack of infrastructure or excessively high prices. There are also potential advantages of trade openness, including increased exposure to new ideas and technologies from other countries, as well as increased levels of competitiveness, which encourages domestic businesses to operate more effectively than they would be if they were sheltered from competition (Afolabi & Oyelekan, 2020).

While more commerce opens up more opportunities for investment, technology, and markets, it also brings substantial risks that might slow economic growth—particularly for a developing

nation like Nigeria. Gaining the complete advantages of trade liberalization is not an easy task for this nation because of its dependence on oil exports, susceptibility to changes in global markets, lack of domestic industry development, trade deficits, weak institutional frameworks, infrastructure problems, and the possibility of rising income inequality. The concept that trade openness sways GDP growth is, interestingly, not new. The literature (empirical research) is, however, deeply divided about the effect's exact nature. This study intends to fill gaps in literature and knowledge regarding the effect of trade openness on economic growth and development. Previous studies have attempted to address this issue (Abinabo & Abubakar, 2023; Ohwofasa & Ekaruwe, 2023; Tyokosu & Abakpa, 2023; Umar, Hawwa, Nazeef & Yahaya, 2021; Omoke & Opuala-Charles, 2021; Afolabi & Oyelekan, 2020; Sunday & Ahmed, 2019). This study's use of a collection of variables—degree of trade openness, real exchange rate, foreign direct investment, and government development assistance—to proxy trade openness is unique among the research appraised in terms of substance. Concerning the time/data gap, the majority of these research utilised yearly time series data, which only covered a brief period and did not extend until 2022. The majority of the research lacked proper technique in that they did not analyze their data employing pre- and post-estimation tests. Thus, this study's starting point is that it looked at how trade openness affected GDP growth in Nigeria. The research employed yearly time series data from 1985 to 2022 to have a bigger sample observation for a rigorous data analysis, and it disaggregated trade openness into degree of trade openness, real exchange rate, foreign direct investment, and government development aid. In order to arrive at more reliable upshots for effective and efficient policy implementation, this research econometrically conducted pre-estimation tests, estimation tests, and post-estimation testing.

Aim and Objectives of the Study

The aim of this study is to study empirically determined the effect of trade openness on economic growth in Nigeria. Specifically, the study sought to:

i. determine the effect of degree of trade openness on Real Gross Domestic Product in Nigeria;
ii. analyse the effect of foreign direct investment on Real Gross Domestic Product in Nigeria;
iii. ascertain the effect of real exchange rate on Real Gross Domestic Product in Nigeria; and
iv. examine the effect of official development assistance on Real Gross Domestic Product in Nigeria.

The subsequent component of this research is organized to address the literature review, including the theoretical framework and an examination of empirical literature. Section three focused on methodology. Section four analyzed the data and discussed the outcomes, while section five concluded with suggestions.

2.0 Literature Review

Theoretical Framework

The theoretical underpinnings of this investigation were two theories that were utilised. In this part, we will go over these theories:

a. Theory of Comparative Advantage

In 1817, David Ricardo laid forth the key principles of classical comparative advantage theory. The idea posits that nations may achieve trade benefits by specializing in producing commodities in their areas of comparative advantage. In congruent with the comparative advantage paradigm, a nation's trading partners help it make better use of its resources by letting it import cheaper products and services that might have been produced domestically. Because domestic production of the capital and intermediate products essential to economic development is so expensive, emerging nations are a suitable case in point. Duru, Bartholomew, Okafor, Adikwu, and Njoku (2020) believed that trade was the key to achieving static production efficiency and international competitiveness, which in turn led to economic development. There are two types of trade gains: static and dynamic. The opportunity cost of production differs among nations due to the fact that factor endowments vary. As a result, static benefits from trade arise from this variation. In contrast, dynamic trade benefits result from more resource participation in production (Thindwa & Seshamani, 2014). Trade liberalization improves access to the market. Trade liberalization might help developing nations gain access to global markets, which would allow them to enjoy these trade benefits. Foreign currency gained via commerce will stimulate economic development. Possibilities for dynamic gains comprise the acquisition of new information and technologies and the enhancement of worker productivity (Thindwa & Seshamani, 2014). Furthermore, in congruent with this idea, a nation ought to focus on producing the good for which its production costs are lowest relative to others. Opportunity cost of production for each item in both nations is compared. It is said that one nation has a comparative advantage in manufacturing a certain product and another nation has a comparative advantage in producing another good if the opportunity costs of creating one good in both nations are different. Although one nation may have a distinct edge in both manufacturing lines, trade will benefit both in this scenario.

b. Theory of Absolute Advantage

Adam Smith, in his book “an enquiry into nature and cause of wealth of nations” released in 1776 made it obvious that nations should trade with one another. The benefits of international trade to a nation were obvious to him. The Absolute Advantage of Trade Theory he developed addressed this same issue. Since absolute advantage can be determined by comparing labor productivities, Adam Smith originally explained it in relation to trade with labor as the sole input. If one side does not have an absolute advantage in anything, then no trade will take place, in congruent with the theory of absolute advantage. When one entity (a person, a company, or a nation) can outproduce its rivals while employing the same quantity of resources, this is known as the concept of absolute advantage (Muhammad & Benedict, 2018). So, in congruent with the Absolute Advantage idea, a nation should focus on making the good or service that it can do so at a lower cost than its competitors and trade it for goods or services that other nations provide at a lower cost. For all intents and purposes, a nation ought to focus on manufacturing the goods at which it excels. Governments should stay out of commerce, in congruent with Adam Smith. To rephrase, he advocated free trade as the optimal trade strategy for nations.

Review of Empirical Literature

An empirical study of the link between Nigeria's GDP growth and trade openness was carried out by Abinabo and Abubakar (2023) between 1990 and 2021. Researchers utilised descriptive statistics, the ADF unit root test to check for stationarity, the Johansen Estimation approaches comprise the Error Correction Mechanism (ECM) model and the Cointegration test, which look for long-run links. Secondary sources, such as the CBN Statistical Bulletin, provided the data utilised in the empirical study for the time period under consideration. The upshots revealed that trade openness (the amount of exports, imports, and international commerce) and economic development in Nigeria are related in the long term. The upshots also revealed that imports had an unfavourable and statistically substantial effect on growth from an economic standpoint in Nigeria, whereas trade openness had a favourable and statistically substantial sway. Foreign investment has been beneficial to the Nigerian economy, in congruent with the report.

Ohwofasa and Ekaruwe (2023) conducted research to determine whether or not there is a link between the openness of businesses to trade and the growth of the gross domestic product of Nigeria. They accomplished this by separating the revenues from exports of solid minerals, manufacturing, agricultural products, and oil trading into the categories of trade openness. For the purpose of the research endeavour, which utilised data spanning the years 1986 to 2020, a model that is known as ARDL model was applied. As a consequence of this, the upshots of the bound test indicated that there was a connection between the expansion of the economy in Nigeria and each of the four sectoral export variables that were in a state of equilibrium throughout the course of the long run. Changes in agricultural and crude oil exports have a favourable and substantial sway on economic development in the short term, in congruent with the upshots of the research. On the other hand, changes in solid mineral exports have an unfavourable and substantial impact on growth from an economic standpoint due to the fact that they comprise a greater proportion of solid minerals. On the other hand, it was shown that the outcome of exports of manufactured goods on the growth of GDP in the short term was statistically negligible. This was the conclusion reached by statistical analysis. It was found that exports of manufactured goods and agricultural products had a considerably favourable sway over the long term. This is in contrast to exports of solid minerals and oil, which had an unfavourable and statistically substantial impact on growth. The upshots of the research were in agreement with the upshots of the study.

By analysing data from 2000–2020, Tyokosu and Abakpa (2023) want to draw conclusions on the connection between Nigeria's GDP growth and trade openness. The researchers will use a method known as ex-post facto study. Secondary sources, specifically the 2022 edition of the Statistical Bulletin published by the CBN, provided all of the data utilised in this investigation. Using the SmartPLS 12.1 OS, a time series regression analysis was conducted. In congruent with the study, there was no meaningful link between exports and either Nigeria's gross domestic product or per capita income over the studied period. The statistics also revealed a similar pattern, showing that FDI had a negligible effect on GDP and per capita income in Nigeria. Conversely, it was shown

that imports substantially affect GDP and PCI levels. Analyses conducted over the duration of the research found that imports substantially impacted Nigeria's GDP growth.

To find out whether trade openness correlates with economic success in Nigeria, Umar, Hawwa, Nazeef, and Yahaya performed study in 2021. In this analysis, we use the following variables from 1980 to 2020: real exchange rate, degree of trade openness, and GDP as the dependent variable. The two variables that were deemed independent were import and export. The study made use of two different testing methods: the PP unit root test and the ADP test. Also used for estimate is the ARDL bound test's co-integration test. A favourable and statistically substantial effect of exports, as well as an unfavourable effect of imports, were seen while examining the long-run impacts of currency rates and exports on growth from an economic standpoint in Nigeria.

Using institutional quality as a variable, Omoke and Opuala-Charles (2021) appraised the connection between Nigeria's GDP growth and trade openness. The research used data from 1984 to 2017 and measured trade openness using total trade, import trade, and export trade. All of the studies took place in the USA. If we want to know if the variables are cointegrated, we can use the ARDL bounds testing method. Evidence of long-run links between the variables was seen in the upshots. In congruent with the calculations, export transactions considerably promote economic development, whereas import commerce considerably slows it down. The upshots show that as Nigeria's institutions (or governance) become better over time, the unfavourable outcome of import trade on GDP growth becomes less pronounced.

Using GDP as their dependent variable, Afolabi and Oyelekan (2020) studied the link between Nigeria's GDP growth and trade openness. The use of secondary data began in 1981 and continued till 2018. It was estimated that trade openness had an sway on GDP growth in Nigeria using a method called Ordinary Least Squares (OLS). Both the CBN Statistical Bulletin and the World Bank's World Development Indicators served as sources of data for the research. The study's upshots are in line with previous research showing a link between Nigeria's GDP growth and trade openness over the long run. The upshots also contradict the a priori, as export is trending downward and import is trending upward.

The empirical study by Sunday and Ahmed (2019) appraised the 1980–2016 period in Nigeria and how trade openness correlated with growth from an economic standpoint. Secondary data used in this study came from the 2016 edition of the CBN's Statistical Bulletin. As part of the diagnostic process, tests such as unit root, error correction model, and cointegration are conducted. Consistent with the upshots of the data investigation, it was shown that trade openness hinders the growth of an economy in the short and long run.

Ajayi and Araoye used data from 1970 to 2016 to appraise the link between Nigeria's GDP growth and trade openness in their 2019 study. Primary sources used in the study included many databases and reports, such as those maintained by the World Bank and International Financial Statistics, the CBN Statistical Bulletin (2014), the International Monetary Fund Data Base (2010), and the World Development Data Base. Based on the results of the ADF and Phillips-Peron (PP) unit root tests,

it was concluded that none of the series are stationary at the valued levels. All variables were determined to be I(1) at the 5% level of significance for ADF and the 1% level for PP, with the exception of labour input, which did not stay stable at first difference in ADF. The results of the Co-integration test showed that the variables were in equilibrium with each other, supporting the thesis of Engel and Granger (1987), who proposed the idea of a long-term relationship between economic variables even when a unit root problem is not present. Each and every coefficient was correctly signed and stable at the 5% level. It was expected, particularly for a nation involved in international commerce, that there would be an unfavourable link between exchange rate and economic growth; however, there was a favourable link between commerce openness and growth from an economic viewpoint.

In their 2019 study, Solomon and Tukur appraised the link between Nigeria's GDP growth and trade openness from 1981 to 2018. As a stand-in for GDP growth, Real GDP was chosen. The model now comprises other relevant factors, such as inflation, trade openness, and exchange rates, as independent variables. The data for the study were taken from the CBN statistics database. When the initial difference was taken into account, the variables were found to have become stationary in congruent with the upshots of the ADF test. Conclusions from the Johansen Co-integration test pointed to a long-term interaction, while those from the ECM showed that, throughout the study period, trade openness constructively and substantially affected the growth of the economy, price increases detrimentally and substantially, and the rate of exchange constructively but not substantially affected economic growth in Nigeria.

Ijirshar (2019) utilised secondary data spanning 1975–2017 to analyse how trade openness sways economic development in ECOWAS member states. Since time was more relevant than cross-sections, non-stationary heterogeneous dynamic panel models were applied in the investigation. Methods such as Pooled Mean Group (PMG) and Mean Group (MG) estimators were utilised in order to attain this aim. In congruent with the Hausman test, the PMG estimator was shown to be the most suitable choice. In the long run, trade openness boosted GDP for ECOWAS members, even if the short-run effects were mixed.

3.0 Methodology

Research Design

In the context of research, the term "research design" refers to a collection of procedures and strategies that are utilised by the researcher in order to integrate different aspects of study in a way that is relatively logical in order to successfully and efficiently address the issue at hand. For this particular research project, the ex-post facto research design was chosen as the appropriate study design. It has been determined that the ex-post facto design is suitable for the research since it is a non-experimental study that aimed to evaluate the causal link between the dependent variable (economic growth) and the independent variable (trade openness) of the study by making use of data that was previously available.

Model Specification

Empirically, a multiple linear regression model that was constructed on the model of Umar, Hawwa, Nazeef, and Yahaya (2021) with small modifications was utilised for the research. This was done in order to enhance the efficiency of the economic estimations, likewise as a consequence of additional degrees of freedom and decreased collinearity. The model consisted of the variables that are independent (X) and dependent (Y), and it was fitted to an equation that was known as a regression equation. The data indicated the connection that existed between the variables. The following equations may be utilised to represent this model of multiple linear regression in general equation form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + u \quad (1)$$

Where: Y = dependent variable (economic growth), a = intercept parameter (where the regression surface crosses the y-axis), β_1 - β_n = Slope parameters (measures the degree of responsiveness of dependent variables to independent variables), X_1 - X_n = independent variables (proxies of trade openness) u = stochastic error term

Owing to the above, the study specifies a functional link between trade openness and economic growth thus:

$$ECG = f(Trade\ Openness) \quad (2)$$

ECG= Economic growth measured in terms of Real Gross Domestic Product
Model 2 is disaggregated as follows:

$$RGDP_t = f(DTO_t,\ FDI_t, RER_t, ODA_t) \quad (3)$$

The functional link in equation 3 is stated in explicit form to enhance its estimation thus:

$$RDGP_t = \beta_0 + \beta_1 DTO_t + \beta_2 FDI_t + \beta_3 RER_t + \beta_4 ODA_t + u_t \quad (4)$$

Equation 4 is stated in log form as follows:

$$RGDP_t = \beta_0 + \beta_1 InDTO_t + \beta_2 InFDI_t + \beta_3 InRER_t + \beta_2 InODA_t + u_t \quad (5)$$

Expressing the model in its ARDL form, we have:

$$\begin{aligned}\Delta \ln(RGDP_t) = {} & \beta_0 + \sum_{t=1}^{p} \beta_{1i} \Delta In(RGDP_t) + \sum_{t=1}^{q} \beta_{2i} \Delta In(DTO_{t-1}) + \sum_{t=1}^{q} \beta_{3i} \Delta In(FDI_{t-1}) \\ & + \sum_{t=1}^{P} \beta_{4i} \Delta In(RER_{t-1}) + \sum_{t=1}^{P} \beta_{5i} \Delta In(ODA_{t-1}) + \alpha_{1i} \Delta(RGDP_{t-1}) \\ & + \alpha_{2i} \Delta \ln(DTO_{t-1}) + \alpha_{3i} \Delta(FDI_{t-1}) + \alpha_{4i} \Delta \ln(RER_{t-1}) + \alpha_{5i} \Delta(ODA_{t-1}) \\ & + u_{ti} \end{aligned} \quad (6)$$

Where: FDI = Foreign direct investment, RER = Real exchange rate, DTO = Degree of trade openness, ODA = Official development assistance, RGDP = Real Gross Domestic Product, Δ = Difference operator, P= Lag of dependent variable, q = Lag of independent variables, t = Time, In = Natural log, β_0 = Constant variable; $\alpha_1 - \alpha_5$ = Co-efficient of long run equilibrium; $\beta_1 - \beta_5$ = Co-efficient of short run dynamic model, u_{ti} = Stochastic term.

Moreover, an error correction model that is related to the long-run estimations is estimated in order to arrive at the short-run dynamic parameters. See below for the model:

$$\Delta \mathrm{In}(RGDP_t) = \beta_0 + \sum_{t=1}^{p} \beta_{1i} \Delta In(RGDP_t) + \sum_{t=1}^{q} \beta_{2i} \Delta In(DTO_{t-1}) + \sum_{t=1}^{q} \beta_{3i} \Delta In(FDI_{t-1}) + \sum_{t=1}^{P} \beta_{4i} \Delta In(RER_{t-1}) + \sum_{t=1}^{P} \beta_{5i} \Delta In(ODA_{t-1}) + \delta ECMT_{t-1} + \varepsilon_{1i} \quad (7)$$

Table 1: Variables Description and Data Sources

Types of Variables	Variable Name	Identifier	Source of Data	Definition and Measurement
Dependent Variable	Real Gross Domestic Product	RGDP	CBN Statistical Bulletin	After accounting for changes in prices caused by inflation or deflation, a nation's total output of goods and services over a certain time period is known as its Real GDP. By taking price changes into consideration, it more accurately represents economic production and so provides a better gauge of economic success over time.
Independent Variable	Degree of trade openness	DTO	CBN Statistical Bulletin	A nation's level of trade openness indicates how actively it participates in global commerce. It is often determined by adding up a nation's exportations and importations and dividing the result by its GDP.
	Foreign direct investment	FDI	WDI	What we call "Foreign Direct Investment" happens when a company or person from one nation puts money into a company or investment in another nation. Whether it's purchasing a controlling position in an existing firm, starting a new business, or extending an existing corporation's activities overseas, it usually entails acquiring a permanent managerial interest in a foreign enterprise.

	Real exchange rate	RER	CBN Statistical Bulletin	It is possible to convert one currency into another at a rate known as the actual exchange rate if the two nations' respective pricing levels are taken into account. The relative value of the currencies is shown by this ratio, which is determined by multiplying the nominal exchange rate by the ratio of the two nations' price levels.
	Official development assistance	ODA	WDI	Government assistance programs that aim to improve the economic situation and general well-being of developing nations are collectively known as Official Development Assistance (ODA). Its goal is to help fund sustainable development, alleviate poverty, and raise living standards in the nations that receive it from various governmental bodies, such as multinational organisations.

Note: CBN = Central Bank of Nigeria, WDI = World Development Indicators.

Data Analysis Technique

To prevent the occurrence of a misleading result, it is therefore crucial to establish the sequence of series integration in modelling. The series' integration qualities were appraised in this research by employing the ADF solution. Consequently, to find out the link between the independent and dependent variables in the long and short term, the ARDL model was utilised. Because the ADF unit root test yielded mixed stationarity upshots (I(0) and I(1)), the ARDL method was utilised.

4.0 Analysis and Discussion of Results

Descriptive Analysis

Conducting the summary statistics of the model's variables is the first stage in the econometric analysis of this research. The upshots are shown in Table 2, and descriptive statistics are utilised for the analysis:

Table 2: Descriptive Statistics

	RGDP	DTO	FDI	RER	ODA
Mean	39894.15	31.07200	1449.895	119.7943	1439.250
Median	33004.80	32.73200	248.2200	120.9700	299.5500
Maximum	72393.67	55.02100	6854.330	400.2400	11431.96
Minimum	16997.52	7.521000	0.430000	0.890000	66.68000
Std. Dev.	20195.37	10.77366	1847.405	109.5664	2203.807
Skewness	0.435313	-0.316975	1.101139	0.876608	2.909684
Kurtosis	1.561574	2.837242	3.291953	3.032136	12.92517
Jarque-Bera	4.358382	0.660425	7.608538	4.740318	204.0767
Probability	0.113133	0.718771	0.022275	0.093466	0.000000

Sum	1476084.	1149.664	53646.13	4432.390	53252.24
Sum Sq. Dev.	1.47E+10	4178.586	1.23E+08	432172.6	1.75E+08
Observations	**38**	**38**	**38**	**38**	**38**

Source: *Computation by Author, 2024.*

Table 2 reveals that there are 38 observations for each series. Real GDP, serving as a proxy for economic growth, has an average value of ₦39,894.15 billion and a median of ₦33,004.8 billion, with maximum and lowest values of ₦72,393.67 billion and ₦16,997.52 billion, respectively. The Degree of Trade Openness (DTO), FDI, Real Exchange Rate (RER), and Official Development Assistance (ODA), utilised as indicators of trade openness, exhibit average values of 31.07%, ₦1449.9 billion, 119.79%, and $1439.25 million, respectively. Their median values are 32.73%, ₦248.22 billion, 120.97%, and $299.55 million, while the maximum values are 55.02%, ₦6854.33 billion, 400.24%, and $11431.96 million. The minimum values recorded are 7.52%, ₦0.43, 0.89%, and $66.68 million, respectively. The volatility metrics, as assessed employing standard deviation values, reveal that FDI and ODA are very variable, but the degree of trade openness (DTO) and real exchange rate (RER) exhibit lower volatility. This table indicates that Real GDP, FDI, and real exchange rate exhibit favourable skewness, but the degree of trade openness displays unfavourable skewness.

Trend Analysis

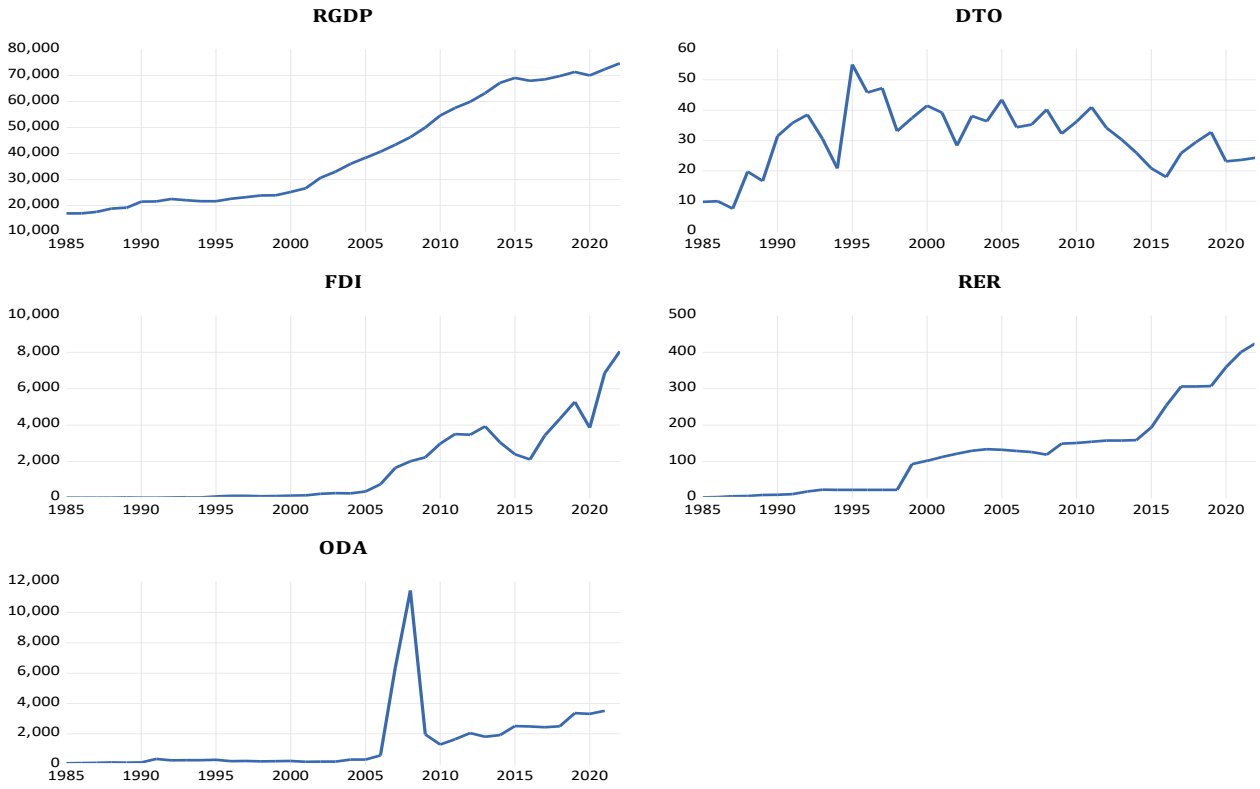

Figure 1: Line Graph Showing the Trend in the Research Variables

Degree of trade openness (DTO), foreign direct investment (FDI), and official development assistance (ODA) exhibited very variable upward and downward movements throughout the research period (1985–2022), in contrast to Real GDP and real exchange rate (RER), which exhibited fairly consistent upward movements (Figure 1).

Pre-Estimation Tests

a. Multicollinearity Test

In order to identify multicollinearity, this research utilised a correlation matrix. By comparing the correlation co-efficient between each pair of independent variables, a correlation matrix may be utilised for detection purposes. Table 3 displays the correlation matrix result:

Table 3: Correlation Matrix

	$InRGDP_t$	$InDTO_t$	$InFDI_t$	$InRER_t$	$InODA_t$
$InRGDP_t$	1				
$InDTO_t$	0.191318	1			
$InFDI_t$	0.235939	0.437771	1		
$InRER_t$	-0.477205	0.478916	0.350631	1	
$InODA_t$	0.495971	0.234340	0.569529	0.266118	1

Source: *Computation by Authors, 2024.*

Table 3 displays the result of the correlation test, which reveal that over the research period, the following variables had weak but mixed positive and negative links with Real GDP: degree of trade openness (DTO), FDI, real exchange rate (RER), and official development assistance (ODA). So, it seems safe to go on with our econometric analysis without worrying about multicollinearity among the independent variables.

b. Unit Root Test

A common practice in time series analysis is to first determine the integration order of the variables in order to rule out false regression. This research began by employing the well-known ADF unit root test to appraise the stationarity of all the variables. This is necessary since assessing the unit roots of a series is a prerequisite to the presence of a cointegration connection. So, below in Table 4, you can see the unit root test upshots:

Table 4: Augmented Dickey-Fuller (ADF) Test Results

	At Levels		At 1st Difference			Decision
Variables	**ADF Statistic**	**5% Critical Value**	**ADF Statistic**	**5% Critical Value**	**Order of Integration**	**Stationary @**
$InRGDP_t$	-0.673092	-2.945842	-3.987927	-2.945842	I(1)	1st difference
$InDTO_t$	-3.130645	-2.943427	-	-	I(0)	Leve
$InFDI_t$	-2.205581	-2.943427	-8.418962	-2.945842	I(1)	1st difference
$InRER_t$	-3.517194	-2.943427	-	-	I(0)	Level
$InODA_t$	-1.025077	-2.951125	-5.696616	-2.951125	I(1)	1st difference

Source: *Computation by Authors, 2024.*

Table 4 displays the outcomes of the variables' levels and various formats owing to the data. For a variable to be considered stationary, either its probability value must be less than 0.05 or its t-statistic must be larger than the crucial value at the 5% significance level. After applying ADF to the data, we find that Real GDP, FDI, and ODA are all stationary at first different, or order I(1), whereas Degree of Trade Openness (DTO) and Real Exchange Rate (RER) are stationary at levels, or order I(0). An ARDL bound was utilised to test for cointegration or long-run links among the variables since the integration orders were mixed up, with both I(0) and I(1) being considered.

c. ARDL Bounds Cointegration Test

Table 5: ARDL Bounds Cointegration Test

	Critical Value Bound		**F-Statistics**
Significance	I(0) Bound	I(1) Bound	
10%	2.2	3.09	
5%	2.56	3.49	7.854974
2.5%	2.88	3.87	
1%	3.29	4.37	

Note: K = 4.

Source: *Computation by Authors, 2024.*

In this particular investigation, the ARDL bounds cointegration test was carried out in order to determine the extent of the long-run link that exists between the dependent and independent variables. The upshots of this test, which are shown in Table 5, indicate that the null hypothesis of no co-integration at a significance level of 5% is rejected. This is due to the fact that the F-Statistics value of 7.854974 is higher than the upper limit value of 4.37. Therefore, there is adequate statistical evidence to draw the conclusion that there is a link between the variables (Real GDP, degree of trade openness, real exchange rate, FDI, and official development assistance) throughout the course of a lengthy period of time. Furthermore, the confirmation of long run dynamics among the variables required the assessment of the extent of the link between the dependent and independent variables. This was accomplished by the estimation of the ARDL model.

Autoregressive Distributive Lag (ARDL) Long-Run and Short-Run Dynamics

This study utilised the ARDL approach to estimate the dynamic link between proxies of trade openness and the indicator of economic growth in Nigeria. This link was evaluated both in the long run and in the short run. Table 6 contains the results, which are as follows:

Table 6: Estimated Long-haul Co-efficient of ARDL

Dependent Variable = $InRGDP_t$				
Long-Run Results				
Variable	Co-efficient	Std. Error	t-Statistic	Prob.*
$InDTO_t$	0.064215	0.018660	3.441367	0.0034
$InFDI_t$	0.050039	0.011375	4.398940	0.0003
$InRER_t$	-1.157234	0.105779	-10.94011	0.0000
$InODA_t$	2.164130	3.648562	0.593146	0.5614
	13.46991	8.628698	1.561060	0.1381
EC = In(RGDP) - (0.0642*In(DTO) + 0.0500*In(FDI) + 1.1572*In(RER) + 2.1641*In(ODA) + 13.4699)				
Short-Run Results				
$D(InDTO_t)$	0.135605	0.085160	1.592351	0.1309
$D(InDTO_t)$	0.049044	0.011013	4.453485	0.0004

$D(InDTO_{t-1})$	-0.291345	0.392804	-0.741705	0.4690
$D(InFDI_t)$	0.030999	0.008296	3.736695	0.0018
$D(InFDI_{t-1})$	-0.010429	0.008280	-1.259542	0.2259
$D(InRER_t)$	-0.045115	0.011889	-3.794807	0.0016
$D(InODA_t)$	2.968885	5.140320	0.577568	0.5716
$D(InODA_{t-1})$	-0.010429	0.005634	-1.851223	0.0827
CointEq(-1)*	0.454031	0.108367	4.189772	0.0007
R^2 = 0.886060; Adjusted R^2 = 0.826377; Durbin-Watson stat = 2.011729				

Source: *Computation by Authors, 2024.*

Interpretation of Long-Run and Short-Run ARDL Model Estimation Upshots
Degree of Trade Openness (DTO) and Real Gross Domestic Product (RGDP)
Table 6 displays the ARDL model's long-run and short-run estimations. The upshots revealed that both the long-run and short-run links between trade openness and Real GDP are favourable and statistically substantial. Degree of trade openness has favourable long-run co-efficient values of 0.064215 and favourable short-run co-efficient values of 0.049044, respectively, and p-values of 0.0034 and 0.0004, all of which are less than 0.05, indicating this. It follows that, both in the short and long term, Nigeria's Real GDP would benefit greatly from a more open trade policy. Abinabo and Abubakar (2023) also discovered that trade openness favourably and substantially affects economic growth in Nigeria, hence these two upshots are connected.

Foreign Direct Investment (FDI) and Real Gross Domestic Product (RGDP)
There is a favourable and statistically substantial link between FDI and Real GDP in both the long and short term, in congruent with the ARDL model's long- and short-run estimations (Table 6). FDI has favourable co-efficient values (0.050039 for the long-run and 0.030999 for the short-run) and p-values (0.0003 and 0.0018, respectively) that are less than 0.05, indicating this. This means that both the long-run and short-run increases in Nigeria's Real GDP would be substantially boosted by a rise in FDI. Afolabi and Oyelekan's (2020) conclusion that FDI contributed to GDP growth in Nigeria is consistent with our own upshots.

Real Exchange Rate (RER) and Real Gross Domestic Product (RGDP)
In both the long and medium term, the ARDL model's estimations revealed an unfavourable and statistically substantial link between the real exchange rate and the Real GDP, as shown in Table 6. This is supported by the fact that official development assistance has unfavourable co-efficient values in the long-run (-1.157234) and the short-run (-0.045115) and by the fact that both its p-values (0.0000 and 0.0016) are less than 0.05. This means that both the short-run and long-run Real GDP of Nigeria would be substantially reduced if the real exchange rate increases. This confirms what Umar, Hawwa, Nazeef, and Yahaya (2021) had discovered: that the exchange rate has a substantial long-run effect on GDP growth in Nigeria.

Official Development Assistance (ODA) and Real Gross Domestic Product (RGDP)

Official development assistance has a favourable but non-substantial link with Real GDP in the long-run and short-run, in congruent with the long-run and short-run estimations of the ARDL model (Table 6). The favourable co-efficient values of ODA in the long-run (2.164130) and at the beginning level in the short-run (2.968885), likewise its p-values of 0.5614 and 0.5716, all of which are larger than 0.05, provide proof of this. This suggests that, both in the short and long term, an increase in government development assistance would result in a negligible rise in Nigeria's Real GDP. This confirms what Omoke and Opuala-Charles (2021) have found: that ODI boosts GDP growth, but not statistically substantially in Nigeria.

Interpretation of CointEq(-1) Result

With the long-run links derived from the error correction model, Tabe 6 also shows the upshots of the short-run dynamic co-efficient. Both the long-run partnership and the short-run dynamic encounters show the same symptoms. A substantial, correctly-signed, and statistically-substantial estimated error correction co-efficient of -0.454031 (p-value = 0.0007) suggests a rather rapid return to equilibrium after a shock. What this means is that half of the disequilibria caused by the shock last year return to the long term equilibrium this year.

Interpretation of Adjusted R-Squared (Adj. R^2) Value

The estimated model is well-fit, in congruent with the Adjusted R-squared value of 0.826377 in Table 6, which comes from the short-run estimates of the ARDL model. This is because the model explains around 83% (R-squared) of the variation in Real GDP, with the remaining 17% explained by variables or factors outside the model. The explanatory variables comprise degree of trade openness, FDI, real exchange rate, and ODA.

Interpretation of Durbin-Watson Statistic Value

Finally, the absence of serial autocorrelation is shown by a Durbin-Watson stat of 2.011729, which is larger than 2.

Post-Estimation (Diagnostic) Tests

Presented and discussed below are the post-estimation (diagnostic) results:

Table 7: Post-Estimation Test Results

Test	Null Hypothesis	X^2 Value	X^2 Prob	Remark
Jarque-Bera	Normal distribution exists	0.411628	0.79251	Normal Residuals
Breusch-Godfrey LM	Serial correlation does not exist	1.914029	0.1841	Serial Independence
Breusch-Pagan-Godfrey	Homoscedasticity exists	0.558327	0.8728	Constant Variance

Ramsey RESET	Model is stable	0.011513	0.9160	Correctly Specified Model

Source: ***Computation by Authors, 2024.***

To make sure the ARDL model doesn't have any problems with traditional linear regression like normality, serial dependency, heteroscedasticity, or stability, it was tested employing diagnostic tools. Table 7 displays the upshots of the testing. The research found that the model utilised to appraise the link between trade openness and economic development in Nigeria is very stable, has homoscedastic errors, and serially independent with normal residuals.

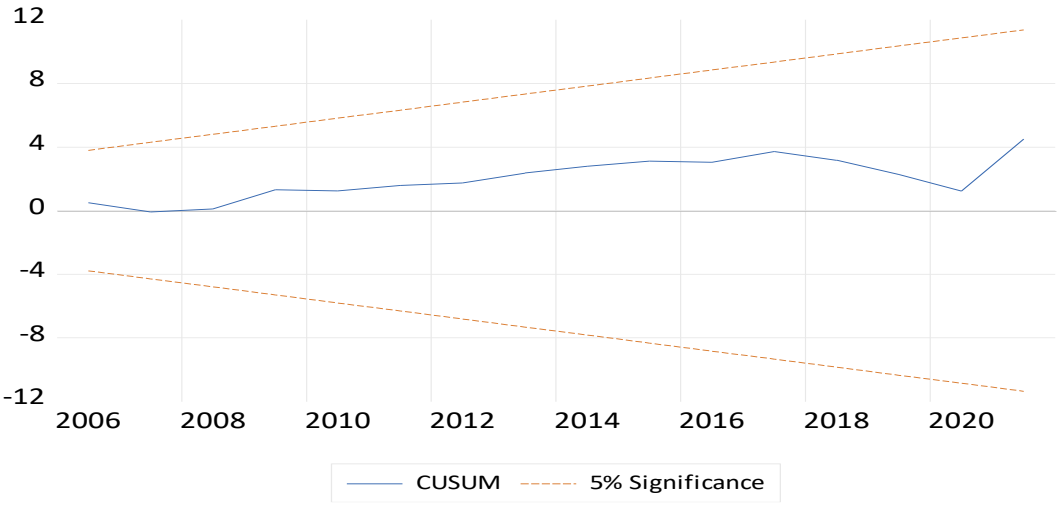

Figure 2: Stability Cusum Test

The cumulative sum line remained within the 5% critical limit, and the CUSUM plot did not go above the 5% critical lines either. The research variables' long-run co-efficient are stable, in congruent with this.

5.0 Conclusion and Recommendations

Conclusion

Evaluating the outcome of trade openness on economic growth in Nigeria from 1985 to 2022, this research utilised the ARDL estimate approach. Study findings revealed that real exchange rate unfavourably affects Nigeria's real GDP, but degree of trade openness, FDI, and official development assistance favourably affect the nation's real GDP. The researchers concluded that trade openness is a key factor in Nigeria's economic success.

Recommendations

The following suggestions for public policy are put out in light of the upshots and conclusion:

i. Trade facilitation measures should be put in place by the government to improve customs processes, lower tariffs, and invest in trade-support infrastructure including roads, ports,

and logistics. Both trade openness and Nigeria's inclusion into the global economy will be enhanced by this.

ii. A more stable and appealing investment environment should be Nigeria's primary objective. As part of this effort, it is important to guarantee political and economic stability, streamline regulatory processes, and provide incentives like tax cuts.

iii. To improve competitiveness in global markets, the government should implement a program of flexible exchange rates that lets the actual exchange rate adapt to economic circumstances.

iv. Additionally, it is crucial for the government to carefully direct ODA into vital areas that contribute to economic growth, such healthcare, education, and infrastructure development.

REFERENCES

Abinabo, P., & Abubakar, A. (2023). Trade openness and economic growth in Nigeria. Nigerian *Journal of Management Sciences, 24*(2), 217- 228.

Afolabi, B., & Oyelekan, B. (2020). Trade openness and economic growth in Nigeria. *Journal of Economics and Sustainable Development, 11*(4), 165- 171.

Ajayi, E. O., & Araoye F. E. (2019). Trade openness and economic growth in Nigeria. *International Journal of Economics and Financial Management*, *4*(2), 50-63.

Duru, I. U., Bartholomew, O. N., Okafor, F., Adikwu, O., & Njoku, F. C. (2020). Trade liberalization and economic growth: An assessment of Nigerian experience. *Asian Development Policy Review, 8*(3), 194-213.

Echekoba, F. N., Okonkwo, V. I., & Adigwe, P. K. (2015). Trade liberalization and economic growth: The Nigerian experience (1971-2012). *Journal of Poverty, Investment and Development*, *14*(4), 51-72.

Ejike, D. C., Anah, S. A., & Onwuchekwa, F. C. (2015). Trade liberalization and economic growth in Nigeria: A analysis (1980-2015). *Journal of Business Management, 1*(1), 1-8.

Engel, R. F., & Granger, C. W. J. (1987). Cointegration and Error Correction: Representation, Estimation and Testing. Econometrica, *55*: 251-276.

Ijirshar, V. U. (2019). Impact of trade openness on economic growth among ECOWAS Countries: 1975-2017. *CBN Journal of Applied Statistics, 10*(1), 75-96.

Muhammad, M. Y., & Benedict, N. A. (2018). Trade openness and economic growth: evidence from Nigeria. *European Journal of Business, Economics and Accountancy, 6*(4), 30-38.

Ohwofasa, B. O., & Ekaruwe, M. (2023). Trade openness and economic growth in Nigeria. *Lafia Journal of Economics and Management Sciences, 8*(1), 23-47.

Omoke, P. C., & Opuala–Charles, S. (2020). Trade openness and economic growth nexus: Exploring the role of institutional quality in Nigeria. *Cogent Economics & Finance, 9*(2), 1-17.

Solomon, O. I., & Tukur, M. U. (2019). Trade openness and economic growth in the developing countries: Evidence from Nigeria. *International Journal of Academic Research in Economics and Management Sciences, 8*(3), 30–42.

Sunday, E. & Ahmed, B. M. (2019). Dynamic impact of trade openness on the economic growth in Nigeria. *International Journal of Engineering and Advanced Technology (IJEAT), 8*(5), 609-616.

Thindwa, M. O., & Seshamani, V. (2014). Trade liberalization and the performance of the tobacco sector in Malawi. *Journal of Emerging Issues in Economics, Finance and Banking, 3*(1), 962-975.

Tyokosu, M. O. & Abakpa, N. (2023). The relationship between trade openness and economic growth in Nigeria from 2000 to 2020. *International Journal of Research and Innovation in Social Science (IJRISS), 7*(11), 1766- 1778.

Ude, D. K. & Agodi, J. E. (2015). Does trade openness make sense? investigation of Nigeria trade policy. *International Journal of Academic Research in Economics and Management Sciences, 4*(1), 6-21.

Umar B., Hawwa, A. A., Nazeef, B. H., & Yahaya, Y.M. B. (2021). Impact of trade openness on economic development in Nigeria. *International Journal of Intellectual Discourse (IJID), 4*(2), 303-312.

Zahonogo, P. (2016). Trade and economic growth in developing countries: Evidence from sub-Saharan Africa. *Journal of African Trade, 3*(1–2), 41