

Research Article

The Effects of International Commodities Trading on Economic Growth from a Developing Economy Perspective: An Evidence of Frequency Domain Causality and ARDL

Chibuikem Dibor-Alfred^{1,*} , Mehdi Seraj¹ , Ozioma Onyeibor² 

¹Department of Economics, Near East University, Nicosia, Turkish Republic of Northern Cyprus

²Iroko Capital, Lagos, Nigeria

Abstract

The study aims to ascertain the effect of international commodity trade on economic growth in Nigeria. The paper used time series data from 1990 to 2021 from a secondary data source the World Bank database and the Central Bank of Nigeria. The study employed the ARDL bound test for co-integration and ARDL short-run and long-run for analysis, and the frequency domain causality, both the results for oil export and non-oil export are statistically significant at 0.05 frequency level, showing that Oil export and non-oil export showed a unidirectional causal effect on economic growth in Nigeria, and significant at the long, medium and short run respectively as well as the impact of international trade on the economic growth of Nigeria. The study showed that oil and non-oil exports had a positive and statistically significant relationship with economic growth. The paper bases its argument on the theories of dependence and structuralism. Thus, encouraging the diversification of Nigeria's economy and lessening the nation's reliance on commodity exports are required to foster sustainable economic development. Overall, this study contributes to the understanding of the effects of international commodities trading on economic growth and provides recommendations for policymakers and stakeholders to promote sustainable development in Nigeria and other developing countries.

Keywords

International Commodities, Developing Countries, Economic Growth, ARDL

1. Introduction

The importance of international trading is vital for any economy's growth and development, international trading in any aspect gives rise to an increase in gross domestic products, sustainable advancement, and an improved standard of living. The study aims to investigate how trading of an international commodity such as oil products and non-oil products impacts the economic growth in a developing country, when dealing

with internationally traded goods we must also analyze the impact of exchange rate volatility on GDP growth, exchange rate and import has a positive relationship with economic growth [9]. International commodities are essential to an economy most economies of the world have made fortunes from trading across borders their resources this in return has helped foster economic growth and development [18]. The

*Corresponding author: chibuikem.dibor-alfred@neu.edu.tr (Chibuikem Dibor-Alfred)

Received: 8 May 2025; **Accepted:** 3 June 2025; **Published:** 28 July 2025



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transfer of commodities and services among countries is referred to as international trade. The activities, which are the total of all activities related to commerce between merchants across borders, should involve at least two nations. Trading occurs intending to maximize profits brought about by differences in national economies' global economic environments [2]. Since the discovery of oil in 1956, the Nigerian economy has seen heavy dependency on the proceeds of oil exports as its major contributor to the gross domestic product of the country over the years. The government was pursuing aggressive diversification of the economy through policies and incentives that will boost non-oil exports, and the manufacturing sector will foster sustainable economic growth and development in the country [11]. International commodities trading has been a critical component of global economic activity for centuries. Commodities such as oil, minerals, and agricultural products have been traded across borders, providing countries with the resources they need to fuel their economies. However, the benefits of commodities trading have not been equally distributed, particularly between developed and developing countries. According to [19], trade may increase development from the supply side, but only if trade balances decrease the availability of imported inputs that enter export products, requiring exporters to employ pricier imports of double quality.

This study will focus on Nigeria, a developing country that is rich in natural resources such as oil, gas, and minerals. Despite these resources, Nigeria has struggled to achieve sustainable economic growth and development, which raises questions about the impact of international commodities trading on the country. As much as export is vital to any economy some exports are done in large quantities and emphasis on the quality is paid little to no attention to this contributes to a negative impact on GDP [27, 28].

This study aims to examine the effects of international commodities trading from a development economic perspective in Nigeria. Specifically, to identify the factors that have contributed to Nigeria's dependence on commodities trading, assess the impact of internationally traded commodities on Nigeria's economy and development, and explore potential policy solutions that could help Nigeria to better leverage its natural resources for sustainable development. Shedding light on the complex relationship between international commodities trading and development in Nigeria, contributing to the broader debate about the role of commodities trading in developing countries, and informing policy decisions that can help to promote sustainable economic growth and development. In contrast, to other literatures, the study adopted the frequency Domain causality, a new method to further ascertain the reliability of the results. The rest of the paper is structured as follows; section two reviews past and related articles on the field. The study's methodology and data sources are described in section three of the paper. The empirical data are presented and discussed in section four, and a summary of the conclusions and their policy implications is

provided in section five.

2. Literature Review

International commodity trade has been a key driver of economic growth and development for many countries across the world. It is still debatable how much this kind of trade promotes development, particularly in the Global South. This form of trade has served as a significant catalyst for economic growth and development in many countries throughout the world, particularly those in the Global South that are heavily dependent on commodity exports [14]. The extent to which this kind of commerce aids in development is still up for dispute, as is the question of whether it also has unfavorable consequences like worsening inequalities and destruction of the environment. Many recent studies in international economics have focused on how exports in different countries. The most important empirical estimates in the international economic literature continue to be the course, the elasticity of income, and investment. Beyond simple theoretical debate, such estimates have an impact on the balance of payments [13]. International commodities refer to raw materials, agricultural products, and natural resources that are traded internationally. Nigeria is a country with vast natural resources such as oil, natural gas, cocoa, rubber, and palm oil, making it heavily reliant on international commodities trading.

2.1. Benefits of International Commodities Trading in Nigeria

Benefits of international commodities trading in Nigeria include foreign exchange earnings, job creation, and access to international markets. The export of oil and other commodities has been a significant source of revenue for the Nigerian government, accounting for about 90% of total export earnings. This revenue has been used to finance critical sectors such as healthcare, education, and infrastructure development. The influx of foreign currency from international trade has also helped to stabilize the Nigerian economy. International commodities trading can have several benefits for Nigeria and other developing countries. Some of these benefits include; Increased foreign exchange earnings, access to new markets, technology transfer, diversification of traded goods, and all-round infrastructural development that leads to economic growth and development.

2.1.1. Infrastructure Development

Finally, international commodities trading can help to promote infrastructure development in Nigeria, as it often requires investments in transportation, storage, and other logistics infrastructure to facilitate the movement of goods to international markets.

However, the demerits of international commodities trading in Nigeria are equally significant. Nigeria's reliance on

international commodities has made the country vulnerable to fluctuations in global commodity prices. Volatility in commodity prices has resulted in significant losses to the Nigerian economy, leading to budget deficits and currency depreciation. Additionally, dependence on a single commodity, such as oil, has made the Nigerian economy susceptible to price shocks, which can lead to economic instability. Nigeria's trade policies have also played a significant role in the country's economic growth. The Nigerian government has implemented various trade policies aimed at promoting exports, import substitution, and economic diversification. These policies have included tariff barriers, export subsidies, and import quotas. Despite these policies, Nigeria's economy has not experienced sustained economic growth over the years. The country's over-reliance on oil exports and insufficient diversification of the economy have made it susceptible to economic shocks. There is a need to develop and implement more comprehensive trade policies that promote the diversification of the economy and increase the value of non-oil exports.

In summary, while international commodities trading has been a significant source of revenue for Nigeria, it has also made the country vulnerable to fluctuations in global commodity prices. The country's trade policies have not been sufficient in promoting sustainable economic growth, and there is a need for more comprehensive policies that promote economic diversification.

2.1.2. Trade Policy in the Nigerian Context

Trade policies refer to the measures and regulations put in place by a country's government to manage its international trade relations with other countries. In the Nigerian context, trade policies have been put in place to regulate the flow of goods and services across the country's borders.

One of the major trade policies in Nigeria is the import and export control policy. This policy regulates the importation and exportation of goods and services by requiring importers and exporters to obtain permits from relevant government agencies before conducting their trade activities. The policy is aimed at protecting local industries from foreign competition and promoting the export of locally produced goods.

Another trade policy in Nigeria is the tariff policy. This policy imposes a tax on imported goods, making them more expensive than locally produced goods. The policy is intended to encourage local production and protect local industries from foreign competition.

Nigeria also has a trade liberalization policy aimed at opening up its economy to foreign investors and trade. The policy involves reducing trade barriers and tariffs and providing incentives to foreign investors to invest in the country. This policy is intended to promote economic growth by attracting foreign investment and increasing export earnings.

In terms of foreign trade, Nigeria has significant trade relationships with several countries, including China, the United States, and India. The country's major exports include

crude oil, natural gas, and agricultural products such as cocoa and cashew nuts. However, Nigeria also imports a significant amount of goods, including refined petroleum products, machinery, and food products.

Overall, trade policies and foreign trade have significant impacts on Nigeria's economy. Effective trade policies can help to promote economic growth and protect local industries, while foreign trade can provide opportunities for increased exports and foreign investment. However, poorly designed trade policies or an overreliance on imports can have negative effects on the economy, including trade deficits and decreased competitiveness.

2.1.3. Absolute Advantage

In a scenario of absolute advantage, a nation, person, or institution can provide an item or service more effectively and at a cheaper cost than its competitors. It is predicated on the idea of resource allocation and production. When a nation has an absolute advantage in producing a certain good, it may do so with the same resources while generating more of the good or with fewer resources than another nation. Let's use the example of two nations, A and B. The resources required to produce 5 units of wheat in Country B may be used to generate 10 units of wheat in Country A. Country A may generate more wheat with the same capital in this situation, giving it a clear edge in the production of wheat.

2.1.4. Comparative Advantage

Contrarily, comparative advantage emphasizes the opportunity cost of creating an item or service. It refers to a nation's capacity to produce a good at a lower opportunity cost than another nation. Opportunity cost is the expense of forgoing the next best option while making a decision.

In contrast to absolute efficiency, comparative advantage considers the relative efficiency of manufacturing. It implies that a country may still profit by specializing in and exporting the items for which it has a lower opportunity cost relative to other nations, even if it has an absolute disadvantage in manufacturing all goods. Let's use the same nations, A and B, as an example. One unit of wheat can be produced in Country A by forgoing the manufacture of two units of fabric, but one unit of wheat can be produced in Country B by forgoing the production of three units of cloth. In this instance, Country A has an absolute advantage in producing both wheat and fabric, but it also has a comparative advantage in producing wheat due to a lower opportunity cost than Country B.

2.2. Empirical Review

The literature and empirical study of the implications of international commodity trade on development economics have shown conflicting conclusions. On the one hand, some studies contend that international commodity trading has a favorable impact on economic growth and development. For example, the dependence theory contends that commodity

exports may supply developing nations with the foreign exchange required for economic growth while simultaneously serving as a source of industrialization through the establishment of backward and forward linkages. Other studies, on the other hand, have found that international commodity trade can have a detrimental impact on economic development, especially when commodity prices are fluctuating. Commodity price volatility may cause uncertainty in investment and trade, as well as swings in government income, making it harder to plan and implement development initiatives.

Also, [17], analysed the impact of foreign trade on Nigeria's economic development utilizing time series data from 1981 to 2019. The research utilized the Ordinary Least Squares (OLS) regression technique to examine the impact of exports, imports, and trade openness on GDP. The study aimed to determine the impact of trade operations on economic performance, whether beneficial or detrimental. The results indicated that exports exerted a positive and considerable influence on GDP, but imports adversely affected growth. Trade openness exerted a dual impact—facilitating short-term growth but exhibiting diminished impacts in the long term due to inherent structural deficiencies within the economy. The study determined that Nigeria needs diversify its exports and diminish import reliance to optimize the advantages of international commerce.

According to [11], the word "external/international trade" or "international business" is used to refer to any business dealings (private and public, sales, investments, logistics, and transportation) that happen between two or more countries. Such transactions are typically carried out by private businesses for financial gain; and by governments for financial gain and political objectives. It describes all business endeavors involving cross-border exchanges of commodities, services, and resources between two or more nations.

In the words of [16], who cites other economists, exports—also known as external commerce are a result of international trade, which occurs when items produced in one country are delivered to another for potential future sales or trade.

Again, [32] with an emphasis on sub-Saharan Africa (SSA), this research explores how trade openness influences economic growth in emerging nations. We employ a dynamic development model with information from 42 SSA nations spanning the years 1980 to 2012. By taking into account long-run equilibrium relations, we use the Pooled Mean Group estimate approach, which is ideal for extracting inferences from dynamic heterogeneous panels. According to the empirical data, there is a trading threshold below which increased trade openness boosts economic growth and over which the impact of trade on growth falls. Our results are encouraging and provide weight to the idea that trade openness and economic growth are not linear in SSA.

According to [31], global trade may support the growth of financial accounting and record-keeping systems as well as the overall field of commerce. International commerce may be said to have accelerated and benefited the economic and po-

litical growth of the whole Western world.

Similarly, this work, as shown in [26], indicated that economies with a high ratio of natural resource exports to GDP in 1971 (the base year) tended to have low growth rates from 1971 to 1989. This negative link persists even after adjusting for characteristics known to be crucial for economic growth, such as beginning per capita income, trade policy, government efficiency, investment rates, and others. They investigated the potential paths for this negative association by examining the cross-country impacts of resource endowments on trade policy, bureaucratic efficiency, and other growth drivers. They also present a basic theoretical model of endogenous growth that may assist in explaining the observed negative connection.

Furthermore, [3] examined the role of non-oil exports in Nigeria's economic development from 1981 to 2010. The findings found that non-oil exports performed below expectations, casting doubt on the usefulness of the export promotion initiatives that have been implemented. They emphasized that the economy is still far from diversifying away from crude oil exports and that as a result, the crude oil sub-sector remains the single most significant sector of the economy.

Again, [1] studies the interrelationship between international commerce and economic growth in Turkey using an econometric model and the Ordinary Least Square test, with the research spanning the years 1981 to 2007, and discovers a strong correlation between foreign trade and economic growth. He remarked that the pace of increase in international trade has pushed up the rate of growth in GDP per capita during the last three decades since Turkey's entry into the global economy. The data confirm that foreign commerce is one of Turkey's economic development drivers.

Furthermore, [20], offered an extensive theoretical framework for comprehending the intricacies of international commerce and finance in *International Economics: Theory and Policy*. The authors synthesized classical and contemporary trade theories, encompassing comparative advantage, new trade theory, and firm-level heterogeneity in international marketplaces. The book, although predominantly theoretical, undergirds practical applications by providing models that elucidate actual trade patterns, the implications of trade policy, and the conduct of multinational corporations. Their study has been extensively utilized to elucidate empirical studies on trade liberalization, the benefits of trade, and the distributional impacts of globalization. The book highlights the connection between productivity disparities and trade flows, establishing a basis for several empirical studies assessing the effects of trade on economic development, labor markets, and income inequality among nations.

Then according to [6] a vector autoregressive (VAR) model to investigate the relationship between exports and economic development in Indonesia. According to the conclusions of the GIRF investigation, both exports and economic growth are important to the Indonesian economy. It was determined that exports and economic growth have a bi-directional causation structure, with exports leading to growth in the long run

and growth leading to exports in the short run.

Several studies have explored the impact of international commodity trading on economic growth and development in Nigeria. A study by Alimi and Olorunfemi (2019) found that international commodity trading had a positive impact on Nigeria's economic growth between 1980 and 2017. However, the study also found that the country's over-reliance on commodity exports made it vulnerable to external shocks and fluctuations in global commodity prices.

Other studies have looked at the distributional effects of international commodity trading on different segments of the population. A study by [10] found that international commodity trading had a positive impact on poverty reduction in Nigeria, but the benefits were not evenly distributed across different regions and social groups. The study also found that the lack of infrastructure and weak institutions in Nigeria limited the potential benefits of international commodity trading.

Another study [5] looked at how entrepreneurship and international commerce affect Nigeria's economic growth and development by looking at real-world examples. The study employs regression analysis, with Gross Domestic Product (GDP) as the dependent variable, using time series data from the Central Bank of Nigeria and the National Bureau of Statistics. Indicators of entrepreneurship (such as small and medium-sized business contributions and business registrations) and international trade (like exports and imports) are examples of independent variables.

Another area of focus in the literature has been the role of international institutions and governance in international commodity trading. A study by [4] highlighted the need for stronger institutions and governance structures to ensure that developing countries like Nigeria are able to participate more effectively in international commodity markets. The study argued that developing countries need to be more proactive in negotiating trade agreements and setting policies that support their interests.

Our research draws on a more recent trade and growth time series analysis. In general, GDP growth is used as a proxy for economic growth, whereas non-oil exports, oil exports, non-oil imports, oil imports, and the balance of payments are used as proxies for international trade.

2.3. Theoretical Review

Dependency Theory [DT]

Dependency theory was developed by a group of Latin American scholars in the 1950s and 1960s, including Raúl Prebisch, Fernando Henrique Cardoso, and Andre Gunder Frank. The theory emerged as a response to the dominant

economic theories of the time, which argued that the free market and trade liberalization would lead to economic growth and development in all countries. Dependency theory challenged this notion, arguing that developing countries were at a structural disadvantage in the global economy and that their underdevelopment was inextricably linked to the historical legacy of colonialism and ongoing exploitation by developed countries. Dependency theory is an economic and political theory that explains the relationship between developed and developing countries. It argues that the global economic system is structured in a way that favors developed countries and perpetuates underdevelopment in developing countries. According to this theory, developing countries are dependent on developed countries for trade, finance, and technology. Developed countries often dominate international trade by setting prices and controlling the production and distribution of commodities. This means that developing countries are often forced to export raw materials and import manufactured goods, resulting in a negative balance of trade. Furthermore, dependency theory argues that international trade in commodities often benefits developed countries at the expense of developing countries. Developed countries often use their economic and political power to control the prices of commodities and maintain a favorable trade balance. This means that developing countries are not able to fully participate in the global economy and are often stuck in a cycle of underdevelopment. Overall, dependency theory suggests that the global economic system needs to be restructured to allow developing countries to participate more fully and benefit from international trade. This includes addressing issues such as unequal exchange, debt, and technological dependence.

3. Data and Methodology

3.1. Data

The study utilized annual data ranging from 1990 to 2021. Gross domestic product (GDP) is the proxy for economic growth and the LOE represents Oil Export, LNOI represents Non-oil Import, and LNOE represents Non-oil Exports which are the independent variables used for this research.

The data employed in this research study was obtained from the Central Bank of Nigeria and the World Bank Indicator and then compiled by the author using Microsoft Excel. Again, data analysis was carried out by two software, the EViews-12, and the STAT-17 computer software.

The data was mathematically represented in the econometrics notation below:

$$GDP = f(LOE, LNOI, LNOE) \quad (1)$$

GDP denotes economic growth, while LOE, LNOI, and LNOE represent oil exports, non-oil imports, and non-oil exports. For equation (2) below authors [15] expressed the model in its log form since the logarithm form enabled the outliers to be reduced.

$$LGDP_t = \gamma_0 + \gamma_1 LOE_t + \gamma_2 LNOI_t + \gamma_3 LNOE_t + \mu \quad (2)$$

γ is the coefficient; t denotes the t -times which is the time series and μ is the error term.

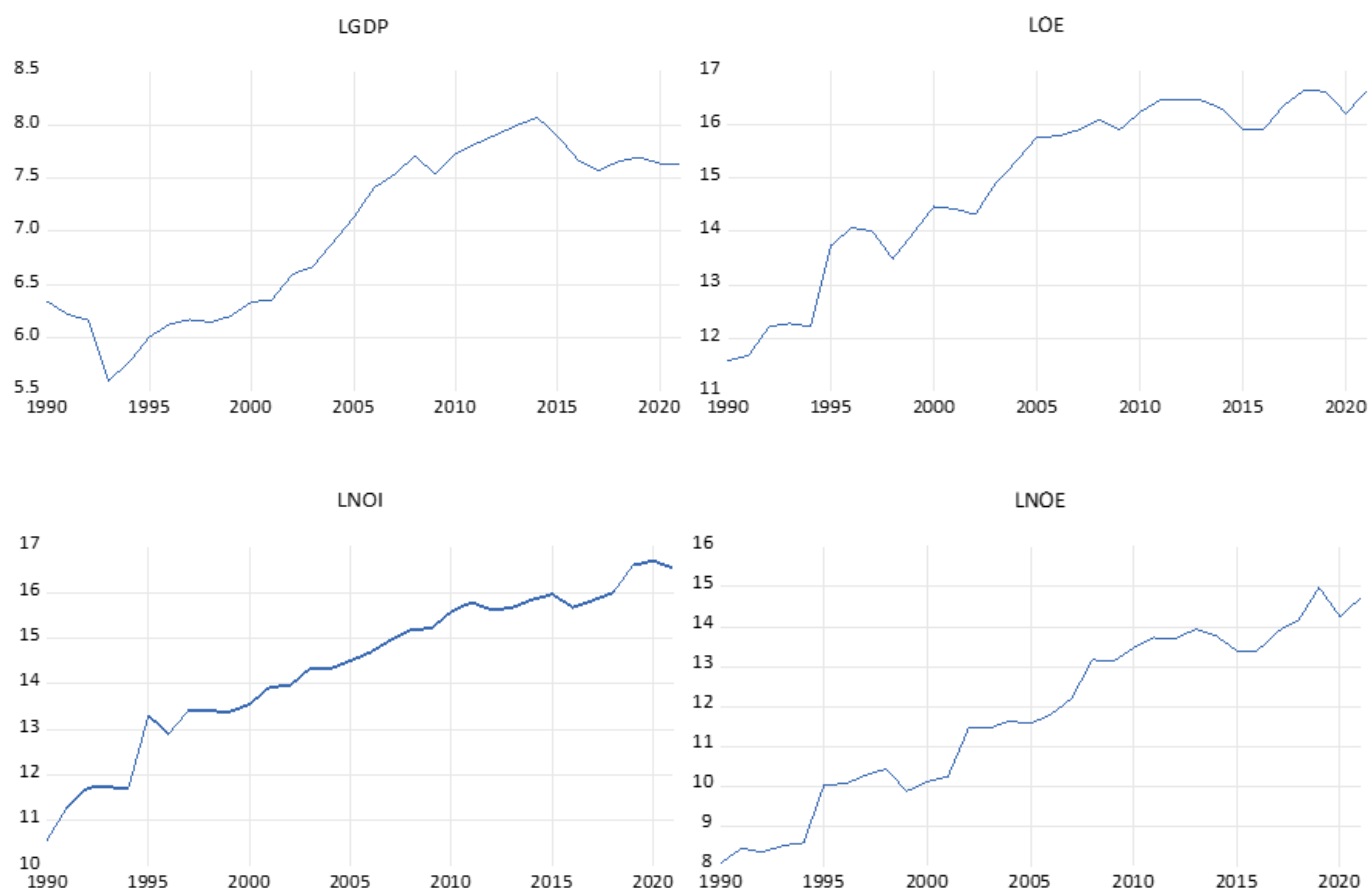


Figure 1. Graph and Trend of Variables.

The graph above captures the economy's whole output of goods and services and its growth rate. The variable was used as the dependent variable in this study from 1990 to 2021. The GDP graph above shows the trends for GDP from 1990-2021 we can see that Nigeria's economy has seen an upward trend since the early 90s' but the economy experienced a recession in 2016 enhancing the significant dent in the graph for 2016. The variable Oil export was represented as LOE in this study. Since 1958 when Oil was discovered in Nigeria it has become the major contributor to the GDP of the Nation. The LOE graph shows that the Oil export in Nigeria is an upward trending graph from 1990 till 2021 exports have been a major part of the GDP of the country although the price volatility has caused fluctuations in the oil exported in the country, in the long run, it's still an upward trendy graph.

The non-oil import variable represented goods and services that are imported into the country that are not crude-oil

products such as agricultural goods, clothing and textiles, and machine. Also, the graph above which is a graphical representation of LNOI shows that over the years the importation in Nigeria has increased drastically and has caused a major international deficit and this trend needs to be reduced by the government by encouraging more production and employment of many mineral resources in the country as this upward trend has a negative relationship with the economic growth. The non-oil export variable represented goods and services that are exported out of the country that are not crude oil products such as agricultural goods, clothing and textiles, and machines. The graph for non-oil exports although has an upward trend to it shows a series of downward breaks but these fluctuations are not significant enough to change the direction of the graph as in the Long-run Non=oil exports have a positive relationship with economic growth.

3.2. Research Methodology Structure

Table 1. Data Measurements and Definition.

Variables	Abbreviation	Definition and Measurement	Source
Gross Domestic Product	GDP	Gross Domestic Product LCU	WDI
Oil Export	OE	Oil product Exported	CBN
Non-oil Import	NOI	Non-oil product imported	CBN
Non-oil Export	NOE	Non-oil product exported	CBN

Source Author's Compilation

Model specification

The study employed the ARDL [24], and Frequency Domain Causality techniques [12]. The ARDL model can be carried out when there is a mixed order of integration at a level $I(0)$ and the first difference $I(1)$, with the criteria that none of the variables will be integrated at the second difference $I(2)$ [29]. The ARDL model is presented in Equation (3):

$$\Delta LGDP_t = \sigma_0 + \sum_{i=1}^p \sigma_1 \Delta LGDP_{t-1} + \sum_{i=1}^q \sigma_2 \Delta LOE_{t-1} + \sum_{i=1}^q \sigma_3 \Delta LNOI_{t-1} + ECTt - 1 \sum_{i=1}^q \sigma_4 \Delta LNOE_{t-1} + \varpi_1 LGDP_{t-1} + \varpi_2 LOE_{t-1} + \varpi_3 LNOI_{t-1} + \varpi_4 LNOE_{t-1} + \mu_t \quad (3)$$

P and q are lags; σ_0 indicates the intercept; short-run coefficients range from $\sigma_1 - \sigma_4$, while the long-run coefficients range from $\varpi_1 - \varpi_4$; ECT represents the Error Correction Term and represent the error term. The study first carried out descriptive statistics to evaluate the overall behavioral pattern, and just in general the relationship and the statistical descriptions of the variables such as the mean, median, and max-min

results. After that, the study went ahead to carry out the unit root test, the ADF and the PP unit root test were employed to ascertain the stationarity of the data, the ARDL and the ARDL bound test were utilized to examine the long-term link, and the short-run relationship of the data, finally, the spectral granger causality or the frequency domain causality was carried out to further prove the reliability of the results [29].

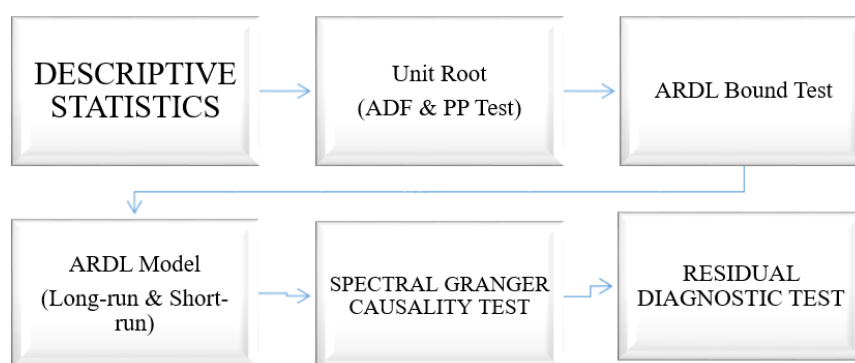


Figure 2. Methodological Framework.

4. Data Presentation, Results, and Discussion

4.1. Unit Root Test

The Unit root test for stationarity employed the Augmented Dickey-Fuller test and the Philip Peron test, and the test for the ADF and the PP test all Variables; $\ln GDP$, $\ln OE$, $\ln NOI$, $\ln NOE$ showed stationarity at first difference. Furthermore, the null hypothesis stating that there is non-stationarity is rejected.

Table 2. Unit Root Test.

ADF				PP			
Variables	T-Statistics	Prob	Integration	Variables	T-Statistics	Prob	Integration
LGDP	-4.64569	0.0032	I (1)	LGDP	-4.409091	0.0011	I (1)
LOE	-6.510802	0.0000	I (1)	LOE	-8.824424	0.0000	I (1)
LNOI	-7.513538	0.0000	I (1)	LNOI	-7.556941	0.0000	I (1)
LNOE	-8.345207	0.0000	I (1)	LNOE	-7.680461	0.0000	I (1)

Source Author's Compilation

4.2. ARDL Bound Test

Table 3. ARDL Bound Test.

F-statistic	Signif	Lower Bound	Upper Bound
10.28746	10%	2.37	3.2
3	5%	2.79**	3.67**
	1%	3.65	4.66

The results of the ARDL bound test, which is used to ascertain whether there is a long-term link between the variables in the model, are shown in Table 3. The significance level is indicated as being significant at the 5% level, and the F-statistic is 10.28746, the critical values' lower and upper limits are claimed to be 2.45 and 3.52, respectively. The results show that there is a co-integration between variables (variables have long-run relationships).

4.3. Autoregressive Distributed Lag Model

Table 4. ARDL Long-run and Short-run Model.

Variable	Coefficient	Std. Error	T-Statistics	Prob*
Long-run Test				
C	4.2616	0.7574	5.6270	0.0000
LOE	0.7596	0.1942	3.9115	0.0010
LNOI	-1.2123	0.1722	-7.0384	0.0000
LNOE	0.7508	0.0821	9.1483	0.0000
Short-run Test				
C	2.754633	0.770298	3.576062	0.0022
DLGDP (-1)	-0.646385	0.102753	-6.290698	0.0000
DLOE (-1)	0.491003	0.120397	4.078188	0.0007
DLNOI (-1)	-0.783593	0.1445	-5.422772	0.0000
DLNOE (-1)	0.485304	0.101746	4.76977	0.0002
ECM	-0.646385	0.081522	-7.928923	0.0000

Source Author's Compilation

In the Long-Run, the ARDL results show that all variables LOE, LNOI, and LNOE are all statistics at a 5% level of significance. LOE shows that there is a positive relationship between Oil Export and GDP growth In Nigeria, as Oil export increases by a percent change in the long run the economic growth rate also increases by 75.96%. Also, results for LNOE (Non-Oil Export) show that as LNOE increases by 1% GDP growth increases by 75.08%. Although LNOI (non-oil import) has a negative long-run effect on GDP still significant, as LNOI increases GDP decreases by 121% in the long run.

The constant coefficient of 2.754633 indicates that when all other variables in the model are held constant, the intercept of the short-run relationship between GDP growth and the other variables is 275 percent. Also, LOE stands for the log of Oil export the results show that in Nigeria as one percentage change in oil exports occurs in Nigeria the GDP growth increases by 64.64%. This is so because Nigeria's major contributor to its GDP annually is its export of crude oil. The short-run results for LNOI show that 1% change in LNOI the GDP growth decreases by 78.36%. In Nigeria, the results are so because of the excess import of non-oil products in plain statements the country has a high level of imports which can result in international trade deficits and result to its negative impact on economic growth.

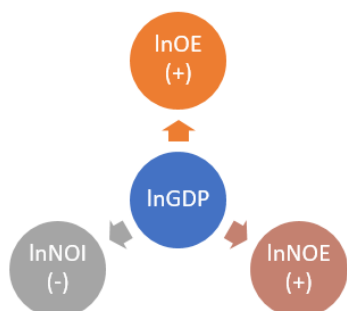


Figure 3. Graphical Representation of ARDL Results.

According to LNOE which is the lagged variable for

non-oil exports shows that there is a positive and statistically significant relationship between exports of non-oil products and GDP growth which is a proxy for economic growth in Nigeria. This conforms to theory because as export increases the economic growth rate of a given country is supposed to increase all other factors remain equal. As LNOE increases by one extra percent the GDP increases by 48.53%. This finding contrasts with the following studies by [3, 23], the following papers found an inverse relationship between non-oil export and GDP. Also, other studies that supported the findings of this paper were, [7, 21-25]. The following authors found that non-oil export has a positive and significant relationship with GDP which supports the results of the paper's analysis.

Short-run Reliability Check

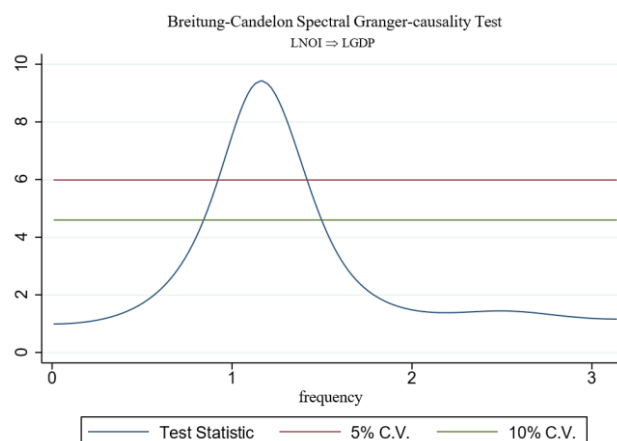
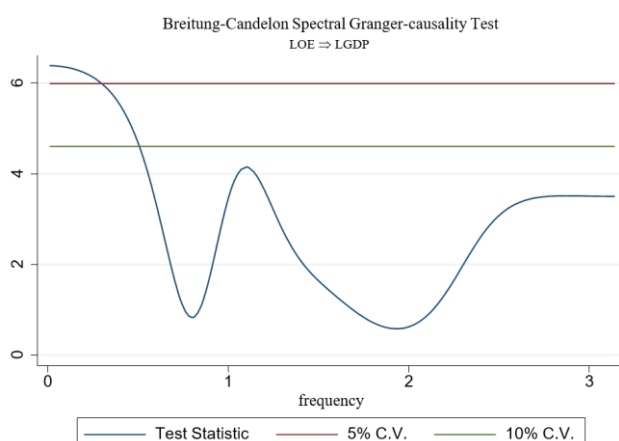
The Error Correction Model has a coefficient of -0.6463 indicating that the rate of speed of adjustment to short-run equilibrium is 64.63%. At a 5% level of significance, the results of ECM cannot be rejected, as they show a negative sign and fall between 0 and 2, and are statistically significant at a 5% level of significance. The F-statistics show that all variables, when combined, are also important at 5%, and the Durbin-Watson statistic indicates that Multicollinearity between variables is absent.

4.4. Spectral Granger Causality

Table 5. Spectral Granger Causality.

H_0 : No Granger-causality at frequency $w = 0.05$

Variables	Wald T-Stats	P-value
NOE	11.0798	0.0039
LOE	6.3783	0.0412
LNOI	7.5084	0.0234



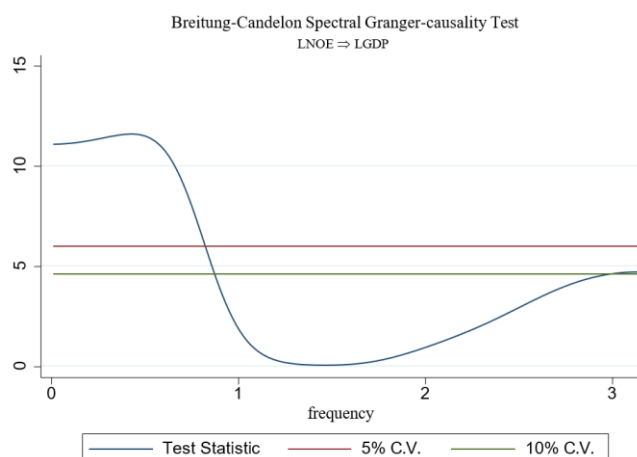


Figure 4. Graph showing the Breitung-Candelon Spectral Granger Causality Test for each of the variable.

4.5. Residual Diagnostic Test

Table 6. Residual Diagnostic Test.

Normality Test		Serial Correlation LM Test		Heteroskedasticity Test	
Jarque-Berra	Prob.	F-statistic	prob. F(2,16)	F-statistic	prob. F(1,29)
0.005923	0.997043	0.190622	0.8283	0.420576	0.5218

The Jarque-Bera test, which determines whether or not a distribution is normal, shows that the model's residuals are normally distributed because its test statistic, 0.005923, is not significant at the 5% level. Further proof that the residuals are normally distributed comes from the probability value (Prob.) associated with the test, which is 0.997043 and is higher than the 5% significance level.

The serial correlation LM test is a test for the presence of autocorrelation in the residuals, and its results indicate that there is no significant autocorrelation at the 5% level since the F-statistic is 0.190622 and the associated probability value is 0.8283.

The heteroskedasticity test examines whether the variance of the residuals is constant or not. The results show that the

F-statistic is 0.420576, and the associated probability value is 0.5218, indicating that there is no evidence of heteroskedasticity at the 5% level.

In summary, the results of all three tests suggest that the model's assumptions, including normality, absence of autocorrelation, and homoscedasticity, are satisfied, and the model is valid.

4.6. Stability Test

According to the CUSUM and the CUSUM-SQ test, we can see that the variables are stable at a 5% level of significance as the blue line is within the red line.

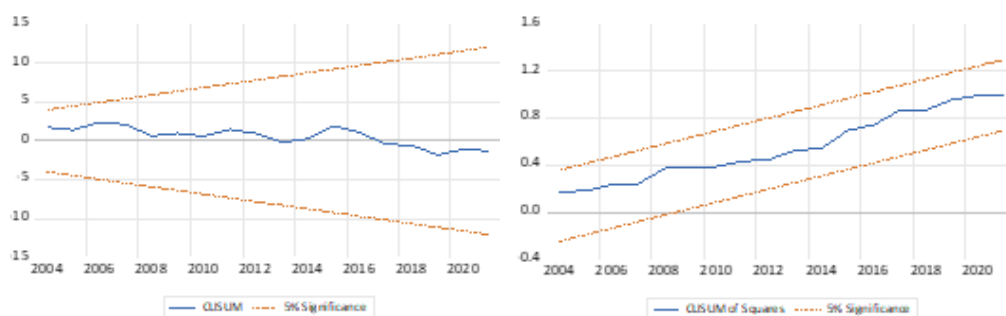


Figure 5. CUSUM and CUSUM-sq Test.

4.7. Quantile on Quantile

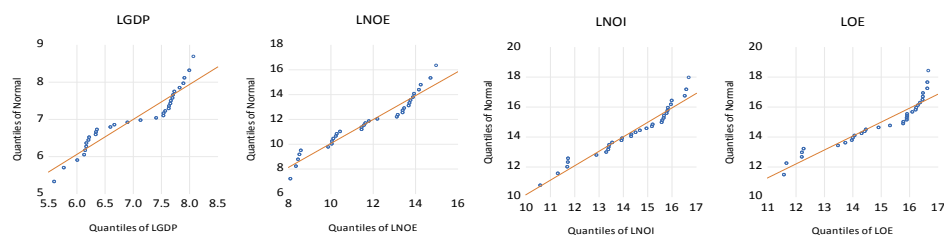


Figure 6. Quantile on Quantile Graph.

4.8. Gradients of the Objective Function

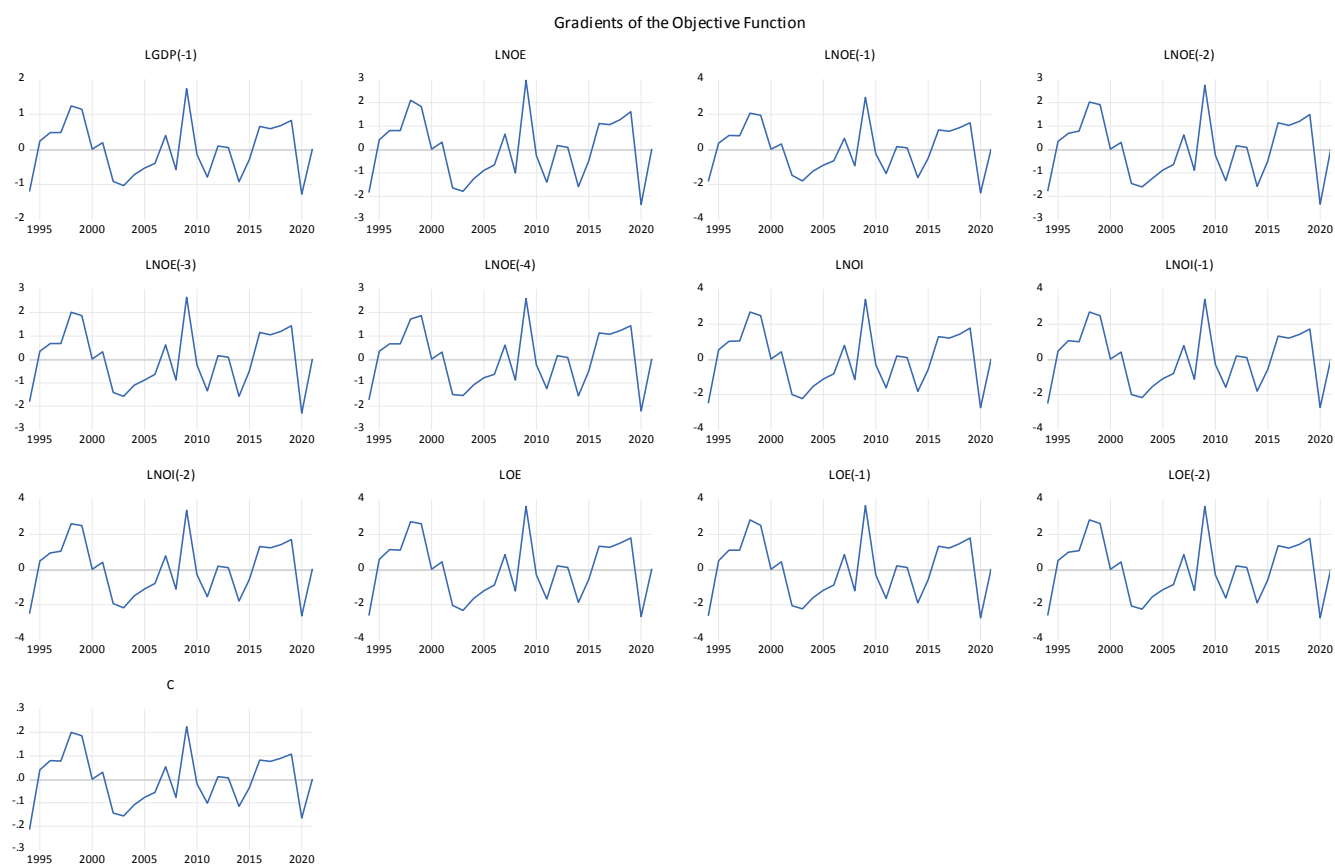
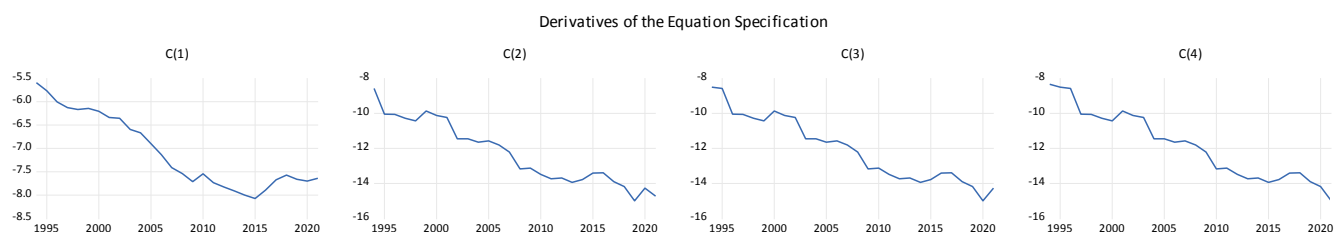


Figure 7. Gradients of the Objective Function.

4.9. Derivates of the Equation Specification



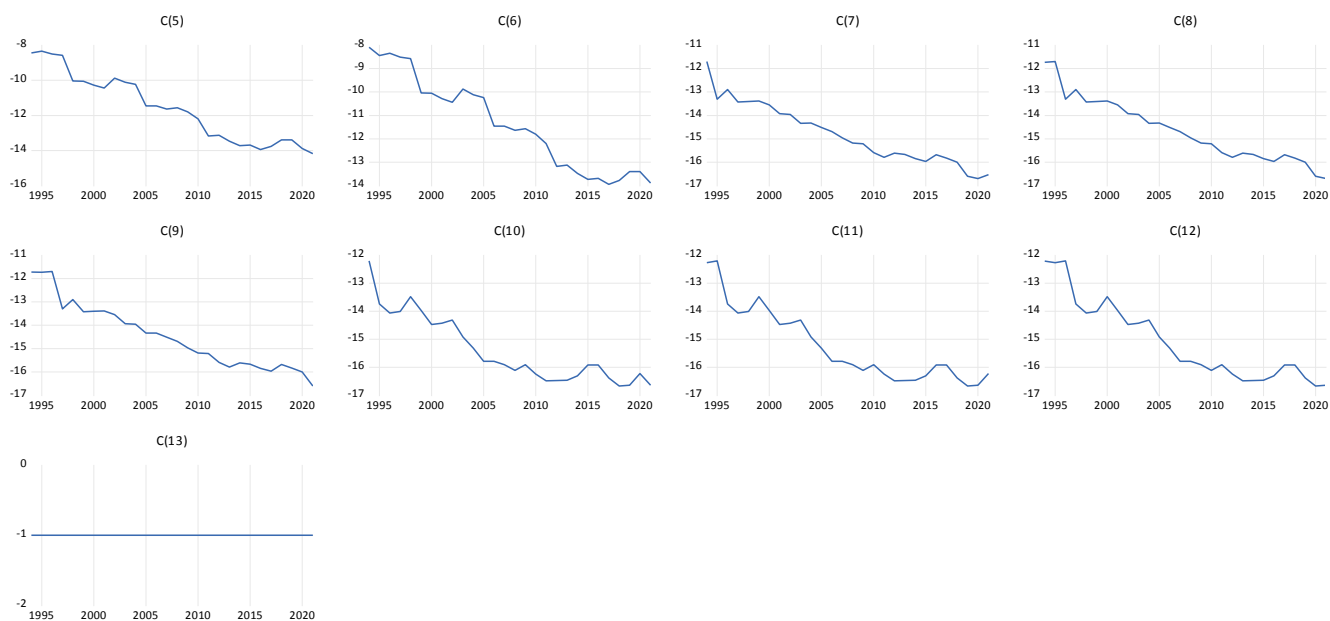


Figure 8. Derivates of the Equation Specification.

4.10. Confidence Ellipse

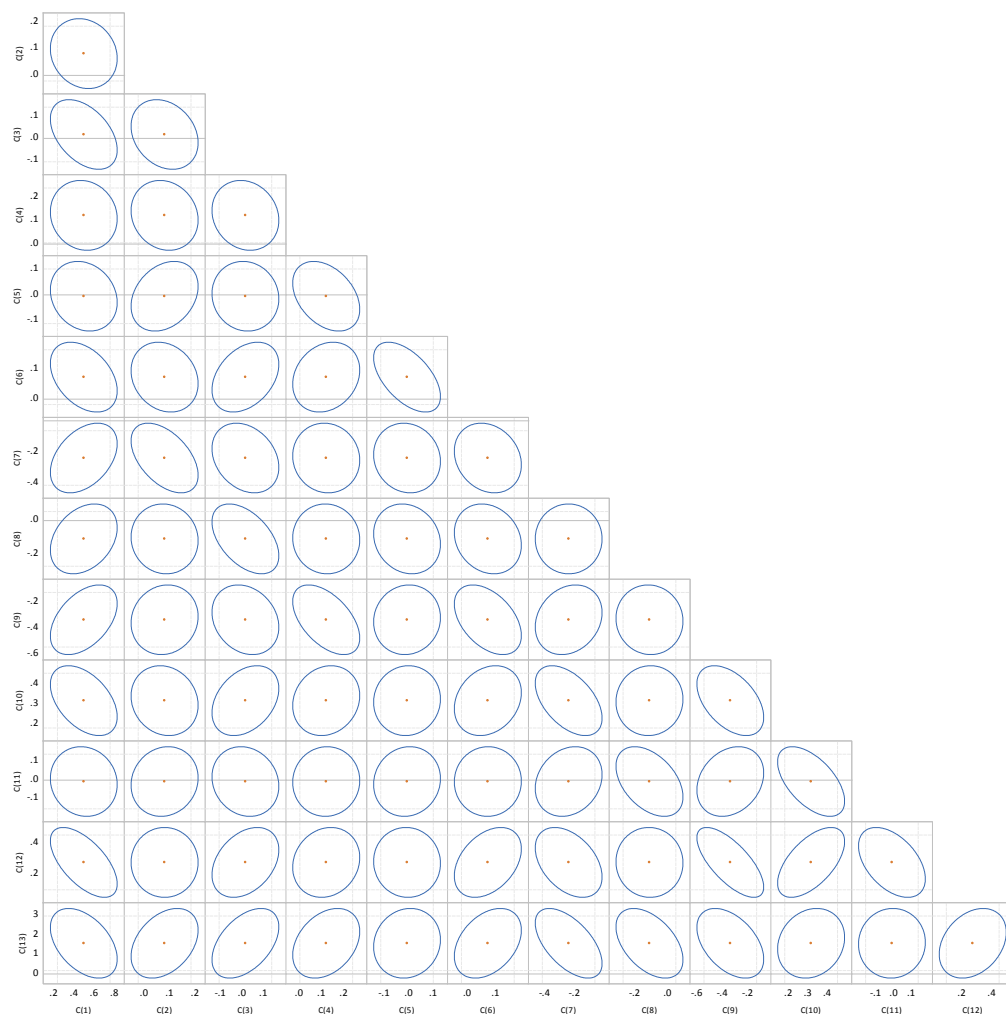


Figure 9. Confidence Ellipse.

5. Conclusion and Policy Recommendation

The paper explores the effects of international commodities trading on economic growth from a developing economy perspective. The study highlights the benefits and challenges associated with commodities trading and their impact on economic growth from a development economic perspective.

The findings showed that in the long run international commodities (Oil export, non-oil Import, and non-oil exports) affect the economic growth in Nigeria. Both Oil export and non-oil export have a positive relationship while Non-oil Import has a negative but significant relationship with Economic growth.

According to [30] in their study, they concluded that international trade had a significant impact on economic growth. Although both studies came to the same conclusion this paper agrees that non-oil exports hurt GDP as results derived from this paper show that both in the short-run and long-run non-oil export has a positive impact on economic growth in Nigeria.

According to the findings of [8], international commodity trading had a favorable influence on poverty reduction in Nigeria, but the gains were not dispersed fairly across different areas and socioeconomic categories. According to the report, Nigeria's lack of infrastructure and poor institutions limit the potential benefits of international commodities trade. Comparing this to the findings of our study, we determined analyses using new data and concluded that as infrastructure in Nigeria grows, the economy will develop further.

Policy Recommendation

The policy recommendation from the study is that developing countries should embrace policies that promote the diversification of their economies to reduce dependence on commodities trading. The policies should aim to enhance domestic value addition, technology transfer, and human capital development to promote sustainable economic growth. Furthermore, the government should invest in infrastructure development, including roads, railways, and energy, to promote competitiveness and ease of doing business.

To incentivize domestic enterprises to increase their exports, governments might provide export promotion programs. These initiatives may include trade mission abroad, export credit insurance, and export finance. Export credit insurance can guard against nonpayment by international customers, while export finance can offer low-cost loans to exporters. Trade missions can assist domestic businesses in discovering new markets and clientele. By increasing local goods' competitiveness in international markets, such policies can boost exports.

Tariffs and other trade restrictions are tools that governments can employ to limit imports and defend indigenous

businesses. Non-tariff barriers are rules and standards that make it harder for foreign businesses to compete, whereas tariffs are charges on imported goods that raise their prices for consumers. While trade restrictions and tariffs might shield home businesses from overseas rivalry, they can also trigger retaliation from other nations and harm exports. As a result, while making such decisions, officials must carefully analyze the possible outcomes.

Governments can devalue their currency to raise the cost of imports while lowering the cost of exports. Foreign purchasers may find local goods more inexpensive if their currency is weaker, but domestic customers may pay more for imports. Currency devaluation is not a tactic to be employed carelessly, either, since it can also result in inflation and other economic issues. In addition, other nations may respond by lowering trade barriers or depreciating their currencies, which might spark a "race to the bottom" that would be detrimental to all parties involved. It is essential to remember that these policy suggestions should be carefully put into action, taking into account the advantages and disadvantages that may arise. The long-term implications of these measures on the economy and international trade ties should also be taken into account by policymakers.

Abbreviations

GDP	Gross Domestic Product
ARDL	Autoregressive Distributed Lag
DT	Dependency Theory
LOE	Log of Oil Exports
LNOI	Log of Non-oil Import
LNOE	Log of Non-oil Export
ECM	Error Correction Model
CBN	Central Bank of Nigeria
WDI	World Development Indicators
SSA	Sub-Saharan Africa
VAR	Vector Autoregressive
ADF	Augmented Dickey-Fuller (Test)
PP	Philips-Perron (Test)
I(0), I(1), I(2)	Order of Integration (Stationarity Levels in Time Series Analysis)
EViews	Econometrics Views (Statistical Software)
STATA	Statistics and Data Analysis Software

Conflicts of Interest

The authors declare no conflicts of interest.

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