



## *Dynamic Effects of Trade Openness, Exchange Rate and Foreign Direct Investment on Economic Growth in Nigeria*

Abdulkarim Yusuf<sup>1</sup>, Abdulkarim Hussaini<sup>2</sup>

<sup>1</sup>Department of Economics, Nigeria Police Academy, Kano Maiduguri Road, Kano Nigeria

<sup>2</sup>Economics Department, Nasarawa State University, Keffi, Nasarawa State, Nigeria

*Citation: Abdulkarim Yusuf<sup>\*</sup>, Abdulkarim Hussaini (2026) Dynamic Effects of Trade Openness, Exchange Rate and Foreign Direct Investment on Economic Growth in Nigeria. J of Eco and Soc Dynamics. 2(2), 1-25. WMJ/JESD-133*

### **Abstract**

Nigeria still faces macroeconomic issues such as poverty, exchange rate volatility, declining foreign reserves, negative trade and balance of payments deficits, inadequate foreign direct investment inflows, and other unfavourable world trade dynamics exacerbated by the growing globalisation of the economy, despite its immense potential for inclusive growth. This study interrogated the dynamic interface between trade openness, exchange rate, foreign direct investment and economic growth in Nigeria using data from 1980 to 2020 along with the Autoregressive Distributed Lag and Granger causality tests approach. The study adopted an extended Cobb–Douglas production function with disaggregated trade openness measures such as oil and non-oil exports, oil and non-oil imports while foreign direct investment inflows, domestic capital formation, nominal exchange rate and labour force were used control variables. The findings indicate a compelling co-integration relationship among the study variables, as well as a noticeable debilitating effect of oil exports and imports on Nigerian economic growth while non-oil imports supported long-term inclusive growth by providing domestic enterprises access to foreign innovations and intermediary goods. The causality tests results indicated an outstanding one-way causal relationship running from oil and non-oil imports and exports, domestic capital formation and labour force to economic growth and a bi-directional causality between foreign direct investment inflow and economic growth. As a result, the study advocated for diversifying exports from oil to viable non-oil products and the effective use of liberal and protectionists trade policy to limit imports and improve domestic industries global competitiveness.

**\*Corresponding author:** Abdulkarim Yusuf, Department of Economics, Nigeria Police Academy Kano Maiduguri Road, Nigeria.

**Submitted:** 21.12.2025

**Accepted:** 24.12.2025

**Published:** 15.02.2026

**Key Words:** ARDL, Economic Growth, Non-Oil Exports, Non-Oil Imports, Oil Exports, Oil Imports

## Introduction

Trade openness approximates the ease of doing business across borders and is an indicator of how integrated into the global world the economy is. Trade openness enhance competition which leads to increased productivity and innovation, ensures that the cost of trading with other countries becomes lower and that firms can easily specialize hence boosting economic growth (Kunofiwa, 2024). The endogenous economic growth theory emphasizes that trade openness promotes long term economic growth by facilitating access to goods and services, expanding markets, achieving resource allocation efficiency, fostering competition and enhancing overall factor productivity through the transfer of knowledge and technology. However, this theory was not without restriction, as it assumes that the contribution of trade to economic growth varies depending on whether the strength of comparative advantage directs the resources of the economy towards activities that generate long-term growth, or away from such activities (Felix et al., 2024) [20].

Trade openness may actually limit long-term growth if the economy specializes in sectors with dynamic comparative disadvantages, where potential productivity growth, technological innovations, or learning by doing have been drained. Less developed countries may lack the social capability to adopt technologies developed in more advanced economies due to technological or financial constraints. Furthermore, domestic industries complain about unfair competition and dumping practices from international markets, which boosts consumption and imports of those goods. Due to their inability to successfully compete with more developed economies, infant industries in a given country may collapse as a result of excessive trade liberalization. The balance of payments and trade deficit problems present a significant challenge for such countries when they are unable to cover the costs of imported goods and services because there exists a wide gap between imports and exports. In these economies, selective protection may facilitate faster technological progress and inclusive growth [5,16,41].

The amount of local currency required to obtain one unit of foreign currency is known as the foreign exchange rate. The ability of a nation to engage in cross-border financial and economic transactions is

directly correlated with the amount of foreign exchange it has and the strength of its currency. According to the theory of purchasing power parity, a nation's exchange rate tends to balance the cost of buying goods and services domestically with the cost of buying them abroad. The exchange rate constitutes a crucial transmission channel of monetary policy in most economies with a significant degree of trade openness, Determining the optimal degree of exchange rate volatility in an open economy buffeted with a wide variety of foreign shocks has been the concern of policy makers. A large body of research have provided theoretical justification on the costs and benefits of fixed exchange rate regimes, in which the monetary authority commits to keeping the nominal exchange rate at a given value, effectively giving up on conducting an autonomous monetary policy. In practice, however, the vast majority of countries worldwide operate some intermediate regime, such as dirty floating (with occasional interventions to reduce exchange rate volatility), crawling bands (that allow exchange rate fluctuations within a periodically adjusted band), or a crawling peg (in which the band collapses to a potentially adjustable fixed value. On average, economies that actively manage their exchange rates exhibit much lower exchange rate volatility and are significantly more open to trade. On the monetary side, there is an exchange rate pass-through, as a nominal devaluation directly increases inflation through its effect on the domestic currency price of imported goods. On the real side of the economy, the real exchange rate affects the terms of trade, affecting domestic demand for foreign goods and aggregate demand (both domestic and foreign) for home-produced goods [11,13,15].

Foreign Direct Investment (FDI) inflow has a substantial role in fostering economic growth particularly in developing countries. The inflow of investment capital between nations and establishing international trade links are key factors that lead to decreased production costs, improved product quality, and a shortening of production cycles [21]. The developing economies are generally characterized with the problem of inadequate capital formation to meet up with the domestic investment demand. This is mainly linked to low income, poor saving attitude and high rate of inflation militating against economic progress in these countries. To close this saving-investment gap, most of these nations resort to sourcing resources from foreign economies in the form of external loans, foreign

direct investment and foreign aid. The recipient country will experience an increase in national income which can help to resolve economic distress as a result of an increase in the quantum of investment occasioned by the inflows of foreign capital. On the contrary, the dependency theory holds the view that FDI inflow has exploitative tendencies and therefore cannot benefit the host economy. The theory clearly asserts that foreign companies investing in the host economy have the potential to cause capital flight from the recipient country by repatriating their profits to their home country thus slowing down the process of capital formation and limiting the path of economic advancement. Also, a persistent increase in the productivity of domestic firms can generate the expected output for export markets, thereby increasing the foreign earnings of the same economy. This, in turn, contributes to the total capital formation of the country of origin and also serves as a foreign investment source to other countries (Udi et al., 2024) [25].

Due to liberalization and globalization, the Nigeria economy has become intricately interconnected with foreign influences, particularly regarding openness. Nigeria's sizeable population and varying world's natural resources makes it a significant market for international corporations and the global market. Despite implementing an export promotion strategy, Nigeria remained largely a mono-product exporter, depending on oil exports as a significant source of foreign exchange and government revenue that has made the country susceptible to oil price volatility and posing significant challenges to macroeconomic management and fiscal sustainability (Malachy et al., 2022). The economy has also faced macroeconomic difficulties such as low foreign direct investment inflows, low level of industrialization, exchange rate volatility, depleting foreign reserves, adverse trade and balance of payments deficits, low growth rate and other negative international trade dynamics, exacerbated by the increasing integration of the global economy in the last several decades [18].

Likewise, the goal of the import substitution industrialization policy has not been fulfilled, as more and more infant industries close as they are unable to compete with multinational corporations [39]. Accepting globalization and economic integration has resulted in improved trade relations with other

countries, causing Nigeria to become a heavily import-dependent economy. The proliferation of imported goods into Nigeria is extremely concerning and poses a risk to regional businesses. Importing is challenging due to the limited availability of foreign currency, particularly for sectors that depend on imports for essential raw materials. This has had a negative impact on domestic industries, a high demand for foreign exchange, and a gradual depreciation of the naira. Domestic manufacturing capacity is contracting and unable to meet rising demand from the country's large and expanding population, resulting in a greater reliance on imports (Onourah, 2018) [33].

Economic growth rate is an important indicator of a country's development progress. Inclusive growth helps in the resolution of some macroeconomic issues, such as poverty, unemployment and income inequality. Nigeria has recorded significant economic growth and transformation in the last few decades but the growth has not been inclusive and largely unsustainable. The concept of inclusive growth recognizes that economic growth alone is insufficient to ensure improvements in social welfare. While a country may experience robust economic growth, the benefits may not be equitably distributed among its citizens, leading to inadequate improvements in overall well-being. Inclusive growth which emphasizes two dimensions of economic growth and the equitable sharing of its benefits across society, seeks to elevate the standards of living and welfare of the entire population. Central to inclusive growth are goals such as sustainable economic growth, poverty reduction, improved income distribution, equal access to social services and the creation of gainful employment for marginalized segments of society. Hence, investigating the dynamic impact of trade openness, exchange rate and foreign direct investment on inclusive growth in Nigeria is a crucial scholarly pursuit in the current period of globalization, offering tangible proof for others to emulate in bolstering their engagement in the global marketplace [9].

To the best of the researchers' knowledge, no similar claim has yet been made for studying the relative effects of disaggregated trade openness variables, exchange rate and foreign direct investment on economic growth in Nigeria in a single multivariate framework. Because the effects of these variables on growth changes over time, the short-run interaction between

the two variables may differ from the long-run relationships. Given the importance of time horizons in econometric modelling, the study fills an important empirical gap by comprehensively assessing the long and short-term dynamic impact of trade openness, exchange rate and foreign direct investment on economic growth in Nigeria using yearly data from 1980 to 2020 and the Autoregressive Distributed Lag (ARDL) methodology. In keeping with earlier research that used a similar method for other sub-Saharan African nations, the current study disaggregated the trade-based predictors into oil and non-oil exports and imports, respectively, while using exchange rate, foreign direct investment, domestic capital formation and labour force as control variables within an extended Cobb–Douglas production function.

By using data-driven economic models to explain the relationship between trade openness, exchange rate, foreign direct investment and economic growth in Nigeria, will help provide more robust country specific insight in making Nigeria's trade policy more efficacious while policymakers may be better able to understand how to promote, regulate, and manage trade in order to address some of the country's macroeconomic challenges, such as persistent balance of trade and balance of payments issues, strengthen the value of the Naira, increase the country's foreign reserve position, and improve global competitiveness. Following the introduction, this paper is structured as follows: Section 2 reviews the theoretical connections between trade openness and economic growth. Section 3 provides the estimation techniques and procedures used in the study. Section 4 covers the empirical findings and discussions. Section 5, which offers policy recommendations, concludes the paper.

### Theoretical Review

The theoretical underpinnings of this research draw from various economic theories, including classical trade theory, neoclassical trade theory, and new trade theory. Mercantilism was the dominant theory of economy and growth before being replaced gradually by Adam Smith's liberal market economy ideas. The Mercantilist theories see benefits in export surpluses, thus advocates for export over import and trade barriers. It argues that economic surplus is the fastest way to achieve economic growth and sustainable development Export, according to mercantilists,

increases a country's wealth, whereas import depletes it. In order for a country to maintain a good trade balance, import substitution and the accumulation of financial capital should be encouraged, while export should be discouraged [24]. Mercantilist ideas are behind export-led growth strategies, which encourage nations to export more and import less. It is an economic approach that many developing nations look to put in place to modernize their societies and increase standards of living. Finding a market for a product on the international market that other nations cannot easily or efficiently provide is the foundation of this strategy. As developing countries gain recognition on the global market, they can bring in positive cash flow that can be used to purchase products and services they are unable to produce themselves [8].

Classical trade theory, as exemplified by Adam Smith's theory of absolute advantage and David Ricardo's theory of comparative advantage, emphasizes the benefits of specialization and trade in enhancing economic efficiency and welfare. Adam Smith asserted that nations should specialize in producing commodities where they had an absolute cost advantage or could produce more efficiently than others and import goods where they had an absolute cost disadvantage or could produce less efficiently than other nations. Countries would gain efficiencies through specialization because their labour force would become more skilled by performing the same tasks. Production would also become more efficient as there would be an incentive to develop more effective and faster production methods in order to expand specialization [33]. Smith saw benefits in unhindered and barrier free trade and posited that trade growth increases specialization. This specialization leads to economies of scale and greater markets for small domestic economies. Adam Smith saw trade as an as enhancer of welfare, growth and an effective mean to vent surplus home production. That vent is a widening of market in overseas. By doing so, it also improves the division of labour and the productivity at home. Smith's assumption of a closed economy, which is currently utopian, is this theory's biggest flaw. The issue with absolute advantage was that some countries were better at producing both goods and thus had an advantage in many areas proposed the concept of comparative advantage to address a variety of concerns that the absolute advantage theory did not address. Countries will benefit from trade, according to Ricardo, even if one country has an absolute

advantage in producing all of the things that they trade. In comparison to other countries, Ricardo's theory of comparative advantage refers to economy's ability to produce goods and services at a lower opportunity cost than that of trade partners. The Ricardian model suggests economies can benefit from specialization in sectors where they have comparative advantages [21,31,41]. A nation has comparative advantage in the production of a commodity in which it has a lower opportunity cost ratio than rivals. As a result, the real cost of producing a commodity in terms of other commodities foregone is considered. Comparative advantage considers relative productivity differences, whereas absolute advantage considers absolute productivity. Thus, the main argument of classical theories is that a country will tend to export commodities with lower comparative costs in autarky and import goods with higher comparative costs in pre-trade isolation. The above presumptions, however, are deemed to be misleading and factually inaccurate. As a result, the theory was discovered to stifle developing countries' growth ambitions, because a critical examination of the theory reveals that a developing country endowed with natural resources should perpetually import capital goods and export raw materials whose demand in the international market is inelastic [5,6].

The Neo-classical theory of international trade arose from the need to tweak some assumptions of the classical theory. Absolute and comparative advantage theories did not assist countries in determining which products would provide a competitive advantage. Both theories assumed that free and open markets would lead countries and producers to decide which goods they can produce more efficiently. As a result Heckscher (1991) and Ohlin (1933) factor endowment trade theory provided a way to study the general equilibrium characteristics of open economies. The Heckscher-Ohlin model of international trade shows that specialization based on factor endowment can lead to static productivity and economic benefits for trading partners. It highlights the role of factor endowments in determining a country's comparative advantage and trade patterns. There are two important factors in economic growth including FDI and Trade because FDI will encourage technological development through transfers from developed to developing countries. In addition, FDI becomes a stimulus for the development of domestic investment

and facilitates the development of human capital. The theory explains why there are differences in relative commodity prices between countries and how a country can gain a comparative advantage by producing products that use factors that are abundant in the country. Differences in comparative costs, they argue, result from differences in relative factor endowment across countries (Kunofiwa, 2024). They posited that the cost of any factor or resource was determined by supply and demand. Factors in high supply relative to demand would be less expensive, while factors in high demand relative to supply would be more expensive. According to this theory, a country will produce and export goods that require extensive use of the country's relatively abundant and cheap factors, while importing commodities that require extensive use of the country's scarce and expensive factors. Thus, a country with a surplus of cheap labour would export labour-intensive goods while importing capital-intensive goods, and vice versa. It implies that factor endowment, rather than productivity, determines trade patterns. This implies that because developing countries have a surplus of labour, they should focus on producing and exporting primary products and import capital-intensive goods from developed countries. Although the factor endowment theory is a notable advancement over Ricardo's comparative cost advantage, the theory was also harshly criticized by its proponents in the 1950s [5,11,22,23].

Further, New growth theory has provided important insights into an understanding of the relationship between trade and growth. These models exhibit international trade can promote economic growth through employment generation, income distribution, technology spill over and external stimulation. Countries can reap welfare through full employment, better allocation of resources as trade creation gains that arise from increased volume of trade, though gains from trade are not equally distributed. Trade has played its part in efficient allocation of resources in countries and among countries, and being the engine of global growth, however, not all countries share the growth or enjoy the benefits it brings. Developing countries have a much smaller share in global trade values and volumes whereas the developed world enjoys the lion share. Developing countries chiefly produce and export raw and primary materials. Even though trade barriers are falling, the developed world still retains some protection to protect their markets from imports [25,41].

With the rise of multinational corporations, a number of contemporary firm-based theories, as opposed to the Classical country-based trade theories, have emerged. The country-based theories were unable to correctly assess the spread of multinational corporations or intra-industry trade, which relates to trade between two countries of goods produced in the same industry. Unlike country-based theories, firm-based theories incorporate other product and service factors such as brand and customer loyalty, technology, and quality into the explanation of trade flows. They replaced the assumption of perfect competition in product markets with monopolistic competition and introduced product differentiation, scale economies, and utility functions including preference for variety. These theories adequately describe the existence of intra-industry trade flows among trade partners with comparable factor intensities and comparative advantages. As a result, they agree with the view that more open global markets would eventually lead to a decrease in cross-country industrial specialization [8].

The internationalization theory developed by Hymer in 1960 concentrated on the actions of multinational corporations and how they affected regional businesses. Prior to Hymer's FDI theory, all investments were viewed as simply cross-border capital transfers that were influenced by the disparities in interest rates between the countries. Hymer demonstrated that there is a difference between financial investment and foreign direct investment. FDI grants the company control over the business activities in other countries, whereas portfolio investments do not (Muhammad & Jian, 2016). Thus, market imperfections that can lead to benefits and conflicts are necessary for FDI to succeed. The global strategic rivalry theory developed in the 1980s focused on multinational corporations and their efforts to gain a competitive advantage over other global firms in their industry. According to the theory, firms will face global competition in their industries, and in order to thrive, they must develop competitive advantages. To remain relevant, firms should evaluate their competitive advantage and try to preserve it by possessing intellectual property rights, obtaining economies of scale or scope, and investing in research and innovation [27].

Although the trade theories mentioned above have

improved economists' understanding of international trade and how to promote, control, and manage it, occasionally actual events run counter to these theories. In many aspects of production or service, countries do not possess absolute or comparative advantages, and in reality, production factors are not evenly distributed among nations. Some nations benefit disproportionately from certain factors, while others have tried to forge their own comparative advantages through low labour, land, or production costs. As a result, it is unclear which theory is dominant globally. What is clear is that international trade is complex and influenced by a plethora of constantly changing factors. Trade cannot be succinctly explained by a single theory, and more importantly, parts and component production that was previously localized to a single factory or nation is now distributed globally. These Global Value Chains (GVCs) give developing nations access to the global economy in ways that were previously impractical. These changes indicate increased global market competition, which suggests that pursuing a dual trade and competitiveness strategy is essential if nations are to fully benefit from openness in terms of trade, investment, and people movement. In reality, governments and businesses combine these theories to decipher trends and devise strategies.

### **Empirical evidences on trade openness and economic growth**

The nexus between trade openness and economic growth of various regions has attracted significant interest in the literature. However, most of these studies have been cross-sectional, although some are country-specific and a few with particular reference to Nigeria. The results of these studies have been mixed due largely to the analytical framework, country specific characteristics, the indicators used as proxy for trade openness, the sensitivity of findings to changes in the set of control variables adopted and time period covered, though the overall indication is that trade openness has a significant positive effect on economic growth. This section focuses on some of these cross-national and Nigerian empirical studies.

Kunofiwa (2024) explored the influence of trade openness on tax revenue in transitional markets employing panel methods with data spanning from 2005 to 2020. The influence of trade openness on tax revenue under fixed effects, random effects and dynamic generalized methods of moments was positive and significant

while same was positive but non-significant in transitional markets according to pooled ordinary least squares. Using data from the ASEAN region covering the period 2000-2022, empirically analysed the relationship between international trade and economic growth. The study findings supported a positive impact of international trade on economic growth of the region. Analysed the non-linear effects of international trade and foreign direct investment on the economic growth of Vietnam using time series data spanning the period 2008 – 2021 and the Nonlinear Autoregressive Distributed Lag technique. The findings suggest that a rise in foreign investment has favourable outcomes for economic growth but a negative impact on growth when it exceeds a certain threshold. The results of the research also indicate that Vietnam continues to face certain negative implications as a result of international commerce [5,25].

In one of the recent studies, using the ARDL bound co-integration method and time series data for the period 1990-2021 investigated the impact of exports, development, imports on economic growth of Iraq. The estimated results indicated a significant positive influence of exports, labour force, capital, government expenditure and trade openness on economic growth of Iraq in the long and short-run while imports retarded growth both in the long and short-run. Using time series data from 1990 to 2020 and the ARDL co-integration method analysed the effect of trade openness, imports, and exports on the economic growth of Namibia. The study's outcomes indicated that imports inhibited growth while exports and trade openness were positive and significant for economic growth of Namibia in both the long and short run [16,40].

Adopting the Vector Error Correction Model and time series data from 1967 to 2020 investigated the impact of investment, exports and imports on economic growth of Indonesia. The empirical results demonstrate that investments, imports and exports had little impact on Indonesia's economic growth. Investigated the effect of trade liberalization on Nigeria's economic growth using data from 1985 to 2019 and the Gauss Markov Switching model. The study modelled RGDP as a function of trade openness, real exchange rate, capital stock and regime policy shift. The outcome of the analysis indicated that in the

first regime, the exchange rate and capital stock have a significant positive impact on economic growth, but trade liberalization has an insignificant effect. Capital stock had a significant positive effect on Nigerian economic growth during the second regime, whilst trade liberalization and the exchange rate had a significant negative impact [20,33].

Using the ARDL bounds testing approach and time series data covering the period from 1984 to 2017, examine the nexus between trade openness and economic growth in Nigeria by incorporating the role of institutional quality. The study employs three indicators of trade openness including total trade, import trade and export trade. The empirical results suggest that export trade has a significant positive impact on economic growth while the impact of import trade on economic growth is negative and significant. The results also show that the negative long-run effects of import trade on economic growth in Nigeria decreases as institutional quality (quality of governance) improves. Using the Panel Fixed Effect Model, using the ARDL bounds testing approach and time series data spanning the period 1975-2014, investigated the dynamic impact of trade openness on economic growth in Botswana. The study employs four different proxies for trade openness, which include total trade, exports, imports and country size and geography into account. Evidence from the results points to the significance of total trade and exports in promoting economic growth in Botswana, but also the lack of growth impetus from imports [24,30].

Assessed the impact of trade openness and foreign direct investment (FDI) on GDP in five South Asian nations from 1975 to 2016. According to the results of the Bootstrap ARDL co-integration test, both FDI and trade openness had a significant positive effect on the GDP of these nations. Evaluated the influence of trade openness on Nigeria's economic growth using the Vector Error Correction Model (VECM) and time series data from 1981 to 2017. The research outcomes suggest that exports and exchange rate had a considerable positive impact on growth while imports was suggestively negative. Assessed the impact of trade openness on economic growth of the Economic Community of West African States (ECOWAS) countries using data from 1975-2017 and the Pooled Mean Group estimation technique. The research results showed that increase in the level of trade openness,

exchange rate, labour force, government expenditure and FDI spur growth in ECOWAS member countries while domestic investment has a considerable negative impact on growth [11,17,34].

Evaluated the dynamic impact of trade openness on Nigeria's economic growth using data from 1980-2016 and the ARDL estimation technique. The empirical results indicated a beneficial impact of exports and imports while trade openness had a significant negative impact on growth both in the long and short-run. Interrogated the relationship between trade openness and economic growth for Cote d'Ivoire over the period 1965–2014 in a multivariate framework including capital stock, labour and trade openness as regressors. It uses the Autoregressive Distributed Lag bounds test to co-integration and the Toda and Yamamoto Granger causality tests. The results showed that trade openness and capital formation had a positive impact on the economic growth of Cote d'Ivoire both in the short and long run. Using time series data covering the period 1989 to 2017 and the Ordinary Least Square (OLS) estimation technique, examined the impact of trade liberalization on economic growth in Nigeria. The findings revealed that trade openness, inflation rate, foreign direct investment, balance of trade and net exports had a significant positive impact on growth while exchange rate and balance of payment demonstrated a significant negative relationship with growth. Zahonogo (2016) investigated the impact of trade openness on economic growth in the developing sub-Saharan African (SSA) economies using a dynamic growth model covering the period from 1980 to 2012. The results from the analysis indicate that the trade openness threshold exists below which increasing the openness of the economy to trade has increasing effects on economic growth and above which the openness effect on growth declines. The empirical analysis concludes that a number of policy considerations are needed in the developing sub-Saharan African (SSA) countries to enhance the growth impact of trade openness [27,39,46].

In differing from most empirical studies previously conducted for the Nigerian economy, the current study contributed to the trade openness-growth literature in three ways. Firstly, despite the fact that different countries' economic structures and developmental stages account for variations in the

relationship between trade openness and economic growth, the majority of empirical studies have concentrated on panel data regression techniques that force cross-sectional homogeneity on coefficients in the hopes that the findings can be generalized to all countries. Given the heterogeneity of economies in terms of trade policy, financial conditions, institutional developments, and technological advancements, the cross-sectional homogeneity assumption is likely to be shattered. The current study therefore, is a country-specific study that is significant since the panel-based studies tend to generalize the findings from a singular regression estimate for a host of economies with varying country-specific characteristics.

Secondly, previous Nigerian studies have adopted the VECM and OLS estimation techniques which are inadequate in generating consistent and robust coefficient estimates about the study variables, thereby providing a gap in the methodology used. The current study adopted the more advanced ARDL method which allows for a more robust co-integration relations between a mixture of  $I(0)$  and  $I(1)$  variables that perform exceptionally well with small sample sizes. Through this process, it becomes methodologically possible to deal with model selection, estimation, inference, and the speed of adjustment to restore the economy to long-term equilibrium growth path after a shock.

Thirdly, Nigeria, a country well endowed, well resourced, paradoxically remains a mono-cultural economy whose major exports is crude oil and natural gas with diversified imports of both oil and non-oil components. Volatility of oil prices on the global market have serious implications on integration through trade and the success of trade reforms in generating growth in Nigeria. The current study disaggregated the trade policy variables into 4 components comprising total oil exports, total oil imports, non-oil exports and non-oil imports modelling them as a function of real GDP which offer varied options for policy formulation. By way of modelling therefore, this study implements an elaborate econometric investigation contributing to economic literature by using an extended Cobb–Douglas production function. By addressing these identified gaps in existing literature, this study provides insight for policy discourse, capable of facilitating economic growth in Nigeria through trade.

### Data and Estimation Procedures

Using annual time series data from 1980 to 2020, this study investigated the impact of trade openness on economic growth of Nigeria. This study used a quantitative approach and a descriptive research design to find empirical answers to the research problems using already available data. The study relied on secondary data sourced from the Central Bank of Nigeria (CBN) and the World Bank's statistical database for the World Development Indicators (WDI). The subjects of the data collection included the dependent variable, Real Gross Domestic Product (RGDP), and the independent variables consisting of Oil Imports (OIMP), Oil Exports (OEXP), Non-oil Imports (NIMP), Non-oil Exports (NEXP), Foreign Direct Investment Inflows (FDI), Gross Fixed Capital Formation (GFCF) Nominal Exchange Rate (EXCR) and. Active Labour Force (LBF) A detailed description of the study variables is shown in Table 1.

**Table 1:** Variables Description and Sources of Data

Code	Variables	Type of variables	Measurement of Data	Data Source
RGDP	Real Gross Domestic Product	Dependent Variable	Millions of US Dollars	World Development Indicators
EXCR	Nominal Exchange Rate	Independent Variable	Naira official exchange rate to one US Dollars	World Development Indicators
FDI	Foreign Direct Investment inflows	Independent Variable	Millions of US Dollars	World Development Indicators
GFCF	Gross Fixed capital Formation	Independent Variable	As a Percentage of GDP	World Development Indicators
LBF	Active Labour Force	Independent Variable	Number of persons between ages 16 to 65 years.	World Development Indicators
NEXP	Total Non-Oil Exports	Independent Variable	Millions of Nigerian Naira	Central Bank of Nigeria
NIMP	Total Non-Oil Imports	Independent Variable	Millions of Nigerian Naira	Central Bank of Nigeria
OEXP	Total Oil Exports	Independent Variable	Millions of Nigerian Naira	Central Bank of Nigeria
OIMP	Total Oil Imports	Independent Variable	Millions of Nigerian Naira	Central Bank of Nigeria

Data on RGDP, OIMP, OEXP, NIMP, NEXP, LBF and FDI taken in millions of Naira (nominal forms) were log-transformed to stabilize the variance of the series and make interpretation in proportionate terms while the GFCF and EXCR retained their percentage form. E-views 12 statistical package was utilized for data analysis.

In its simple framework, the Solow growth model (1956) asserts that the proximate causes and dynamics of economic growth and cross-country income differences arise from two paths: differences in total factor productivity (state of technology and worker efficiency) and differences in capital quality per worker across countries. Among other assumptions, the model posits that savings is decided exogenously, and technology is free; generally accessible as a non-excludable, non-rival good, and that technological state is labour augmenting or Harrod-neutral. According to the Solow-style neoclassical growth model, a country can achieve long-term prosperity by investing in technological advancement and human capital development. For the endogenous growth theories, government policies and institutions serve as influences that could have a direct impact on long-term economic growth. Thus, countries with high level of efficiency, appropriate economic system, sound

economic policy, tend to grow more rapidly [32]. In terms of empirical implementation of Equation (1), we are more focused on the proximate factors that drive growth, and how much growth increases owing to various measures of trade openness and changes resulting from other exogenous influences (e.g., FDI, domestic capital formation, labour force growth, nominal exchange rate, etc.).

The study modelled economic growth proxy by RGDP as a function of disaggregated measures of trade openness and the previously stated control variables, following the growth accounting context of and [16,30,33,38]. It is well known that econometric tests are susceptible to missing variables, and thus studies based on a bivariate framework may suffer from misspecification bias [24]. Differences in economic structure and trade policy, in contrast, may justify why the trade-growth nexus is country-specific. It is essential to adopt a country-specific approach and a disaggregation of exports and imports into oil and non-oil components to minimize variable omission and aggregation biases because Nigeria primarily exports oil and non-oil products and also imports oil and non-oil products, such as machines and capital goods. In accordance with the literature and the study's objectives, a modified Autoregressive Distributed Lag (ARDL) model, presented in its general form as an unrestricted error-correction model (UECM) regression, from which all tests and estimations are made, was developed and specified as follows:

$$\begin{aligned} \Delta \ln RGDP_t = & \alpha_0 + \alpha_1 \ln OIMP_t + \alpha_2 \ln OEXP_t + \alpha_3 \ln NIMP_t + \alpha_4 \ln NEXP_t + \alpha_5 \ln FDI_t \\ & + \alpha_6 GFCF_t + \alpha_7 EXCR_t + \alpha_8 \ln LBF_t + \sum_{i=0}^n \beta_1 \Delta \ln RGDP_t + \sum_{i=0}^n \beta_2 \Delta \ln OIMP_t + \\ & \sum_{i=0}^n \beta_3 \Delta \ln OEXP_t + \sum_{i=0}^n \beta_4 \Delta \ln NIMP_t + \sum_{i=0}^n \beta_5 \Delta \ln NEXP_t + \sum_{i=0}^n \beta_6 \Delta \ln FDI_t + \sum_{i=0}^n \beta_7 \\ & \Delta GFCF_t + \sum_{i=0}^n \beta_8 \Delta EXCR_t + \sum_{i=0}^n \beta_9 \Delta \ln LBF_t + ECT_{t-1} + \varepsilon_t \dots \dots \dots \text{Eqn 1} \end{aligned}$$

Where:  $\alpha_0$  = Intercept and  $i$  is the lag indicator.  $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7$ , and  $\alpha_8$  represent the long-run multipliers which show the long-run effects of the identified measures of trade openness on economic growth to be calculated.  $\Delta$  = Denotes the first difference operator,  $t$  = deterministic time trend consisting of years from 1980-2020.  $\beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$  and  $\beta_9$  are the short-run dynamic coefficients which help to estimate the error correction mechanism and the model's convergence to equilibrium.  $k$  is the number of explanatory variables, and  $\xi$  is the disturbance term that is uncorrelated with the  $x$ 's. while  $ECT_{t-1}$  is the error correction term's one-period lag value and the speed adjustment parameter that measures how quickly the variables, in the event of a disturbance, returned from short-run disequilibrium to long-run equilibrium. The coefficient must be negative, less than one and statistically significant in order to achieve long-run equilibrium. A test of the disturbance term,  $\varepsilon_t$ , can confirm that the regression includes an adequate lag length. If the error series is serially uncorrelated and indicative of a white noise process, the lag lengths included are sufficient. Theoretically,  $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7$  and  $\alpha_8$  are all expected to produce positive coefficients to suggest that trade openness increases economic growth.

### Estimation Procedures

Prior to testing for co-integration, it is the standard practice to check the stationary properties of the series using an efficient unit root test procedure. The reason behind running stationarity tests is that if a series is stationary, the mean, variance and autocorrelations can be well approximated using long-time averages based on a single set of realisations (Enders, 2004). However, if a series is non-stationary, it will tend to drift away from its long-run mean, leading to inferences based on spurious results. This step is also necessary to establish the appropriateness of applying the ARDL methodology since the ARDL bounds test requires the dependent variable to be integrated of order one and the explanatory variables to be  $I(0)$  or  $I(1)$  stationary. The presence of any  $I(2)$  variable in the model will invalidate the methodology and the F-test will provide biased and unreliable results. The traditional Augmented and tests were used for this purpose. While ADF tests use parametric auto-regression to approximate the Autoregressive Moving Average (ARMA) structure of the errors in the test regression, PP tests help to correct the bias caused by ADF tests due to omitted autocorrelation. Thus, the

Phillips-Perron (PP) unit root tests differ from the ADF tests primarily in how they handle serial correlation and heteroscedasticity in the errors [1,10,29].

Furthermore, the empirical analysis covered a time period that included several trade policy reforms, global oil price volatility, and the COVID-19 pandemic which can cause structural breaks that has the potential of leaving a lasting shock on the Nigerian economy and endanger the economic data stability. Such a fundamental breach in the economy has a tendency of affecting the long-run interaction of the variables. Keeping in mind that the traditional unit roots tests are severely distorted in the presence of structural breaks, the Zivot-Andrews (ZA) unit root test, developed by was additionally used in the current study to overcome this issue since it can both detect a single unknown structural break and the series' stationarity characteristics [1,48].

The Akaike Information Criterion (AIC) was adopted in this study since it is more appropriate for data from small sample sizes and detects the best lag length for each variable. The significance of the F-test results relies heavily on the choice of the appropriate lag length, so it is crucial to use this automatic lag length selection to obtain accurate results and inferences. Also state that for annual data, choosing the best lag for each variable should take into account a maximum of two lag length. Therefore, in this study, a maximum lag length of 2 was chosen for the conditional ARDL model in Equation 1. The Wald test is used to derive the F-statistic and to juxtapose the F-statistics with the lower and upper bound critical values proposed by in order to test for co-integration after the ideal lag length has been determined. The null hypothesis is rejected if the estimated F statistic is higher than the upper bound critical value at the 5% level of significance, correlating a long-term relationship between the variables. In contrast, if the computed F-statistic is less than the lower bound critical value, indicating that there is no co-integration, the null hypothesis is accepted. Similarly, if the calculated F-statistic falls between the upper and lower bounds, the decision is indeterminate [3,28].

To empirically investigate the impact of trade openness on economic growth in Nigeria, the study employs the Autoregressive Distributed Lag (ARDL) approach established by [28]. Due to its robustness, dependability, and statistical properties, this approach is thought to be superior to other long-run analytical techniques in the literature and has numerous econometric advantages. Whether the underlying variables are integrated of order one, order zero, or a mixture of both, the bound's testing approach is applicable. Additionally, using a straightforward linear transformation, it is possible to generate a dynamic unrestricted error correction model (UECM) from the ARDL bounds testing. Without sacrificing any long-term information, the UECM integrates short-run dynamics with long-run equilibrium. The speed of adjustment to long-run equilibrium caused by any short-run exogenous shocks can also be estimated using ARDL, as can unbiased estimates of the long-run and short-run parameters of the study variables. The desirable robustness and efficiency of the ARDL approach, particularly in studies with comparatively small and finite time series samples (30–80), was another factor in its selection over other approaches to co-integration [1].

The ARDL model can also accommodate more variables than vector autoregressive (VAR) models and is more flexible with regard to the lag structure since it allows for different optimal lag structures for various model variables. Since the ARDL approach enables the co-integration relationship to be estimated by OLS once the model's lag order is established, it is also more user-friendly and straightforward than other multivariate co-integration methods. The ARDL method also takes any possible endogeneity among the explanatory variables into account. Since the macroeconomic variables used in this study are predisposed to have an endogenous effect on one another, the ARDL approach is anticipated to tackle the endogeneity issue [24].

We employ the Granger-causality approach proposed by to provide details on the direction of causal relationships among the variables. The Granger causality test is a statistical hypothesis test applied to ascertain the direction of a causal relationship between two variables. It can be deduced that there is a causal relationship between two or more variables in one direction if they are stationary at the first difference,  $I(1)$ , and also show a long-term relationship, according to. This method has the benefit of producing reliable results in both large

and small sample sizes, regardless of the order in which the variables are integrated. The Granger-causality test, however, does not assess the relative strength of causal relationships between the variables outside of the chosen time frame, which reduces the accuracy of the results [12,42].

Finally, tests for serial correlation, heteroscedasticity, normality, and functional form were performed in this study to diagnose the model. In addition, to test the estimated model's goodness-of-fit and determine how stable the model is over the sampled periods, the study followed the advice of by performing Cumulative Sum of recursive residuals (CUSUM) and Cumulative Sum of Squares of recursive residuals (CUSUMSQ) [28].

## Results and Discussion

### Preliminary Analysis of Study Variables

This preliminary analysis provided a general idea of the nominal data set by describing the main attributes of the study variables in our model to establish if the data series are normally distributed and suitable for running the OLS regression. Descriptive statistics are used to characterize the basic or distributional properties of the data in a study. The summary of descriptive statistics of the study variables in their nominal form are presented in table 1.

**Table 2:** Descriptive Statistics of the Examined variables in Nominal Form

Variables	RGDP	OIMP	OEXP	NIMP	NEXP	FDI	GFC	EXR	LBF
Mean	35673613	887137	4877425	3021297	369573	2.46	36.94	102.9	42.44
Median	23688280	220818	1649446	764204.7	29163	1.35	34.05	101.8	41.44
Maximum	84064360	3686178	17281954	17802182	3207100	8.56	89.39	381	68.63
Minimum	13779256	51.8	7201.2	5069.7	203.2	0.19	14.17	0.55	23.35
Std. Dev.	13779256	1167341	5660544	4289697	634320	2.53	20.47	99.69	13.25
Skewness	0.756	1.111	0.788	1.844	2.573	1.18	1.03	0.95	0.26
Kurtosis	2.125	2.767	2.165	6.248	10.973	3.17	3.49	3.38	1.97
J. Bera	5.21933	8.524637	5.43903	41.2624	153.845	9.651	7.72	6.48	2.261
J.B Prob.	0.131	0.085	0.108	0.144	0.24	0.326	0.021	0.039	0.323
Obs.	41	41	41	41	41	41	41	41	41

While standard deviation values in table 2 show some significant drifting of the variables away from their mean values, their kurtosis however indicated that our policy variables are normally distributed. In particular, RGDP, OIMP, OEXP and LBF indicated kurtosis values under 3, suggesting that these variables produce outliers that are less frequent and less extreme than those found in the normal distribution. However, NIMP, NEXP, FDI, GFC and EXR all show evidence of leptokurtic distribution with kurtosis values exceeding 3. This indicates that these variables are with higher-than-normal kurtosis and the weight in the tail of their population density function is larger than normal. The data's asymmetry as shown by the skewness values in Table 1 indicate that all the variables are positively skewed with a somewhat heavy-right tail.

The Jarque-Bera statistics measures how well sample data fit a normal distribution in terms of skewness and kurtosis. The null hypothesis is firmly accepted for RGDP, OEXP and LBF observations in their nominal form; and OIMP, NIMP, NEXP and FDI series after being log transformed, as demonstrated by the probability values of their respective Jarque-Bera statistics. As a result, these variables can be said to have a normal

distribution since their corresponding Jarque-Bera probability values have a significance level greater than 5 percent. The GFCF and EXCR series on the other hand, display substantial Jarque-Bera probability values of less than 0.05, which clearly confirm a lack of normalcy in their residuals. This suggests that these variables are highly susceptible to shocks and other fluctuations in the economy which may have caused outliers, resulting in residual non-normality. However, normality of data distribution is not required to apply the ARDL co-integration method used in this study [1].

Using the Spearman rank-order correlation coefficient, the researcher assessed the degree of linear dependency and the level of multi-collinearity issues among the explanatory variables specified in the empirical model. The correlation analysis, on the other hand, does not extrapolate any measure of causality or causal relationship between the variables under consideration. The Spearman rank-order correlation coefficient of the explanatory variables in their nominal form are displayed in table 3.

**Table 3:** Spearman's Correlation Coefficients for Explanatory Variables.

Correlation	OIMP	OEXP	NIMP	NEXP	FDI	GFCF	EXCR	LBF
OIMP	1.00							
OEXP	0.761	1.00						
NIMP	0.792	0.745	1.00					
NEXP	0.784	0.743	0.724	1.00				
FDI	0.550	0.684	0.409	0.350	1.00			
GFCF	-0.667	0.733	-0.575	-0.496	-0.637	1.00		
EXCR	0.662	0.741	0.798	0.600	0.406	-0.722	1.00	
LBF	0.790	0.809	0.764	0.685	0.524	-0.807	0.717	1.00

Table 3 shows that multi-collinearity among the study variables expressly mentioned in the model does not pose a significant challenge because the correlation coefficients of the explanatory variables are found to be within the reasonable tolerance level of 0.80. However, high correlation coefficient or high VIF values of the explanatory variables should not be interpreted as evidence of a high degree of multi-collinearity because such values do not, by themselves, invalidate the inferences of regression studies, recommend the use of ridge regression, or encourage the integration of two or more independent variables into one new variable to resolve multi-collinearity challenges. Similarly, several recent studies have demonstrated that multi-collinearity may not always be a challenge, and that the commonly used method of reconciling multi-collinearity difficulties in regression analysis may sometimes cause more complications than they attempt to solve [3].

### Test of Stationarity of Study Variables

Table 4 reports the results for the traditional and structural breaks unit root tests of this study.

**Table 4:** ADF, PP and Zivot-Andrews Stationarity Tests Results

Variables	ADF		PP Test			Zivot-Andrews			
	Level	1st Diff.	Level	1st Diff.	Remark	Break Date	Level	1st Diff	Rmk
<b>RGDP</b>	-1.319n	-3.336a	-0.327n	-3.071a	I(1)	2016	-3.423n	-11.451a	I(1)
<b>OIMP</b>	-8.525a	-7.661a	-2.367n	-7.761a	I(0)	2018	-2.919n	-8.169a	I(1)
<b>OEXP</b>	-1.888n	-4.685a	-1.389n	-6.052a	I(1)	2014	-5.256A	-8.267A	I(0)
<b>NIMP</b>	-1.134n	-7.487a	-0.411n	-7.426a	I(1)	2005	-2.219n	-5.194a	I(1)
<b>NEXP</b>	-0.854n	-6.994a	-0.964n	-7.811a	I(1)	2017	-6.429a	-10.009a	I(0)
<b>FDI</b>	-1.243n	-10.093a	-1.692n	-10.124a	I(1)	2008	-5.998a	-8.899a	I(0)
<b>GFCF</b>	-3.851a	--4.677a	-3.186n	-4.803a	I(0)	2014	-4.367n	-6.318a	I(1)

<b>EXCR</b>	-2.638n	-3.827a	-2.909n	-3.867a	I(1)	2014	-1.137b	-6.318a	I(0)
<b>LBF</b>	-2.404n	-4.075a	2.166n	-4.068a	I(1)	2013	-3.074a	-6.318a	I(0)

Notes: a, b and c denotes the rejection of the null hypothesis at 1%, 5% and 10% significance levels respectively while n denotes Not Significant.

According to the results in table 4, the variables under evaluation were stationary at levels and first difference, but not at second difference in both the traditional and structural break unit root tests. Only after first differencing did the dependent variable (RGDP) achieve stationarity, indicating that the essential and sufficient conditions for implementing the ARDL method were met. The use of I(1) and I(0) variables provided theoretical justification for using the ARDL approach to test for co-integration while also ensuring the accuracy of the estimated results. The researcher then performed the bound test to determine whether the variables have a long run co-integrating relationship.

### Bounds Test to Co-integration

The ARDL bounds test technique relies on the F-test for deciding the presence of a long-run relationship between the variables under examination, and it tests for the joint significance of the model's lagged level variables. The observations in the study are annual, and the sample size is 41 with 8 parameters. Given the small number of observations and the need to maintain degrees of freedom, an ideal lag length of 2 was preferred and foisted on the dependent variable and dynamic regressors, despite the fact that the ARDL model does not require lag length uniformity. This guaranteed that the model dynamics were not constrained by too few lags and that the chosen model did not suffer from serial correlation. The results of the optimal lag length for each variable specified in Equation 1 was automatically predicted to be (2, 1, 1, 2, 0, 2, 2, 1, 1) being the most efficient of the top 20 estimated models. The results obtained from the ARDL bounds testing approach and the estimated F-test are contained in table 5.

**Table 5:** ARDL Bounds Test for Co-Integration Results

Model	F- Statistics	K	Critical Values			Decision
LOGRGDP=f(L-nOIMP, LnOEXP, LnNIMP, LnNEXP, LnFDI, GFCF, EXCR, LnLBF)	7.3896	8	%	Lower Bound I(0)	Upper Bound 1(1)	Reject H0 and accept HA. Series are co-integrated
			1%	2.79	4.10	
			2.5%	2.48	3.70	
			5%	2.22	3.39	
			10%	1.96	3.06	

Table 5 compares the calculated F-statistics from the ARDL co-integration test to Narayan's critical values (2005). The results show that the null hypothesis of no co-integration is rejected. The calculated F-statistic value of 7.3896 is greater than the upper bound critical value of 4.10 at the one percent significance level, indicating the existence of a compelling long-run relationship between economic growth and various indicators of trade openness, indicating the need for a long-run analysis. The result also implies that in the long run, these variables move together, and any short-run divergence in their interaction will revert to equilibrium.

### Long-run Effects of Trade Openness on Economic Growth in Nigeria

From equation 1, the conditional ARDL long-run model was evaluated to ascertain the long-term effects of trade openness on economic growth in Nigeria. The long-run estimated results are shown in Table 6.

Table 6: ARDL Long-run Estimated Results

Variables	Coefficients	Std. Error	t-Statistic	P-Value
LnOIMP	-0.173	0.0593	-2.9199	0.0091***
LnOEXP	-0.2944	0.1139	-2.5832	0.0091***
LnNIMP	0.4981	0.1756	2.8355	0.0188**
LnNEXP	0.0344	0.0525	0.6546	0.5210 <sup>NS</sup>
LnFDI	0.1978	0.0453	4.3671	0.0004***
GFCF	-0.0274	0.0078	-3.495	0.0026***
EXCR	0.0031	0.0013	2.4543	0.0245**
LnLBF	-0.9953	1.0208	-0.9751	0.3424 <sup>NS</sup>

Notes: (\*\*\*) Significant at the 1% level, (\*\*) Significant at 5% level while NS denotes Not Significant.

In accordance with its theoretically hypothesized sign, the long-run coefficient of Total Oil Imports (LnOIMP) is negatively correlated with economic growth and statistically significant at the one percent level. From the findings in Table 6, a percentage increase in oil imports in Nigeria will, all else being equal, slow economic growth by 17.30 percent. The outcome supports the mercantilists' and factor endowment theory postulations that countries can maximise the benefit from trade openness, ramp up production efficiencies, and spur growth by exporting goods which make intensive use of those factors that are locally abundant while importing goods that make intensive use of factors that are locally scarce. Nigeria is primarily a mono-economy, with enormous crude oil and gas resources to build infrastructures, stimulate investment, create jobs, reduce poverty and accelerate growth. Paradoxically, Nigeria is the only OPEC country that still imports petroleum products because of a superficial lack of capacity and effectiveness to refine petroleum products to satisfy domestic demand. Spending approximately a trillion Naira per year to subsidize petroleum product imports has been a huge drain on government revenue, the country's scarce foreign exchange reserve, fuelling inflation, encouraging exchange rate volatility, and restricting growth over the last 10-20 years. The findings are consistent with those of who found significant evidence of a negative effect of non-oil imports on economic growth of Iraq, Namibia and Nigeria [16,30,40].

The long-run coefficient of Total Oil Exports (LnOEXP) in violation of its theoretically hypothesized sign, generated a negative impact on economic growth that is statistically significant at one percent level. Based on Table 6, a percentage increase in total oil exports, while holding other explanatory variables constant, elicited a decline of around 29 percent in long-term economic growth. Nigeria has been Africa's largest oil producer for decades. However, Nigeria's oil production has been dwindling owing to a variety of factors including oil asset insecurity and a deteriorating capacity to produce from a technical and market production standpoint. Technical factors such as infrastructure decay, field productivity decline, theft, and vandalism are limiting market production and the amount of crude oil Nigeria can export, refine, and sell on the domestic market. This exposes the economy to fluctuations in global oil production and prices. As a consequence, foreign exchange earnings and government revenue are drastically reduced, causing a decrease in economic growth. The deterioration in actual growth performance makes poverty reduction much more difficult. The findings are consistent with previous research by which discovered notable evidence of an adverse impact of oil exports on Nigeria's economic growth [4,36,35].

The long run coefficient of Non-Oil Imports (LnNIMP) displays a positive effect on economic growth that is significant at one percent level, suggesting that an increased in non-oil imports is required to engender growth. The findings indicate that a percentage increase in non-oil imports, all else being equal, stimulated an increase in economic growth of about 49.81 percent. Imports can support long-term economic growth by giving home enterprises access to foreign innovations and intermediary goods. In order to accelerate industrialization and diversify its productive and revenue base, Nigeria needs to import capital, intermediate, and consumer goods, which will help the country reap the benefits of technology transfer from trade openness and fast-track

long-term growth. The result conforms with the findings of and who reported a positive impact of imports on economic growth in their studies [11,30,40].

Table 6 shows that the long-run coefficient of Non-Oil Exports (LnNEXP) had a negligible positive impact on Nigerian economic growth during the review period. The result, though rightly signed, show that the Nigerian economy has not been diversified, as oil exports continue to be a major contributor to government revenue but not to the economy as a whole. The insignificant impact of non-oil exports on economic growth in Nigeria can be attributed to narrow production base, exports base dominated by low value products and over-dependence on crude oil exports. Economic diversification through non-oil product and service exports remains the path to long-term economic growth and development. Economic diversification is no longer a desirable ambitious state for the Nigerian economy; it is now a requirement for long-term economic growth. The recent COVID-19 pandemic-caused global oil shock, which comes after a long history of oil price shocks, has highlighted Nigeria's over-dependence on crude oil for its export market. With over 89 million people (45% of the population) living in poverty, and the oil-dependent state's economic vulnerabilities exacerbated by the COVID-19 pandemic, it is critical that the government, as well as private sector participants, build their short and medium-term strategy in Nigeria around the development of viable non-oil products in order to diversify the country's export market and build diverse streams of foreign exchange. To drive export diversification, market actors (both public and private) must work together to identify and catalyse key value drivers of the economy that have the potential to propel market actors (both public and private) away from oil and into non-oil sectors. The findings are consistent with those of who discovered evidences indicating a positive influence of non-oil exports on Nigerian economic growth in their studies [36,35,39].

Table 6 shows that the long-run coefficient of Foreign Direct Investment Inflow (LnFDI) has a significant positive impact on growth at the one percent level. In particular, a percentage increase in FDI inflows will, on average, result in an increase in long-run economic growth of about 19.78 percent. The coefficient's positive sign indicates that FDI is crowding-in domestic investment and promoting growth in Nigeria during the review period. Foreign direct investment (FDI) is frequently cited as a viable economic growth vehicle because it can provide greater technology transfer to host economies and is thought to be less susceptible to crisis because investors usually have better investment arrangements and understand the host country's economic realities. Nigeria requires significant inflows of foreign direct and portfolio investment to catapult growth since it is developing country with limited domestic capital formation and a lack of basic infrastructure. The findings are in agreement with previous research by and, who found that FDI has a significant beneficial impact on economic growth in Nigeria and Vietnam, respectively [16,17,34].

At the one percent probability level, the estimated coefficient of Gross Fixed Capital Formation (GFCF) in violation of a priori expectation demonstrated a significant negative impact on long-term growth. According to Table 6, a percentage increase in domestic capital formation will result in a 2.74 percent decrease in long-run economic growth. Nigeria require increased domestic investment to create jobs, an enduring improvement in the lives of ordinary citizens and a lasting reduction in poverty, Lack of strategic policy decisions, prevalent and institutional security threats create economic risks and uncertainties that alter people's saving, investing, and consumption habits, distorting the equilibrium resource allocation within a country. Insecurity in Nigeria impedes and weakens domestic investment, curtailing growth. The result is in accord with extant studies by, and which posited a significant negative relationship between domestic capital formation and long-term economic growth in Nigeria, Botswana and ECOWAS countries respectively [17,24,33].

Table 6 indicated a positive influence of Nominal Exchange Rate (EXCR) on economic growth that is significant at five percent level. Accordingly, an appreciation in the value of the Naira relative to one United States of America Dollar while other explanatory variables remain constant, results in a 0.31 percent increase in economic growth. The exchange rate is a crucial economic price that influences the attractiveness of a country's exports as well as the cost of its imports. Countries with rising currency values experience increased import

intensity and strong export growth. When a country exports more than it imports, there is a high demand for its goods and, as a result, its currency. When demand is high, prices rise and the currency appreciates in value. If a country imports more than it exports, there is less demand for its currency, and thus the currency depreciates, or loses value. Assuming that currencies are floating rather than fixed, trade balances and, as a result, currencies can swing back and forth. The result validates the trade-led growth hypothesis, pursuant to which increased trade increases levels of economic output and in harmony with earlier research by, and who reported a significant positive impact of foreign exchange rate on economic growth in Nigeria and ECOWAS countries, respectively [17,27,33].

The long run coefficient of Active Labour Force (LnLBF) motivated an insignificant negative impact on economic growth suggesting that a rapidly growing population constitutes a threat to economic growth because of its potential to decrease employment opportunities and discourage labour force mobility across industries. Further argued that rapid population growth decreases both the capital per worker and the steady-state output per worker, thereby slowing productivity and growth [38].

### Short-run Impact of Trade Openness on Economic Growth in Nigeria

In order to examine the model's short-run dynamics, the researchers estimated an unrestricted Error Correction Model (ECM) connected to the long-run relationship from equation (1) using the most efficient lag length. The short-run dynamic characteristics of the model's transition to equilibrium are listed in Table 7.

**Table 7: ARDL Short-run Estimated Results**

Variables	Coefficients	Std. Error	t-Statistic	P-Value
D(LnRGDP(-1))	-0.3269	0.1289	-2.5366	0.0207**
D(LnOIMP)	-0.0352	0.0061	-5.7763	0.0000***
D(LnOEXP)	-0.0169	0.0156	-1.0825	0.2933 <sup>NS</sup>
D(LnOEXP (-1))	0.0612	0.0102	6.0165	0.0000***
D(LnNIMP)	0.0458	0.0211	2.1752	0.0452**
D(LnNEXP)	0.0083	0.0103	0.8062	0.4306 <sup>NS</sup>
D(LnFDI)	0.0124	0.0076	1.6201	0.1226 <sup>NS</sup>
D(LnFDI(-1))	-0.0408	0.0071	-5.747	0.0000***
D(GFCF)	-0.0003	0.001	-0.2964	0.7703 <sup>MS</sup>
D(GFCF(-1))	0.0041	0.0011	3.8794	0.0011***
D(EXCR)	-0.0019	0.0002	-9.3355	0.0000***
D(LnLBF)	0.7649	0.2166	3.5311	0.0024***
C	6.2549	0.7079	8.8354	0.0000***
ECT(-1)	-0.3011	0.0342	-8.7997	0.0000***

Notes: (\*\*\*) Significant at the 1% level, (\*\*) Significant at 5% level while NS denotes Not Significant.

$$\text{Cointeq} = \text{LnRGDP} - (-0.4981***\text{LnNIMP} - 0.1730***\text{LnOIMP} - 0.2944**\text{LnOEXP} + 0.0344\text{NS LnNEXP} + 0.1978***\text{LnFDI} - 0.0274***\text{GFCF} + 0.0031** \text{EXCR} - 0.9953\text{NSLnLBF})$$

According to the results in table 7, the behaviour of the investigated variables in the short run did not change significantly, particularly in terms of the signs of the coefficients. The model's lagged error correction term (ECT(-1)) captures the dynamic long-run relationship and is correctly signed (negative) and statistically significant. The coefficient of the error correction mechanism in a single equation must lie between -1 and 0. Otherwise, the error correction term is explosive. The coefficient of the lagged error correction term in Table 7 is significant at the one percent level and has the right sign, demonstrating a consistent long-term relationship between Nigeria's economic growth and trade openness indicators. The coefficient implies that 30.11 percent

of the current year's deviation from the long run equilibrium level of output is corrected over the succeeding year. Because of the slow pace of adjustment, any short-run glitches should take about 3.32 years to recover from and return the economy to its long-run optimum growth path.

The one year lagged economic growth rate  $D(\text{LnRGDP}(-1))$  displayed a significant negative influence on the current level of GDP growth that is statistically significant at five percent level. From table 7, the short-run coefficient of the present level of oil imports  $D(\text{LnOIMP})$  in Nigeria in agreement with the long-run results motivated a negative impact on the current level of economic growth that is significant at one percent level. Clearly, a percentage increase in the present rate of oil imports in Nigeria is expected to produce about 3.52 percent decline in the current level of economic growth. The Nigerian economy is beleaguered by structural flaws that limit its ability to sustain growth, create jobs, and alleviate poverty. Despite its vast oil and gas resources, Nigeria is the only OPEC country that imports petroleum products to meet domestic consumption needs due to corruption, malfeasance, and a top rate inefficiency that is affecting every aspect of the Nigerian economy.

The current level of Oil Exports  $D(\text{LnOEXP})$  in consonance with the long-run results, is inversely related to the current level of economic growth but statistically insignificant. In contrast to the long-run result, the coefficient of the one-period lag of Oil Exports  $D(\text{LnOEXP}(-))$  reinforced a positive and significant impact on the current level of growth at the one percent probability level. As a result, a percentage increase in previous levels of oil exports engendered a 6.12 percent increase in current economic growth. For decades, Nigeria has relied on volatile oil revenue for commercial, fiscal, and foreign exchange operations, while ignoring the agricultural and solid mineral sectors, which would have enlarged the country's productive and revenue base. Other economic sectors' competitiveness has also declined dramatically over the years, while productivity in the non-oil sector of the economy has suffered. As a result, its growth trajectory has been erratic and non-inclusive, owing to the tribulations of oil prices [30]. According to an emerging trend, the economy has grown without creating jobs or reducing poverty over the last seven years. Expectedly, the government's focus had shifted to non-oil export as a way out of this quandary.

The short-run coefficient of present level of Non-Oil Imports  $D(\text{LnNIMP})$  in concord with the long-run result initiated a positive impact on the current level of economic growth that is significant at five percent level. Specifically, a percentage increase in the current level of Non-oil imports activated a rise of about 4.58 percent in the current rate of economic growth. The coefficient of present rate of Non-Oil Exports  $D(\text{LnNEXP})$  in agreement with the long-run result is accompanied by a statistically unimportant positive impact on the current level of economic growth.

From Table 7, the current level of foreign direct investment inflow  $D(\text{LnFDI})$  in covenant with the long-run result is positively linked to the current level of economic growth in Nigeria and statistically irrelevant. However, the coefficient of the one-period lag of the log of foreign direct investment inflow  $D(\text{LnFDI}(-))$  in difference with the long-run result, is associated with a negative impact on the current level of economic growth that is significant at one percent probability level. Evidently, a percentage increase in previous levels of foreign direct investment inflow motivated a decline of about 4.08 percent in the current rate of economic growth. While it appears that FDI can provide greater technology transfer to host economies, one-year lagged FDI results show that Nigeria has not successfully attracted FDI commensurate with its vast resources or achieved a high growth rate since it failed to create the intellectual capital to profit from foreign investment. The government's apparent inability to create a secure and safe atmosphere for people, property, and the performance of business and economic activities is causing a progressive implosion of foreign direct and portfolio investment from Nigeria to other West African countries, which has a deleterious impact on government revenue generation and economic growth.

Gross fixed capital formation in the current period  $D(\text{GFCF})$  in accord with the long-run results had a negligible

negative impact on the current level of growth, whereas its one-year lag value  $D(\text{GFCF}(-1))$  is positively related to the current level of economic growth and significant at the one percent level. Accordingly, a percentage increase in the variable's one-year lag value increases the current rate of economic growth by approximately 0.41 percent. Increased domestic investment is critical for increasing the supply side of the economy's production capacity, which leads to increased output and exports.

The current level of Naira exchange rate to the United States of American Dollar  $D(\text{EXCR})$  in disparity with the long-run result activated a significant negative influence on the current rate of economic growth at one percent probability level. Specifically, a percentage point increase in current Naira exchange rate stimulated about 0.19 percent decrease in the current level of economic growth. Exchange rates do have an impact on price stability and growth in international trade. In the long run, exchange rates track relative prices. As one country's currency exchange rate rises, imports to that country become cheaper, while exports to other countries become more expensive. Exchange rate volatility usually has a deleterious impact on trade. The magnitude of this impact is determined by a variety of factors, including the availability of hedging instruments, production structure, and extent of economic integration. As a result, currency depreciation results in lower export prices paid by foreigners and higher import prices, which leads to an increase in exports and a decrease in imports. Depreciation would generally increase a country's exports while decreasing imports due to changes in terms of trade and the effect of price elasticity of demand [11].

Active Labour Force in the current period  $D(\text{LnLBF})$  in contradiction with the long-run results activated a positive impact on the current level of economic growth that is significant at one percent level. Clearly, a percentage increase in labour force, keeping all else the same, produced an increase of about 7.65 percent in the current level of economic growth. The result is in accord with the findings of and who found that a fast-growing population offers an opportunity for growth and development since rapid population growth can lead to technology-pushed and demand-pulled growth, thereby significantly improving both income per capita and living standard [16,17].

### Granger Causality Test Analysis

Having defined that more than two variables in the growth model are first differenced stationary,  $I(1)$  and co-integrated suggesting that a causal relationship exists in at least one direction, the analysis progressed to perform the pairwise Granger causality test to confirm our ARDL results. The pairwise Granger causality tests results are reported in Table 8. To keep track of the findings, the researcher reported only the relevant estimates of the findings of the causality test between economic growth and its predictors.

**Table 8:** Granger Causality Test Results for economic growth and its predictors

Null Hypothesis	Obs.	F-Statistic	Prob.
LnNIMP does not Granger Cause LnRGDP	40	3.79059	0.0502**
LnRGDP does not Granger Cause LnNIMP		0.16324	0.6885NS
LnOIMP does not Granger Cause LnRGDP	40	6.30757	0.0165**
LnRGDP does not Granger Cause LnOIMP		0.16333	0.6884NS
LnOEXP does not Granger Cause LnRGDP	40	8.09951	0.0072***
LnRGDP does not Granger Cause LnOEXP		0.53452	0.4693NS
LnNEXP does not Granger Cause LnRGDP	40	6.75212	0.0134***
LnRGDP does not Granger Cause LnNEXP		0.14365	0.7078NS
LnFDI does not Granger Cause LnRGDP	40	4.19499	0.0477**
LnRGDP does not Granger Cause LnFDI		4.42087	0.0424**
GFCF does not Granger Cause LnRGDP	40	17.6131	0.0002***

LnRGDP does not Granger Cause GFCF		0.00204	0.9642NS
EXCR does not Granger Cause LnRGDP	40	0.025	0.8752NS
LnRGDP does not Granger Cause EXCR		0.46657	0.4988NS
LnLBF does not Granger Cause LnRGDP	40	4.4048	0.0427**
LnRGDP does not Granger Cause LnLBF		0.17149	0.6812NS

Notes: (\*\*\*) Significant at the 1% level, (\*\*) Significant at 5% level while NS denotes Not Significant.

From table 8, it is evident that the null hypotheses which state that changes in non-oil imports do not Granger-cause variations in economic growth could be overwhelmingly rejected at five percent probability level. This implies that changes in non-oil imports significantly motivated economic growth in Nigeria. The null hypotheses which states that economic growth does not Granger-cause changes in non-oil imports could not be decisively rejected at any acceptable level of probability. This means that changes in economic growth do not explain the variations in non-oil imports as the results in table 8 found significant evidence of a uni-directional causality flowing from non-oil imports to economic growth in Nigeria during the review period. The Granger causality test results between oil imports and economic growth detected a uni-directional relationship between these variables that is significant at five percent level with causality running from oil imports to economic growth.

The results of the Granger causality tests in table 8 also indicated that changes in oil exports does not Granger-cause variations in economic growth in Nigeria and is significant at one percent probability level. This suggests that oil export causes economic growth at one percent significance level. However, the causality results failed to conclusively reject the null hypothesis that economic growth does not Granger-cause changes in oil export at any acceptable level of probability. This means that there is a uni-directional causality running from variations in oil exports to economic growth at one percent significance level. Similarly, the causality results contained in table 8 decisively rejected the null hypothesis in favour of the alternative hypothesis that changes in non-oil exports do not Granger-cause variations in economic growth at one percent significance level. This implies that there exist a uni-directional causality running from non-oil exports to economic growth at one percent level of probability.

What is intuitive however, is the understanding that oil exports Granger causes economic growth in Nigeria. While Nigeria is one of the leading oil producing countries in the world, it should be noted that the finding is not sustainable because oil is an international product whose price is determined by developments in the global oil market and the Organization of Petroleum Exporting Countries (OPEC) cartel pricing policy. The over-dependence on volatile oil revenue for government fiscal operations accounts for the Nigerian economy being one of the most volatile in the world, feeble economic growth trajectory and a manifestation of the Dutch-disease syndrome [30].

Furthermore, table 8 also shows significant evidence in support of a bi-directional causal relationship between foreign direct investment inflows and economic growth which implies that causation flows in both directions as both variables Granger-causes each other at five percent level of probability. This causality result is consistent with the findings of the ARDL long and short-run results and the realities of the Nigerian economy. Increased FDI inflows could result in significant improvements in the level of economic growth while increased provision of basic infrastructures and appropriate fiscal incentives could reduce the cost of doing business and attract more FDI into the country.

The causal relationship between Gross Domestic Capital Formation and economic growth indicated a one-way causal relationship that was significant at one percent probability level with causality running from domestic capital formation to economic growth while no causal relationship was detected both ways between nominal exchange rate and economic growth as the null hypotheses could not be convincingly rejected at any

acceptable level of probability. This implies that an independent relationship exists between the nominal exchange rate and economic growth in Nigeria as both variables do not Granger cause each other. The results can be attributed to the volatile nature of the Naira exchange rate and its competitive devaluations over the years. Clearly, there also exists a strong unidirectional causality from labour force to economic growth that is significant at five percent level indicating that increase in labour force stimulates growth.

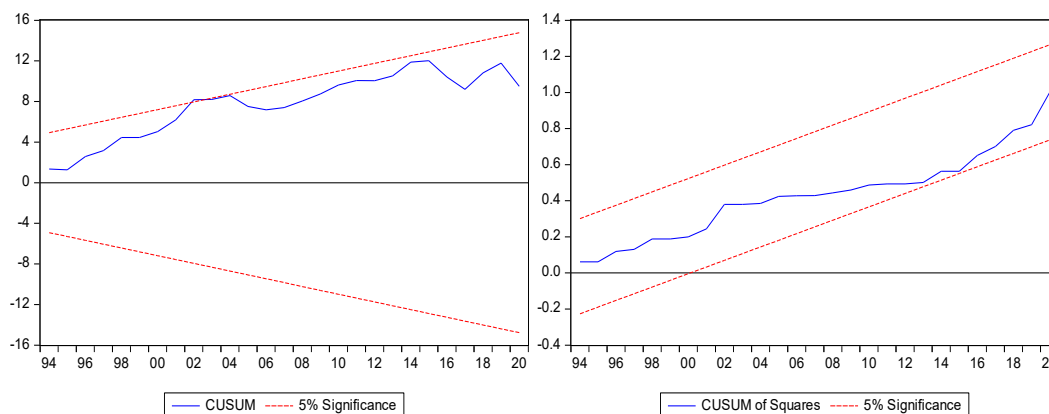
**Econometric Diagnostics Checks.**

Using various diagnostics tests, the estimated model regressors were checked for normality, serial correlation, heteroscedasticity, and specification errors. The results of the diagnostics tests are presented in table 9.

**Table 9: Diagnostics Tests Results**

Problem	Test	Probability	Conclusion
Normality	Jarque Bera	0.7215	Normality exists
Serial Correlation	Breusch-Godfrey LM Test	0.6569	No serial correlation
Heteroscedasticity	Breusch-Pagan-Godfrey	0.3713	No heteroscedasticity
Specification Error	Ramsey RESET	0.1406	Correctly specified

The diagnostic test statistics in Table 9 show that the model's residuals are normally distributed and have no problems with multi-collinearity, serial correlation, heteroscedasticity, or model misspecification error. Because the preceding qualities are desirable for OLS models, the estimated model is regarded as properly defined. The CUSUM and CUSUM of squares tests, depicted in Figures 1 and 2 are within the critical bounds at 5 percent level of significance, confirming that the model's predicted values are pretty good for structural changes and that the estimated coefficients are credible and satisfactory for predictive modelling and decision-making.



**Figure 1: CUSUM Test Figure 2: CUSUMSQR Test**

**Conclusion and policy implications**

Several macroeconomic vulnerabilities, such as increased inflationary pressure, chronic unemployment, persistently unfavourable balance of payments, continued depletion of foreign reserves, decline in exports, and intensified exchange rate depreciation, have hampered Nigeria's ability to achieve inclusive growth over the years. Despite significant macroeconomic policy alignment, Nigeria has been unable to leverage her productive capacity for rapid economic growth. Given that Nigeria has undergone two major trade policy changes involving import substitution industrialization and an export promotion strategy, this study conducted a disaggregated analysis of the impact of various metrics of trade openness on Nigerian economic growth from 1980 to 2020. Measures of trade openness were disaggregated into oil and non-oil exports and imports, respectively, while the nominal exchange rate, foreign direct investment inflows, gross fixed capital formation and labour

force were used as control variables, and their relative effects on economic growth tested using the ARDL procedure. Furthermore, the Toda and Yamamoto Granger-causality approach was used to unravel the direction of causality between trade openness and economic growth in Nigeria.

The empirical findings confirm co-integration among the study variables and show that oil imports have a noteworthy negative impact on Nigerian economic growth in both the long and short run. Total oil export and oil import were both detrimental to growth in the long and short-run reflecting the manifestation of resource-curse or the Dutch disease syndrome in the Nigerian economy. Non-oil imports considerably accelerated growth in the long and short term while non-oil exports had a positive impact on growth that is inconsequential over the long nor short run. Foreign direct investment inflows prompted a beneficial impact on growth that is significant only in the long-run. The nominal exchange rate inspired growth in the long run while noticeably slowing growth in the short run. Domestic capital formation was growth inhibiting but important only in the long-run while labour force that was growth retarding in the long-run but suggestively promoted growth in the short-run. The causality test results revealed a bi-directional causality between foreign direct investment inflow and economic growth while a notable one-way causal relationship was detected flowing from oil and non-oil imports and exports, domestic capital formation and labour force to economic growth.

Based on the results, it can be concluded that international trade represented by oil and non-oil imports and exports has an impact that deviates from the theory that imports have a negative effect on economic growth while exports have a positive effect but confirming the resource curse hypothesis in Nigeria. This must be a concern for the government to prioritize export diversification from oil to non-oil sources and the introduction of tariffs and quotas to restrict more oil imports. There has never been a better time to promote the advancement of non-oil exports, given the world's rapid transition from fossil fuel to renewable and clean energy alternatives. Economic diversification through the export of non-oil products and services is the key to achieving sustainable economic growth. To promote export diversification, concerted efforts must be made to identify and

stimulate the key economic value drivers that have the potential to encourage market actors (both public and private) to shift away from the oil industry and into non-oil sectors. Such a concerted effort should aim to provide an export diversification pathway through trade by highlighting sustainable non-oil products, particularly those related to agriculture, solid minerals, manufacturing, and industry with the potential to transform the economy.

Furthermore, the positive impact of FDI on growth in the long run suggests that policymakers should evaluate the investment process or conditions and focus more on existing trade policies that can lure foreign investors, increase capital inflows and boost economic growth. Escalating trade openness is likely to subject the economy to exogenous shocks, which could endanger fiscal sustainability, the balance of payments, and economic growth. Since the nominal exchange rate inspired growth in the long run but remarkably inhibited it in the short run, the study recommends that policymakers should implement a managed float of the currency as against letting the exchange rate float freely in response to macroeconomic shocks or the fixed exchange rate regimes, in which the monetary authority commits to keeping the nominal exchange rate at a given value, effectively giving up on conducting an autonomous monetary policy to minimise exchange rate volatility. As excess demand for foreign currency weakens the domestic currency, the study recommends stockpiling foreign currency to mitigate the impact of exchange rate volatility and optimize resource mobilization.

The results also show that the effect of labour participation is an important part in supporting the economic growth schemes that directly impact the quality of the workforce in the short term. Trade policy should drive improvements in capital-intensive sectors that can boost human capital development capable of assimilating innovative technologies. This has implications for labour productivity that can positively impact growth in the long run. The study also proposed greater integration of the informal sector into the mainstream economy, as well as significant investments in raw produce processing to increase the value addition to exportable products. The government should embark on a conscientious trade liberalization while protecting domestic industries to give them enough time to grow and compete with rivals in the developed world.

Despite the fact that the current research produced pertinent empirical findings and policy recommendations for Nigeria, it is essential to acknowledge its limitations, primarily related to data availability and quality, the use of proxy variables, potential omitted variable bias and methodological constraints that may be taken into consideration in future research. One fundamental attribute of time-series models is that the inclusion of excessive variables might have an impact on the dependability of the model. One of the limitations of this research is the lack of full inclusion of all pertinent factors related to financial liberalization. Future studies should concentrate on specific harmful globalisation or excessive economic liberalization practices, such as climate change or CO<sub>2</sub> emissions, and their effects on economic growth and contemplate broadening the scope of their study to include the subject of financial liberalization, specifically focusing on capital and foreign currency transactions, and delving into its ramifications on overall economic growth. Moreover, asymmetric dynamic responses and time varying coefficient which cannot be calculated by the linear ARDL methodology are popular in the empirical literature of time series. Therefore, it may be important to combine the ARDL method with a time-varying modelling technique like the Quantile ARDL (QARDL), or Nonlinear ARDL (NARDL) in order to produce more interesting results on the asymmetric effects of these variables on economic growth. Future research should address these limitations by expanding the scope of analysis, incorporating additional variables, exploring nonlinearities and threshold effects, utilising alternative methodologies.

## References

1. Abdulkarim Y, Mohd S (2023) Nonlinear effects of public debt on economic growth in Nigeria *SN Business & Economics* 3: 1-31.
2. Abdulkarim Y, Mohd S (2022) Growth and fiscal effects of insecurity on the Nigerian economy. *European Journal of Development Research* 1-27.
3. Abdulkarim Y, Mohd S (2021) The impact of fiscal policy variables on private investment in Nigeria. *African Finance Journal* 23: 41-55.
4. Agu O C, Ajoje I O, Olubunmi O (2022) Reassessing the influence of oil price on economic growth and some macroeconomic indicators in Nigeria. *African Journal of Economic Review* 8:176-197.
5. Aminuddin A, Mustika N M, Muhammad A Z, Ahmad K (2024) International trade and economic growth in ASEAN. *Jurnal Kebijakan Ekonomi dan Keuangan* 3: 109-115.
6. Asnake G A, Liu H (2020) The impact of trade openness on human capital development and economic growth in Ethiopia. *Management and Human Resource Research Journal* 9: 1-18.
7. Central Bank of Nigeria (CBN) (2022) Annual Report and Statistical Bulletin, Abuja, Nigeria.
8. Charles M G (2022) Trade openness and female employment: An empirical sectoral analysis from Kenya. *International Journal of Science and Business* 16: 42-58.
9. Christopher N, Paul A O, Alex Oi I (2024) Fiscal policy and inclusive growth in Nigeria. *World Journal of Advanced Research and Reviews* 22: 1715-1732.
10. Dickey D A, Fuller W A (1981) Distribution of the estimators for autoregressive Time-series with a unit root. *Journal of American Statistical Association* 74:427-431.
11. Emehelu C I (2021) Effects of international trade on economic growth of Nigeria. *International Journal of Innovative Finance and Economic Research* 9: 144-157.
12. Engel R F, Granger C W F (1987) Cointegration and error correction representation: Estimation and testing. *Econometrica* 55: 25-39
13. Hailat M, Magableh S, Ababneh H (2023) "Foreign reserves Under chronic trade deficit in developing context, an ARDL approach: Evidence from Jordan", *Montenegrin Journal of Economics* 19: 79-87.
14. Heckscher E F, Ohlin B (1991) Heckscher-Ohlin trade theory, translated, edited, and introduced by Harry Flam and M June Flanders, Cambridge, Mass, MIT Press 1991.
15. Heresi R, Eric P (2023) Trade openness and exchange rate management, Inter-America Development Bank IDB working paper series No. IDB-WP-1563.
16. Idan A M (2023) The role of exports, development, imports and trade openness on the economic growth in Iraq: Assessment using the ARDL Co-integration method. *International Journal of Economics and Finance Studies* 15: 80-100.
17. Ijirshar, Victor U. (2019): Impact of trade openness on economic growth among ECOWAS countries: 1975-2017. *CBN Journal of Applied Statistics* 10: 75-96.

18. Imadeddin AA, Mohamed AA (2024) The relationship between economic growth and trade openness: Comparison of high- and middle-income countries. *Journal of Administrative and Economic Sciences* 17: 39-56.
19. International Monetary Fund (2022) *International financial statistics*. Washington, D.C.: IMF.
20. Juliansyah H, Ganesha Y, Ichsan I, Nailufar F, Terfiadi S Y (2022) Effect of export import and investment on economic growth In Indonesia (VECM Analysis Method). *Journal of Malikusaleh Public Economics* 5: 16-32.
21. Kazeem A S, Joel H E (2023) Trade openness, foreign direct investment and economic growth: Case of Southern African Development Community, *Cuadernos de Economía* 46: 64-74.
22. Kunofiwa Tsurai (2024) Impact of trade openness on tax revenue in transitional markets. *Journal of Accounting and Management* 14: 1-13.
23. Lingaraj M, Smruti R B (2020) Does trade openness affect economic growth in India? Evidence from threshold co-integration with asymmetric adjustment, *Cogent Economics & Finance* 8: 1782659.
24. Malefa M R (2020) Trade openness and economic growth in Botswana: Evidence from co-integration and error-correction modelling, *Cogent Economics & Finance* 8: 1783878.
26. Nguyen Xuan Dung, Phan Thi Hang Nga, Le Thi Thuy Hang (2024) Asymmetric effects of international trade and foreign direct investment on economic growth: Empirical evidence from Vietnam. *Journal of Social Economics Research* 11: 250-261
27. Omar A A, Amro A B, Hasan A (2022) The impact of fiscal policy and trade liberalisation on economic growth: Evidence from structural breaks for Jordan. *International Journal of Professional Business Review* 7: 1-16.
28. Onuorah A C (2018) Trade liberalization and economic growth in Nigeria. *International Journal of Advance Research* 6: 389-400.
29. Pesaran M H, Shin Y (2001) Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics* 16: 289-326.
30. Phillips P, Perron P (1988) Testing for a unit root in time series regression. *Biometrika* 75: 335-346.
31. Philip C O, Silva O C (2021) Trade openness and economic growth nexus: Exploring the role of institutional quality in Nigeria, *Cogent Economics & Finance* 9: 1868686.
32. Ricardo D (1817) *On the principles of political economy, and taxation*. Cambridge University Press.
33. Romer P M (1990) The origin of endogenous growth. *Journal of Economic Perspectives* 8: 3-22.
34. Salami L A, Maku O E, Adelowokan O A, Oye-wole S A, Toriola A K (2022) Trade liberalization and economic growth in Nigeria: Evidence from Gauss Markov regime switching model. *Rajasthali Journal* 1: 1-12.
35. Saleem H, Shabbir M S, Bilal Khan M (2020) The short-run and long-run dynamics among FDI, trade openness and economic growth: using a bootstrap ARDL test for co-integration in selected South Asian countries. *South Asian Journal of Business Studies* 9: 279-295.
36. Samuel O A, Auta I A, Awjola A A (2019) Oil exportation and economic growth in Nigeria. *Developing Countries Studies* 5: 83-93.
37. Samuel O A, Bello O J (2022) Modelling the effects of crude oil production and other factors on Nigeria's economy: An Autoregressive distributed lag (ARDL) approach. *Science Archives* 3: 72-79.
38. Smith A (1776) *An inquiry into the nature and causes of the wealth of Nations*. University of Chicago Press.
39. Solow R M (1956) A contribution to the theory of economic growth. *Quarterly Journal of Economics* 70: 65-94.
40. Sunday E, Ahmed B M (2019) Dynamic impact of trade openness on the economic growth of Nigeria. *International Journal of Engineering and Advanced Technology* 8: 609-616.
41. Sunde T, Tafirenyika B, Adeyanju A (2023) Testing the Impact of Exports, Imports, and Trade Openness on Economic Growth in Namibia: Assessment Using the ARDL Cointegration Method. *Economies* 11: 86.
42. Tahir M, Norulazidah O A, Imran N, Umar B (2023) Trade openness and inflation rate in China: Empirical evidence from time series data. *Economies* 11: 240 -257.
43. Toda H Y, Yamamoto T (1995) Statistical inference in Vector Auto-regressions with possibly integrated processes. *Journal of Econometrics* 66: 225-250.
44. Udi J, Tajudeen O B, Alfred A M, Afolabi L O (2024) A comparative assessment of the contribution of foreign direct investment to economic development of Nigeria and Ghana. *Regional Economic*

- Development Research 5: 18-34.
45. UNCTAD (2022) A practical guide to trade policy analysis. United Nations.
  46. World Bank (2022) World development indicators. [www.worldbank.org](http://www.worldbank.org)
  47. Yaya K (2017) The impact of trade openness on economic growth: The case of Cote
  48. d'Ivoire, Cogent Economics & Finance 5: 1332820.
  49. Zahonogo P (2017) Trade and economic growth in developing countries: Evidence from sub-Saharan Africa. *Journal of African Trade* 3: 41-46.
  50. Zivot E, Andrews D W K (1992) Further evidence on the Great Crash, the oil-price shock, and the unit root hypothesis. *Journal of Business, Economics and Statistics* 106: 251-270.