Poverty Reducing Effect of Trade Openness: The Nigerian Experience

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ABSTRACT

The research analyzes the connection between trade openness and the poverty situation in Nigeria for 2000-2024, particularly paying attention to the impact of the trade openness, the volume of imports and exports on the poverty reduction in Nigeria. The primary objective of the research is to analyze the level of impact of trade openness on poverty, the impact of imports on poverty rates and the connection between export volumes and poverty in Nigeria. According to the review of the existing literature, there are several gaps: firstly, previous research analyzes either the global economy or the region excluding Nigeria, which fails to consider the specific economic features of the country, including the dependence on the oil production and regional differences. Secondly, most previous research uses trade indexes calculated since simple trade level figures and the outdated statistics, which do not allow reflecting dynamic long-term connections and shocks occurred after 2022, including the global crisis. Through the application of the descriptive survey design, it becomes feasible to conduct an in-depth analysis of the link between trade and poverty using secondary data for a period of 25 years. The results have revealed that the rates of poverty are highly significant in countries with high trade openness and high export volumes; however, the import level is found to significantly reduce poverty in Nigeria. This implies that the efforts aimed at reducing poverty in Nigeria through import-based strategies may become more difficult due to the relationship between the volume of exports and poverty. Recommendations made in this study include the need for strict measures in matters relating to trade policy to ensure fair gains from trade openness, proper management of imports and diversification of exports from oil to agriculture and manufacturing. Further research into foreign direct investment, small and medium enterprises, and microfinance in relation to poverty is recommended.

Keywords: Trade Openness; Poverty Reduction; Import Volume; Export Volume; ARDL Model.

1.1 INTRODUCTION

The relationship between Nigeria and international trade has gone through a lot of changes over the centuries, from pre-colonial days with extensive inter-ethnic trade to the present-day economy, dominated by trade in oil. One of the most contentious and critical debates in Nigeria's economic policy is whether increased trade openness is truly effective and has a significant impact on reducing poverty. The study explored the correlation between trade openness and poverty rate in Nigeria between 2000-2024 and examined the impact of the twenty first century external shocks such as the oil price crash in 2014, the COVID-19 pandemic and the supply chain disruptions caused by the Russia-Ukraine war in 2022, the liberalisation initiatives of the Structural Adjustment Programme era, and the consolidation of democratic governance from 2000 respectively.

To classical development economics and modern development economics, openness of trade, defined as the level of integration of an economy into international markets, which is usually calculated as the ratio of the total value of exports and imports to the gross domestic product (GDP), is considered to be a potential factor of economic growth, jobs and income distribution. The intellectual underpinning of much of the free trade advocacy that has guided policy in Nigeria since the mid-1980s is Adam Smith's argument (The Wealth of Nations, 1776) that specialisation and exchange contribute to the welfare of the nation. The argument of Adam Smith, The Wealth of Nations (1776), that the welfare of the nation is increased by specialisation and exchange, which was later developed by David Ricardo's theory of comparative advantage, forms the intellectual basis of much of the free trade advocacy that has guided policy in Nigeria since the mid 1980s. But dependency theorists like Andre Gunder Frank and Immanuel Wallerstein remind us that the structure of the market in which developing countries make their trade can also increase, not reduce, the level of poverty, especially when the developing countries are specializing in primary commodity exports, and importing manufactured goods and services with higher value-added content.

Nigeria is uneasily positioned between these two theoretical worlds. It is a country of huge resource wealth; more than 200 million people; immense agricultural area and known petroleum reserves, but it is always one of the countries with the largest absolute number of poor people. According to the World Bank (2021), the economic contraction caused by the Covid-19 pandemic would further push more than 40 percent of Nigerians (about 83 million people) into poverty, according to the National Bureau of Statistics (NBS, 2020). This conundrum of resources-rich regions alongside high poverty rates has prompted research and policy analysis on the impacts of the structure and policies of trade on poverty outcomes.The juxtaposition of resource wealth and high poverty levels has generated interest in the part that might be played by the structure and policy of trade in shaping poverty outcomes.

The country is mainly an exporter of petroleum products, and in the past petroleum exports have generated over 90 per cent of export revenue (NBS, 2020; World Bank, 2020). The mono-commodity dependence creates high exposure to price fluctuations in the global market: When oil prices dropped in 2014-2016, Nigeria experienced its first recession in more than 20 years. In addition, non-oil exports, which consist of agricultural commodities like cocoa, sesame and cashew nuts, manufactured goods and other commodities, are inadequately developed, and the import bill is high due to the importation of refined petroleum products, machinery, pharmaceuticals, and food items that are not being produced in substantial quantities and quality in the country. This causes trade deficits, depletes foreign exchange reserves, degrades the currency and introduces inflationary pressures, which are disproportionately felt by the poor.

In this background, the problem statement of the research is clear. While more openness in trade is expected to boost growth and poverty alleviation, the fact that Nigeria continues to face high poverty rates indicates that such a link is not automatic or direct. The findings from the past studies are mixed, as some studies point to the manner by which countries in Sub Saharan Africa have experienced poverty reduction impacts of trade liberalisation in the long-run, while others conclude that trade liberalisation has had adverse impacts in the short-run or only had positive impacts on certain groups in society. Critically, there is no study that has specifically analyzed the disaggregated impact of trade openness by both the scale of trade openness (import volume, export volume and overall openness) and the extended period of time for Nigeria 2000-2024, which covers both the pre-democratic and post-democratic era and a number of significant external shocks. This study is filling that void.

The aim of the study is three-fold. First, it aims at establishing the impact of trade openness on the poverty rate in Nigeria during the period of study. Second, it analyzes the relationship between the level of imports and poverty rates. Thirdly, it examines the effect of exports on the poverty rate. The above objectives are based on three hypotheses that trade openness does not significantly affect poverty rates, import volume does not significantly affect poverty rates and export volume does not significantly affect poverty rates. The alternative hypothesis will be tested against each null hypothesis at the 0.05 level of significance using the ARDL model which is suitable for capturing the short run dynamics and long run equilibrium relationships in time series data.

Macro-level and national level, with secondary data from NBS, the World Bank and the International Monetary Fund (IMF). The period 2000-2024 has been selected mindfully to represent a complete historical period of Nigeria's economy since the SAP, with a span of 25 years of annual data sufficient to capture structural trends and turning points. Findings are not broken down by region or by demographic group but are presented at the national level as an econometric evaluation from which policy implications can be drawn.

Studying has importance in three aspects. It enhances the study on academic scholarship by making an econometric analysis which is rigorous, Nigeria specific and fills in the gaps in the literature relating to geographical, methodological and recency aspects. For policy makers it provides evidence-based policy advice on whether import management, export promotion or overall openness have the largest impact on poverty reduction and on which policy alternatives have the most impact. From the side of civil society and development practitioners, it underscores the notion that at the centre of trade policy is social policy the very conditions under which Nigeria trades with the world directly impact the livelihoods of millions of the poorest and most vulnerable people in the country.

LITERATURE REVIEW

Overview of the Concept of Trade Openness

Trade Openness is the ratio of the total value of a country's trade (both exports and imports) to its gross domestic product (GDP). According to the classical economists such as Adam Smith, trade liberalisation and openness create competitive environment by specialisation of trade, which utilises the comparative advantage by allocating resources in the best possible manner (Bhatti et al., 2011). Competition maximises the allocation of domestic resources and improves total productivity, thus promoting economic growth. Recent research also has confirmed that more open trade is associated with better domestic economic outcomes, as nations access more resources and markets from abroad (Coe, Helpman, & Hoffmaister, 2020).

The introduction of the Structural Adjustment Programme (SAP) in 1986 that was designed to liberalize the Nigerian economy and to boost export-led growth, made trade openness an important policy tool in Nigeria (Ewe-Ghee & Raseed, 2020). Traditionally, the openness of trade is measured by the trade-to-GDP ratio, which is the ratio of total trade to GDP (exports plus imports). To gain more insightful information, other methods like the Pitched Index have been developed, which regress trade intensity against socioeconomic factors such as population and economic output (Bhatti et al., 2011; Amin & Turok, 2022). In addition to its numerical aspects, openness to trade is associated with the endogenous growth theory, which holds that liberalisation would provide dynamic effects in the form of better access to low-cost intermediate products and more advanced technologies that would lead to increased productivity and competition (Agenor, 2004; Dollar & Kraay, 2004).

The literature, however, shows some inconclusive answers to the effect of trade openness in developing nations such as Nigeria. The advantages are very different depending on the local market conditions, infrastructure and government policies (Oyejide, 2019). Also, data consistency is an issue, and aggregate trade-to-GDP ratios can mask the intricacies of trade policies (Edoh & Ojo, 2022). However, with these challenges, recent studies indicate that increase in international trade can create employment and enhance income generation to alleviate poverty (Okeowo & Adeniran, 2021).

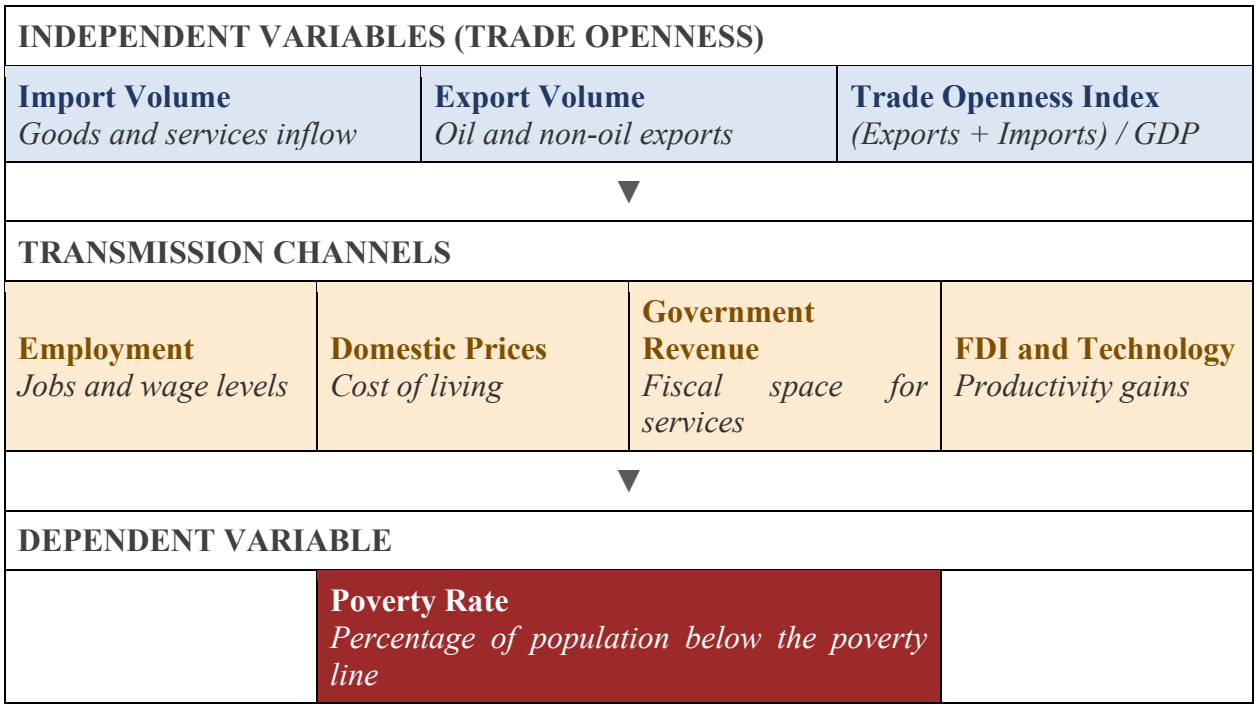
Poverty Rate in Nigeria

Poverty in Nigeria is multifaceted and not just about the lack of income, it is also characterized by lack of food, lack of health care, lack of education and lack of potable water (Central Bank of Nigeria 2010). The World Bank has defined extreme poverty, using the indicator of poverty as survival on $1.90 a day, but this income-focused definition is broadly criticized as not considering other factors of well-being, particularly health and education (Oyekale, 2022). The capability approach developed by Sen (1999) is more a comprehensive framework, including health, education and the environmental aspects, and seen in the Human Development Index (HDI), which combines life expectancy, education and income per capita (UNDP, 2021).

Economic mismanagement, corruption, poor governance, and lack of infrastructure have led to a dramatic increase in poverty rates in the past, with rates reaching as high as 90.8 percent in some assessments in 2022 (IMF, 2020; MacroTrends, 2022). The COVID-19 pandemic has made these vulnerabilities worse, and Nigeria may face another five million people becoming extremely poor by the end of 2021 due to the pandemic (World Bank 2021). A multi-dimensional approach to the challenge would involve trade-based economic growth and specific social schemes (Rasiah & Govind, 2019; Ogunleye & Ogundipe, 2021).

Figure 1

Conceptual Framework of the Poverty-Reducing Effect of Trade Openness in Nigeria



Note. Author's conceptualisation (2026).

Figure 1 presents the revised conceptual framework for the study. Import volume, export volume and the trade openness index constitute the independent variables, representing Nigeria's deepening integration into global markets. Their effects reach poverty through four transmission channels: employment generation, domestic price stability, government revenue, and foreign direct investment with technology transfer. These channels jointly determine the dependent variable, the poverty rate, measured as the percentage of Nigerians living below the poverty line. Infrastructure, trade policy, oil price shocks and governance operate as moderate context, strengthening or weakening each pathway. Consequently, trade openness reduces poverty only when supportive conditions exist.

This study was conducted based on a conceptual framework as shown above. The three main indicators of trade openness import volume, export volume, and trade-to-GDP ratio are used to operationalise trade openness, which then has four intermediate channels of impact on poverty: employment and wages; domestic prices; government revenue; and foreign direct investment (FDI) and technology transfer. The ultimate outcome variable is Nigeria's national poverty rate. Importantly, the context in which these transmission pathways take place from infrastructure quality to the design of trade policies, to oil price volatility, to the overall governance framework is also acknowledged as shaping the actual outcomes of the potential benefits of openness for the real world.

The years 2000-2024-mark key turning points in the three areas of the framework. Compounding shocks were created in the early years by the Structural Adjustment Programme, in 2000 by the return of civilian governments in trade governance, in 2005-2008 by the commodity boom that caused fiscal windfalls to several of the countries, in 2014 by the oil crash which revealed the fragility of mono-commodity dependence, and in

the post-2020 period by the global pandemic and the European conflict that re-priced food and energy across countries that are import-dependent. The analysis that follows aims to map the effect of these structural and cyclical forces on the lives of Nigerians over more than 30 years of highly volatile relationship with the global economy through the channels identified above.

Theoretical Review

According to the classical theory of international business, based on the concepts of absolute and comparative advantages by Smith (1776) and Ricardo (1817), nations will be better off allocating their resources more efficiently due to specialising in goods produced with relatively lower opportunity cost, and trading freely, thereby increasing their overall level of production, income and welfare. It is predicted that the benefits from specialisation will lead to higher real income levels, cheaper consumer goods, and increased employment opportunities, thus reducing poverty rates. In the case of Nigeria, this approach implies an economic model characterised by export-led growth and economic diversification from the production of crude oil, hence utilising trade as a means for combating poverty (Amin & Turok, 2022). Evidence from empirical research conducted for the developing world provides some support to this argument as there is generally a positive correlation between openness and economic growth and growth is generally pro-poor (Dollar & Kraay, 2004). Nevertheless, classical theory relies on certain assumptions of full employment, perfect labour mobility across countries, and the lack of structural constraints, none of which can be found in poor nations.

The dependency approach poses a counterpoint to the optimism of the classical perspective. According to Frank (1966) and Wallerstein (1974), developing nations are placed peripherally within the international economic system, which is composed of industrialized core countries, and in which primary commodities are exported and value-added goods are imported, thus making the surplus available in the core, perpetuating poverty and impeding industrialization within the developing nation. This perspective was partially anticipated by the Prebisch-Singer proposition, where it is contended that the terms of trade of the producers of primary commodities are worsening relative to those of producers of manufactured goods over time (Prebisch, 1950; Singer, 1950). Dependency theory finds strong validation in the Nigerian case study. Oil is the main source of export earnings and government revenues, whereas Nigeria imports most of its value-added goods, including petroleum. The above makes Nigeria vulnerable to international price volatility, and as seen in resource curse and Dutch disease literature, crowds out the development of tradable non-oil industries, such as agriculture and manufacturing industries, which are those sectors employing the poor.

However, modern development theories reconcile these two different perspectives on the matter by because the poverty effects of trade do not depend on the degree of openness but rather on the conditions within the country under which such openness occurs. From the review of the evidence provided in Winters et al. (2004), one may conclude that the influence of trade liberalization on poverty is neither automatic nor uniform because it depends on price movements, changes in the markets of factors of production, government budgets, and distribution of the costs of adjustment among households. In other words, current research states that trade openness will be able to bring about inclusive gains for poverty alleviation only in cases where it is combined with institutional development, appropriate infrastructure and human capital formation (Ogunleye & Ogundipe, 2021; OECD, 2022). Institutional development ensures the protection of property rights and prevention of rent-seeking, good infrastructure makes the cost of linking producers and poor households with markets lower, and human capital development makes it possible for people to shift between sectors.

Empirical Review

Findings on the effects of trade openness on poverty through empirical studies have yielded inconsistent results based on the approach used and location of data collected. Nwankwo (2023), for instance, in his study carried out in Nigeria by adopting the ARDL model showed that there is a positive effect of trade openness on per capita income in the long run while foreign direct investments positively influence per capita income and human development. Linus et al (2025), in their analysis of 40 Sub-Saharan Africa countries between 1990 and 2017 with panel ARDL and SYS-GMM models, revealed that trade openness increases poverty in the short run but decreases it in the long run. Onakoya et al. (2019), using the pooled OLS approach in 21 African countries

from 2005 to 2014, established a negative and significant relationship between trade openness and poverty at 5% significance level. In the study carried out by Sunge et al. (2021), the use of the GMM approach in 30 Sub-Saharan African countries from 2003 to 2017 indicated that the benefits of poverty reduction through trade openness depend on the trading partners, especially those in the intra-African and MENA regions.

Several country-specific papers may be cited as evidence for the poverty-reducing effect of openness in the long run. As reported by Agusalim (2017), who used VECM approach in the research conducted in Indonesia in the period of 1978-2015, trade openness reduces poverty in the long run, and the most pronounced effect is observed after nine years. The VECM analysis used by Ozcan and Kar (2016) showed that in Turkey trade openness reduced poverty in the long run. At the same time, the paper by Bayar and Sezgin (2016) stated the results of panel study of 11 Latin American countries in 2001-2013 according to which openness and financial development reduce poverty and income inequality in the long run. On the other hand, the cointegration and error correction approach applied by Sunday and Musa (2019) revealed that in the short and long runs trade openness negatively influences economic growth in Nigeria. Additionally, it was found in the GMM framework by Akinlo et al. (2013) that trade liberalization has no influence on poverty reduction in Nigeria in 1980-2009.

Yusuf, Malarvizhi & Khin (2013) through their study employing ARDL bounds test in the case of Nigeria have arrived at similar conclusions that trade liberalisation is not favorable for the poor. Kelbore (2015) performed a study in 43 African countries over the period 1981 to 2010 and found out through SYS-GMM technique that even though initially trade openness increases poverty rates, but then with trade structural change, trade reduces poverty rates. Trabelsi & Liouane (2013) employed panel regression techniques in 106 developing countries between 1980 and 2010 and arrived at the conclusion that trade openness has no impact on poverty or income inequality. Haddad et al. (2013) in an unbalanced panel of 77 economies from 1976 to 2005 concluded that trade openness reduces growth volatility.

According to Nwankwo (2023) and Yameogo and Omojolaibi (2020), openness' growth and poverty reduction impact is mainly achieved in the long run, which is further supported by Agusalim (2017), who states that the most significant effect is seen after several years in the case of Indonesia. On the contrary, the research conducted in Nigeria by Akinlo et al. (2013), Yusuf et al. (2013), and Sunday and Musa (2019) is characterised by the presence of weak or adverse results, thus suggesting that the difference is caused by the different study periods, methods used, and variables examined and not because of openness itself. Kelbore (2015) and Sunge et al. (2021) provide an interesting connection between these two groups of studies, as their results imply that openness impacts are conditioned by the structural change and the nature of trade partners. No effect was found by Trabelsi and Liouane (2013) across many developing countries, while Haddad et al. (2013) argue that openness leads to lower growth volatility, which in turn can ensure stable growth. All in all, the findings indicate that the nature of the relationship between openness and poverty is time-sensitive, as well as being affected by the choice of method and the countries in question. The studies also vary in the unit of analysis in that while cross-country panels like the ones used by Onakoya et al. (2019) and Okwueze et al (2025) pool diverse institutional contexts, the single-country time-series studies provide a better reflection of local circumstances but suffer from small samples.

Gaps

Literature review concerning the relationship between trade openness and poverty rates in Nigeria indicates the presence of three main research gaps, which this paper intends to address.

The first gap is the geographical gap. At present, most existing research studies are focused on Sub-Saharan Africa in general, Indonesia, Turkey, or Latin America without providing any analysis that is specific to the conditions in Nigeria Linus, Lawal, & Kalu. (2024). In particular, the Nigerian economy is heavily dependent on the export of oil and has specific infrastructure differences in comparison with other regions along with its special agricultural potential. In such a way, results obtained in the economies with diversified structures of exports cannot be applied in the conditions of Nigeria due to the dependence of these results on the country's specificity. This gap is filled by conducting research specifically for Nigeria, basing on time-series data of Nig-

eria for 2000-2024 provided by NBS and the World Bank.

Methodological gap constitutes the second gap. Many studies have relied on the aggregate measure of trade-to-GDP ratio. The interdependencies between trade and poverty variables are too complex to be treated in this way, considering such factors as no lagged effects, no structural breaks, and differential effects of export/import volume (Bhatti et al., 2011; Amin & Turok, 2022). The current study bridges the gap by means of using the ARDL technique complemented by tests for multicollinearity, heteroscedasticity, and autocorrelation with 0.05 level of significance Chidinma, L.F., Yalouli, T., & Kalu, E.U. (2025). Moreover, the aggregation of the indicators makes it unclear whether poverty reacts to increase exports, imports competition, or both. The models, which neglect the presence of structural breaks, may confuse changes in openness with reversal of policies or economic crises. Considering lagged adjustments becomes crucial as previous findings indicate that it takes time to realize the positive effects.

The third reason is recency. All the literature is written before some major global events that have taken place, such as the war between Russia and Ukraine in 2022, where the price of imported wheat and imported energy prices were raised, leading to inflation and inability to spend socially fiscally on the part of Nigeria (World Bank, 2022; IMF, 2023). This research includes data until 2024, where the impact of any external shocks after 2022 are taken as sub-variables. Due to these shocks, the cost of food and energy would have been changed, which could have affected the channels through which the impacts of trade are affecting the poor households via import prices. The previous research is estimated for samples until this time, which will not be able to show if the relationship still exists or has weakened.

3. METHODOLOGY

Annual data for 2000–2024 (25 observations) were supplied by the user. EXPGDS and IMPGDS are reported in local currency unit for the purposes of proper domestication. TOUT is trade openness. As supplied it is a small ratio (0.0004–0.0047), much smaller than the usual (exports + imports)/GDP ratio, which suggests a different scaling or denominator; it was multiplied by 1,000 so that its coefficients are of readable size. Rescaling changes the units of the coefficients but not their t-statistics, p-values or sign.

The ARDL(p, q1, q2, q3) model for GDPGR is written as:

$$\boldsymbol{GDPGR_t = \beta_0 + \sum_{n=1}^{k} \Delta \beta_1 GDPGR_{t-n} + \sum_{n=1}^{k} \Delta \beta_2 TOUT_{t-n} + \sum_{n=1}^{k} \Delta \beta_3 IMPGDS_{t-n} + \sum_{n=1}^{k} \Delta \beta_4 EXPGDS_{t-n} + \vartheta_1 TOUT + \vartheta_2 IMPGDS_t + \vartheta_3 EXPGDS_t + \varepsilon_t}$$

Where;

β_0 = *The Intersect;*

$\beta_1 - \beta_5$ = *The Coefficient of the short-run parameters;*

$\vartheta_1 - \vartheta_4$ = *The Coefficient of the long-run parameters;*

ε_t = *The Noise term.*

A maximum of two lags was allowed for each variable, and the Akaike Information Criterion (AIC) was used to choose the order. The best-fitting orders were ARDL(2,0,2,1), ARDL(2,1,2,1) and ARDL(1,0,2,1). The model whose error-correction form is unrestricted and uses the full sample is ARDL(1,1,2,1), whose AIC (107.5) is within about 1 point of the best, and this is the specification reported. With only 25 observations, longer lags would exhaust the degrees of freedom, so the lag order is deliberately short. After lagging, the effective sample is 23 observations.

The variables of interest are as described in table 1.

Table 1: Variables and units

Variables	Role	Scale
GDPGR	Real GDP growth rate (dependent)	% per annum
EXPGDS (EXP)	Exports of goods and services	US$ billion
IMPGDS (IMP)	Imports of goods and services	US$ billion
TOUT	Trade openness (as supplied)	Ratio × 1,000

Inferences follow the 0.05 level of significance.

4. RESULTS

First the basic properties of the observations are shown in table 2.

Table 2: Descriptive statistics

Variable	Mean	Std. dev.	Min	Max	Obs
GDPGR	4.986	3.569	-1.794	15.329	25
EXPGDS (US$ bn)	58.932	24.644	18.1	102	25
IMPGDS (US$ bn)	56.124	25.555	12	101	25
TOUT (×1,000)	2.245	1.33	0.415	4.67	25

Growth averaged 4.99% a year but was highly variable (standard deviation 3.57), ranging from a 1.79% contraction in 2020 to a 15.33% spike in 2002. Exports averaged 58.9 billion naira and imports 56.1 billion naira, so trade was roughly balanced over the period. Trade openness (TOUT) fell from 4.67 in 2000 to 0.42 in 2024, a decline of about 91% (Figure 1), which means the economy became far less open over the period. Growth also slowed after 2014, with a contraction in 2016 and in 2020.

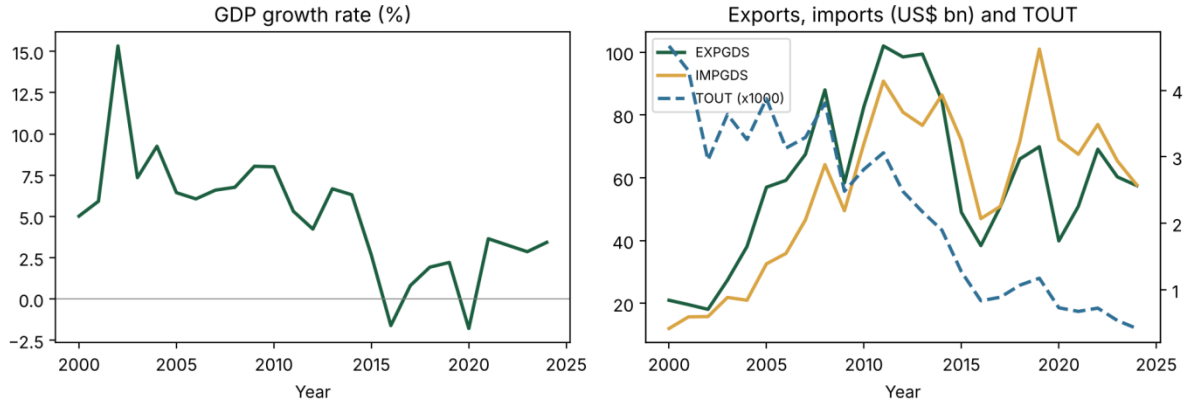


Figure 1: GDP growth, trade flows and TOUT, 2000–2024

Second, the linear relationship of the studied series is shown in table 3.

Table 3: Correlation matrix

	GDPGR	EXPGDS	IMPGDS	TOUT
GDPGR	1	-0.067	-0.439	0.632
EXPGDS	-0.067	1	0.784	-0.144
IMPGDS	-0.439	0.784	1	-0.59
TOUT	0.632	-0.144	-0.59	1

GDPGR is positively correlated with trade openness (TOUT) (0.63), which is strong, and with EXPGDS (-0.07). The correlation with IMPGDS is weak (-0.44). EXPGDS and IMPGDS are highly correlated with each other (0.78), so their separate effects are hard to identify. Trade openness is itself built from exports and imports, so some overlap with those two variables is also expected.

The ARDL bounds test is valid when no variable is I(2), and the critical values assume each variable is I(0) or I(1). Augmented Dickey-Fuller (ADF) tests were applied to every series in levels and in first differences, with an intercept and with an intercept and trend (lag length chosen by AIC, at most two lags).

Thirdly, to show the unit root properties of the studied series, the ADF outputs are reported in table 4.

Table 4: Augmented Dickey-Fuller unit root tests

Variable	Level: intercept	Level: trend	1st diff: intercept	1st diff: trend	Decision
GDPGR	-1.652 (p=0.456)	-4.249 (p=0.004)	-6.885 (p=0.000)	-6.724 (p=0.000)	I(0) around a trend (I(1) with intercept only)
EXPGDS	-2.088 (p=0.249)	-1.835 (p=0.688)	-4.469 (p=0.000)	-4.556 (p=0.001)	I(1)
IMPGDS	-2.037 (p=0.271)	-1.799 (p=0.705)	-4.720 (p=0.000)	-5.137 (p=0.000)	I(1)
TOUT	-0.137 (p=0.946)	-3.746 (p=0.019)	-7.089 (p=0.000)	-6.974 (p=0.000)	I(1) with intercept; trend-stationary at 5%

5% critical values are approximately −3.00 (intercept) and −3.61 (intercept and trend). A t-statistic more negative than the critical value rejects the unit root.

EXPGDS and IMPGDS are non-stationary in levels and stationary after first differencing: they are I(1). GDPGR and TOUT are I(1) when only an intercept is allowed, but they reject the unit root at the 5% level once a deterministic trend is included, so both behave as stationary around a trend. No variable is I(2), because all series are stationary after one difference. The mixed orders of integration are exactly the case for which the ARDL bounds approach was designed. A caution is that ADF tests have low power in 25 observations, so these classifications should be treated as indicative.

The possible existence of long-run cointegrating relationship is shown in table 5.

Table 5: ARDL bounds test (unrestricted intercept, no trend; k = 3)

Statistic	Value	10% I(0) / I(1)	5% I(0) / I(1)	1% I(0) / I(1)	Decision
F-statistic (case III)	2.84	2.72 / 3.77	3.23 / 4.35	4.29 / 5.61	F < lower bound: no cointegration
t-statistic on GDPGR(−1)	-2.747	−2.57 / −3.66	−2.86 / −3.99	−3.43 / −4.60	Between bounds: inconclusive

Critical values from Pesaran, Shin and Smith (2001), Table CI(iii) and CII(iii), asymptotic. In small samples the true critical values are larger, which makes the conclusion of no cointegration more, not less, secure.

The F-statistic of 2.84 is below gthe lower 10% bound of 2.72, so the null hypothesis of no long-run relationship cannot be rejected at any conventional level. The t-test on the lagged dependent variable lies between its bounds and does not change the conclusion. GDPGR, EXPGDS, IMPGDS and TOUT therefore do not have a stable long-run equilibrium in this sample. Long-run coefficients and an error-correction term are reported below for completeness, but they should be read as descriptive, not as evidence of a long-run relationship. The error correction representation checks the results of the bound tests. This is as reported in table 6.

Table 6: UECM estimates, dependent variable ΔGDPGR

Variable	Coefficient	Std. error	t-statistic	p-value	
Constant	0.22	3.069	0.072	0.944	
GDPGR(−1)	-0.608	0.221	-2.747	0.016	**
EXPGDS(−1)	-0.014	0.049	-0.285	0.78	
IMPGDS(−1)	0.003	0.063	0.045	0.965	
TOUT(−1)	1.173	1.034	1.134	0.276	
ΔEXPGDS	0.042	0.062	0.68	0.508	
ΔIMPGDS	0.097	0.057	1.698	0.112	
ΔIMPGDS(−1)	-0.064	0.039	-1.644	0.122	
ΔTOUT	-4.284	1.735	-2.469	0.027	**

**** p<0.01, ** p<0.05, * p<0.10. n = 23, R^2 = 0.797, adjusted R^2 = 0.681, F = 6.878 (p = 0.0009), AIC = 102.81.*

The longrun coefficients of the ARDL model is shown in table 7.

Table 7: Long-run coefficients (descriptive only, because no cointegration)

Variable	Long-run coefficient	Std. error (delta method)	t-statistic	p-value
EXPGDS	-0.023	0.08	-0.285	0.78
IMPGDS	0.005	0.104	0.045	0.965
TOUT	1.929	1.428	1.35	0.198
Constant	0.362	5.032	0.072	0.944

None of the long-run coefficients is significant: EXPGDS (-0.023, p = 0.78), IMPGDS (0.005, p = 0.96) and TOUT (1.929, p = 0.20). The standard errors are several times larger than the estimates, which means the data are consistent with no long-run effect at all. The coefficient on trade openness has the expected positive sign but is far from significant, so there is no evidence that greater openness raises growth in the long run.

The coefficient on GDPGR(−1) is -0.608 (t = -2.75, p = 0.016). It is negative and lies between −1 and 0, which is the correct sign and size for an error-correction term, and it implies that about 61% of any deviation of growth from its path is corrected within a year. Because the bounds test does not support cointegration, this term should be read as ordinary persistence in growth, not as adjustment toward a long-run equilibrium with the trade variables. Its fast adjustment mainly reflects the volatile, mean-reverting nature of an annual growth rate.

Only one short-run effect is significant at the 5% level: a rise in TOUT is associated with a lower growth rate in the same year (ΔTOUT, a change in trade openness, = -4.284, p = 0.027). A one-unit rise in trade openness (×1,000) is associated with a fall of about 4.3 percentage points in GDPGR in the same year. The coefficients on ΔIMPGDS (0.097, p = 0.112) and ΔIMPGDS(−1) (-0.064, p = 0.122) are only marginally insignificant and have opposite signs: an import surge boosts growth in the year it occurs, and about two-thirds of that gain is reversed the next year. Change in exports has no reliable effect (p = 0.51).

Because cointegration was rejected, two alternative specifications were estimated to check whether the short-run conclusions depend on the model. This is as reported in table 8

Table 8: Differenced model, dependent variable ΔGDPGR

Variable	Coefficient	Std. error	t-statistic	p-value	
Constant	-1.308	0.544	-2.404	0.028	**

ΔGDPGR(−1)	-0.173	0.164	-1.056	0.306	
ΔEXPGDS	0.077	0.057	1.357	0.192	
ΔIMPGDS	0.105	0.055	1.908	0.073	*
ΔIMPGDS(−1)	-0.08	0.036	-2.207	0.041	**
ΔTOUT	-6.227	1.351	-4.61	0	***

n = 23, R^2 = 0.682, adjusted R^2 = 0.589, F p-value = 0.0008. Breusch-Godfrey p = 0.659; Breusch-Pagan p = 0.383; Jarque-Bera p = 0.730.

The result is the same as in the error-correction model: ΔTOUT is strongly negative and significant (p<0.001), ΔIMPGDS is positive at the 10% level, and ΔIMPGDS(−1) is negative at the 5% level. This confirms that the sign pattern and the significance of TOUT do not depend on the error-correction term. ARDL(1,1,1,1) in levels with a time trend is estimated to further confirm the relationship.

Table 9: ARDL(1,1,1,1) in levels with trend, dependent variable GDPGR

Variable	Coefficient	Std. error	t-statistic	p-value	
Constant	0.107	7.825	0.014	0.989	
GDPGR(−1)	0.498	0.208	2.396	0.03	**
EXPGDS	0.101	0.054	1.857	0.083	*
EXPGDS(−1)	-0.083	0.066	-1.262	0.226	
IMPGDS	0.049	0.054	0.905	0.38	
IMPGDS(−1)	-0.1	0.062	-1.631	0.124	
TOUT	-5.084	1.761	-2.886	0.011	**
TOUT(−1)	5.662	1.696	3.337	0.005	***
Trend	0.126	0.348	0.361	0.723	

n = 24, R^2 = 0.783, adjusted R^2 = 0.668, F p-value = 0.0008. Joint Wald tests: TOUT F = 6.77 (p = 0.008); EXPGDS F = 1.72 (p = 0.212); IMPGDS F = 1.35 (p = 0.288). Breusch-Godfrey p = 0.380; Breusch-Pagan p = 0.316; Jarque-Bera p = 0.933.

Because GDPGR and TOUT are trend-stationary, a levels model with a trend is a reasonable check. TOUT is again the only variable with a significant joint effect (F = 6.77, p = 0.008). The current coefficient is -5.08 and the lagged coefficient is 5.66, almost equal and opposite, so a sustained change in TOUT has a net effect of only 0.58. This is the same finding as before: TOUT matters for the timing of growth, with a change today depressing growth and the effect reversing next year, but its level has no lasting effect. EXPGDS and IMPGDS are jointly insignificant. A summary of the diagnostic tests are shown in table 10.

Table 10: Diagnostic tests on the UECM residuals

Test	Null hypothesis	Statistic	p-value	Decision
Breusch-Godfrey (2 lags)	No serial correlation	2.148	0.342	No serial correlation
Breusch-Pagan	Homoskedasticity	7.778	0.455	Homoskedastic
Jarque-Bera	Normal residuals	2.093	0.351	Normal
Ramsey RESET (squared fitted)	Correct functional form	1.254	0.283	Correctly specified
CUSUM of residuals	Stable parameters	0.62	0.836	Stable

Durbin-Watson = 1.416. All tests are at the 5% level.

The model passes every diagnostic test. There is no evidence of serial correlation, heteroskedasticity, non-normality or functional-form misspecification, and the CUSUM statistic is well inside its 5% bands, so the

parameters are stable. The residual plot in Figure 2 shows no obvious outliers in the estimation window. Passing these tests means the model is statistically well behaved; it does not mean the sample is large enough to detect weak effects.

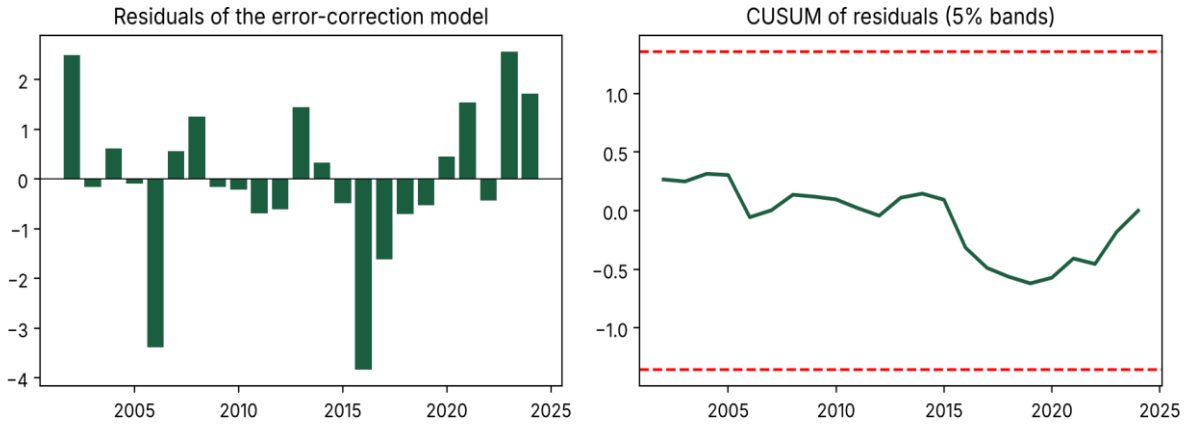


Figure 2: Residuals and CUSUM stability plot

5. DISCUSSION OF FINDINGS

No long-run link between trade and growth

The central result is that the bounds test finds no cointegration ($F = 2.34$, below the 10% lower bound of 2.72). Over 2000–2024 growth, exports, imports and trade openness did not move together toward a common long-run path. This is consistent with the data: growth was high and volatile in the 2000s and fell below 3% for most of the years after 2015, while exports rose, peaked in 2011 at 102 billion naira and then fell back. The two paths do not track each other closely. This does not prove that trade is irrelevant to growth. It means that, in a 25-year annual sample, there is not enough evidence of a stable long-run relation among these variables.

Exports and imports

Neither EXPGDS nor IMPGDS has a significant long-run or error-correction level effect on growth. The only trace of an effect is in imports: a rise in imports is associated with higher growth in the same year ($p = 0.11$), and the effect partly reverses a year later ($p = 0.12$). The pattern is typical of imports of capital goods and intermediate inputs that raise output when they arrive. It may equally reflect imports rising because output is already rising. Because exports and imports are correlated at 0.94, the regression cannot separate their effects well, so the lack of significance should not be read as proof of no effect. A specification regarding net exports or trade openness might identify the trade effect better.

Trade openness (TOUT)

Trade openness is the one variable with a statistically reliable influence on growth, and it works only in the short run. In the error-correction model and in both robustness models, a rise in openness in a year is associated with lower growth in that year (about 4 to 6 percentage points per unit of the rescaled variable). In the levels model that effect is offset by an almost equal positive effect of the lagged value, so there is no lasting gain or loss from a change in openness. Over the full period openness fell by about 91% while growth also slowed, which is why the two are positively correlated (0.63): both drifted down together. The regression coefficients describe what happens year to year around that drift, and there the sign is negative. One plausible reading is that a sudden jump in openness reflects a surge in trade flows relative to output, for example import surges or exchange-rate shocks, that coincides with weak growth and fades once the shock passes. This is an interpretation, and the data do not test it. The result does not support the claim that greater openness delivers faster growth in the long run.

Implications for poverty reduction

Poverty falls when growth is sustained, broadly shared and creates jobs. The evidence in this sample is that growth was strong in 2000–2014 (mean about 7.2%) and weak after 2015 (mean about 1.7%, with two contractions). Even without a poverty series, a growth path of that kind implies a much weaker poverty-reducing effect in recent years, especially if population growth is high, because growth per head is then lower still. The estimates here do not show that expanding exports or imports by themselves will restore that growth: neither variable, nor trade openness, has a reliable long-run effect. This points to policy that does not rely on trade volumes alone, and that addresses the factors behind growth directly: investment, productivity, infrastructure, macroeconomic stability and the sectors where poor households earn their living. These are suggestions drawn from the weakness of the trade-growth link and from general economic reasoning, not conclusions estimated from poverty data.

6. CONCLUSIONS AND RECOMMENDATIONS

This study asked whether exports, imports and trade openness shape GDP growth, the main channel for poverty reduction, in 2000–2024. The ARDL bounds test finds no cointegration, so the data support no stable long-run relationship between GDP growth and these variables. In the short run, only trade openness (TOUT) has a statistically reliable effect, and it is a transitory one: a rise lowers growth in the same year and the effect reverses the next year. Exports have no significant effect, and imports show a weak positive effect that is largely reversed after a year. The result is robust to specification and the model passes all diagnostic tests.

The poverty-reducing effect of trade through growth is therefore not supported as a long-run effect in this sample. The practical message is that policy should not rely on raising trade volumes alone to deliver the growth needed to reduce poverty. Based on these results, the following are recommended:

- Promote growth through investment, productivity and infrastructure in sectors that employ poor households, in addition to trade promotion.
- Reduce growth volatility through stable macroeconomic policy, since the 15% spike of 2002 and the contractions of 2016 and 2020 show how unstable growth has been.
- Pursue trade openness as part of a wider growth strategy, not as a stand-alone growth policy, and manage short-run swings in openness, which are associated with year-to-year changes in growth.
- Track a direct poverty measure alongside growth, since this analysis could only infer poverty effects from growth.

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