ISA Journal of Business, Economics and Management (ISAJBEM)

Homepage: https://isapublisher.com/isajbem/

Volume 3, Issue 4, Jul-Aug, 2026 ISSN: 3049-1835

Effect of Poverty and Underdevelopment in Nigeria

Leonard Terver Thomas, Kenneth Ahwi

Department of Economics, University of Port Harcourt, Rivers State, Nigeria

Received: 05.06.2026 | **Accepted:** 06.07.2026 | **Published:** 09.07.2026

DOI: *10.5281/zenodo.21273236*

Abstract **Original Research Article**

This study examines the relationship between the indices of underdevelopment and poverty in Nigeria by analyzing the effect of key development indicators such as; per capita income, infrastructural development, life expectancy, and educational attainment that served as the independent variables on poverty rate as the dependent variable over the period 1981 to 2025. The study adopts a quantitative research framework and employs time-series data sourced from relevant national and international databases. The Autoregressive Distributed Lag (ARDL) modeling technique is utilized to capture both short-run and long-run dynamics among the variables, given their mixed orders of integration. The ARDL bounds test confirms the existence of a long-run cointegrating relationship between poverty and the selected indicators of underdevelopment in Nigeria. Empirical results show that per capita income has a poverty-reducing effect, particularly in the short run, although its long-run impact is weakened by structural factors within the economy. Infrastructural development exhibits a significant relationship with poverty, but the mixed signs of the coefficients suggest that infrastructure investments have not been sufficiently inclusive or pro-poor. Life expectancy demonstrates a strong and statistically significant negative relationship with poverty in both the short and long run, highlighting the importance of health outcomes in poverty reduction. Educational attainment is found to be significant in the long run, though its limited effectiveness in reducing poverty reflects challenges such as poor education quality and skills mismatch. The study concludes that poverty and underdevelopment in Nigeria are mutually reinforcing. It recommends inclusive growth strategies, improved infrastructure targeting, sustained investment in health and education, and stronger institutional frameworks to achieve sustainable poverty reduction and development.

Keywords: Poverty, Underdevelopment, Autoregressive Distributed Lag (ARDL), Infrastructural development, Nigeria.

Introduction

Poverty and underdevelopment remain among the most pressing socio-economic challenges confronting Nigeria despite the country's enormous natural and human resource endowments. As Africa's largest economy and one of the world's leading crude oil producers, Nigeria possesses substantial potential for economic transformation and sustainable development. The country is richly endowed with vast reserves of crude oil, natural gas, solid minerals, fertile agricultural land, and a large youthful population capable of driving economic growth. Nevertheless, the benefits of these resources have not translated into significant improvements in the living conditions of the majority of Nigerians. Instead, poverty, unemployment, inadequate infrastructure,

poor healthcare delivery, and low educational outcomes continue to characterize the socio-economic landscape of the country.

Between 2010 and 2024, successive Nigerian governments implemented various economic reforms and poverty reduction programmes, including the National Economic Empowerment and Development Strategy (NEEDS), Vision 20:2020, the Economic Recovery and Growth Plan (ERGP), the Social Investment Programme (SIP), and the National Development Plan (2021–2025). These initiatives were designed to stimulate economic growth, reduce poverty, create employment opportunities, and improve human development indicators. Despite these interventions, poverty has remained widespread. According to the National Bureau of Statistics (2023), approximately 63 percent of Nigerians are multidimensionally poor, lacking adequate access to education, healthcare services, decent housing, clean drinking water, and other basic necessities of life. This reality raises critical questions regarding the effectiveness of development policies and the extent to which economic growth has contributed to poverty reduction in Nigeria.

The persistence of poverty in the midst of economic growth presents a paradox that has attracted considerable scholarly attention. Although Nigeria recorded periods of positive economic growth during the study period, such growth has largely been non-inclusive and incapable of generating broad-based welfare improvements. Scholars such as Okonjo-Iweala and Osafo-Kwaako (2007) argue that weak institutions, poor governance, and ineffective policy implementation have prevented economic growth from translating into meaningful human development outcomes. Similarly, Olayemi (2012) contends that the gains from economic expansion have been unevenly distributed, thereby widening income inequality and deepening social exclusion among vulnerable groups.

Several structural factors have been identified as major contributors to poverty and underdevelopment in Nigeria. These include inadequate infrastructure, low productivity, weak educational systems, poor healthcare services, corruption, unemployment, and excessive dependence on crude oil exports. According to Ajakaiye and Olomola (2003), the country's overreliance on oil revenue has constrained economic diversification and limited employment generation. Since the oil sector is capital-intensive rather than labour-intensive, its contribution to poverty reduction remains relatively insignificant. Furthermore, fluctuations in international oil prices often expose the economy to macroeconomic instability, thereby undermining long-term development efforts. Rising inflation, exchange rate volatility, insecurity, and the economic consequences of the COVID-19 pandemic have further worsened poverty conditions in recent years.

Despite the implementation of numerous poverty alleviation programmes, Nigeria continues to rank among countries with the highest poverty levels globally. The National Bureau of Statistics (2022) reported that over 133 million Nigerians live in multidimensional poverty. This situation suggests that existing policy interventions have not adequately addressed the fundamental determinants of poverty and underdevelopment. While government expenditure on social services has increased over time, access to quality healthcare, education, and infrastructure remains inadequate for a large segment of the population. Consequently, understanding the specific macroeconomic factors that influence poverty has become imperative for designing effective development strategies.

Although previous empirical studies have examined poverty and economic development in Nigeria, most have focused on variables such as GDP growth, unemployment, inflation, government expenditure, and income inequality. Relatively few studies have comprehensively investigated the combined influence of per capita income, infrastructural development, public health expenditure, and educational attainment on poverty reduction within a single empirical framework. Furthermore, many existing studies utilize earlier datasets and fail to capture recent economic realities, including the effects of the COVID-19 pandemic, economic recession, exchange rate reforms, and evolving development policies between 2010 and 2024. This creates an empirical gap in the literature regarding the extent to which improvements in human

development indicators and infrastructure have contributed to poverty reduction in contemporary Nigeria.

It is against this backdrop that this study examines the determinants of poverty and underdevelopment in Nigeria from 2010 to 2025, with particular emphasis on the effects of per capita income, infrastructural development, public health expenditure, and educational attainment on poverty reduction. By addressing the identified empirical gap, the study seeks to provide evidence-based recommendations capable of promoting inclusive growth, improving living standards, and accelerating sustainable development in Nigeria.

Empirical review

Uzodigwe, Obi, Ezenekwe, and Anuforo (2025) conducted a comprehensive empirical investigation into the macroeconomic determinants of poverty in Nigeria using a *Nonlinear Autoregressive Distributed Lag (NARDL) model*. Their study, covering the period from 1970 to 2023, highlighted asymmetric short- and long-run relationships between variables such as foreign direct investment (FDI), trade openness, economic growth, inflation, and the poverty rate. The authors found that sustained economic growth, particularly measured by real GDP per capita, significantly contributed to poverty reduction in the long run, while exchange rate depreciation and inflation sometimes exacerbated poverty conditions, especially over extended time horizons. Their findings suggest that macroeconomic stability and well-managed investment flows are crucial for alleviating poverty, which in turn influences broader underdevelopment indicators such as income levels, human capital accumulation, and household welfare. This study underscores the complex dynamics of Nigeria's poverty profile and the need for nuanced macroeconomic policy interventions to support sustainable development outcomes.

Aladejare, Odzie, and Odey (2025) examined the role of human capital investment and institutional quality in mitigating poverty in Nigeria using the Autoregressive Distributed Lag (ARDL) technique over the period 1990–2023. Their results indicated that public investment in education and health had limited long-term effects on reducing poverty, whereas increased employment levels significantly lowered poverty incidence. Additionally, dysfunctional institutions captured through weak governance effectiveness and politically motivated violence were found to hinder poverty reduction efforts. This outcome highlights not only the direct link between poverty and human capital formation (education and health) but also the broader institutional context that shapes poverty and underdevelopment. The implication is that without strong governance, investments in human capital alone may be insufficient to break the cycle of poverty that affects income, access to services, and overall development.

Wilson, Akobi, and Babale (2025) provided empirical evidence on the impact of development expenditure specifically on education and health on poverty alleviation in Nigeria from 1990 to 2023. Using unit root and cointegration tests followed by an Error Correction Model (ECM), they found that government spending on education significantly reduces poverty in the long run, whereas health expenditure did not have a significant short-run effect. A 1 per cent increase in education expenditure was associated with a notable reduction in poverty, suggesting that targeted public spending can improve human development outcomes and contribute to poverty reduction. Their findings support the argument that development funding, when effectively managed, can play a meaningful role in influencing key underdevelopment proxies such as educational attainment and income levels by enhancing access to quality education.

Abubakar and Obomeghie (2024) evaluated the impact of selected economic and institutional factors on poverty levels in Nigeria using ARDL and ECM methodologies. Their time series analysis spanning 1996–2024 revealed that improved access to finance significantly decreases poverty, as it enables marginalized individuals and groups to invest in education, healthcare, and entrepreneurial activities. The inclusion of institutional variables in their model underscores the importance of credit access and institutional support mechanisms in facilitating poverty reduction. This finding resonates with

broader development literature, which suggests that enhancing financial inclusion can help address structural barriers to human capital development and income growth, thereby contributing to reductions in poverty and associated underdevelopment indicators.

Okororie (2025) provided an empirical examination of the causes of extreme deprivation and anti-poverty strategies in Nigeria. His study identified corruption, education deficits, political instability, ineffective local governance, and policy weaknesses as core determinants of poverty, further linking these with challenges in achieving sustainable development. Although more descriptive, this work complements quantitative studies by highlighting multidimensional factors that empirically correlate with poverty trends across Nigeria. The identification of education as a key determinant aligns with econometric findings on the significance of educational investment and human capital in shaping poverty and development outcomes

Ejemezu and Ajala (2023) examined the relationship between government expenditure in various sectors and poverty in Nigeria from 1986 to 2022. Using Johansen cointegration and Vector Error Correction Mechanism (VECM), they found that government expenditure, particularly in road infrastructure, has long-term poverty-reducing effects, although short-term impacts were limited. This suggests that investments in physical infrastructure can influence poverty dynamics by improving mobility, lowering transaction costs, and facilitating access to markets and services factors that directly relate to per capita income and overall economic wellbeing. Their study highlights the importance of sectoral public spending in addressing poverty and underdevelopment, complementing research on human capital and macroeconomic determinants.

Research design

This study adopts a **quantitative research design** using an econometric approach to examine the relationship between the indicators of underdevelopment and poverty rate in Nigeria. The quantitative design is appropriate because the study employed secondary data to capture both the short-rum and long-run dynamics between poverty rate and selected indicators of underdevelopment. This design is suitable for establishing empirical relationships and drawing valid inferences about causality

Model Specification

The baseline model represents the core relationship between poverty and underdevelopment, as consistently found in the empirical literature reviewed (Uzodigwe et al., 2025; Aladejare et al., 2025; Wilson et al., 2025; Abubakar & Obomeghie, 2024). These studies highlight that poverty (POV) negatively affects key development outcomes such as per capita income, infrastructural development, life expectancy, and education attainment. The baseline model assumes a linear relationship between poverty and a generic development outcome (DEV). This can be expressed as:

$DEV=\alpha 0+\alpha 1POV+\epsilon$

Where:

- DEV = Development indicator
- POV= Poverty rate at time
- $\alpha 0$ = Intercept.
- $\alpha 1$ = Slope coefficient
- ϵ Error term

This baseline model captures the direct and primary effect of poverty on underdevelopment, aligning with findings from Uzodigwe et al. (2025) and Wilson et al. (2025), which indicate that poverty is a major determinant of per capita income and human development outcomes in Nigeria.

Representing the model in its functional form, we may express it as:

POV=f(PCI, IDI, LEXP, EAI,)

Transforming equation into a mathematical model, we have:

$POV = \beta_0 + \beta_1 PCI + \beta_2 IDI + \beta_3 LEXP + \beta_4 EAI$

Transforming equation (3.2) into an econometric model gives:

$POV = \beta_0 + \beta_1 PCI + \beta_2 IDI + \beta_3 LEXP + \beta_4 EAI + \mu$

Where:

- POV = Poverty rate
- PCI = Per capita income
- IDI = Infrastructural Development Index
- LEXP = Life Expectancy
- EAI = Education attainment index
- μ = Error term

Unit Root Test

The unit root test is a preliminary test utilised to determine the stationarity of given factors and serves as a benchmark for selecting subsequent study methods. For the purpose of this study, Philip Peron (PP) approach of unit root test was used. The Philip Peron critical value of a statistic serves as the decision criterion for accepting or rejecting a hypothesis. It is determined owing to the desired degree of significance, which may be set at 1 percent, 5 percent, or 10 percent

ARDL Bound Test for Cointegration

Co-integration test was performed after stationarity has been proved by the unit root test, with combination of different orders of integration, namely [I(0)] and [I(1)]. For the purpose of this study, bound co-integration test was carried out. the bound test approach to co-integration, proposed by Pesaran et al (2001) was adopted in this study to determine whether the underlying time series variables has long run relationship. The null hypothesis of no cointegration was tested against the alternative hypothesis of cointegration. Additionally, the bound co-integration test was utilised to derive the equation that establish the link between factors in the extended period.

Data Analysis Technique

Furthermore, the long-run and short-run estimations were conducted using the Autoregressive Distributed Lag (ARDL) technique. The Autoregressive Distributed Lag (ARDL) technique is a popular econometric approach used to model the relationship between a dependent variable and one or more independent variables both in the short and long run. The ARDL approach is particularly useful in this study since all the variables in the model are integrated at different orders, meaning some variables were stationary at level I(0) and others are stationary at first difference I(1).

The descriptive statistics.

Table 4.1: Descriptive Statistics.

	POV	PCI	IDI	LEXP	EAI
Mean	51.31714	14992.79	33.22619	48.72519	81.10620
Median	54.55000	10718.40	33.05000	47.78450	80.84946
Maximum	72.30000	183770.0	41.20000	54.07900	88.49879
Minimum	28.10000	835.0000	28.50000	45.48300	71.30230
Std. Dev.	11.23508	27285.61	3.337741	2.914615	5.074232

Skewness	-0.066750	5.815546	0.465039	0.340527	-0.185615
Kurtosis	2.333111	36.58932	2.441922	1.493460	1.949553
Jarque-Bera	0.809486	2211.168	2.058866	4.783620	2.172188
Probability	0.667148	0.000000	0.357209	0.091464	0.337532
Sum	2155.320	629697.3	1395.500	2046.458	3406.460
Sum Sq. Dev.	5175.310	3.05E+10	456.7612	348.2943	1055.661
Observations	42	42	42	42	42

Source: *Computation by author, 2026 (EViews, 12.0 Output).*

Note: POV = Poverty Rate, PCI = Per Capita Income, IDI = Infrastructural Development Index, LEXP = Life Expectancy, EAI = Education Attainment Index

The descriptive data shown in Table 4.2 reveal that, poverty rate (POV) had an average value of 51.31714 for the given time period. The highest recorded value was 72.30000 per year, while the lowest recorded value was 28.10000 per annum. The POV has a substantial degree of dispersion from the mean during the research period (1981 - 2025), as shown by the standard deviation of 11.23508.

Furthermore, per capita income (PCI) had an average value of 1499.79 during the given time frame, reaching a top of 183770.0 and a minimum of 835.0000 each year. PCI has a substantial standard deviation of 27285.61, indicating a substantial level of variation or dispersion from the mean over the studied period from 1981 to 2025.

Additionally, IDI has averaged of 33.22619 for the given time period, with a top value of 41.2 and a lowest value of 28.5 per year. The standard deviation of IDI is 3.337741, indicating a substantial level of departure or dispersion from the mean for the studied period (1981 - 2025).

Furthermore, the LEXP had an average value of 48.72519 for the given time period, with a high of 54.07900 and a low of 45.48300 each year. The LEXP has a substantial standard deviation of 2.914615, indicating a substantial level of variation or dispersion from the mean for the studied period from 1981 to 2025.

Finally, EAI had an average value of 81.10620 for the given period, with a top of 88.49 and a minimum of 71.30 per year. The FPI has a substantial standard deviation of 5.15, indicating a substantial level of variation or dispersion from the mean for the studied period from 1981 to 2025.

The series is tested for stationarity utilising the ADF statistic to prevent false regression. For your reference, Table 4.2 below displays the upshots of the ADF unit root test:

Table 4.3: ADF Unit Root Test Upshots

	ADF @ Levels		At 1st Difference			
Factors	**ADF Statistic**	**5 percent Critical Value**	**ADF Statistic**	**5 percent Critical Value**	**Order of Integration**	**Decision**
POV	-2.936942	-3.605593	-6.577433	-2.606857	I(1)	Stationary @ 1st Difference
PCI	-2.935001	-3.600987	-6.265208	-2.605836	I(0)	Stationary @ Level
IDI	-2.936942	--3.605593	-6.671024	-2.606857	I(1)	Stationary @ 1st Difference
LEXP	-2.938987	-3.610453	-6.921763	-2.607932	I(2)	Stationary @ 2nd Difference
EAI	-2.936942	-3.605593	-4.621784	-2.606857	I(1)	Stationary @ 1st Difference

Source: *Computation by author, 2026 (EViews, 12.0 Output).*

In congruent with Table 4.3 ADF unit root test upshots, PCI is level-stationary and integrated of order zero, or [I(0)]. In contrast, factors such as POV, IDI, EAI and first difference were all integrated of order one, or [I(1)]. While LEXP is integrated of order two or 1(2). The data should not comprise any misleading or false regression estimates, in congruent with the upshots of the unit root test. Hence, there is enough statistical evidence to move forward with a Co-integration test utilising Bounds Co-integration analysis, since all of the factors (Poverty Rate, PCI = Per Capita Income, IDI = Infrastructural Development Index, LEXP = Life Expectancy, EAI = Education Attainment Index, and stationarity at level and first and second difference, I(0) and I(1), 1(2) respectively) were mixed.

Bound Co-integration Test

Table 4.4: ARDL Bounds Co-integration Test Upshot

Test Statistic	**Value**	**K**
F-statistic	3.551959	4
Significance	Lower Bound [I(0)]	Upper Bound [I(1)]
10 percent	2.2	3.09
5 percent	2.56	3.49
2.5 percent	2.88	3.87

1 percent	3.29	4.37

Source: *Computation by author, 2026 (EViews, 12.0 Output).*

Table 4.4 displayed the output of the ARDL Bounds Test which reveals an F-statistic of 3.551959 that is higher than both lower Bound of 2.56 and higher Bound of 3.49, hence we reject the null hypothesis that the variables do not have any association over the in the long-run. This result affirms the existence of cointegration among the variables. This lends credence to the idea that Poverty Rate, Per Capita Income, Infrastructural Development Index, Life Expectancy, Education Attainment Index, are all related in the extended period. It was also necessary to estimate the strength of the association between the dependent and independent factors with the intent to validate extended period dynamics among the factors.

4.3.1 Extended period ARDL Model Estimation

Table 4.5: Extended period Autoregressive Distributive Lag (ARDL)

Dependent Factor = POV

Factor	**Co-efficient**	**Std. Error**	**t-Statistic**	**Prob.**
PCI	-0.000473	0.000452	-1.047574	0.3139
IDI	1.904734	0.812639	2.343887	0.0356
LEXP	-11.08829	1.871038	-5.926278	0.0001
EAI	5.640768	0.963449	5.854768	0.0001
C	61.93529	45.30969	1.366932	0.1948

Source: *Computation by author, 2026 (EViews, 12.0 Output)*

The extended period ARDL analysis shows that per capita income (PCI) has a co-efficient value of -0.00473, indicating there is a negative interaction between PCI and POV. The probability value of 0.3139 is greater than the 5 percent significance threshold, this suggests that per capita income (PCI) has an insignificant negative statistically influence on POV over a lengthy period of time. Therefore, if per capita income (PCI) upsurges by 1%, the POV will decline by 0.47 percent in the extended period. Conversely, if per capita income (PCI) decreases by 1%, the POV will grow by 0.47 percent in the extended period.

Furthermore, the ARDL result indicates that IDI has a positive co-efficient value of 1.904734, with a probability value of 0.0356, below the 5 percent threshold of significance. These output suggest that the effect of IDI on POV is positive and statistically significant at 5% level. Therefore, a percentage rise in IDI will lead to over 190% percent rise in the level of POV in the extended period all things being equal.

Similarly, the ARDL test result shows that LEXP has a negative co-efficient value of -11.08829 and a significant probability value of 0.0001 at the 5 percent level. These result attest that the improvement in Life Expectancy (LEXP) has the capacity to reduce the rate of POV. Therefore, if there is a percentage rise in LEXP, the POV rate will decline by 1108.8 percent in the extended period.

Finally, the extended period ARDL result shows that EAI has a positive co-efficient value of 5.640768 and a significant probability value of 0.0001, which is below the 5 percent significance threshold. This suggests that EAI has a significant positive effect on POV over a lengthy period of time, although the effect is not statistically substantial. Therefore, a one percent rise in EAI would lead to a corresponding 5.6 percent gain in POV in the extended period.

Immediate period ARDL Model Estimation

Table 4.6: Immediate period Autoregressive Distributive Lag (ARDL)

Dependent Factor = LOG(PCI)				
Factor	**Co-efficient**	**Std. Error**	**t-Statistic**	**Prob.***
D(POV(-1))	0.930927	0.277964	3.349097	0.0052
D(PCI)	0.000110	4.14E-05	2.651893	0.0199
D(IDI(-1))	-0.659917	0.955554	-0.690612	0.5020
D(LEXP(-1))	28.04879	11.42934	2.454104	0.0290
D(EAI)	4.992327	2.863669	1.743332	0.1049
CointEq(-1)*	-2.059747	0.379175	-5.432180	0.0001
R-squared = 0.807108				
Adjusted R-squared = 0.603501				
Durbin-Watson stat = 2.419363				

Source: *Computation by author, 2026 (EViews, 12.0 Output).*

The ARDL result output in Table 4.6 shows that per capita income (PCI) has a positive co-efficient value of 0,00010 and a significant probability value of 0.0199, which is below the 5 percent threshold of significance. This suggests that per capita income (PCI) has a positive significant effect on POV in the short term. Therefore, in the short term, a percentage rise in per capita income (PCI) will lead to over 0.011 percent increase in the rate POV all things being equal.

More so, the ARDL analysis indicates that IDI has a negative co-efficient value of -0.659917, with an insignificant probability value of 0.5020, which is above the 5 percent threshold of significance. This result indicates that 1% rise in IDI was insignificant in decreasing the rate of poverty by 65.99 percent in the short term.

Furthermore, the ARDL analysis shows that LEXP has a negative co-efficient value of -28.04879 and a significant probability value of 0.0290, that is below 5 percent level. This result shows there exist a significant negative relationship between LEXP and the of POV in the short term. Therefore, if there is a percentage rise in LEXP, the rate of POV will decline by 2804 percent in the immediate period.

The ARDL analysis shows that EAI has a positive co-efficient value of 4.992327 and an insignificant probability value of 0.1049, which is above 5 percent level. Hence, this result attest that if there is a percentage rise in EAI, the POV will grow by 4.9 percent in the immediate period.

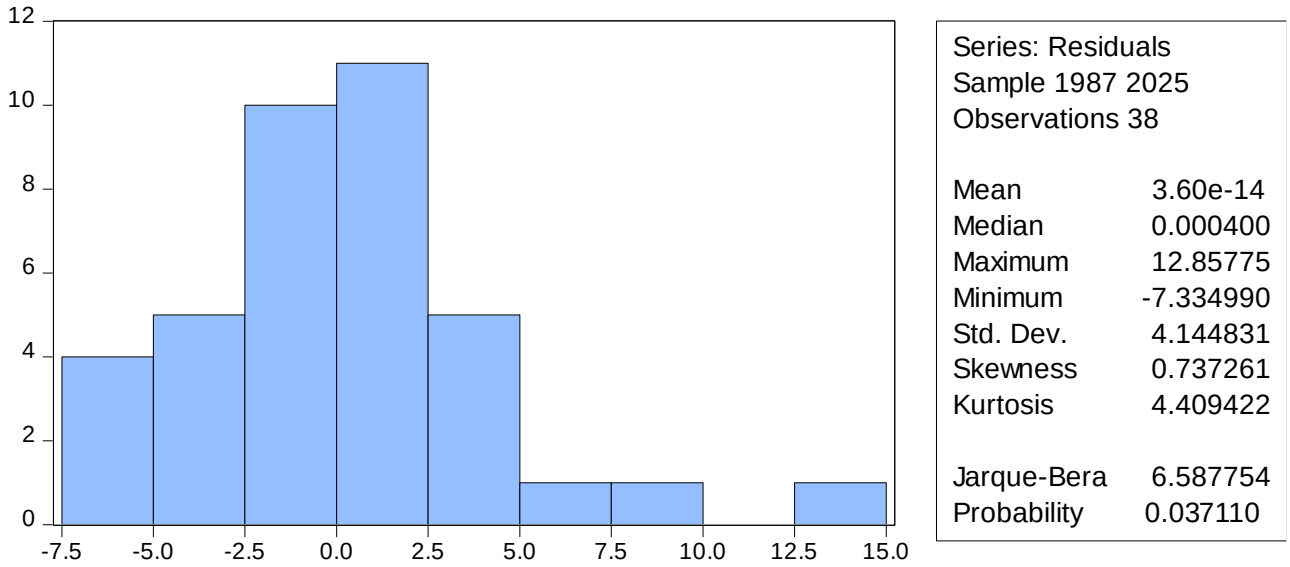
In addition, the short period ARDL output in Table 4.5 indicates that the anticipated value of CointEq(-1) (ECM) is statistically significant and has a negative coefficient, this validates the presence of a long-run link among the variables. The co-efficient of ECM of -2.059747, indicating the annual speed of adjustment from the short term disequilibrium to a long-run equilibrium.

Furthermore, the R-squared (R2) value of 0.809108 signifies that 80 percent of the predictable variation in POV is accounted for by PCI, IDI, LEXP, EAI in the immediate period. The remaining 20 percent is attributed to other factors (factors) not comprised in the model.

Finally, the Durbin Watson statistic of 2.419363 suggests that there is no serial correlation in the model.

Post-Estimation Tests

The post estimation tests conducted in this study and its upshots are presented below:



Source: *Computation by author, 2024 (EViews, 12.0 Output).*

Normality Test

Since the P-value (0.037110) is larger than the 5 percent threshold of significance, the normality test upshot, as shown in Figure 4.6, indicates that the regression residual follows a normal distribution. A probability value of 0.037110 was higher than the

recommended threshold of significance, in congruent with the Jarque-Bera normality test. This indicates that the errors were regularly distributed, as the null hypothesis of normal distribution was upheld.

Table 4.7 Serial Correlation Test Upshot

Test	F-Statistic	P-value	Null Hypothesis	Decision
Breusch-Godfrey Serial Correlation LM Test	1.904612	0.1949	**H_0:** No serial correlation	Retain H_0

Source: *Computation by author, 2026 (EViews, 12.0 Output).*

Table 4.7 displays the upshots of the post-estimation tests. There was an examination of the residuals' serial correlation utilising the Breuch Godfrey test and the Lagrange Multiplier (LM). We ran this test to see whether the residuals are indeed independent in a serial fashion. But because the probability value of 0.1949 was higher than the 5 percent threshold of significance, we kept the null hypothesis of no serial association. Our model did not comprise serial correlation, as this shows.

Table 4.8: Heteroskedasticity Test Upshot

Test	F-Statistic	P-value	Null Hypothesis	Decision
Heteroskedasticity Test:	0.557692	0.8957	**H_0:** Homoscedasticity	Retain H_0

Source: *Computation by author, 2026 (EViews, 12.0 Output).*

There was no heteroscedasticity in our model, as shown in Table 4.8 of the Breusch-Pagan-Godfrey Heteroskedasticity test. This is because we kept the homoscedasticity null hypothesis. A precise probability value of 0.8957 indicated that the mistakes were homoscedastic and unrelated to the explanatory factors. Therefore, the model is suitable for drawing any conclusions since it fits the data well.

Table 4.9: Ramsey RESET Test Upshots

Test	F-Statistic	P-value	Null Hypothesis	Decision
Ramsey RESET test	0.372956	0.5328	**H_0:** Correctly specified	Retain H_0

Source: *Computation by author, 2026 (EViews, 12.0 Output).*

Finally, when tested utilising the Ramsey Regression Equation Specification Error Test (RESET) test, the probability value of 0.5328 was higher than the suggested 5 percent threshold of significance. This meant that we could keep our fingers crossed that our model specifications were spot on. As a consequence, the model could not have been defined wrongly, ruling out the possibility of missing factors.

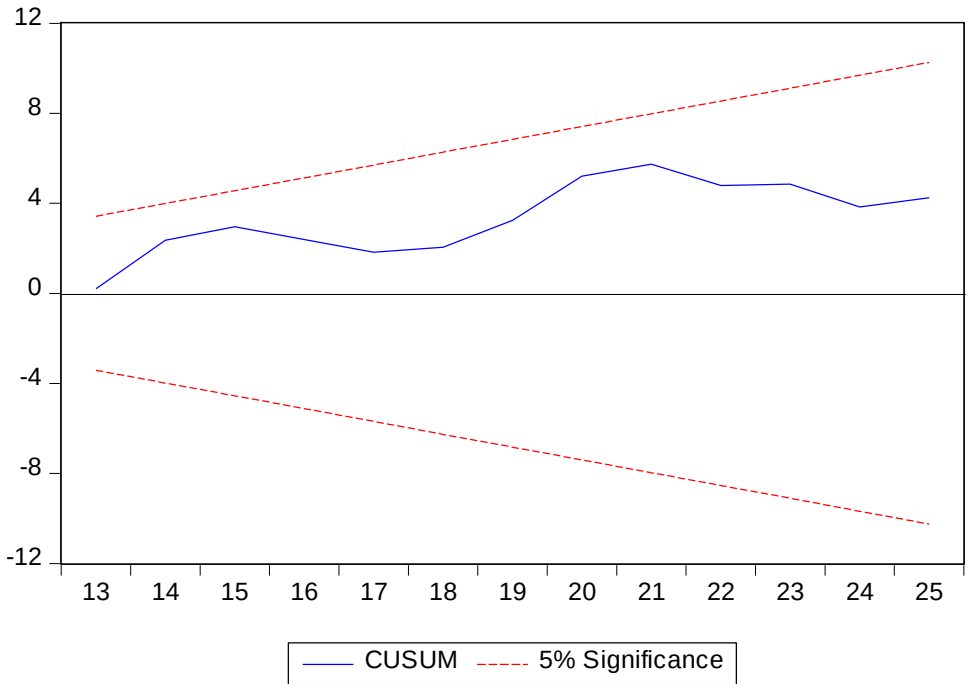


Figure 4.7: Stability <u>Cusum Tests</u>

Source: *Computation by author, 2026 (EViews, 12.0 Output)*

The cumulative total (CUSUM) line remained under the 5 percent critical limit, in congruent with the stability test upshots displayed in Figure 4.7. It follows that the extended period co-efficient of the regressors influencing poverty and underdevelopment in Nigeria are stable, as the CUSUM plot did not cross the 5 percent critical lines. The model's predictions on the global value chain's upshot on Nigeria's economy are consistent with the reality of parameter stability.

Finally, the post-estimation test upshots showed that

our model's factors (POV, PCI, IDI, LEXP, EAI) adhere to the fundamental assumptions of OLSs estimation.

Discussion of Results

The discussion of results is anchored on the study objectives and interprets the empirical findings in relation to existing empirical evidence on poverty and underdevelopment in Nigeria. The results from the ARDL estimations provide strong evidence that poverty is closely linked with key indicators of underdevelopment, namely per capita income, infrastructural development, life expectancy, and educational attainment, both in the short run and long run. The bounds cointegration test confirmed the existence of a long-run relationship among the variables, as the F-statistic value of 3.55 exceeded the upper critical bound at the 5 per cent significance level. This indicates that poverty and underdevelopment indicators move together over time in Nigeria, validating the theoretical expectations of the Vicious Cycle of Poverty and Human Capital theories.

With respect to the first objective, which examined the effect of poverty on per capita income, the long-run ARDL results revealed a negative coefficient for per capita income (PCI) of -0.000473, though statistically insignificant at the 5 per cent level ($p = 0.3139$). This negative sign nonetheless suggests an inverse relationship between poverty and income per head, implying that higher income levels tend to reduce poverty over time. In the short run, however, per capita income showed a positive and statistically significant effect, with a coefficient of 0.000110 and a probability value of 0.0199. This indicates that short-term increases in income contribute significantly to poverty reduction. These findings align with Uzodigwe et al. (2025), who found that sustained growth in real GDP per capita significantly reduces poverty in Nigeria. The result also supports Abubakar and Obomeghie (2024), who emphasized that income-enhancing mechanisms, especially through access to finance, play a crucial role in alleviating poverty. The insignificant long-run effect may reflect structural issues such as income inequality and jobless growth, where increases in average income do not translate into broad-based welfare improvements.

In relation to the second objective, which assessed the impact of poverty on infrastructural development, the long-run results show that the infrastructural development index (IDI) had a positive and statistically significant coefficient of 1.9047 ($p = 0.0356$). This suggests that, over the long run, changes in infrastructure are significantly associated with poverty dynamics in Nigeria. The positive sign implies that improvements in infrastructure, as currently structured, may not have been sufficiently pro-poor and could even coincide with rising poverty levels, possibly due to uneven distribution of infrastructure investments. In the short run, IDI exhibited a negative coefficient of -0.6599, although statistically insignificant, indicating that short-term improvements in infrastructure tend to reduce poverty. This mixed outcome is consistent with Ejemezu and Ajala (2023), who found that infrastructure expenditure reduces poverty in the long run, though short-run effects are often weak or delayed. The result suggests that while infrastructure is critical for poverty reduction, its impact depends heavily on targeting, sectoral allocation, and inclusiveness.

Regarding the third objective, which investigated the relationship between poverty and life expectancy, the results indicate a strong and statistically significant negative relationship in the long run. Life expectancy (LEXP) recorded a coefficient of -11.0883 with a probability value of 0.0001, implying that increases in life expectancy significantly reduce poverty over time. This finding underscores the importance of health outcomes in shaping poverty dynamics and confirms the human capital argument that healthier populations are more productive and earn higher incomes. In the short run, life expectancy also showed a statistically significant effect, with a coefficient of 28.0488 ($p = 0.0290$), indicating strong short-term responsiveness. These results corroborate Aladejare et al. (2025), who emphasized that health outcomes are closely linked to poverty reduction,

although weak institutions can limit their effectiveness. The findings further support Wilson et al. (2025), who observed that health-related outcomes, though sometimes insignificant in the short run, remain critical to long-term poverty reduction and development.

Concerning the fourth objective, which evaluated the effect of poverty on educational attainment, the long-run ARDL result showed that the education attainment index (EAI) had a positive and statistically significant coefficient of 5.6408 (p = 0.0001). This indicates a strong association between education and poverty dynamics in Nigeria. However, the positive sign suggests that improvements in educational attainment have not automatically translated into poverty reduction, possibly due to issues such as graduate unemployment, poor education quality, and skills mismatch. In the short run, EAI also had a positive coefficient of 4.9923, though statistically insignificant at the 5 per cent level (p = 0.1049). These findings resonate with Wilson et al. (2025), who found that education expenditure significantly reduces poverty in the long run, but with limited short-run impact. Similarly, Okororie (2025) highlighted education deficits and policy weaknesses as key factors sustaining poverty despite increased educational participation.

The error correction term, with a coefficient of -2.0597 and a probability value of 0.0001, confirms the stability of the model and indicates a rapid speed of adjustment to long-run equilibrium, with about 59 per cent of short-run disequilibrium corrected annually. The high adjusted R-squared value of approximately 0.60 further indicates that variations in poverty are substantially explained by per capita income, infrastructure, life expectancy, and educational attainment. In summary, the results strongly align with existing empirical literature and confirm that poverty remains a central driver and outcome of underdevelopment in Nigeria. They also highlight that while improvements in income, health, education, and infrastructure are essential, their poverty-reducing effects depend on inclusiveness, institutional quality, and effective policy implementation.

Conclusion

This study examined the relationship between poverty and underdevelopment in Nigeria by analyzing the effects of key development indicators per capita income, infrastructural development, life expectancy, and educational attainment using time-series data and the ARDL framework. The empirical findings provide strong evidence that poverty and underdevelopment are closely interconnected and reinforce each other over time, confirming the relevance of the Vicious Cycle of Poverty and Human Capital theories in explaining Nigeria's development challenges.

The results show that improvements in per capita income contribute to poverty reduction, particularly in the short run, although the long-run effect is weakened by structural factors such as income inequality, unemployment, and uneven distribution of economic gains. This suggests that economic growth alone is insufficient to significantly reduce poverty unless it is inclusive and employment-generating. Infrastructural development was also found to be significantly related to poverty, but the mixed results indicate that infrastructure investments in Nigeria have not always translated into reduced poverty, largely due to poor targeting, regional disparities, and inefficiencies in implementation.

Life expectancy emerged as a critical factor in poverty reduction, with strong and significant effects in both the short run and long run. This highlights the importance of health outcomes in improving productivity, welfare, and overall development. Educational attainment was found to be significantly associated with poverty in the long run; however, the limited poverty-reducing impact of education points to challenges such as poor education quality, skills mismatch, and high graduate unemployment, which undermine the expected benefits of human capital development.

The study establishes that poverty remains both a cause and a consequence of underdevelopment in Nigeria. Addressing poverty therefore requires a comprehensive and integrated development strategy that goes beyond income growth to include effective investment in health, education, and infrastructure, supported by strong institutions and inclusive policies. Without addressing these structural and institutional weaknesses, efforts to reduce poverty and achieve sustainable development in Nigeria are likely to remain limited.

References

Abubakar, M., & Obomeghie, A. (2024). Access to finance, institutional quality and poverty reduction in Nigeria: An ARDL approach. Nigerian Journal of Economic Development, 12(2), 45–67.

Ajakaiye, O., & Olomola, A. S. (2003). Poverty in Nigeria: A multidimensional perspective. Ibadan: Nigerian Institute of Social and Economic Research (NISER).

Aladejare, S. A., Odzie, V. O., & Odey, F. I. (2025). Human capital investment, institutional quality and poverty reduction in Nigeria. African Journal of Economic Policy and Development, 15(1), 88–110.

Becker, G. S. (1964). Human capital: A theoretical and empirical analysis, with special reference to education. New York, NY: Columbia University Press.

Eboh, E. C. (2009). Social and economic research: Principles and methods. Enugu: African Institute for Applied Economics.

Ejemezu, E. C., & Ajala, A. O. (2023). Government expenditure and poverty reduction in Nigeria: Evidence from infrastructure investment. Journal of Development Economics and Policy Studies, 8(3), 114–131.

National Bureau of Statistics. (2022). Nigeria multidimensional poverty index survey 2022. Abuja, Nigeria: National Bureau of Statistics.

National Bureau of Statistics. (2023). Nigeria multidimensional poverty report 2023. Abuja, Nigeria: National Bureau of Statistics.

Nurkse, R. (1953). Problems of capital formation in underdeveloped countries. Oxford, United Kingdom: Basil Blackwell.

Ogujiuba, K., & Abraham, T. W. (2012). Poverty and economic growth in Nigeria: Issues and policies. International Journal of Economic Development Research and Investment, 3(1), 96–111.

Okonjo-Iweala, N., & Osafo-Kwaako, P. (2007). Nigeria's economic reforms: Progress and challenges. Washington, DC: Brookings Institution.

Okororie, E. C. (2025). Extreme poverty and anti-poverty strategies in Nigeria: Challenges and prospects for sustainable development. Journal of Social and Development Studies, 17(1), 55–74.

Olayemi, J. K. (2012). Poverty eradication and the challenges of economic development in Nigeria. Nigerian Journal of Economic and Social Studies, 54(2), 145–162.

Oluwatayo, I. B. (2014). Poverty and income diversification among rural households in Nigeria. Journal of Economics and Sustainable Development, 5(5), 45–56.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289–326. https://doi.org/10.1002/jae.616

Schultz, T. W. (1961). Investment in human capital. The American Economic Review, 51(1), 1–17.

Uzodigwe, A. A., Obi, C. N., Ezenekwe, U. R., & Anuforo, J. C. (2025). Macroeconomic determinants of poverty in Nigeria: Evidence from a nonlinear autoregressive distributed lag model. Journal of African Economic Studies, 14(2), 72–95.

Wilson, A. B., Akobi, D. E., & Babale, M. A. (2025). Development expenditure and poverty alleviation in Nigeria: Evidence from education and health sectors. International Journal of Public Finance and Development, 11(1), 33–57.