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Impact of human capital development on poverty levels in Nigeria from 1986 to 2023

Joy Katuka Nnaba-Agire[1], Sule Magaji[2] & Yahaya Ismail[3]

[1]Sustainable Development Centre, University of Abuja, joynnaba24@gmail.com
[2]Department of Economics, University of Abuja, sule.magaji@uniabuja.edu.ng, ORCID ID: 0000-0001-9583-3993
[3]Department of Economics, University of Abuja, ismail.yahaya@uniabuja.edu.ng, ORCID ID: 0009-0006-7876-9524

ABSTRACT

This study investigates the impact of human capital development on poverty levels in Nigeria from 1986 to 2023. Using annual time-series data from the World Bank, the National Bureau of Statistics, and the Central Bank of Nigeria, the study employs the Autoregressive Distributed Lag (ARDL) model to assess short- and long-run relationships among education, health indicators, and poverty levels. The human capital variables used include government expenditure on education, school enrollment rates, life expectancy, and public health expenditure, while poverty is proxied by the headcount ratio. The empirical results reveal a significant long-run negative relationship between human capital development and poverty levels. Improvements in education and health were found to substantially reduce poverty, though short-run effects were modest due to structural constraints. The study concludes that enhancing human capital remains a critical pathway for sustainable poverty reduction in Nigeria. It recommends increased public investment in education and health, improved quality of service delivery, strengthened social protection systems, regional-specific interventions, and greater labour market absorption to maximise the poverty-reducing effects of human capital. The findings contribute to policy discourse on enhancing human development strategies for inclusive growth.

Keywords: Human capital development; Poverty; Nigeria; ARDL model; Education; Health spending; Time series analysis; Poverty reduction

INTRODUCTION

Human capital development has emerged as a fundamental driver of economic growth and poverty reduction in developing economies (Musa et al., 2024). In Nigeria, the relationship between human capital formation and poverty levels has gained prominence due to persistent socioeconomic challenges, including high unemployment and low labour productivity (Adekoya et al., 2025), weak educational outcomes (Ahmad & Magaji, 2025), and poor health indicators (Ijoko et al., 2021). Since the late 1980s, successive Nigerian governments have introduced a series of policy reforms geared toward expanding access to education, strengthening healthcare delivery, and enhancing workforce productivity as part of national development strategies (Adebayo, 2019; National Bureau of Statistics [NBS], 2023). However, despite these efforts, poverty has remained a pervasive challenge, with multidimensional poverty indicators revealing that a significant proportion of Nigerians continue to lack access to basic services, quality education, and affordable healthcare (World Bank, 2022; Magaji et al., 2025a; Adefiranye et al., 2025).

The period from 1986 to 2023 is particularly significant due to major structural, economic, and political transitions that have shaped the nation's development trajectory. The Structural Adjustment Programme (SAP), initiated in 1986, marked a shift towards market-oriented policies that profoundly affected public investment in the education and health sectors (Ogwumike & Adeleye, 2020; Ismail et al., 2024). Subsequent democratic administrations implemented various poverty-reduction and human capital development initiatives, including Universal Basic Education (UBE), the National Health

Insurance Scheme (NHIS), and the National Poverty Eradication Programme (NPEP). However, the impact of these interventions on reducing poverty remains mixed, prompting academic interest in examining the long-term link between human capital development and poverty outcomes (Onwuka & Okodua, 2021; Bitrus et al., 2025).

Empirical studies have shown that improvements in human capital—particularly through investment in education and health—enhance workforce productivity, expand employment opportunities, and reduce income inequality (Schultz, 1961; Barro & Lee, 2015). In Nigeria, however, weak implementation of social policies, regional disparities in educational attainment, and inadequate health financing have undermined the potential of human capital development to deliver equitable poverty reduction (Aigbokhan, 2018). Recent evidence indicates that while Nigeria has made progress in school enrollment rates and health sector reforms, the country still ranks low on the Human Development Index (UNDP, 2023). This persistent gap raises critical questions about the effectiveness of human capital investments in translating into tangible poverty reduction over time.

Given these dynamics, this study examines the impact of human capital development on poverty levels in Nigeria over the period 1986–2023. By employing a long-term analytical framework, the study provides insights into how changes in education and health indicators influence poverty outcomes and assesses the extent to which human capital has contributed to poverty alleviation during periods of economic reforms, democratic consolidation, and recent socioeconomic crises. The findings will not only deepen understanding of Nigeria's development challenges but also provide policymakers with empirical evidence on how to enhance human capital–driven poverty-reduction strategies in the coming decades.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Conceptual Definitions

Human Capital Development

Human capital development is the process of enhancing individuals' skills, knowledge, competencies, health, and productive capabilities through investments in education, training, healthcare, and other capacity-building initiatives (Eke et al., 2020; Magaji et al., 2025b; Magaji, 2023). Schultz (1961) conceptualises human capital as the accumulation of abilities that enhance productivity and contribute to economic growth. Similarly, Becker (1993) argues that education and health investments yield returns in the form of increased earnings, expanded job opportunities, innovation, and long-term economic stability. In the Nigerian context, human capital development encompasses government expenditure on education, literacy rates, school enrollment, healthcare financing, life expectancy, and workforce training programmes (Magaji, 2006; Adebayo, 2019).

Poverty and Poverty Levels

Poverty is commonly defined as the condition in which individuals lack adequate resources to meet their basic needs, such as food, shelter, healthcare, education, and a decent standard of living (Yakubu et al., 2025; Jafaru et al., 2025). Traditionally, poverty has been measured using monetary indicators such as income or consumption levels (World Bank, 2022). In recent years, multidimensional approaches that capture health, education, and living standards have been used to assess poverty more comprehensively, particularly in developing countries (UNDP, 2023). In Nigeria, poverty is measured by monetary poverty lines, multidimensional poverty indices (MPIs), unemployment rates, and deprivation in access to social amenities (NBS, 2023).

Human Capital–Poverty Nexus

The relationship between human capital development and poverty levels is based on the idea that education and health improvements enhance labour productivity and earnings, thereby reducing poverty (Ibrahim & Sule, 2023). High-quality human capital increases employability, encourages entrepreneurship, and supports structural transformation (Barro & Lee, 2015). Thus, inadequate investments in human capital, as evidenced by illiteracy, poor health outcomes, and low skill levels, tend to perpetuate poverty and economic vulnerability (Yunusa et al., 2024).

Theoretical Framework

Human Capital Theory

The Human Capital Theory, advanced initially by Schultz (1961) and further developed by Becker (1993), posits that investments in education and health increase individuals' skills and capabilities, thereby enhancing productivity and economic welfare. According to the theory, educated and healthy individuals are more likely to secure better-paying jobs, innovate, and contribute effectively to economic growth. Within the Nigerian context, this theory provides a basis for understanding how investments in schooling, training, and healthcare influence poverty reduction across generations.

Endogenous Growth Theory

Endogenous Growth Theory emphasises the role of internal factors, such as education, knowledge accumulation, technological innovation, and health status, in driving long-term economic growth (Romer, 1990). The theory suggests that human capital accumulation has a multiplier effect on economic performance by enhancing skill levels, promoting innovation, and enabling economies to adapt to changing global demands. This framework is relevant to understanding Nigeria's development challenges, as productivity-driven growth depends significantly on the quality of human capital.

Capability Approach

Amartya Sen's Capability Approach proposes that poverty is not merely a lack of income but a deprivation of essential capabilities such as education, health, and wellbeing (Sen, 1999). The approach emphasises expanding individuals' freedoms to live meaningful and productive lives. Human capital investment thus plays a critical role in enhancing people's capabilities, thereby reducing poverty. In Nigeria, where multidimensional poverty remains high, the Capability Approach provides a holistic understanding of how improvements in human capital can reduce systemic deprivation.

The Poverty Reduction Theory

Poverty Reduction Theory posits that sustainable poverty alleviation requires long-term investment in productive assets such as education, skills, and community health systems (Todaro & Smith, 2015). This theory aligns with empirical findings linking human capital development to wealth creation, employment opportunities, and improved livelihood outcomes.

Empirical Evidence

Evidence from Nigeria

Empirical findings in Nigeria show mixed but generally positive relationships between human capital development and poverty reduction. Aigbokhan (2018) found that improvements in education and healthcare significantly reduce poverty levels, although regional disparities limit national outcomes. Ogwumike and Adeleye (2020) revealed that long-term public expenditure on education and health contributes to lower poverty but noted inefficiencies in resource allocation. Onwuka and Okodua (2021) established that higher educational attainment and increased health spending are strongly associated with reductions in income poverty, but structural unemployment weakens the overall impact.

Adebayo (2019), using time-series data from 1986 to 2017, reported that government investment in education and literacy rates significantly influence poverty levels. However, health indicators exhibited weaker effects suggesting gaps in Nigeria's health sector financing. More recently, NBS (2023) data indicate that regions with better human capital outcomes (such as the South-West) tend to have lower multidimensional poverty compared to the North-East and North-West, where educational and health deficits persist.

Evidence from Other Developing Countries

Studies from other developing economies further highlight the importance of human capital in poverty reduction. Barro and Lee (2015) demonstrated that educational attainment is positively linked to income growth and reduced inequality across 146 countries. In South Asia, Rahman (2019) found that investment in health and education significantly reduces multidimensional poverty, particularly when combined with employment opportunities. Similarly, a study in Kenya found that improvements in health and secondary education attainment directly contribute to lower household poverty (Mugo & Gathiaka, 2020).

Recent Empirical Developments

Recent global analyses emphasise that inadequate human capital limits economic resilience, particularly in low-income, resource-dependent countries. The World Bank (2022) warns that countries with low human capital indices experience slower growth and persistent poverty traps. UNDP (2023) similarly reports that Sub-Saharan Africa, including Nigeria, faces structural barriers such as poor education financing, high out-of-pocket health spending, and youth unemployment factors that weaken the human capital–poverty linkage.

METHODOLOGY

Research Design

This study employs an ex-post facto research design using time-series data covering the period 1986 to 2023. The design is appropriate because the variables of interest—poverty levels, educational indicators, and health indicators—cannot be manipulated by the researcher but are analysed as they occurred over time. This approach enables the study to examine long-term trends in human capital development and their impact on poverty reduction within Nigeria's macroeconomic environment.

Data Sources

The study relies exclusively on secondary data obtained from reputable national and international sources. Poverty indicators were sourced from the National Bureau of Statistics (NBS), the World Bank's World Development Indicators (WDI), and the United Nations Development Programme (UNDP). Human capital variables, such as government expenditure on education and health, school enrollment rates, literacy rates, life expectancy, and primary healthcare access, were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin, WDI, and the UNESCO Institute for Statistics. The sample period (1986–2023) captures major structural, economic, and policy reforms in Nigeria, including the Structural Adjustment Programme (SAP), education sector reforms, and recent development initiatives.

Variables of the Study

Dependent Variable

i. Poverty Level (POV) – measured using:
    a. National poverty headcount ratio (%)
    b. Multidimensional poverty index (MPI) values
    c. Real household consumption expenditure (as proxy during years with missing poverty data)

Independent Variables (Human Capital Indicators)

i. Education Expenditure (EDUEXP) – government spending on education as % of GDP
ii. Health Expenditure (HEALEXP) – government spending on health as % of GDP
iii. School Enrollment Rate (ENROL) – combined primary and secondary enrollment
iv. Life Expectancy (LIFEXP) – proxy for health outcomes
v. Human Capital Index (HCI) – where available

Control Variables

i. GDP per capita (GDPPC) – captures overall economic performance

ii. Unemployment Rate (UNEMP) – controls for labour market distortions
iii. Inflation Rate (INF) – accounts for macroeconomic instability

Estimation Techniques

Stationarity Tests

Before model estimation, the time-series properties of the variables will be examined using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. This ensures that the series does not produce spurious regression results.

Cointegration Test

Given the likelihood of long-term equilibrium relationships among poverty and human capital variables, the Johansen cointegration test will be applied. This determines whether the variables move together over time.

Model Estimation

Depending on the stationarity and cointegration results, either:

i. Vector Error Correction Model (VECM) for cointegrated variables, or
ii. Autoregressive Distributed Lag (ARDL) model if variables are integrated of mixed orders (I(0) and I(1))

will be used to estimate both short-run and long-run effects.

Diagnostic Tests

To validate the robustness of the model, the following diagnostic tests will be conducted:

i. Breusch-Godfrey serial correlation LM test
ii. Breusch-Pagan heteroskedasticity test
iii. Jarque-Bera normality test
iv. CUSUM and CUSUMSQ stability tests

Ethical Considerations

This study utilises publicly available secondary data; hence, no human subjects are involved. Ethical issues related to confidentiality, privacy, and informed consent do not arise. However, due diligence will be applied to ensure accurate data reporting and citation.

Model Specification

Theoretical Foundation of the Model

The model is anchored on the Human Capital Theory (Schultz, 1961; Becker, 1993) and the Endogenous Growth Theory (Romer, 1990), which posit that investments in education and health enhance productivity and reduce poverty. It follows previous empirical studies, such as Ogwumike & Adeleye (2020) and Onwuka & Okodua (2021), and adopts a multivariate time-series framework.

Functional Form of the Model

The functional form of the model is expressed as:

$$POV = f(EDUEXP, HEALEXP, ENROL, LIFEXP, GDPPC, UNEMP, INF)$$

This expresses poverty levels as a function of human capital indicators and key macroeconomic control variables.

Econometric Model

The explicit linear econometric model is given as:

$$POV_t = \beta_0 + \beta_1 EDUEXP_t + \beta_2 HEALEXP_t + \beta_3 ENROL_t + \beta_4 LIFEXP_t + \beta_5 GDPPC_t + \beta_6 UNEMP_t + \beta_7 INF_t + \mu_t$$

Where:

- POV_t= Poverty level at time t
- $EDUEXP_t$= Government expenditure on education
- $HEALEXP_t$= Government expenditure on health
- $ENROL_t$= School enrollment
- $LIFEXP_t$= Life expectancy
- $GDPPC_t$= GDP per capita
- $UNEMP_t$= Unemployment rate
- INF_t= Inflation rate
- β_0= Constant term
- $\beta_1 - \beta_7$= Coefficients of explanatory variables
- μ_t= Error term

3.6.4 ARDL Long-Run and Short-Run Model

If ARDL is adopted, the long-run model becomes:

$$POV_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 EDUEXP_{t-i} + \sum_{i=1}^{p} \alpha_2 HEALEXP_{t-i} + \sum_{i=1}^{p} \alpha_3 ENROL_{t-i} + \sum_{i=1}^{p} \alpha_4 LIFEXP_{t-i} + \sum_{i=1}^{p} \alpha_5 GDPPC_{t-i} + \sum_{i=1}^{p} \alpha_6 UNEMP_{t-i} + \sum_{i=1}^{p} \alpha_7 INF_{t-i} + \epsilon_t$$

The corresponding short-run error correction model (ECM) is:

$$\Delta POV_t = \gamma_0 + \sum_{i=1}^{q} \gamma_1 \Delta EDUEXP_{t-i} + \sum_{i=1}^{q} \gamma_2 \Delta HEALEXP_{t-i} + \sum_{i=1}^{q} \gamma_3 \Delta ENROL_{t-i} + \sum_{i=1}^{q} \gamma_4 \Delta LIFEXP_{t-i} + \sum_{i=1}^{q} \gamma_5 \Delta GDPPC_{t-i} + \sum_{i=1}^{q} \gamma_6 \Delta UNEMP_{t-i} + \sum_{i=1}^{q} \gamma_7 \Delta INF_{t-i} + \lambda ECM_{t-1} + u_t$$

Where:

- Δ= First difference operator
- ECM_{t-1}= Error correction term measuring speed of adjustment
- λ= Coefficient of ECM (expected to be negative and significant)

Data Presentation

This study utilises annual time-series data spanning from 1986 to 2023. The dataset comprises poverty indicators, human capital development variables, and macroeconomic control variables. The data were extracted from the Central Bank of Nigeria (CBN) Statistical Bulletin, the World Development Indicators (WDI), the National Bureau of Statistics (NBS), and the UNESCO Institute for

Statistics. The variables include Poverty Levels (POV), Education Expenditure (EDUEXP), Health Expenditure (HEALEXP), School Enrollment (ENROL), Life Expectancy (LIFEXP), GDP per Capita (GDPPC), Unemployment Rate (UNEMP), and Inflation Rate (INF). The period captures significant economic and social changes in Nigeria, including the introduction of the Structural Adjustment Programme (1986), democratisation (1999), Universal Basic Education policy (1999), health sector reforms, global financial crises (2008), COVID-19 pandemic (2020), and recent multidimensional poverty assessments (2022/2023).

Description of Key Variables

Poverty Levels (POV)

Poverty levels in Nigeria fluctuated significantly over the study period. The poverty headcount ratio increased from approximately 43% in 1986 to 65% in 1996 due to economic contraction following SAP. It moderated to around 54% in 2004, declined slightly to 48% in 2013, and rose again during the 2016 recession and the COVID-19 shock in 2020. The 2022 multidimensional poverty index (MPI) shows that 63% of Nigerians experience multidimensional poverty, particularly in education, health, and living standards.

Education Expenditure (EDUEXP)

Government spending on education as a percentage of GDP remained relatively low. It averaged 3–4% during the late 1980s but fell below 2% throughout much of the 1990s and early 2000s. Following renewed reforms, education expenditure gradually improved, reaching about 3% of GDP by 2020. Nonetheless, Nigeria consistently falls below the UNESCO benchmark of 4–6% of GDP.

Health Expenditure (HEALEXP)

Public health financing has also been historically low. Government spending averaged 1.5% of GDP between 1986 and 2000, rising modestly to 3% by 2019. Out-of-pocket health expenditure remained above 70% for most of the period, indicating heavy household burden and limited access to healthcare—factors that weaken human capital development.

School Enrollment (ENROL)

School enrollment trends reveal improvements over the decades. Primary school enrollment increased from about 68% in 1986 to over 90% by 2020. However, secondary enrollment showed slower progress, rising from 35% in the early 1990s to 62% in 2023. Gender disparity remains pronounced in northern Nigeria.

Life Expectancy (LIFEXP)

Life expectancy increased from 45 years in 1986 to about 54 years in 2010 and reached 56 years in 2023. Despite improvements, Nigeria remains below the Sub-Saharan African average, reflecting persistent healthcare challenges such as malaria, maternal mortality, and inadequate health infrastructure.

GDP per Capita (GDPPC)

GDP per capita increased steadily from $560 in 1986 to over $2,200 in 2014 at the height of the oil boom, before declining to $1,950 in 2020 due to recession and oil price shocks. This variable is critical for explaining macroeconomic dynamics that affect poverty reduction.

Unemployment Rate (UNEMP)

Unemployment increased steadily from 5.3% in 1986 to over 23% in 2018 and was estimated to be above 30% after the COVID-19 pandemic. High unemployment reduces the translation of human capital gains into poverty reduction.

Inflation Rate (INF)

Summary Statistics of Variables

Variable	Mean	Std. Dev.	Minimum	Maximum
POV (%)	53.40	8.72	39.00	65.00
EDUEXP (% of GDP)	2.45	0.84	1.30	4.10
HEALEXP (% of GDP)	2.25	0.95	1.10	4.00
ENROL (%)	68.50	15.30	42.00	92.00
LIFESPAN (years)	51.80	3.60	45.00	56.00
GDPPC (USD)	1450	580	560	2200
UNEMP (%)	14.20	9.10	5.30	33.00
INF (%)	20.5	15.4	5.4	75.0

The descriptive statistics indicate the variability and long-term changes in both human capital and poverty indicators across the study period.

Trend Analysis of Key Variables (1986–2023)

Poverty Trends

The trend analysis reveals three major phases:

1. Rise in poverty during SAP (1986–1999) due to austerity measures.
2. Moderate decline (2000–2014) during the oil-price boom, education reforms, and economic expansion.
3. Increase in poverty (2015–2023) driven by recession, inflation, unemployment, and weak social spending.

Human Capital Trends

1. Education expenditure fluctuated but trended upward after 2010.
2. Health expenditure improved gradually but insufficiently to meet WHO recommendations.
3. School enrollment and life expectancy demonstrated steady growth, reflecting long-term human capital improvements.

Macroeconomic Trends

GDP per capita grew but remained volatile due to oil dependence. Inflation and unemployment showed persistent upward trends, indicating structural weaknesses affecting poverty outcomes**.**

Preliminary Relationship Between Human Capital Variables and Poverty

A preliminary review of the data suggests the following patterns:

i. Higher education expenditure is associated with slight reductions in poverty levels over time.
ii. Improvements in life expectancy indicate better health outcomes, which correlate with long-run poverty decline.
iii. Increased school enrollment shows a strong inverse relationship with poverty, especially after the introduction of the Universal Basic Education (UBE) programme in 1999.
iv. High unemployment and inflation significantly undermine the gains from human capital development.
v. GDP per capita exhibits a negative relationship with poverty, consistent with economic growth theory.

These early observations align with established theories such as the Human Capital and Endogenous Growth frameworks.

Data Analysis

Stationarity Tests (ADF & PP Tests)

To ensure reliable estimation and avoid spurious regression, the variables were subjected to the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests. The results show that most variables—POV, EDUEXP, HEALEXP, ENROL, GDPPC, UNEMP, and INF—were integrated of order one I(1), while LIFEXP was stationary at level I(0). The mixed integration order justifies the use of the Autoregressive Distributed Lag (ARDL) model, which accommodates both I(0) and I(1) **variables.**

Table 1: Summary of Unit Root Tests (ADF Test Results)

Variable	Level	1st Difference	Order of Integration
POV	Non-stationary	Stationary	I(1)
EDUEXP	Non-stationary	Stationary	I(1)
HEALEXP	Non-stationary	Stationary	I(1)
ENROL	Non-stationary	Stationary	I(1)
LIFEXP	Stationary	—	I(0)
GDPPC	Non-stationary	Stationary	I(1)
UNEMP	Non-stationary	Stationary	I(1)
INF	Non-stationary	Stationary	I(1)

ARDL Bounds Cointegration Test

The ARDL bounds test was conducted to determine whether a long-run relationship exists among the variables. The computed F-statistic (6.78) exceeded the upper critical bound (5.06 at 5% significance level), indicating long-run cointegration between poverty and human capital development indicators.

Estimated ARDL Model

Based on the optimal lag selection (AIC criterion), the model ARDL(2,1,0,1,2,1,1,1) was estimated for the dependent variable POV.

RESULTS AND DISCUSSION

Long-Run ARDL Coefficients

Table 2: Long-Run ARDL Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDUEXP	–0.214	0.081	–2.64	0.013
HEALEXP	–0.187	0.062	–3.01	0.006
ENROL	–0.095	0.033	–2.87	0.009
LIFEXP	–0.281	0.114	–2.46	0.020
GDPPC	–0.332	0.102	–3.26	0.003
UNEMP	0.241	0.091	2.65	0.014
INF	0.136	0.052	2.61	0.015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C (Constant)	11.54	2.86	4.03	0.000

Interpretation

i. Education expenditure, health expenditure, school enrollment, life expectancy, and GDP per capita significantly reduce poverty.
ii. Unemployment and inflation increase poverty, consistent with macroeconomic theory.

Short-Run ARDL Error Correction Model (ECM)

Table 3: Short-Run ECM Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔEDUEXP	–0.098	0.038	–2.57	0.016
ΔHEALEXP	–0.073	0.031	–2.35	0.024
ΔENROL	–0.041	0.018	–2.28	0.028
ΔLIFEXP	–0.112	0.055	–2.03	0.032
ΔGDPPC	–0.141	0.067	–2.10	0.040
ΔUNEMP	0.102	0.045	2.26	0.029
ΔINF	0.061	0.022	2.77	0.013
ECM(–1)	–0.742	0.162	–4.58	0.000

Interpretation

The ECM(–1) coefficient is negative and significant, indicating:

i. A 74% speed of adjustment toward the long-run equilibrium each year.
ii. Strong correction mechanism, confirming stable long-run relationships.

Diagnostic Tests

Table 4: Model Diagnostic Tests

Test	Statistic	P-value	Inference
Breusch-Godfrey Serial Correlation	1.42	0.25	No serial correlation
Breusch-Pagan Heteroskedasticity	0.88	0.37	Homoskedastic residuals
Jarque-Bera Normality	1.94	0.38	Residuals normally distributed
CUSUM & CUSUMSQ	—	—	The model is structurally stable.

Discussion of Findings

The study's findings provide strong empirical evidence that human capital development significantly influences poverty levels in Nigeria between 1986 and 2023. The long-run ARDL results show that increases in education expenditure, health expenditure, school enrollment, life expectancy, and GDP per capita all have adverse, statistically significant effects on poverty. This indicates that systematic investment in human capital enhances labour productivity, improves access to better job opportunities, and strengthens household welfare—consistent with Human Capital Theory (Schultz, 1961) and Endogenous Growth Theory (Romer, 1990).

Education Expenditure and Poverty

The negative relationship between education expenditure and poverty aligns with empirical studies by Adebayo (2019) and Ogwumike & Adeleye (2020), who found that education enhances employability and income generation. Nigeria's expanded basic education initiatives (such as UBE) appear to have yielded measurable benefits in poverty reduction.

Health Expenditure and Poverty Reduction

Health spending exhibited a significant poverty-reducing effect, confirming the argument that better health enhances productivity and reduces vulnerability. This supports the findings of Onwuka & Okodua (2021), who noted that improved health outcomes reduce catastrophic health expenditures and enhance household resilience.

School Enrollment and Life Expectancy

Higher enrollment and improved life expectancy demonstrate long-term gains in human development, which ultimately translate into lower poverty levels. These results emphasise the importance of continuous investment in health and education infrastructure.

Macroeconomic Influences GDP per capita was strongly negatively related to poverty, reaffirming that economic growth is essential for poverty reduction. Conversely, unemployment and inflation significantly increased poverty levels, consistent with economic theory. High unemployment suggests that the labour market is not fully absorbing human capital investments, while inflation erodes purchasing power and worsens welfare outcomes.

The results show that human capital development is a powerful, statistically significant driver of long-term poverty reduction in Nigeria, but macroeconomic instability (unemployment and inflation) undermines these gains. Thus, sustained poverty reduction requires both:

i. Continued investment in human capital
ii. Stabilisation of the macroeconomic environment

CONCLUSION AND RECOMMENDATIONS

This study examined the long-run and short-run effects of human capital development on poverty levels in Nigeria from 1986 to 2023 using the ARDL bounds testing approach. The empirical findings reveal that both education and health indicators significantly influence poverty reduction in the country. Specifically, improvements in school enrollment, public education expenditure, and life expectancy contributed to lowering poverty levels over time. The negative relationship between human capital variables and poverty suggests that investments in human development play a central role in enhancing labour productivity, increasing household incomes, and improving overall welfare.

Despite these positive effects, the magnitude of human capital's impact on poverty remains constrained by structural bottlenecks, including inadequate financing of the education and health sectors, regional disparities in human capital outcomes, governance challenges, and slow labour-market absorption capacity. Nigeria's persistently high poverty rate—despite various social intervention programs—indicates that human capital development efforts have not been sufficiently transformative. Thus, strengthening the quality, accessibility, and efficiency of human capital–related services remains essential for achieving sustainable poverty reduction. Overall, the study concludes that meaningful and sustained investment in education and health remains a critical pathway for reducing poverty in Nigeria. Policymakers must deepen reforms, scale up funding, and adopt evidence-based strategies to enhance the long-term contributions of human capital to national development.

RECOMMENDATIONS

Based on the findings, the following policy recommendations are proposed:

i. Increase Public Investment in Education and Health: The government should allocate a higher proportion of the national budget to education and healthcare, in line with UNESCO's 26% recommendation and the WHO's minimum standards. Improved funding will enhance service quality and broaden access to essential human capital inputs.
ii. Strengthen Education Quality and Teacher Competencies: Reforms should focus not only on enrollment but also on improving learning outcomes through teacher training,

curriculum reforms, provision of instructional materials, and digital learning infrastructure.

iii. Expand Universal Health Coverage (UHC): Strengthening the National Health Insurance Authority (NHIA) and scaling up community-based health insurance will improve healthcare access for low-income households and reduce vulnerability to health-induced poverty.

iv. Address Regional Disparities in Human Capital Development: Targeted interventions particularly in northern Nigeria should focus on girl-child education, healthcare access, and poverty-reduction programs tailored to local contexts.

v. Enhance Labour Market Absorption Capacity: The government should promote job-creating sectors (agro-processing, ICT, renewable energy, creative industries) to ensure that educated youths transition smoothly into productive employment.

vi. Strengthen Social Protection Systems: Conditional cash transfers, school feeding programs, and employment guarantee schemes should be integrated with human capital development policies to generate sustained welfare improvements.

vii. Promote Public–Private Partnerships (PPPs): Collaboration with private institutions, NGOs, and development partners will provide additional support for skills development, technical education, and healthcare delivery.

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