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Article

Poverty mitigation in Nigeria: The role of human capital investment and institutions

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Abstract: Despite the enormous resource wealth and human capital of Nigeria, poverty has become endemic among its population. Thus, this paper assessed the role of human capital investment and institutions in mitigating poverty in Nigeria between 1990 and 2023. By employing the autoregressive distributed lag technique, the paper demonstrated that human capital has a weak effect in decelerating poverty levels in the country. Specifically, while public investment in education and health has no significant long-term impacts on poverty, an increase in employment significantly reduces poverty levels for Nigeria. Conversely, institutions were found to aid the rising trend of poverty in the country, with dysfunctionality in government effectiveness and politically motivated violence being significantly responsible. Thus, the study recommends an increase in funding for the health and educational sectors and an enabling environment for sophisticated manpower investment to further boost income levels against poverty incidences. Also, the dysfunctionality in the institutional workings of the country will need to be tamed before the dividends of governance can effectively tackle poverty.

Keywords: poverty; education; health; investment; governance; Nigeria

1. Introduction

Since the turn of the 21st century, poverty has remained a primary concern in most developing economies, Nigeria included. This is despite Nigeria being endowed with natural resources and human capital; yet, a significant number of its population live below the poverty line and survive on less than $1.90 per day [1,2]. Poverty in Nigeria, for instance, according to the World Bank, was estimated to be over 56% (or 129 million) Nigerians living below the international poverty line of $1.9 per day in 2024 [3]. Furthermore, the percentage of Nigerians living in absolute poverty increases each day; that is, those who cannot afford the basic essential foods, shelter, and clothing are 40% of the total population, or almost 83 million [4]. Consequently, Nigeria ranks 163 out of 189 countries in the world on the United Nations human development index due to the growing incidence of poverty, which is pervasive in the country [5].

Accordingly, investing in human capital through education and healthcare is seen as one of the ways through which the effect of poverty can be eradicated in developing countries. Human capital investment is recognized as a fundamental driver of wealth creation and development, with education and healthcare being the central pillars of this investment. The concept of human capital, which refers to the skills, knowledge, and health acquired by individuals that contribute to economic productivity, has become increasingly significant in discussions of sustainable development [6-8].

The importance of human capital investment as a mitigating factor for poverty lies in its capacity to foster innovation and improve economic outcomes, which are central elements of endogenous growth theories. Endogenous growth theory posits that economic growth is primarily generated from within a country, particularly through the accumulation of human capital, innovation, and knowledge [9]. Education plays a crucial role in developing human capital by equipping individuals with the skills and knowledge needed to participate effectively in the economy [10]. Moreover, healthcare investments ensure a healthy, capable workforce, which is essential for maintaining high productivity levels and for poverty reduction.

Focusing on Nigeria, a country with immense potential but also facing numerous challenges, the effects of human capital investment are particularly significant. Nigeria's economy, which is rich in natural resources and characterized by a large youthful population, has experienced varying rates of growth over the years. However, the country has struggled to reduce poverty, partly due to inadequate investment in human capital and security challenges. The Nigerian educational system has faced problems including underfunding, poor infrastructure, and inadequate teacher training, leading to below-average educational outcomes and inhibiting the development of a skilled and knowledgeable workforce [11,12]. Similarly, Nigeria's healthcare system is plagued by insufficient funding, a shortage of medical personnel, and inadequate healthcare facilities. These deficiencies have resulted in poor health outcomes, such as high infant mortality rates, low life expectancy, and a generally unhealthy population, all of which negatively impact workforce productivity and promote poverty [13,14]. The underperformance in both the education and healthcare sectors has significant implications for Nigeria's poverty alleviation drive, as a less educated and unhealthy workforce is less likely to be productive and hence economically emancipated [15].

Similarly, it has been widely argued that insecurity and violent extremism can have a negative impact on economic growth in the short and long run through a variety of channels, hence promoting poverty. Terrorism reduces the capital stock of a country by destroying human and physical capital. To combat terrorism, public outlay on security may have to increase. The risk and uncertainty associated with rising levels of insecurity can result in foreign direct investments (FDI) being redirected from countries with higher security risks toward countries with lower security challenges. [16] emphasized that increased levels of insecurity reduce investment returns and diminish a developing country's capacity to attract foreign direct and portfolio investments. Furthermore, terrorist activities create economic risks and uncertainties that distort the equilibrium resource allocation within a country by influencing individuals' savings, investment, and consumption behavior, thus widening the poverty gap [17,18]. Terrorist activity also stifles growth by increasing the cost of doing business through higher wages, higher insurance premiums, and increased security expenditures. These higher costs result in lower profits and, as a result, a lower return on investment, increasing unemployment and lowering income levels. Terrorist attacks can also devastate infrastructure, causing business disruptions and loss of livelihood.

In the past two decades, terrorist activities have significantly grown to worrisome heights, making the country unsafe for Nigerians and foreign investors. In fact, the

country was named the eighth most afflicted by terrorism in the 2024 Institute for Economics and Peace global terrorism index [19]. The disturbing level of insecurity, coupled with the lackadaisical attitude of the government in fighting corruption, is rendering the economy unappealing to local and foreign investors, who have become apprehensive of investing and putting their hard-earned resources in profitable investments in Nigeria [16,20].

Hence, this study examined the mitigating roles of human capital investment and institutions in poverty reduction in Nigeria. To the best of our knowledge, most literature has linked human capital investment and institutional quality to economic growth and development. However, seldom do studies examine the impact of both variables on poverty, particularly for Nigeria. Thus, this empirical lacuna is the primary focus of the study, since no meaningful development can occur without significant human capital investments and strong institutions in place to combat poverty levels in the economy.

Therefore, by consolidating on the extant literature related to the role of human capital and institutional quality in reducing poverty, the research adopted the autoregressive distributed lag (ARDL) technique to derive its empirical findings from data sourced between 1990 and 2023 for Nigeria. The next section is the literature review. Section 3 covers the data and methodology. Section 4 contains the results and discussions. Finally, Section 5 concludes the paper and offers policy recommendations.

2. Literature review

2.1. Theoretical review

The theoretical proposition for this study is based on the Keynesian and Neoliberal theoretical perspectives of poverty. A succinct discussion of the divide and similarity between both schools is provided in this section.

The Keynesian and Neoliberal theoretical view of poverty

According to a Keynesian/liberal viewpoint, the fate of certain minorities who drop short of employment, cannot find jobs, or have no expectation to—despite their desire to do so—is the primary cause of poverty. Therefore, in order to "regulate, supplement, and exhort, but not impose", the state has to implement action [21]. According to this view, market failures could indicate poverty and, in some cases, warrant monetary and in-kind redistributive taxes. Although the New-Keynesians' neoliberal school likewise takes an isolated, money-driven perspective on poverty, the significance placed on government activities permits a stronger emphasis on inequality and public goods. For example, disadvantaged groups in society may find it easier to participate if income distribution is more equitable. In contrast, the New-Keynesians are in line with neoclassical economists in their belief that overall growth in income is ultimately the most effective element in poverty removal.

Since human and physical capital are thought to be the cornerstones of economic growth, publicly provided capital—including education—has a significant role to play. Sachs [22] also pointed out that low levels of human capital (health, skills, and education), business capital (buildings and machinery), infrastructure (power, transportation, and sanitation), natural capital (viable land), public institutional capital

(rule of law and security), and knowledge capital (technical know-how required to increase productivity) are the primary indicators of underdevelopment in a nation or region. Sachs' method is novel since it is "clinical" in its design of anti-poverty interventions and requires situational adaptation rather than a "one size fits all" strategy.

Like people, economies should be viewed as complex systems, with different "diseases" and failures in one area (like corruption) leading to failures in other areas (like market systems) [23]. The existence of a poverty trap, the framework for economic policy, the fiscal framework and fiscal traps, physical geography, governance patterns and failures, cultural obstacles, and geopolitics are some of the factors that need to be considered. In this sense, the existence of a particularly poor institutional framework, such as corruption, which negatively affects how markets function, may have a significant impact on poverty in a particular nation. Geographic isolation may be the most important factor in another situation, as it can hinder the importation of essential commodities and services that people require to achieve a particular level of well-being.

In a nutshell liberal theory is based on the notion that poverty is caused by both market distortions and widespread underdevelopment in all of its manifestations. Keynesians contend that growth can alleviate poverty by fostering economic development, which supports macroeconomic government involvement (via monetary and fiscal policy), primarily to address involuntary unemployment.

2.2. Empirical review

2.2.1. Studies on public health and education investment and poverty

Olopade et al. [24] explored the relationship between human capital and reduction in poverty in the Organisation of Petroleum-Exporting Countries (OPEC) member economies. By applying a panel fully modified ordinary least squares (PFMOLS) estimation approach, the study revealed that human capital components have significant and positive long-run effects on poverty reduction in the 12 OPEC member countries examined.

More so, Amakom [25] examined the role of government expenditure in poverty reduction in Nigeria. By applying a Benefit Incidence Analysis (BIA), the research showed that primary education and healthcare acted significantly more as pro-poor in absolute terms than tertiary education and healthcare. Thus, the study concluded that income redistribution may be implemented by subsidized public services instead of through measures that involve direct consumption or income transfer.

Moreover, Arsani et al. [26] employed a 2-stage least squares (2-SLS) analysis to explore the relationship between human capital investment and poverty in Indonesia. Their study found that education to a large extent impacts household income and health. They noted specifically that tertiary education has higher returns on income than secondary and primary education levels in Indonesia.

Also, Yu and Li [27] assessed the effect of social security outlay on income disparity reduction and rural poverty in China. The research adopted a correlation and cointegration approach and found that there is a beneficial correlation between social security spending and the income gap of urban and rural dwellers in the long term.

Also, the study demonstrated that the elasticity of rural poverty incidence to social security outlay is significantly negative; hence, implying that social security spending aids the reduction of rural absolute poverty.

Furthermore, Nenbee et al. [28] evaluated the association between defense expenditure, unemployment, and poverty in Nigeria. By employing the ARDL technique, the study demonstrated that inconsistency in public defense spending has been aggravating poverty levels in Nigeria.

Moreover, Abaidoo [29] studied the relationship between education and poverty in Ghana. By applying the probit and logit approaches as well as the 2-SLS model, the study was able to significantly establish an inverse association between education and poverty. It was further revealed that having a higher educational qualification reduces the chances of a household head's poverty.

More so, Sirag and Nor [30] assessed the nexus between out-of-pocket health outlay and poverty for 145 economies. The study employed the dynamic panel threshold technique to derive its inferences. Results from the research revealed that out-of-pocket expenditure promoted poverty.

Also, Wei et al. [31] examined the impact of women's empowerment on poverty eradication in rural areas of Bangladesh. By adopting the questionnaire approach and analyzing the data through logistic and OLS methods, the study was able to deduce some notable findings. Specifically, the result showed that increasing women's exposure to education, asset ownership, and decision-making chances on a child's education and health substantially reduced income and multidimensional poverty amongst rural women.

In a study for Nigeria, Olaoye [32] applied the ARDL technique and concluded that public investment in education has adversely impacted the poverty reduction drive in Nigeria. In contrast, government health investment was revealed to have positively aided the fight against poverty in the country. Similarly, Zaria and Tuyon [33] tried to determine the causal implication of government spending on education on poverty mitigation in Nigeria. The study employed an error correction mechanism and Granger causality technique to derive its findings. Evidence from the study indicated that public spending on education significantly depreciated poverty in the long-run.

Similarly, Fagbemi et al. [34] employed the ARDL method and revealed that social infrastructure expenditure, including health and education spending, significantly mitigates the level of poverty in Nigeria. Also, Widiastuti et al. [35] conducted a study for 39 Organization of Islamic Cooperation (OIC) member nations. The paper found an inverse correlation between human development and poverty in the examined countries. Furthermore, by adopting a quantitative estimation approach, Harnani [36] showed that human resource quality is substantially beneficial for poverty eradication in East Java Province.

2.2.2. Studies on institutional quality and poverty

By employing the ARDL method, Olaoye [32] demonstrated the various impacts of institutional quality indicators on poverty reduction in Nigeria. First, the study submitted that a significant inverse effect of the rule of law on poverty reduction exists in Nigeria. Also, voice and accountability affect poverty mitigation in the country. Singh [37] engaged the fully modified ordinary least squares (FMOLS) methodology

in assessing the mitigating role of institutional quality on poverty in Brazil, Russia, India, China, and South Africa (BRICS) countries. By using the FMOLS technique, the research submitted that the rule of law is the substantial governance metric that helps in decelerating poverty rates in BRICS economies. In a related study, Aracil et al. [38] assessed the moderating role of institutional quality in the financial inclusion-poverty nexus across different economies. Their findings affirmed that institutional quality aided the positive poverty mitigating role of financial inclusion in the examined countries. Kouadio and Gakpa [39] conducted a study of the relationship between economic growth, institutional quality, and poverty for West African economies. The study applied the pooled mean group (PMG) approach and empirically confirmed that strong institutions are a prerequisite to reducing poverty levels in the West African sub-region. Similarly, Iddrisu et al. [40] employed pooled OLS for a study of 36 Sub-Saharan African (SSA) countries. Evidence from the paper showed that institutional quality is needed to aid Chinese foreign direct investment into Nigeria to mitigate poverty levels.

Mojeed et al. [41] examined the relationship between economic prosperity, poverty, and institutional quality in Nigeria. By applying the fully modified OLS (FMOLS), the study was able to reveal that by increasing the control of corruption, the impact of poverty was tamed in the short run. Furthermore, the control of corruption was established to limit the pervasiveness of poverty in the country. Ayoade et al. [42] tried to determine the interactive effects of institutional quality and different elements of human capital development on poverty in Nigeria. By employing the ARDL technique, institutional quality was demonstrated to significantly and positively impact poverty levels in the short- and long-run periods for Nigeria. Similarly, Orisadare and Ayoade [43] tried to assess by using the ARDL method in their examination of the association between institutional quality, international trade, and poverty in Nigeria. While institutional quality was determined to reduce the effect on poverty in the short term, the impact was substantially enhancing of poverty in the long term.

Idowu and Idowu [44] examined the interlinkage between institutional quality and poverty in Nigeria. Empirically, the research applied the ARDL method for their analysis and showed that no long-term association exists between institutional quality and poverty. However, the effect of institutional quality was established to be significantly short-termed. In contrast, Yakubu and Aladejare [3] employed the ARDL approach and showed that government effectiveness enhanced poverty in the short- and long-run periods for Nigeria.

Nsiah and Tweneboah [45] used Hansen's threshold estimation approach to determine the moderating role of institutional quality between financial inclusion and poverty in African countries. The outcome from the study revealed that institutional quality is significant in the poverty reduction role of financial inclusion in African economies. Likewise, Micah et al. [46] employed the system generalized method of moments for a study of 33 SSA economies. Evidence from the research showed that institutional quality robustly and positively impacts poverty levels in SSA countries. In a related study, Abdulhakeem [47] employed a system generalised method of moments (system-GMM) and found that improvement in governance would mitigate poverty levels in 41 SSA economies. Furthermore, Ndzembanteh et al. [48] conducted

a related study on ex-British and French colonies. They applied the ARDL estimation method and found that institutions play a substantial and positive role in reducing poverty in these former colonies. Also, Goh et al. [49] employed a quantile regression technique and revealed that at low quantiles, institutional quality exacerbates poverty in Indonesia. However, at higher quantiles, institutional quality was effective for poverty eradication.

Gap in the Literature

The aforementioned empirical assessments demonstrate that few studies have looked at how government spending on health and education affects the fight against poverty in Nigeria. Likewise, there are limited studies that have evaluated the role of institutions in poverty mitigation in Nigeria. Therefore, by extending the conversation on government investment in human capital and poverty in Nigeria and examining the place of institutions in the fight against poverty, this study closes this empirical gap in the literature.

3. Data and methodology

The data required for this study were collected between 1990 and 2023. They are as captured in **Table 1**. Poverty is measured using the poverty gap index, while human capital investment is measured using government total spending on health and education, as well as the level of employment in the economy. Institutional quality is indicated by the control of corruption, government effectiveness, and absence of violence and political stability. Population growth was employed as a control variable in the model. **Table 1** shows the sources of these data as well as their measurements.

Table 1. Variable description.

Variable	Measurement	Source	Symbol
Poverty	Poverty gap index	World Bank Poverty and Inequality Platform [50]	pgi
Public spending on education	Educational spending as share of total budget (%)	CBN [51]	edu
Public spending on health	Health spending per total budget (%)	CBN [51]	hlt
Employment level	Index	Feenstra et al. [52]	emp
Corruption	Index	WGI [53]	cor
Government effectiveness	Index	WGI [53]	gof
Absence of violence	Index	WGI [53]	apv
Population growth	% growth	WDI [54]	pog

Source: Authors' compilation.

Model specification

The study employs the ARDL approach made popular by Pesaran et al. [55] to investigate the study's objectives. Compared to the Engle-Granger and maximum likelihood-based approaches suggested by Juselius [56] and Johansen [57] co-integration procedures, this methodology has several econometric advantages. First off, since the bounds test can be performed on series that are mutually integrated—solely I(0) or I(1)—it is not necessary to pre-test the series to ascertain their order of integration [58]. Second, according to Mallik and Chowdhury [59] and Totochi [60],

the ARDL modeling includes an adequate amount of lags to reflect the data-generating process that is peculiar to a certain modeling framework.

Furthermore, the ARDL technique addresses endogeneity issues since it applies the proper lags to adjust for serial correlation and endogeneity. According to Totonchi [60], endogeneity is less problematic if serial correlation is absent from the predicted ARDL model. This method estimates the model's long- and short-term parameters simultaneously and makes the assumption that every variable is endogenous.

Two ARDL equations were specified in the study's model. Equation (1) is an ARDL representation of the long- and short-run effect of human capital on poverty.

$$\Delta pgi_t = \beta_0 + \delta_1 edu_{t-i} + \delta_2 hlt_{t-i} + \delta_3 emp_{t-i} + \delta_4 pog_{t-i} + \sum_{i=1}^{m} \beta_1 \ \Delta edu_{t-i} + \sum_{i=1}^{m} \beta_2 \ \Delta hlt_{t-i} + \sum_{i=1}^{m} \beta_3 \ \Delta emp_{t-i} + \sum_{i=1}^{m} \beta_4 \ \Delta pog_{t-i} + \ \theta_{1t} ecm_{t-1} + \varepsilon_t \quad (1)$$

Equation (2) is an ARDL representation of the effect of institutional quality variables used in the research on poverty in Nigeria.

$$\Delta pgi_t = \gamma_0 + \gamma_1 cor_{t-i} + \gamma_2 gov_{t-i} + \gamma_3 apv_{t-i} + \gamma_4 pog_{t-i} + \sum_{i=1}^{m} \alpha_1 \ \Delta cor_{t-i} + \sum_{i=1}^{m} \alpha_2 \ \Delta gov_{t-i} + \sum_{i=1}^{m} \alpha_3 \ \Delta apv_{t-i} + \sum_{i=1}^{m} \alpha_4 \ \Delta pog_{t-i} + \ \theta_{2t} ecm_{t-1} + \varepsilon_t \quad (2)$$

where ECM depicts the error correction mechanism and its coefficient θ, which is the speed of the adjustment parameter from a short to a long-run steady state, and a priori is demanded to be negatively signed and statistically substantial to affirm the prevalence of a long-run adjustment process.

4. Analysis and discussions

4.1. Correlation test

Represented in **Table 2** is the correlation matrix for the variables, showing that the independent series are not highly correlated with each other. This decision was based on the proof that the correlation coefficients between most of the regressors attained less than 0.50 (or 50%) correlation significance. However, the exceptions were correlation coefficients between corruption and government effectiveness (0.59), and absence of political violence and employment (−0.70). Both high correlations are plausible given that, first, corruption can define how effective a government can be and vice versa. Secondly, political violence can hamper employment levels in a country and vice versa. Nevertheless, the level of multi-collinearity challenge between the independent series adopted for the study is considered insignificant.

Table 2. Correlation matrix.

	pgi	***edu***	***hlt***	***emp***	***cor***	***gof***	***abv***	***pog***
pgi	1							
edu	0.114	1						
hlt	−0.037	0.014	1					
emp	−0.857	−0.067	0.210	1				
cor	0.171	0.040	0.094	−0.050	1			
gof	0.588	0.178	0.110	−0.462	0.586	1		
apv	0.728	−0.147	−0.128	−0.704	0.109	0.327	1	
pog	0.161	0.318	−0.121	−0.424	−0.208	0.030	−0.264	1

Source: Authors' estimated result.

4.2. Descriptive statistics

Table 3 summarizes the descriptive statistics applied in this research. The estimates shown in the table indicate that the poverty gap index over the studied period averaged 17.46, suggesting a high level of poverty in the country. With a mean education expenditure per budget of 8.2%, Nigeria can be said to be underfunding the educational sector since it falls short of the 26% recommended by the United Nations Educational, Scientific and Cultural Organization (UNESCO). Similarly, health spending per budget of 4.04% can be considered highly insignificant to meet the country's health demand. The mean employment rate of 47.96% indicates a high level of unemployment for the research period. This value is grossly inadequate considering the enormous resources the nation is endowed with. Furthermore, the average corruption, government effectiveness, and absence of political violence are −1.11, −0.99, and −1.64, respectively, indicating a weak level of governance institutions in the country. Also, the mean population growth rate within the period is 2.6%, which is considerably high.

Table 3. Descriptive statistic.

	Mean	***Maximum***	***Minimum***	***Std. dev.***	***Obs.***
pgi	17.465	27.900	9.000	7.524	34
edu	8.209	43.410	3.960	6.504	34
hlt	4.042	7.320	1.100	1.675	34
emp	47.963	73.021	29.204	14.525	34
cor	−1.110	−0.580	−1.500	0.183	34
gof	−0.989	−0.485	−1.210	0.170	34
apv	−1.643	−0.590	−2.210	0.426	34
pog	2.591	2.764	2.380	0.112	34

Source: Authors' estimated result.

4.3. Unit root test

The stationarity level of the variables utilized in the analysis was ascertained through the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root procedures. These test outcomes are represented in **Table 4**. For the critical unit root

analysis, three test criteria were used: Test with constant, test with constant and trend, and test without constant and trend. Inference from the test shows that the poverty gap index and absence of political violence were the two variables stationary at first difference, while the other variables exhibited a mix of level and first difference stationarity. Thus, the PP and ADF unit root investigation confirmed the presence of level and first difference stationary variables, justifying the adoption of the ARDL technique for the study.

Table 4. Unit root test.

	ADF Unit Root Test			**PP Unit Root Test**		
	With Constant	**With Constant & Trend**	**Without Constant & Trend**	**With Constant**	**With Constant & Trend**	**Without Constant & Trend**
pgi	-0.553^{c1}	-5.620^{c1}	-5.568^{c1}	-5.553^{c1}	-5.621^{c1}	-5.568^{c1}
edu	-5.105^{c0}	-5.019^{c0}	-2.610^{b0}	-5.106^{c0}	-5.019^{c0}	-2.389^{b0}
hlt	-5.242^{c0}	-5.144^{c0}	-5.543^{c1}	-2.716^{a0}	-4.950^{c1}	-5.046^{c1}
emp	-3.455^{b1}	-3.441^{a1}	-2.56^{a1}	-3.455^{b1}	-3.505^{a1}	-1.998^{b1}
cor	-3.920^{c0}	-4.226^{b0}	-6.289^{c1}	-6.215^{c0}	-6.163^{c0}	-14.738^{c1}
gof	-16.818^{c1}	-16.541^{c1}	-17.089^{c1}	-5.594^{c0}	-6.500^{c0}	-21.460^{c1}
apv	-8.639^{c1}	-2.619	-8.624^{c1}	-9.254^{c1}	-10.047^{c1}	-8.726^{c1}
pog	-1.635	-1.444	-0.421	-3.105^{b1}	-3.401^{a1}	-3.159^{c1}

Note: a, b, c indicates significance at 10%, 5%, and 1%, respectively, and 0 and 1 are level and first difference stationarity. Source: Authors' estimated output.

4.4. Bounds cointegration test

The ARDL bounds cointegration test is employed in this research to examine the effect of human capital and institution quality on poverty in Nigeria. Two cointegrating outcomes are presented in **Table 5**. Evidence from the result depicts that the computed F-statistics (5.953 and 4.569) are higher than the lower and upper bound values at the 1%, 2.5%, 5%, and 10% significance levels. Hence the conclusion of a long-term link between the regressors in both equations.

Table 5. ARDL bounds test for cointegration.

Equation	**Test statistic**	**Value of F-Statistic**	**K**	**Sign.**	**I(0)**	**I(1)**
*pgi = f(*edu, hlt, emp, pog*)*	Sample size (*n*) = 33	5.953	4	10% 5% 2.5% 1%	2.45 2.86 3.25 3.74	3.52 4.01 4.49 5.06
*pgi = f(*cor, gof, apv, pog*)*	Sample size (*n*) = 33	4.569	4	10% 5% 2.5% 1%	2.2 2.56 2.88 3.29	3.09 3.49 3.87 4.37

Source: Authors' estimated result.

4.5. Discussions

Table 6 represents the long- and short-run ARDL estimates for human capital investment indicators used in the study. Deduced evidence from the table showed that both education and health investments have no significant impact on poverty in the

long run. This outcome contrasts with Amakom [25], Olaoye [32], and Zaria and Tuyon [33], who reported a significant effect of human capital investment on poverty reduction in Nigeria. Nevertheless, the ineffectiveness of human capital on poverty mitigation as found in this study suggests that public spending on the education and health sectors has not been effective in tackling poverty in the country. This is not surprising given the average share of both sectors in the annual budget, which is considered irrelevant (see **Table 3**). However, the employment level has a significant and negative effect on poverty in the long run. This result follows with a priori expectations since, as employment levels increase, poverty levels will decline due to the fact that citizens' income levels are enhanced.

In the short run, education has a substantial poverty-aggravating effect. This implies that education investment by the government crowds out social security spending and public transfer payments that can help mitigate poverty levels in the country. Nevertheless, investment in the health sector shows no significance in reducing poverty in the short term. Also, the speed of the adjustment coefficient reveals that it will take about 39 months for long-run equilibrium restoration in the event of short-term distortions.

Table 6. ARDL estimates for human capital effect.

Variables	Coefficient	Std. Error	t-statistics	Prob.
edu	−0.333	0.265	−1.257	0.220
hlt	0.719	0.630	1.142	0.264
emp	−0.626	0.082	−7.663	0.000[c]
pog	−32.256	11.677	−2.762	0.011[b]
$Intercept$	40.969	7.023	5.834	0.000[c]
Δedu	0.078	0.032	2.394	0.025[b]
Δhlt	−0.311	0.220	−1.415	0.170
ecm_{t-1}	−0.313	0.053	−5.876	0.000[c]
R^2	0.655			
$Adj.R^2$	0.620			
$normality$	34.966			0.000[c]
$serial\ correlation$	1.770			0.183
$heteroskedasticity$	11.032			0.137
$Ramsey\ Reset$	0.073			0.790

Note: b and c indicate significance at 5%, and 1% respectively. **Source**: Authors' estimated result.

Represented in **Table 7** is the estimated ARDL output for the impact of institutions on poverty. Evidence from the table shows that corruption has no significant effect on poverty in the long run. However, government effectiveness and perception of political violence are demonstrated to robustly enhance poverty levels in the long term. Furthermore, while government effectiveness significantly increases poverty in the short run, the absence or perception of political violence shows no substantial impact in the short run. Generally, this outcome shows that institutional quality promotes poverty in Nigeria and aligns with extant studies such as Ayoade et al. [42], Orisadare and Ayoade [43], and Yakubu and Aladejare [3], which reported

similar results. However, the finding is in contrast with Olaoye [32], Mojeed et al. [41], and Idowu and Idowu [44], who submitted that institutional quality has helped to mitigate poverty in Nigeria.

The implication of these findings is that there are inherent challenges with institutional practicality in the country. For instance, there is yearly evidence of public budgeting for infrastructure, but such projects are usually conceived without due consultations with the people they are meant to serve [61]. Also, political violence has been on the rise since the return to stable democracy in 1999. This phenomenon is exacerbated by political appointments, projects, and palliative measures for the poor mostly initiated based on political and ethnic affiliations to the ruling party. Thus, the perceptions of the probability of political instability and/or politically instigated violence, including acts of terrorism, are usually heightened. Both scenarios portend dysfunctionality in the workings of the state institutions in effectively mitigating poverty in the country. Similarly, an increase in population growth is shown to aggravate poverty, which is plausible. Given that as the population rises, competition for the limited opportunities in the economy becomes stiffer, thus affecting the standard of living in the country. In addition, the speed of adjustment parameter demonstrates that it will take about 24 months for long-run equilibrium restoration in the event of short-term distortions.

Table 7. ARDL estimates for institutional effect.

Variables	Coefficient	Std. Error	t-statistics	Prob.
cor	6.957	4.884	1.424	0.167
gof	27.091	6.799	3.985	0.000[c]
apv	12.225	2.095	5.836	0.000[c]
pog	13.434	6.646	2.022	0.054[a]
$Intercept$	36.978	19.117	1.934	0.065[a]
Δgof	3.423	1.703	2.010	0.055[a]
Δapv	2.734	1.692	1.615	0.119
ecm_{t-1}	−0.490	0.085	−5.736	0.000[c]
R^2	0.522			
$Adj.R^2$	0.490			
$normality$	0.042			0.979
$serial\ correlation$	3.210			0.201
$heteroskedasticity$	10.375			0.168
$Ramsey\ Reset$	1.328			0.260

Note: a, b, and c indicate significance at 10%, 5%, and 1%, respectively. Source: Authors' estimated result.

5. Conclusion and recommendations

This paper assessed the role of human capital investment and institutions in mitigating poverty in Nigeria between 1990 and 2023. By employing the ARDL methodology, the paper demonstrated that human capital has a weak effect in decelerating poverty levels in the country. Specifically, while public investment in education and health has no significant long-term impacts on poverty, an increase in

employment significantly reduces poverty levels for Nigeria. Conversely, institutions were found to aid the rising trend of poverty in the country, with dysfunctionality in government effectiveness and absence of political violence being significantly responsible.

Hence, the study recommends that the government needs to increase its budgetary allocation to the educational and health sectors. For the educational sector, the UNESCO 26% annual budgetary allocation should be implemented for better funding of the sector. This measure will ensure that Nigerians have access to quality education that can help them boost personal confidence and improve their income opportunities. It would also ensure that the country has access to highly productive manpower which can entice FDI and help to reduce unemployment; hence, poverty is also tackled.

Furthermore, the government will have to increase the allocation to the health sector. The slightly above 4% mean allocation to the sector is grossly inadequate, hence the high level of poverty, since most people have to pay for health services using their life savings. A significant improvement in health spending will help to lower the cost of health services, increase the quality of health delivery, and provide satisfaction to health workers. Also, such funding should include increasing allocations to health research for the development of drugs that are considered highly expensive and needed by the citizens. These measures will propel the health sector to contribute to poverty reduction in the country. Also, there is the need to correct the dysfunctionality in the operations of institutions if they are to mitigate poverty in the country. The idea of "winner takes all" in governance needs to be replaced with equity in the distribution of public projects and resources. Importantly, issues of the quota system in job and political appointments should be replaced with competence for effective delivery on the goals of governance. Public consultations and participation are also required in the initialization and execution of government projects if they are to tackle the direct needs of the society.

Nevertheless, the impact of brain drain, medical tourism, and the quality of manpower will have further enriched this study. However, the absence of data on these variables serves as the constraint of the research. Future studies can leverage this limitation to deepen the impact of human capital and institutional quality on poverty mitigation in Nigeria.

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