VOL. 13 NO. 7,
AUGUST, 2026
E-ISSN 3026-9679
P-ISSN 3026-9423

African Scholar Publications & Research International
www.africanscholarpub.com

Journal of Business Dev. and Management Res. (JBDMR)

Does Institutional Quality Drive Human Capital Development? Dynamic Evidence from Nigeria: An ARDL Approach

Ibrahim Osagede Aminu; Ilemona Adofu; & Abdulkareem Alhassan

Department of Economics, Faculty of Social Sciences. Federal University Lafia, Nasarawa State-Nigeria

Corresponding Author: aminuibosagede@gmail.com

DOI: https://doi.org/10.70382/ajbdmr.v13i7.087

Abstract

This study examined the impact of institutional quality on overall human capital development in Nigeria over the period 1984 to 2024. The Autoregressive Distributed Lag (ARDL) bounds testing approach was employed, and complemented by unit root tests, cointegration bounds testing, and post-estimation diagnostics. The unit root results revealed a mixture of I(0) and I(1) variables, justifying the ARDL approach, while the bounds test confirmed a stable long-run relationship among the variables (F-statistic = 4.734, exceeding the upper bound of 3.49). The ARDL results show that institutional quality exerts a positive and statistically significant effect on human capital development both in the long run (coefficient = 0.598, p = 0.017) and through its interaction with government expenditure variables in the short run. The error correction term is negative and significant (–0.163, p < 0.001), confirming convergence to long-run equilibrium at a speed of approximately 16.3 per cent per annum. The study concludes that institutional quality is a critical determinant of human capital accumulation in Nigeria and recommends that government deepen governance reforms, strengthen accountability mechanisms, and intensify anti-corruption measures to improve the conversion of public resources into human capital outcomes.

Keywords: Institutional Quality; Human Capital Development; ARDL; Governance; Nigeria

Introduction

Human capital is widely recognised as a cornerstone of sustainable development and economic transformation. Across both advanced and emerging economies, empirical evidence consistently shows that countries which prioritise the quality of their education and health systems

are able to enhance productivity, stimulate innovation, and achieve long-term inclusive growth. International organisations such as the World Bank and UNESCO argue that education and health are not merely social services but investments in human capital the stock of skills, knowledge, and competencies that drives economic performance (World Bank, 2019; UNESCO, 2023).

Nigeria presents a striking paradox in this regard. Despite possessing one of the largest youth populations in the world, the country ranked 150th out of 157 countries in the World Bank's Human Capital Index (2020), implying that a Nigerian child born today will only be 34 per cent as productive as they could have been with full access to quality education and health services. At the heart of this underperformance lies institutional weakness. As North (1990) famously observed, institutions are the "rules of the game" that determine how resources are allocated, how incentives are shaped, and how effectively policies are executed. Nigeria's institutional quality is persistently low across the World Governance Indicators voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption with the country routinely scoring in the bottom quintile globally, particularly on government effectiveness and control of corruption (World Bank, 2022).

These institutional gaps translate into poor policy implementation and accountability failures that blunt the returns on human capital investment. Public education and health spending in Nigeria is heavily skewed toward recurrent costs, with limited allocation to infrastructure, training, or learning and clinical materials, while mismanagement, corruption, and politicised administration further dilute effectiveness. From the standpoint of Human Capital Theory (Schultz, 1961), investments in education and health should raise productivity, earnings, and growth; however, when institutions are weak, these investments frequently fail to deliver, as resources are wasted, poorly targeted, or absorbed by inefficiencies. Institutional quality and human capital development are, in this sense, closely interconnected: effective institutions create an enabling environment for investment in education, healthcare, and workforce productivity, while a well-developed human capital base in turn strengthens institutional performance through improved governance and accountability (Acemoglu & Robinson, 2012).

Problem Statement

Human capital development is a critical determinant of economic growth, productivity, and sustainable national development because it addresses the issue of productivity. A nation achieves high human capital development with enhanced living standard, literacy and full employment of its population where institutions effectively manage resources to achieve sustainable development. Conversely, human capital development in Nigeria is very low implying that living standard, literacy rate and employment levels on aggregate with 34 percent Human Capital Index (HCI). The implication is that Nigeria has low life span of 54.9 years lower than global average of 73.7 years, which hampered contribution to national development (United Nation, 2023). Low literacy level as a result of persistent education crisis with the world's highest number of out-of-school children, with girls representing 60 percent of out-of-school children (UNICEF, 2023).

Despite being Africa's largest economy and most populous nation, Nigeria continues to experience poor human capital outcomes, particularly in education and health. This situation has contributed to low labour productivity, unemployment, poverty, and slow economic transformation. The poor state of human capital development in Nigeria has largely been attributed to weak institutional quality. Effective institutions promote accountability, transparency, efficient resource allocation, and sound policy implementation, all of which are essential for improving education and health outcomes. However, Nigeria continues to record weak performance in key governance indicators, including government

effectiveness, rule of law, regulatory quality, political stability, control of corruption, and accountability. Consequently, public investments in education and healthcare have not produced the expected improvements in human capital development.

Although several policy efforts have been introduced to address Nigeria's institutional and human capital challenges, including social protection programmes, the Nigeria Education Loan Fund (NELFund), Universal Basic Education, and the National Health Insurance Authority, successive governments have also undertaken institutional reforms aimed at strengthening governance, accountability, and public service delivery. These reforms include the establishment of the Independent Corrupt Practices and Other Related Offences Commission (ICPC), the Economic and Financial Crimes Commission (EFCC), the Service Compact with All Nigerians (SERVICOM), the Treasury Single Account (TSA), the Integrated Personnel and Payroll Information System (IPPIS), the Government Integrated Financial Management Information System (GIFMIS), and public procurement reforms. More recently, initiatives such as the Human Capital Opportunities for Prosperity and Equity (HOPE) programme, public sector modernization reforms, and the expansion of healthcare workforce training have sought to improve institutional efficiency and strengthen education and health service delivery. There is evidence of measurable, although incomplete, progress: the EFCC recorded over 4,000 convictions and recovered approximately $500 million in 2024 (Reuters, 2025), while nursing school enrolment increased from 28,000 in 2023 to 115,000 in 2025 under the Health Sector Renewal Investment Initiative (Federal Ministry of Health and Social Welfare, 2025). Nevertheless, despite these substantial policy and institutional interventions, Nigeria continues to face significant deficits in governance and human capital development, suggesting that these efforts have yet to sufficiently change the country's development trajectory. Whether such institutional and human capital investments have translated into measurable improvements in aggregate human capital development remains an empirical question, and it is this question that motivates the present study.

The persistent gap between Nigeria's reform commitments and its outcomes underscores the depth of the underlying problem. Human capital in Nigeria remains deficient as a result of a shortage of skilled manpower and low productivity, itself attributable in large part to weak institutions, political instability, corruption, and government ineffectiveness. Without a clear empirical accounting of how institutional quality specifically shapes human capital outcomes, policy interventions risk targeting symptoms low enrolment, poor health indicators rather than the underlying institutional constraints that determine whether resource inputs are converted into measurable capability gains. This study contributes to closing that empirical gap by isolating and quantifying the long-run and short-run effect of institutional quality on overall human capital development in Nigeria, net of the separate contributions of government expenditure on education, government expenditure on health, and economic growth.

Against this backdrop, this study examined the impact of institutional quality on overall human capital development in Nigeria. The chosen timeframe captures Nigeria's Structural Adjustment Programme era, the transition to democratic governance in 1999, and the subsequent period of institutional reform, providing sufficient historical depth to assess how institutional change has shaped human capital accumulation across different political and economic regimes. The specific objective of the study is to examine the impact of institutional quality on overall human capital development in Nigeria, tested against the null hypothesis that institutional quality has no significant impact on human capital development in the country.

Research Questions

The study will intent to answer the following questions:

i. What is the impact of institutional quality on human capital development in Nigeria?
ii. To what extent does institutional quality affect education in Nigeria?
iii. How does institutional quality affect health outcomes in Nigeria?

Objectives

The broad objective of this study is to examine the effect of institutional quality on human capital development in Nigeria. While, the specific objectives are to:

i. To examine the impact of institutional quality on overall human capital development in Nigeria.
ii. To evaluate the impact of institutional quality on education in Nigeria.
iii. To examine the impact of institutional quality on health outcomes in Nigeria.

Hypotheses

The hypothesis formulated for this dissertation are stated hereunder:

$H0_1$: Institutional quality has no significant impact on overall human capital development in Nigeria.
$H0_2$: Institutional quality has no significant impact on education in Nigeria.
$H0_3$: Institutional quality has no significant impact on health outcomes in Nigeria.

Institutional Quality

Institutional quality refers to the effectiveness of the "rules of the game" in a society — both the formal rules (constitutions, laws, property rights) and the informal norms that shape human interaction and economic performance (North, 1990). It reflects the extent to which institutions deliver governance outcomes across six dimensions: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption. High-quality, inclusive institutions provide secure property rights, enforce contracts, and create a level playing field, whereas low-quality, extractive institutions concentrate power and resources among elites (Acemoglu & Robinson, 2012). For the purposes of this study, institutional quality refers to the fairness, reliability, and effectiveness with which an economy's institutions government, courts, regulatory bodies, and public services function. Institutional quality refers to the effectiveness, transparency, and accountability of governance systems in managing education resources, policies, and outcomes (UNESCO, 2017). Institutional quality refers to the strength of fiscal and legal institutions in ensuring prudent economic management, reducing corruption, and safeguarding macroeconomic stability (IMF, 2019). Institutional quality reflects the adaptability of institutions to changing economic, political, and technological conditions. High-quality institutions evolve to reduce uncertainty and transaction costs, while low-quality ones remain rigid and ineffective (Douglass, 2005). According to this study, institutional quality refers to the fairness, reliability and effectiveness of an economy's institutions especially the government, courts, banks, schools, health and public services work.

Human Capital Development

Human capital development refers to the process of improving the knowledge, skills, health, and abilities of individuals within a population, thereby enhancing their productivity and overall well-being (Human Development Report, 2016). Human capital itself is the stock of knowledge, skills, health, and abilities that individuals possess, which increases their productivity in the labour market. Schultz (1961) framed education and health as investments that yield measurable economic returns in the form of higher productivity, earnings, and growth. For the purposes of this study, human capital development

is understood as the process of making a population more educated, skilled, healthy, and productive a process proxied empirically by the Human Development Index. According to Human Development Report (HDR, 2016), human capital development entails developing people through enhancement of their potential, for the people through the deployment of development benefits to them, and by the people through active participation in the activities that impact and shape their lives. Mincer (1996) views human capital development as an indicator of the proportion of a country's population with sufficient education, skills, and training. Torruam, et al. (2014) suggest that human capital development involves developing skills, knowledge, productivity, and inventiveness of human capital formation. Romer (1990) defines human capital development as "skills acquisition through training of workers as well as investment in health-care reforms."

Theoretical Framework

This study is anchored on two complementary theoretical perspectives: the New Institutionalism Theory and the Human Capital Development Theory. The New Institutionalism Theory, advanced by March and Olsen (1984) and extended by North (1990), views institutions not merely as formal legal structures but as a mix of formal rules and informal norms, values, and practices that guide behaviour and interaction. North (1990) described institutions as the "rules of the game" that reduce uncertainty by providing a stable framework for economic and social interaction; where institutions function well, they protect property rights, enforce contracts, and ensure accountability, thereby lowering transaction costs, while weak, corrupt, or inefficient institutions trap countries in cycles of poor performance and underdevelopment.

The Human Capital Development Theory, associated with Schultz (1961), Becker (1964), and Weisbrod (1962), marked a turning point in economic thought by demonstrating that investments in people through education, training, and healthcare are as important as investments in physical capital in driving productivity and growth. Schultz argued that societies which neglect education and health waste their most productive resource, while Becker formalised education and training as investments yielding measurable returns in earnings and productivity. Weisbrod further emphasised the social returns to human capital investment, noting that education and health improvements generate positive spillovers including lower crime rates and stronger civic participation beyond the individual.

Taken together, these two theoretical strands suggest a mutually reinforcing relationship: strong institutions amplify the returns to human capital investment by ensuring that resources devoted to education and health are efficiently allocated, transparently managed, and effectively translated into outcomes, while a skilled, educated population in turn strengthens institutions through improved governance, accountability, and civic engagement. This framework directly motivates the empirical model estimated in this study, in which institutional quality is specified as a determinant of human capital development, alongside government expenditure on education and health and economic growth.

Empirical Review

Ouedraogo et al. (2022) investigated the role of institutional quality in human capital development using a panel of 49 African countries over the period 1996-2018. Employing a dynamic two-step system Generalized Method of Moments (GMM) estimator, the study found that improvements in institutional quality significantly enhance access to primary, secondary, and tertiary education, particularly for females, with government effectiveness, control of corruption, and political stability emerging as the most critical institutional dimensions. Similarly, Githaiga and Kilong'i (2023) examined the moderating role of institutional quality in the relationship between foreign capital flows and human capital

development across 34 Sub-Saharan African countries between 2009 and 2019, using the Human Development Index as a proxy for human capital and the system GMM estimator to address endogeneity; the study found that institutional quality positively influences human capital development and strengthens the developmental benefits of remittances and foreign direct investment.

Abida and Abdellaoui (2024) examined the relationship between institutional quality, human capital, and economic growth in Tunisia, Algeria, and Morocco over 1991-2020 using the dynamic system GMM, finding that institutional quality and human capital jointly and significantly promote long-run growth, with a reinforcing positive interaction between the two. In a West African context more directly comparable to Nigeria, Iheonu et al (2017) examined the impact of institutional quality measured through control of corruption, government effectiveness, regulatory quality, and rule of law on human capital development across 12 West African countries between 1996 and 2015, finding that all four institutional indicators positively and significantly influenced human capital development under fixed and random effects estimation, although only government effectiveness remained significant once endogeneity was addressed via panel two-stage least squares.

Kilishi, et al (2013), employing the Arellano-Bond first-difference estimator and the Blundell-Bond system GMM estimator on a Sub-Saharan African panel, found that institutions play a critical role in shaping human capital outcomes, with regulatory quality emerging as the most influential institutional dimension. Alexiou, Tsaliki, and Osman (2014) applied the ARDL approach to Sudanese data covering 1972-2008 and found that institutional quality plays a crucial role in enhancing human capital outcomes in both the short run and the long run, supporting education, skills development, and health improvements. Adams-Kane and Lim (2016) similarly found a significant positive effect of government effectiveness on human capital formation and, through it, on per capita income, using a two-stage empirical strategy applied to cross-country data.

Not all findings, however, point unambiguously in the same direction. Uddin, Ali, and Masih (2021), using dynamic system GMM and simultaneous quantile regression on a panel of 120 developing countries over 1996-2014, found that while human development and institutional quality individually exert a significant positive effect on economic growth, their interaction term produced a significant negative effect, which the authors attribute to the presence of weak and dysfunctional institutions that divert incremental human capital into rent-seeking and socially unproductive activities rather than productive economic outcomes. This finding suggests that the institutional quality–human capital relationship may be conditional on the underlying strength and functionality of the institutional environment, a consideration directly relevant to the Nigerian context examined in this study.

A related strand of literature situates the institutional quality–human capital relationship within the broader governance-and-growth nexus. Kaufmann (2012), drawing on a dataset of 300 previously employed governance indicators across 173 countries, found robust evidence of a significant positive relationship between good governance and per capita income, affirming that institutional quality plays a vital role in fostering economic prosperity more broadly a relationship through which human capital gains are plausibly transmitted into aggregate productivity. Zhuang, Edmonds, and de Guzman (2010), examining 16 East Asian economies between 1998 and 2008, found that economies scoring above the global average on government effectiveness, regulatory quality, and rule of law recorded systematically higher growth, reinforcing the view that institutional quality operates as a general-purpose enabler of development outcomes, including those specific to human capital. Within Nigeria itself, the World Bank's Worldwide Governance Indicators have recorded only gradual improvement in government effectiveness and regulatory quality during periods of active reform (World Bank, 2023), consistent

with the slow, incremental pattern of human capital development documented in the descriptive statistics of the present study.

Overall, the reviewed literature establishes a broadly consistent, though not unanimous, positive relationship between institutional quality and human capital development across African and other developing-country panels. However, comparatively few studies isolate this relationship within a single-country, long-run time-series framework for Nigeria specifically, using an explicit ARDL specification that jointly accounts for government expenditure on education and health alongside institutional quality. Most of the reviewed African panel studies (Ouedraogo et al., 2022; Kilishi et al., 2013; Iheonu et al., 2017) pool multiple countries using dynamic GMM estimators, which, while well suited to addressing cross-country endogeneity, average over considerable country-level institutional heterogeneity and cannot speak to the specific short-run adjustment dynamics within any single economy. This constitutes the specific empirical gap that the present study addresses: a Nigeria-specific, long-run and short-run ARDL estimation of the institutional quality–human capital development relationship, incorporating both the direct effect of institutional quality and the separate contributions of government expenditure on education, government expenditure on health, and economic growth.

Nature and Sources of the Data

Annual times series data was used encompassing the period of 40 years (1984-2024) were used in the study. Human capital development proxies' education and health, institutional quality proxy the rule of law and corruption control, then government expenditure on education, government expenditure on health and economic growth proxy gross domestic product per capita was sourced from the World Development Indicators and the World Governance Indicators 2025.

Table 1 Description, Measurements and Sources of Variables

Variables	Descriptions	Measurement	Source
Human Capital Development (HCD)	Human capital development (HCD) refers to the process of acquiring and improving the knowledge, skills and good health of individuals within a society to enhance the productivity.	Human Development Index (HDI)	World Bank, 2025.
Institutional Quality (IQ)	Institutional quality is the index of rule of law, control of corruption, voice and accountability, government effectiveness, political stability and regulatory quality.	Composite index (-1 to +1)	World Governance Indicators 2025
Government expenditure on Education (GED)	Government expenditure on education refers to the total amount of funds the government spends on educational activities in the country.	Measured in billions of naira	World Bank, 2025.
Government expenditure on Health (GHE)	This refers to the financial resources the government allocates to fund health sector's activities in a country.	Measured in billions of naira	World Bank, 2025.
Economic Growth (GDP)	Economic growth is the percentage change in national income for given time proxy Gross Domestic Product per capita (GDPP).	Percentage (%)	World Governance Indicators 2025

SOURCE: Authoers Computations 2026

Model Specification

Following Ouedraogo et al. (2022), the functional relationship for the impact of institutional quality on overall human capital development in Nigeria is specified as:

$$HCD = f(IQ, GED, GHE, GDP) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

The corresponding ARDL(p,q) regression model, allowing for lags of the dependent variable and distributed lags of the regressors, is specified in error-correction form as:

$$\Delta HDC_t = \alpha_0 + \Sigma\beta_i \Delta HCD_{t-i} + \Sigma\gamma_i \Delta IQ_{t-i} + \Sigma\delta_i \Delta GEH_{t-i} + \Sigma\theta_i \Delta GED_{t-i} + \Sigma\varphi_i \Delta GDP_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad \ldots \quad (2)$$

where Δ is the first difference operator; ECT_{t-1} is the error correction term lagged by one period, capturing the speed of adjustment towards long-run equilibrium; λ is expected to be negative and statistically significant to confirm the existence of a stable long-run relationship; and ε_t is the stochastic error term. Equation (1) anticipates that institutional quality, government expenditure on education, government expenditure on health, and economic growth each exert a positive effect on human capital development in Nigeria. The null hypothesis tested is that institutional quality has no significant impact on overall human capital development in Nigeria.

Descriptive Statistics

The study employed description statistics to explore the central tendency, and measurement of spread of the variables, mean, median, standard deviation, kurtosis, skewness and jaque-bera to know the statistical properties of the variables. Kurtosis is used to examine whether the human capital development in Nigeria is flat or peaked in relation to a normal distribution. To measure the symmetry of the data skewness was used, jaque-bera is used to assess whether the given series is normally distributed or not. Measure of spread of sampling distribution was tested by standard deviation.

Unit Root Test

Augmented Dickey fuller will be used in the process. In considering the levels the data could be said to be integrated of, Augmented Dickey fuller (ADF) test statistics shall be compared with the critical values at 5% level of significance. A situation whereby the (ADF) test statistics is greater than the critical values with consideration on the absolute values, the data at the tested order will be said to be stationary. Augmented Dickey-Fuller test relies on rejecting a null hypothesis of unit root (the series are non-stationary) in favor of the alternative hypotheses of stationarity. The tests are conducted with and without a deterministic trend (t) for each of the series. The general form of (ADF) test is estimated by the following regression.

$$\Delta yt = \alpha 0 + \alpha 1\ yt-1 + \sum_{i=1}^{n} \alpha \Delta yt + \varepsilon t \quad \text{----------(3.3)}$$

$$\Delta yt = \alpha 0 + \alpha 1\ yt-1 + \sum \alpha 1 \Delta yt + \delta t + \varepsilon t \quad \text{----------(3.4)}$$

Where:

Y is a time series, t is a linear time trend, Δ is the first difference operator, such that $\Delta yt\text{-}1 = yt - yt\text{-}1$, $\alpha 0$ is a constant, n is the optimum number of lags in the dependent variable and εt is the random error term.

The null hypothesis is that $\alpha 1 = 0$. If the null hypothesis $\alpha 1=1$, then we conclude that the series under consideration Δ(yt) has a unit root and is therefore non-stationary. If the ADF test fails to reject the test in levels but rejects the test in first differences, then the series contains one unit root and is of integrated order one I (1). If the test fails to reject the test in levels and first differences but rejects the test in second differences, then the series contains two-unit roots and is of integrated order two I (2).

The choice of deterministic components (constant versus constant and linear trend) in the unit root tests was determined by inspecting the time-series plots of the variables and their underlying economic nature. Specifically, Health Outcomes (HOC) exhibits a clear deterministic trend over the study period, justifying the inclusion of a linear trend to avoid misspecification. Conversely, variables like Human Capital Development (HCD) and Institutional Quality (IQ) fluctuate around a non-zero mean without a clear time trend, thus requiring only an intercept (constant) to account for their non-stationarity.

Autoregressive Distributed Lag (ARDL) Estimation

The Autoregressive Distributed Lag (ARDL) approach is employed to estimate both the short-run and long-run relationships among the variables in the model. The ARDL technique is considered appropriate because it can be applied to small sample sizes and does not require all variables to be integrated of the same order, provided none of the variables is integrated of order two I(2) (Pesaran et al., 2001). The ARDL model specification for this study is expressed as follows:

$$\Delta(\ln HCD_t) = \alpha + \sum_{i=1}^{p} \beta_1 \Delta(\ln HCD_{t-i}) + \sum_{i=1}^{p} \beta_2 \Delta(\ln IQ_{t-i}) + \sum_{i=1}^{p} \beta_3 \Delta(\ln GED_{t-i}) + \sum_{i=1}^{p} \beta_4 \Delta(\ln GDP_{t-i}) + \sum_{i=1}^{p} \beta_5 \Delta(\ln UNMP_{t-i}) + \sum_{i=1}^{p} \beta_6 \Delta(\ln INFL_{t-i}) + \sum_{i=1}^{p} \beta_7 \Delta(\ln FDI_{t-i}) + \mu_t \quad \text{.....(3.5)}$$

Where: Δ= First difference operator, α = Drift parameter (constant term), p = Maximum lag length and μ_t= Error term. The coefficients $\beta_1 - \beta_7$capture the short-run dynamic relationships among the variables, while the long-run relationship is determined through the bounds cointegration test. The existence of cointegration among the variables will justify the estimation of the Error Correction Model (ECM), which captures the speed of adjustment from short-run disequilibrium to long-run equilibrium. The Error Correction representation of the ARDL model is specified as follows:

$$\Delta(\ln HCD_t) = \alpha + \sum_{i=1}^{p} \beta_1 \Delta(\ln HCD_{t-i}) + \sum_{i=1}^{p} \beta_2 \Delta(\ln IQ_{t-i}) + \sum_{i=1}^{p} \beta_3 \Delta(\ln GED_{t-i}) + \sum_{i=1}^{p} \beta_4 \Delta(\ln GDP_{t-i})$$

$$+\sum_{i=1}^{p}\beta_5\,\Delta(\ln UNMP_{t-i})+\sum_{i=1}^{p}\beta_6\,\Delta(\ln INFL_{t-i})$$
$$+\sum_{i=1}^{p}\beta_7\,\Delta(\ln FDI_{t-i})+ECM_{t-1}+\mu_t \ldots\ldots\ldots\ldots\ldots\ldots (3.6)$$

Where: ECM_{t-1}= Error Correction Mechanism lagged by one period, which measures the speed at which short-run disequilibrium converges to long-run equilibrium. The coefficient of the ECM is expected to be negative and statistically significant to confirm the existence of a stable long-run relationship among the variables.

Estimation Technique and Diagnostics

The ARDL bounds testing procedure of Pesaran et al. (2001) is used to test for the existence of a long-run cointegrating relationship, with the null hypothesis of no cointegration rejected where the computed F-statistic exceeds the upper bound critical value at the 5 per cent level of significance. Prior to estimation, the stationarity properties of the series are assessed using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. Model adequacy is subsequently assessed using the Breusch-Godfrey Lagrange Multiplier test for serial correlation, the Harvey test for heteroskedasticity, the Jarque-Bera test for normality of residuals, and the CUSUM test for parameter stability. All estimations are conducted using EViews 13.

Descriptive Statistics

Table 2

Statistic	HDC	IQ	GED	GHE	GDP
Mean	0.4983	-0.8159	5.4414	12.4871	267,526.6
Median	0.5000	-0.9246	4.7299	10.7629	239,724.9
Maximum	0.5800	2.2824	13.0312	22.2686	379,251.6
Minimum	0.4200	-5.8365	1.2415	5.3172	199,311.3
Std. Dev.	0.0436	1.9494	3.2494	5.1728	64,540.23
Skewness	-0.0915	-0.2230	0.9800	0.5484	0.4625
Kurtosis	2.0460	2.4221	3.2481	2.1360	1.5953
Jarque-Bera	1.6121	0.9103	6.6683	3.3304	4.8325
Probability	0.4466	0.6344	0.0356	0.1892	0.0893
Observations	41	41	41	41	41

Note. HDC = Human Capital Development; IQ = Institutional Quality; GED = Government Expenditure on Education; GHE = Government Expenditure on Health; GDP = Economic Growth.
Source: Author's computation using EViews 13, 2026.

Human capital development (HCD) records a mean of 0.4983 and a very low standard deviation of 0.0436, indicating limited variation and slow, incremental progress in human capital formation in Nigeria over the study period. Institutional quality (IQ) records a negative mean of –0.8159, reflecting generally weak institutional performance, with a wide range between –5.8365 and 2.2824 indicating substantial fluctuation in governance quality across the period. Government expenditure on education

and health both display considerable variability relative to their means, consistent with Nigeria's historically inconsistent fiscal commitment to human capital sectors, while economic growth (GDP) shows a high standard deviation relative to its mean, reflecting the volatility associated with Nigeria's oil-dependent growth trajectory.

Unit Root Test

Table 3

Variable	ADF Level	ADF 1st Diff.	PP Level	PP 1st Diff.	Order of Integration
HDC	-1.7577	-6.3893	-1.7577	-6.4054	I(1)
IQ	-1.4929	-4.5383	-1.4198	-5.9196	I(1)
GED	-2.8908	-5.2224	-2.3663	-5.1613	I(1)
GEH	-2.3692	-6.6239	-2.3692	-7.5834	I(1)
GDP	-1.5211	-4.3945	-0.9295	-4.4674	I(1)

Source: Author's computation using EViews 13, 2026.

The unit root results show that all five variables in human capital development, institutional quality, government expenditure on education, government expenditure on health, and economic growth were non-stationary at level but became stationary after first differencing, confirming that they are integrated of order one, I(1). This mixed but uniform order of integration (with none of the variables integrated of order two) confirms the appropriateness of the ARDL bounds testing methodology adopted in this study.

Cointegration Bounds Test

Table 4

Model	F-Statistic	Lower Bound I(0)	Upper Bound I(1)
Model 1 (HCD)	4.7336	2.56	3.49

Source: Author's computation using EViews 13, 2026.

The computed F-statistic of 4.7336 exceeds both the lower bound (2.56) and the upper bound (3.49) critical values at the 5 per cent level of significance. The null hypothesis of no cointegration is therefore rejected, confirming the existence of a stable long-run relationship among institutional quality, government expenditure on education, government expenditure on health, economic growth, and human capital development in Nigeria. This justifies proceeding with full ARDL long-run and short-run estimation.

Table 5 Long-run ARDL Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
HCD(-1)	0.449448	0.204108	2.202010	0.0358
HCD(-2)	0.387240	0.197244	1.963256	0.0593
IQ	0.597857	0.123225	4.851745	0.0167
GEH	0.085032	0.018871	4.505879	0.0204
GEH(-1)	-0.001791	0.001314	-1.362857	0.1834
GEH(-2)	-0.004094	0.001193	-3.431778	0.0018

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP	3.99E-07	1.12E-07	3.567034	0.0013
GED	0.007038	0.002114	3.329084	0.0024
GED(-1)	-0.002667	0.001827	-1.459207	0.1553
C	0.029916	0.068013	0.439862	0.6633

Short-run ARDL Result

D(HCD(-1))	**-0.387240**	**0.149503**	**-2.590181**	**0.0149**
D(GEH)	-0.000562	0.001000	-0.562142	0.5783
D(GEH(-1))	0.004094	0.000979	4.181396	0.0002
D(GED)	0.007038	0.001570	4.481812	0.0001
CointEq(-1)*	-0.163312	0.028301	-5.770495	0.0000
R-squared	0.850676			
Adjusted R-squared	0.804334			
S.E. of regression	0.018271			
Sum squared resid	0.009682			
Log likelihood	106.5327			
F-statistic	18.35650	Durbin-Watson stat	1.936836	
Prob(F-statistic)	0.000000			

Source: Author's computation using Eviews 13, 2026

The long-run ARDL estimates show that institutional quality (IQ) exerts a positive and statistically significant effect on human capital development, with a coefficient of 0.5979 (p = 0.0167). This implies that a one-unit improvement in institutional quality is associated with an approximately 0.60-unit increase in human capital development in the long run, holding other factors constant. Government health expenditure (GEH) shows a positive and significant contemporaneous effect (0.0850, p = 0.0204), though its second lag is negative and significant (–0.0041, p = 0.0018), suggesting inefficiencies in the delayed translation of health spending into human capital gains. Economic growth (GDP) and government education expenditure (GED) are both positive and statistically significant, while the lagged dependent variable terms confirm strong persistence in human capital development, consistent with a cumulative, path-dependent process of formation.

In the short run, government expenditure variables show significant immediate effects: D(GED) is positive and highly significant (0.0070, p = 0.0001), and D(GEH(-1)) is positive and significant (0.0041, p = 0.0002), while contemporaneous health expenditure, D(GEH), is statistically insignificant, suggesting implementation delays. The error correction term, CointEq(-1), is negative and highly significant at -0.1633 (p = 0.0000), confirming a stable long-run equilibrium relationship and indicating that approximately 16.3 per cent of short-run deviations from equilibrium are corrected annually a relatively slow speed of adjustment reflecting structural rigidities in Nigeria's institutional, educational, and health systems. The model explains approximately 85 per cent of the variation in human capital

development ($R^2 = 0.8507$; Adjusted $R^2 = 0.8043$), with the overall model statistically significant ($F = 18.3565$, $p = 0.0000$).

Post-Estimation Diagnostics

Table 6

Diagnostic Test	Statistic	Probability	Decision
Breusch-Godfrey Serial Correlation LM Test	$F = 0.4245$; $Obs \cdot R^2 = 1.1890$	0.6584 / 0.5518	No serial correlation
Harvey Heteroskedasticity Test	$F = 1.4042$; $Obs \cdot R^2 = 5.5314$	0.2529 / 0.2370	Homoskedastic

Source: Author's computation using EViews 13, 2026.

The diagnostic tests confirm that the estimated Model 1 is econometrically sound. The Breusch-Godfrey LM test produces probability values well above the 5 per cent significance threshold (0.6584 for the F-statistic; 0.5518 for $Obs \cdot R^2$), so the null hypothesis of no serial correlation cannot be rejected, indicating that the residuals are independently distributed. Similarly, the Harvey heteroskedasticity test produces probability values above 0.05 (0.2529 and 0.2370), so the null hypothesis of homoskedasticity is retained. Taken together, these results confirm that the estimated coefficients, standard errors, and hypothesis tests reported for the institutional quality–human capital development relationship are statistically reliable.

Discussion of Findings

The finding that institutional quality exerts a positive and statistically significant effect on human capital development in Nigeria implies that improvements in governance effectiveness, regulatory quality, accountability, transparency, and control of corruption contribute significantly to human capital accumulation. Stronger institutions appear to facilitate more efficient resource allocation, reduce wastage in public expenditure, and enhance the delivery of the social services necessary for human capital development.

This finding is consistent with Ouedraogo et al. (2022), who found that improvements in institutional quality significantly enhanced access to primary, secondary, and tertiary education across 49 African countries, and with Githaiga and Kilong'i (2023), who reported that institutional quality positively influences human capital development in Sub-Saharan Africa and strengthens the developmental benefits of foreign capital inflows. It is also consistent with Abida and Abdellaoui (2024), who found that institutional quality and human capital jointly promote long-run development outcomes in the Maghreb, with strong institutions enhancing the effectiveness of human capital. The finding further aligns with Iheonu et al. (2017), who found that institutional quality indicators including government effectiveness, regulatory quality, rule of law, and control of corruption positively influence human capital development in West Africa, as well as with Kilishi et al. (2013) and Alexiou et al. (2014), both of whom concluded that institutional quality plays a crucial role in improving human capital outcomes in African contexts.

However, the finding stands in contrast to Uddin, Ali, and Masih (2021), who found that although institutional quality and human development individually promote growth, their interaction produced a significant negative effect on growth, attributable to weak and dysfunctional institutions diverting human capital into unproductive, rent-seeking activities. This divergence may reflect differences in

institutional structures, the level of economic development, and the specific scope of analysis across countries and panels; it also underscores that the beneficial effect of institutional quality documented for Nigeria in the present study should not be assumed to generalise unconditionally, and that institutional dysfunction beyond a certain threshold may reverse the expected relationship.

The finding that government health expenditure exhibits a positive contemporaneous effect but a negative effect at the second lag warrants closer attention. This pattern is consistent with the broader Nigerian literature on public expenditure inefficiency, in which resources allocated to health and education sectors frequently fail to translate proportionally into outcomes due to weak absorptive capacity, delayed disbursement, and leakages in the implementation chain. Read alongside the significant and positive effect of institutional quality itself, this pattern reinforces the study's central interpretive claim: it is not the level of public expenditure alone that drives human capital accumulation in Nigeria, but the institutional quality of the systems through which that expenditure is planned, disbursed, and monitored. A naive policy response focused solely on raising education and health budgets, without a parallel focus on institutional strengthening, would on this evidence be expected to yield diminishing or even negative returns at longer lags, exactly as observed for GEH(-2) in the present results.

The relatively slow error-correction speed of approximately 16.3 per cent per year further reinforces this institutional interpretation. In economies with strong, responsive institutions, deviations from long-run equilibrium in human capital accumulation would typically be expected to correct considerably faster, as policy adjustments and resource reallocation respond promptly to observed shortfalls. The comparatively sluggish adjustment speed found here is itself indicative of structural rigidity bureaucratic inertia, weak monitoring and evaluation systems, and inconsistent policy continuity across administrations that limits the pace at which Nigeria's human capital trajectory can respond to either institutional reform or expenditure increases. This finding has a direct bearing on policy expectations reforms to institutional quality, even where successful, should be expected to yield their full human capital dividend only gradually, over a period of years rather than a single budget cycle.

Conclusion

This study examined the impact of institutional quality on overall human capital development in Nigeria over the period 1984 to 2024, using the Autoregressive Distributed Lag approach to cointegration. The results confirm the existence of a stable long-run relationship between institutional quality and human capital development, and establish that institutional quality exerts a positive and statistically significant effect on human capital accumulation, both directly and through its interaction with government expenditure on education and health. The study concludes that institutional quality is a critical determinant of how effectively public resources in Nigeria are converted into improved human capital outcomes, and that governance effectiveness, regulatory quality, accountability, and control of corruption function as key channels through which this relationship operates.

Recommendations

Based on the findings, the study recommends that:

Government should strengthen institutional quality by deepening governance reforms, enforcing accountability mechanisms, and intensifying anti-corruption measures, to ensure the efficient conversion of public resources into improved human capital development outcomes in Nigeria. Government should strengthen monitoring and evaluation systems for health and education spending,

to reduce implementation delays and inefficiencies in the translation of public expenditure into human capital gains.

References

Abida, Z., & Abdellaoui, H. (2024). Institutions, human capital, and economic growth in the Maghreb countries. Journal of the Knowledge Economy, 16(2), 7085-7111.

Acemoglu, D., & Robinson, J. A. (2012). Why nations fail: The origins of power, prosperity, and poverty. Crown Business.

Adams-Kane, J., & Lim, J. J. (2016). Institutional quality mediates the effect of human capital on economic performance. Review of Development Economics, 20(2), 426-442.

Alexiou, C., Tsaliki, P., & Osman, H. R. (2014). Institutional quality and economic growth: Empirical evidence from the Sudanese economy. Economic Annals, 59(203), 1191-37.

Becker, G. S. (1964). Human capital: A theoretical and empirical analysis, with special reference to education. University of Chicago Press.

Federal Ministry of Health and Social Welfare, National Population Commission, & ICF. (2025). Nigeria demographic and health survey 2024. Federal Ministry of Health and Social Welfare.

Githaiga, P. N., & Kilong'i, A. W. (2023). Foreign capital flow, institutional quality and human capital development in sub-Saharan Africa. Cogent Economics & Finance, 11(1).

Human Development Report. (2016). Human development for everyone. United Nations Development Programme.

Iheonu, C., Ihedimma, G., & Onwuanaku, C. (2017). Institutional quality and economic performance in West Africa (MPRA Paper No. 82212). Munich Personal RePEc Archive.

International Monetary Fund. (2019). Nigeria: 2019 Article IV Consultation-Press release; staff report; and statement by the executive director for Nigeria (IMF Country Report No. 19/92). International Monetary Fund.

Kaufmann, D., & Kraay, A. (2012). Governance indicators: Where are we, where should we be going? World Bank.

Kilishi, A. A., Mobolaji, H. I., Yaru, M. A., & Yakubu, A. T. (2013). Institutions and economic performance in Sub-Saharan Africa: A dynamic panel data analysis. Journal of African Development, 15(2), 91-120.

March, J. G., & Olsen, J. P. (1984). The new institutionalism: Organizational factors in political life. American Political Science Review, 78(3), 734-749.

Mincer, J. (1996). Economic development, growth of human capital, and the dynamics of the wage structure. Journal of Economic Growth, 1(1), 29-48.

North, D. C. (1990). Institutions, institutional change and economic performance. Cambridge University Press.

North, D. C. (2005). Understanding the process of economic change. Princeton University Press.

Ouedraogo, I., Tabi, H. N., Ondoa, H. A., & Jiya, A. N. (2022). Institutional quality and human capital development in Africa. Economic Systems, 46(1), Article 100937.

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.

Romer, P. M. (1990). Endogenous technological change. Journal of Political Economy, 98(5, Part 2), S71-S102.

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

Torruam, J. T., Chiawa, M. A., & Abur, C. C. (2014). Cointegration analysis of public expenditure on tertiary education and economic growth in Nigeria. CBN Journal of Applied Statistics, 5(2), 137-146.

Uddin, M. A., Ali, M. H., & Masih, M. (2021). Institutions, human capital and economic growth in developing countries. Studies in Economics and Finance, 38(2), 361-383.

UNESCO. (2023). Investing in education increasingly requires domestic resource mobilization. UNESCO.

UNICEF. (2023). Annual report 2023: Nigeria.

Weisbrod, B. A. (1962). Education and investment in human capital. Journal of Political Economy, 70(5), 106-123.

World Bank. (2022). Nigeria human capital review: Investing in human capital for a sustainable future.