ASSESSING THE ROLE OF HUMAN CAPITAL DEVELOPMENT IN ECONOMIC GROWTH OF NIGERIA

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ABSTRACT

This study examines the role of human capital development in fostering economic growth in Nigeria, with a specific focus on the impacts of education and health investments, electricity access, and foreign aid. Motivated by Nigeria's ambition to transition to a knowledge-based economy, the study explores how investments in human capital and infrastructure contribute to sustained economic growth. The primary objective is to assess both the short-term and long-term effects of these investments using the Auto-Regressive Distributed Lag (ARDL) model. The methodology involves analysing time-series data to capture the dynamic relationships between human capital development, infrastructure, and economic growth. The scope of the study covers a period from 1980 to 2023, focusing on key variables such as education spending, healthcare expenditure, electricity access, and foreign aid. The theoretical framework draws on three key theories: Neo-Classical Economic Growth Theory, Human Capital Theory, and the Infrastructure-Augmented Solow Model. These theories collectively highlight how investments in human capital, infrastructure, and technological progress drive economic growth. The findings reveal that lagged increase in Growth Domestic Product (GDP) significantly influences current economic performance, while the effects of education and health investments are more long-term, with delayed returns. Additionally, the study highlights that electricity access and foreign aid have immediate impacts, while human capital investments require more time to generate visible results. Based on these insights, the study recommends that policymakers prioritise long-term strategies to enhance human capital and infrastructure development, while reconsidering the effectiveness of foreign aid in promoting sustainable economic growth in Nigeria.

Key Words: Economic Growth; Human Capital Development; ARDL Model; Infrastructure; Nigeria.
JEL: O15, E2, H52, O11

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INTRODUCTION

Investment in human capital has long been recognised as a critical driver of economic development and growth. Human capital, comprising the knowledge, skills, health, and productivity of a population, is fundamental to the success of nations in the global economy (Becker, 1964). In the Nigerian context, the significance of human capital development is underscored by its potential to propel the country towards sustained economic growth, poverty reduction, and increased competitiveness in the international arena. Despite the recognised importance of human capital development in fostering economic growth, Nigeria continues to face challenges in effectively harnessing its population's potential. The nation has made substantial investments in education, health, infrastructure, and has received foreign aid and investments; however, the impact of these investments on human capital development and, subsequently, on economic growth remains a subject of concern (United Nations Development Program [UNDP], 2021). The efficacy of education investments in Nigeria faces challenges such as disparities in access, quality, and relevance. While increased spending on education has been observed, issues like inadequate infrastructure, teacher shortages, and regional variations persist, impacting the overall effectiveness of educational programmes.

Notwithstanding the efforts employed to improve healthcare infrastructure and services, Nigeria continues to grapple with health disparities, high disease burdens, and limited access to quality healthcare, especially in rural areas. The effectiveness of health investments in enhancing the overall health status and productivity of the population requires thorough examination (World Health Organisation [WHO], 2021). The insufficient and unreliable supply of electricity hampers economic activities, operational activities of educational institutions, and healthcare services (World Bank, 2018). The inadequate infrastructure, particularly in electricity access, poses a significant hurdle to unlocking the full potential of human capital development in Nigeria. In addition, infrastructural development, specifically electricity access, is a critical determinant of economic activities and human capital development. Adequate and reliable electricity supply is essential for educational

institutions, healthcare facilities, and various industries, impacting the overall productivity and quality of life (Sakiru & Mufutau, 2011). Infrastructure deficits, particularly in electricity access, have been identified as challenges that require attention to unlock the full potential of human capital in Nigeria. Although Nigeria receives foreign aid and investments, the impact and effectiveness of these external contributions in addressing human capital development challenges are not well understood. Issues of aid dependency, accountability, and the alignment of foreign assistance with national development priorities need thorough investigation.

This study examines the impact of education investments, health investments, infrastructure development (electricity access), and foreign aid and investments on human capital development in Nigeria (WHO, 2021). By doing so, it aims to provide insights into the obstacles hindering effective human capital development and propose evidence-based recommendations for policy formulation and implementation.

LITERATURE REVIEW

The literature review provides a comprehensive exploration of the theoretical and empirical studies relevant to this research, focusing on the relationship between human capital development, economic growth, and the roles of education, health, infrastructure, and foreign aid in fostering sustainable economic development. By reviewing the existing body of knowledge, this section aims to establish the foundation for the research, highlighting key theories, concepts, and empirical findings that inform the investigation of these variables in the context of Nigeria.

Conceptual Review

Human capital development refers to the enhancement of individuals' skills, knowledge, and health to improve their productivity and economic contribution. Becker (1964) emphasises that investments in education and healthcare are fundamental in building human capital, leading to increased workforce efficiency and innovation. Schultz (1961) further argues that human capital development is a key driver of economic progress, as it enables individuals to adapt to changing

economic conditions and technological advancements.

Economic growth, broadly defined, is the sustained increase in a nation's output and overall economic performance. Solow (1956) posits that economic growth is influenced by capital accumulation, labour force expansion, and technological progress. Todaro and Smith (2015) add that economic growth is not just about increasing GDP but also about improving living standards and reducing poverty. This study examines how education, health, infrastructure - particularly electricity access - and foreign aid contribute to human capital development and, in turn, drive economic growth in Nigeria.

Theoretical Review

A strong theoretical foundation is essential for understanding the complex relationships between economic growth, human capital, and infrastructure development. This section reviews key economic theories that explain how investments in education, health, and infrastructure contribute to long-term economic expansion. By examining these theories, we establish a framework for analysing the factors that drive sustainable growth in Nigeria.

Human Capital Theory

The foundational theory that permeates the theoretical literature is the Human Capital Theory pioneered by Becker (1964). This theory asserts that investments in education and health are akin to capital investments, enhancing an individual's productivity and contributing to overall economic growth. In the context of education, the theory posits that increased investments lead to higher levels of human capital, resulting in improved skills, innovation, and workforce productivity. Similarly, health investments contribute to a healthier and more productive workforce. This theoretical perspective provides a lens through which to analyse the relationships between education, health, and economic growth in Nigeria. Nigeria, as a developing nation, faces challenges in human capital development, including disparities in education access and healthcare outcomes. Human Capital Theory underscores the need for targeted investments in education and health to enhance the skills and productivity of the population (Becker, 1964). The theory aligns with efforts to address educational inequalities, improve healthcare infrastructure, and

elevate overall human capital in Nigeria. Nigeria grapples with educational disparities, and healthcare challenges that impact human capital development. Human Capital Theory is pertinent as it underscores the need for targeted investments in education and health to improve workforce skills, productivity, and overall economic growth. Addressing educational and health inequalities aligns with Nigeria's goal of building a robust and skilled workforce.

Endogenous Growth Theory

Complementing the Human Capital Theory, the Endogenous Growth Theory as expounded by scholars like Romer (1986), emphasises the role of knowledge and human capital in driving long-term economic growth. According to this theory, investments in education and research and development lead to an increase in human capital, fostering technological progress and innovation. This perspective is particularly relevant when examining how education investments in Nigeria may spur innovation, enhance technological capabilities, and contribute to sustained economic growth. Nigeria's aspirations for sustained economic growth require technological progress and innovation. The Endogenous Growth Theory emphasises the role of knowledge and human capital in driving innovation, aligning with Nigeria's efforts to diversify its economy through technological advancements (Romer, 1986). Policies that foster research and development, improve educational quality, and promote innovation resonate with the principles of this theory. Nigeria's pursuit of economic diversification and technological progress aligns with the principles of the Endogenous Growth Theory. Investing in education, research, and development is crucial for fostering innovation and sustaining long-term economic growth. This theory resonates with Nigeria's aspirations to move beyond resource-dependent industries and promote a knowledge-based economy.

Empirical Review

Numerous scholars have undertaken empirical studies to investigate the relationships between education and health investments, infrastructure development (electricity access), foreign aid, and investments on human capital and economic growth in Nigeria. The existing body of literature provides valuable insights into the

complex interplay of these variables.

A study by Ogundele and Egunjimi (2017) explored the impact of education investments on economic growth in Nigeria. The findings indicated a positive and significant relationship between increased education spending and GDP growth. Specifically, higher allocations to education were associated with improved human capital development, leading to enhanced productivity and economic expansion. Oyewole and Adegoke (2018) conducted research on the relationship between health investments and human capital development in Nigeria. The study revealed that increased healthcare spending was correlated with improved health outcomes and increased life expectancy. This, in turn, contributed to the development of a healthier and more productive workforce.

In an empirical investigation by Adaramola and Oyewola (2011), the link between infrastructure development, particularly electricity access, and economic productivity in Nigeria was explored. The study found a positive association between improved electricity infrastructure and increased economic activities. Reliable power supply was identified as a crucial factor in fostering business growth and attracting investments. Odusola (1998) delved into the impact of foreign aid and investments on economic growth in Nigeria. The study highlighted that well-managed foreign aid and strategic investments positively influenced GDP growth. Effective utilisation of foreign resources was emphasised as a key determinant in achieving sustained economic development.

Akinlo and Apanisile (2014) and Paul and Akindele (2016) conducted comprehensive studies that integrated education and health investments, infrastructure development, and foreign aid in analysing their collective impact on human capital and economic growth. The research demonstrated that holistic approaches, considering the synergies between these factors, yielded more significant positive outcomes on both human capital development and economic growth. Research by Onakoya (2019) focused on regional disparities in the relationship between these variables within Nigeria. The findings suggested variations in the impact of education, health, infrastructure, and foreign aid across different regions, emphasising the need for region-specific policy interventions to

address disparities and promote inclusive development. In the domain of infrastructure, particularly electricity access, the literature highlights its pivotal role in supporting education and healthcare services. Sakiru and Mufutau (2011) demonstrated the significance of electricity in economic activities, asserting that reliable and accessible electricity is essential for enhancing the overall productivity of educational institutions, healthcare facilities, and various industries. Shifting to the dimension of foreign aid and investments. Easterly (2006) critically examined the impact of foreign aid on development outcomes. While foreign aid has the potential to augment resources for education and health, Easterly cautions against potential pitfalls such as aid dependency and misallocation of funds. This prompts a nuanced consideration of the effectiveness of foreign aid in supporting human capital development initiatives.

These empirical studies collectively contribute to a nuanced understanding of the relationships between education, health, infrastructure, foreign aid, and investments in the Nigerian context. While the specific findings may vary, the overarching consensus is that strategic investments in education, health, infrastructure, and well-managed foreign aid are essential components for fostering human capital development and sustained economic growth in Nigeria. Many existing studies have focused on short-term impacts, providing insights into immediate relationships between variables. However, the long-term trends and sustained effects of education, health, infrastructure, and foreign aid on human capital and economic growth remain relatively underexplored. To this end, this study aims to contribute by investigating the long-term trends and sustained impacts of the aforementioned factors on human capital and economic growth. Understanding the dynamics over an extended period will provide insights into the durability and persistence of the relationships.

Summary of Empirical Studies

Empirical studies have consistently shown that investments in education, health, infrastructure (particularly electricity access), and foreign aid play crucial roles in Nigeria's human capital development and economic growth. Research by Ogundele and Egunjimi (2017) as well as Oyewole and Adegoke (2018) confirmed that

increased spending on education and healthcare enhances productivity and workforce efficiency. Infrastructure studies, such as those by Adaramola and Oyewola (2011) as well as Sakiru and Mufutau (2011), highlighted the importance of reliable electricity in supporting economic activities, education, and healthcare services. Meanwhile, Odusola (1998) and Easterly (2006) examined the impact of foreign aid, cautioning against aid dependency while emphasising its potential when effectively managed. Regional disparities in these impacts were noted by Onakoya (2019), emphasising the need for targeted policies. While most studies focus on short-term effects, this research bridges the gap by analysing long-term trends and sustained impacts, providing deeper insights into the durability of these relationships in Nigeria's economic development.

METHODOLOGY

Sources of Data

The data used for the study spans from 1980 to 2023. The period is chosen to ensure that the time frame captures long-term trends and patterns in the macroeconomic variables under investigation. The data was sourced from the Central Bank of Nigeria (CBN) statistical bulletin, the National Bureau of Statistics (NBS), the World Bank, and the International Monetary Fund (IMF).

Theoretical Framework

Nigeria's drive for economic diversification and human capital development makes it crucial to examine the role of education, health, and infrastructure in economic growth. This study draws on the Human Capital Theory as its theoretical framework. The Human Capital Theory (Becker, 1964) views education and health as investments rather than costs, leading to higher productivity, wages, and economic growth. However, challenges such as unequal access to quality education and healthcare in Nigeria limit these benefits, necessitating targeted policies. This theory justifies the use of the Autoregressive Distributed Lag (ARDL) model to examine both short-term and long-term impacts of education, health, and infrastructure on economic growth. The ARDL model effectively captures dynamic relationships, making it well-suited for assessing Nigeria's economic trajectory. By integrating

these theoretical perspectives, this study provides a comprehensive framework for understanding the role of human capital and infrastructure in sustainable economic growth.

Model Specification

The Autoregressive Distributed Lag (ARDL) model is a commonly used econometric model to analyse the relationship between variables in a time series framework. It is particularly suitable for modeling situations where variables may have different orders of integration. The ARDL model allows for both short-run and long-run relationships between variables. The general form of an ARDL model is specified below:

For a multivariate ARDL (p, q, r, d) model:

$$\Delta Y_t = \alpha + \beta_1 Y_{t-1} + \beta_2 X_{t-1} + \beta_3 X_{t-1} + \beta_4 X_{t-1} + \beta_5 X_{t-1} +$$

$$\delta_1 \Delta Y_{t-1} + \delta_2 \Delta X_{t-1} + \delta_3 \Delta X_{t-1} + \delta_4 \Delta X_{t-1} + \delta_5 \Delta X_{t-1} + \sum_{i=1}^{p-1} \theta_i \Delta Y_{t-i} +$$

$$\sum_{i=0}^{q-1} \phi_i \Delta X_{t-i} + \sum_{i=0}^{r-1} \gamma_i \Delta X_{t-i} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

where:

Y_t is the dependent variable,

X_t is the independent variable,

Δ denotes the differencing operator to make the series stationary if needed,

p is the number of lagged levels for the dependent variable,

q is the number of lagged levels for the independent variable,

α is the constant term,

β_1, β_2, β_3, β_4 and β_5 are the coefficients of the lagged levels,

δ_1, δ_2, δ_3, δ_4 and δ_5 are the coefficients of the lagged differences,

θ_i and θ_i are coefficients of lagged differences for

i= 1, 2, 3, 4, 5,...,p-1 and i= 1, 2, 3, 4, 5,..., q-1, respectively,

ε_t is the error term.

The Autoregressive Distributed Lag (ARDL) model developed by Pesaran and Shin (1999) is suitable for analysing the long-run and short-run relationships between

variables. In the context of this study, the general ARDL model (Pesaran & Shin, 1999) can be represented as:

$$\Delta GDPGR_t = \alpha + \beta_1 GDPGR_{t-1} + \beta_2 EDU_{t-1} + \beta_3 HLTH_{t-1} + \beta_4 INFRA_{t-1} + \beta_5 FAI_{t-1} +$$
$$\delta_1 \Delta GDPGR_{t-1} + \delta_2 \Delta EDU_{t-1} + \delta_3 \Delta HLTH_{t-1} + \delta_4 \Delta INFRA_{t-1} + \delta_5 \Delta FAI_{t-1} +$$
$$\sum_{i=1}^{p} \theta_i \Delta GDPGR_t \sum_{i=0}^{q} \theta_i \Delta EDU_{t-i} + \sum_{i=0}^{r} \psi_i \Delta HLTH_{t-i} + \sum_{i=0}^{s} \xi_i \Delta INFRA_{t-i} +$$
$$\sum_{i=0}^{u} \Delta FAI_{t-i} + \lambda ECT_{t-1} + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(7)$$

Where:

$\Delta GDPGR_t$ represents the first-differenced GDP Growth Rate at time t.

ΔEDU_t stands for the first-differenced education investments at time t.

$\Delta HLTH_t$ represents the first-differenced health investments variable at time t.

$\Delta INFRA_t$ represents the first-differenced infrastructural development variable at time t.

ΔFAI_t represents the first-differences foreign aid and investments variable at time t.

ECT represents the Error Correction Term at t time

The α term represents the intercept.

The β coefficients ($\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$) represent the short-run impact of EDU, HLTH, INFRA, and FAI on

GDPGR, respectively.

The δ coefficients ($\delta_1, \delta_2, \delta_3, \delta_4, \delta_5$) represent the long-run relationship between the variables.

θ_i represents the coefficients of the lagged differences of GDPGR.

Θ_i represents the coefficients of the lagged differences of EDU.

ψ_i represents the coefficients of the lagged differences of HLTH.

ξ_i represents the coefficients of the lagged differences of INFRA.

η_i represents the coefficients of the lagged differences of FAI.

λ represents the coefficient of the error correction term.

p is the maximum lag order for GDPGR.

q is the maximum lag order for EDU.

r is the maximum lag order for HLTH.

s is the maximum lag order for INFRA.

μ is the maximum lag order for FAI.

u_t is the error term.

A Priori expectations:

$\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0, \beta_5 > 0$

Where: β_1 to β_5 represent the slope coefficients.

α is the intercept.

ϵt is the error term.

This ARDL model equation allows for the investigation of the short-run and long-run relationships between GDP Growth Rate (GDPGR), education investments (EDU), health investments (HLTH), infrastructural development (INFRA), and foreign aid and investments (FAI) while accounting for lagged effects and autoregressive terms.

Estimation Technique

In order to test the stationarity of the series, the Augmented Dickey-Fuller (ADF) test was used to determine the order of integration. The Autoregressive Distributed Lag (ARDL) Model was employed to examine both short-term and long-term dynamics and assess the impact of education, health, infrastructure, and foreign aid on human capital and economic growth while incorporating lagged values to capture temporal dependencies.

RESULTS AND DISCUSSIONS

Descriptive Statistics and Analysis

In this section, the study delves into a comprehensive examination of essential statistical measures that summarise and elucidate the key characteristics of a dataset. These measures include the mean, standard deviation, minimum and maximum values, and other statistical parameters.

Table 1:   Summary of Descriptive Statistics

	GDP GROWTH RATE	EDUCATION INVESTMENTS	HEALTH INVESTMENTS	ELECTRICITY ACCESS	FOREIGN AID & INVESTMENTS
Minimum	-13.12790	1.090000	2.490600	21.63380	31709999
Maximum	15.32920	17.59000	5.053600	59.50000	1.14E+10
Mean	3.065039	6.623636	3.554314	42.33524	1.41E+09
Std. Dev.	5.197511	3.472669	0.464886	12.69044	2.09E+09
Observations	44	44	44	44	44

Source: Authors' Computation with EViews 10, 2024.

Table 1 presents the summary of descriptive statistics for key variables in the study, including GDP growth rate, education investments, health investments, electricity access, and foreign aid and investments, based on 44 observations. The GDP growth rate varies significantly, with a minimum of -13.13, a maximum of 15.33, a mean of 3.07, and a standard deviation of 5.20. This indicates considerable fluctuations in

economic performance over the period observed. Education investments range from a minimum of 1.09 to a maximum of 17.59, with a mean of 6.62 and a standard deviation of 3.47, suggesting variability in government allocation to education. Health investments show a narrower range, with a minimum of 2.49 and a maximum of 5.05, a mean of 3.55, and a standard deviation of 0.46, indicating relatively stable investments in health. Access to electricity among the population spans from 21.63 to 59.50, with a mean of 42.34 and a standard deviation of 12.69, reflecting improvements in infrastructure over time. Foreign aid and investments show considerable variation, with a minimum of approximately 31.71 million USD and a maximum of 11.4 billion USD. The mean is around 1.41 billion USD, with a standard deviation of 2.09 billion USD, illustrating substantial changes in foreign financial inflows to Nigeria. These statistics provide an overview of the distribution and variability of the variables under consideration in the study.

Unit Root Test

In statistics, a unit root test tests whether a time series variable is non-stationary and possesses a unit root. If there are unit roots, the series is not stationary. The unit root result is presented in Table 2.

Table 2: Unit Root Test

Variable	Test Stat.	Critical Value @5%	P. Value	Integration Rank
D(GDP GROWTH RATE)	-12.23016	-2.933158	0.0000	I(1)
D(EDUCATION INVESTMENTS)	-3.875145	-2.931404	0.0047	I(0)
D(HEALTH INVESTMENTS)	-3.941789	-2.931404	0.0039	I(0)
D(ELECTRICITY ACCESS)	-10.53557	-2.933158	0.0000	I(1)
D(FOREIGN AID & INVESTMENTS)	-3.338059	-2.931404	0.0191	I(0)

Source: Authors' Computation with EViews 10, 2024.

The Augmented Dickey-Fuller unit root test was carried out, and the results presented in Table 2 clearly revealed that GDP growth rate proxied for economic growth, and electricity access became stationary at first difference. Meanwhile, education investments, health investments, as well as foreign aid and investments became stationary at level difference therefore allowing us to perform ARDL Regression test.

Bounds Test Result

Table 3: ARDL Bounds Test Result

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	4.571713	4
Critical Value Bounds		

Significance	I(0) Bound	I(1) Bound
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Source: Authors' Computation with EViews 10, 2024.

Bounds test was carried out to determine the presence of long run relationship in the model. The decision rule as explained in E-views 10 user guide (2015) as well as Pesaran and Shin (1999) stated that if the F-statistics value is less than the chosen critical value of I(0) bound representing the lower bound, we accept null hypothesis. That is, there is no long run relationship. However if the F-statistics value is greater than the chosen critical value of I(0) bound then we reject null hypothesis which means there is a long run relationship in the model. Also, if the value of the F-statistics is greater than the chosen critical value of I(0) but less than the chosen critical value of I(1), it means there is both short run and long run relationship and only long run relationship if the F-statistics value is greater than the chosen critical value of I(1) bound. From the result it could be seen that the F-statistics value was 4.571713. This value was greater than the upper bound critical values of I(1) at all levels of significance. This result, therefore, showed the existence of long run effect in the model, and as such it was necessary to develop the short run and long run forms of the equation.

ARDL Cointegrating, Short-run and Long-run Form

Table 4: ARDL Cointegrating, Short-run and Long-run Form Result

SHORT RUN Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
GDP GROWTH RATE(-1)	0.496634	0.149847	3.314281	0.0022
GDP GROWTH RATE(-2)	0.271791	0.138356	1.964430	0.0577
EDUCATION INVESTMENTS	-0.075401	0.187883	-0.401319	0.6907
HEALTH INVESTMENTS	-1.365021	1.518014	-0.899215	0.3749
ELECTRICITY ACCESS	-0.400808	0.229842	-1.743844	0.0902
ELECTRICITY ACCESS(-1)	0.379468	0.225523	1.682612	0.1016
FOREIGN AID & INVESTMENTS	-4.37E-11	3.35E-10	-0.130341	0.8971
CointEq(-1)*	-0.231575	0.070410	-3.288934	0.0023
LONG RUN Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
GDP GROWTH RATE(-1)*	-0.231575	0.172415	-1.343122	0.1881
EDUCATION INVESTMENTS**	-0.064603	0.259823	-0.320416	0.4620
HEALTH INVESTMENTS**	-1.457104	2.621307	-0.748301	0.2544
ELECTRICITY ACCESS(-1)	-0.042130	0.075624	-0.538328	0.6037
FOREIGN AID &NVESTMENTS**	-4.56E-13	3.45E-11	-0.240632	0.7382
D(GDP GROWTH RATE(-1))	-0.362682	0.327245	-1.853470	0.0516
D(ELECTRICITY ACCESS)	-0.210730	0.427340	-1.462934	0.0952
C	7.738508	6.329524	1.222605	0.2299

Source: Authors' Computation with EViews 10, 2024.

In the short run, the positive coefficients of lagged GDP growth rates suggest that past economic performance has a substantial influence on current growth. This aligns with Endogenous Growth Theory, which emphasises that economic policies and conditions can have a lasting impact on growth. The results indicate that Nigeria's GDP growth tends to build on its previous performance, suggesting a certain momentum in the economy. However, it is also important to note that the coefficient of the second lag is only marginally significant, indicating that while past growth is influential, its impact diminishes over time.

Education investments in the short run appear to have an insignificant impact on GDP growth, as indicated by the negative coefficient and high p-value. This might seem counterintuitive, considering the critical role of education in building human capital. However, this can be explained through Human Capital Theory, which suggests that the benefits of education investments are typically realised over the long term, rather than immediately. The insignificant short-run impact may reflect the time it takes for education to translate into a more skilled workforce and,

consequently, higher productivity.

Similarly, health investments also show an insignificant and even negative short-run impact on GDP growth. Like education, health investments are a vital component of human capital, and their benefits might not be apparent in the short term. The lack of immediate impact could suggest that improvements in public health and the resulting economic gains take time to materialise. This aligns with the broader perspective of Human Capital Theory, where the long-term nature of such investments is emphasised.

Interestingly, electricity access shows a complex relationship with GDP growth. In the short run, the initial coefficient is negative, but it becomes positive when lagged by one period. This indicates that while immediate improvements in electricity access might not boost GDP growth right away, the benefits become apparent over time as businesses and households adapt to and fully utilise improved electricity access. This finding is consistent with Infrastructure and Development Economics, which highlights the critical role of physical infrastructure in supporting economic growth, though the benefits may not be instantaneous.

The coefficient for foreign aid and investments is negligible and statistically insignificant in both the short and long run. This result could be interpreted through the lens of Dependency Theory, which posits that reliance on external assistance can limit a country's ability to develop self-sustaining growth mechanisms. In Nigeria's case, the minimal impact of foreign aid suggests that such external funds might not be effectively channeled into growth-enhancing projects or that their benefits are offset by other factors.

In the long run, the error correction term (CointEq(-1)) is negative and significant, indicating that there is a tendency for GDP growth to return to equilibrium after a shock. This implies that while there are short-term fluctuations, the economy adjusts back to its long-run growth path, which is a reassuring sign of stability. The long-run coefficients, however, largely mirror the short-run findings-education, health investments, and foreign aid remains insignificant. This suggests that while these factors are critical for development, their impact on GDP growth is not immediately evident and may require a more extended period or more effective implementation to

bear fruit.

In summary, the ARDL results emphasise the importance of past economic performance and infrastructure in driving growth, while the long-term benefits of human capital investments, like education and health, may take time to materialise. Additionally, the negligible impact of foreign aid highlights the complexity of relying on external funds for sustainable growth, resonating with Dependency Theory's caution against over-reliance on foreign assistance.

The findings in this study provide valuable insights into the relationships between various independent variables and economic growth proxied by GDP growth rate. The results of the ARDL analysis shed light on the impact of human capital development on Nigeria's economic growth. The results of the ARDL model reveal significant insights into the dynamics of economic growth in Nigeria, particularly in relation to past GDP performance, education and health investments, electricity access, and foreign aid.

Firstly, the positive and significant impact of past GDP growth on current growth aligns with the findings of scholars like Iyoha (2011) and Oyinlola and Adedeji (2019), who have emphasised the momentum effect in Nigeria's economic growth. These scholars have noted that economic policies and conditions tend to have a lasting impact, with previous growth rates influencing future economic performance. This supports the Endogenous Growth Theory, which suggests that internal factors, such as policy frameworks and institutional quality, can generate sustained economic growth. The persistence of GDP growth in Nigeria emphasises the importance of maintaining sound economic policies and stable macroeconomic environments.

However, the results showing the insignificant impact of education and health investments on GDP growth in the short run are consistent with the work of Anyanwu and Erhijakpor (2007), who argue that the benefits of human capital investments in Africa, including Nigeria, are often realised over a longer period. This is in line with Human Capital Theory, which posits that education and health are crucial for enhancing labour productivity and fostering economic growth. The findings suggest

that while these investments are necessary, their impact may not be immediate, requiring time to manifest in significant economic gains. This delay could be due to factors such as the quality of education and healthcare services, the efficiency of resource allocation, and the time it takes for a more educated and healthier workforce to translate into higher productivity.

The study's findings on the role of infrastructure, particularly electricity access, resonate with the conclusions drawn by Eboh et al. (2018) and Akinlo (2008), who highlight the critical role of physical infrastructure in supporting economic activities in Nigeria. The positive impact of electricity access, especially when lagged, suggests that improvements in infrastructure can stimulate economic growth over time as businesses and households adjust to better utilities. This finding is consistent with Infrastructure and Development Economics, which emphasises that physical capital, such as electricity, is fundamental to driving productivity and economic growth. However, the initial negative impact of electricity access in the short run could reflect the challenges associated with the distribution and reliability of electricity in Nigeria, a point noted by scholars like Aderibigbe and Shittu (2017).

Furthermore, the negligible impact of foreign aid and investments on GDP growth is in line with the observations made by Ekpo and Udoh (2013). These scholars have noted that foreign aid in Nigeria has often failed to translate into meaningful economic growth, partly due to issues related to governance, corruption, and the misallocation of resources. This finding supports the arguments of Dependency Theory, which cautions that excessive reliance on foreign aid can hinder the development of self-sustaining growth mechanisms. The results suggest that for foreign aid to be more effective in Nigeria, it needs to be better aligned with national development priorities and more efficiently managed.

CONCLUSION AND RECOMMENDATIONS

This study emphasises the complex nature of economic growth in Nigeria, where past performance, infrastructure, and human capital investments all play crucial roles. While the immediate benefits of education and health investments may not be apparent, their long-term impact on human capital and, ultimately, economic growth

cannot be overlooked. The mixed results regarding foreign aid suggest that simply receiving external assistance is not enough; how these resources are managed is critical. For Nigeria to achieve sustained economic growth, a comprehensive approach that prioritises consistent economic policies, strategic infrastructure development, and long-term investments in education and health is essential.

Therefore, this study recommends that:

i.   The government should invest in long-term education and health initiatives. Specifically, the Federal Ministry of Education and the Federal Ministry of Health should focus on enhancing the quality and accessibility of education and healthcare, particularly in underserved regions. By so doing, long-term policies will improve educational infrastructure, teacher training, healthcare facilities, and preventive care will eventually contribute to a more robust human capital base, driving sustained economic growth.

ii. The electricity infrastructure should be enhanced. Thus, the Federal Ministry of Power and the Nigerian Electricity Regulatory Commission (NERC) should prioritise expanding and stabilising electricity access across the country. Investments in renewable energy, grid expansion, and maintenance are essential to ensure that electricity infrastructure supports both urban and rural economic activities, fostering more consistent growth.

iii. A well-developedintegrated infrastructure policy should be put in place. Given the mixed impact of infrastructure development on economic growth, a more integrated approach is needed. The Federal Ministry of Works and Housing and the Ministry of Transportation should collaborate to create comprehensive infrastructure development plans that not only focus on electricity but also on roads, transportation, and digital infrastructure. This will create an environment conducive to economic activities and further stimulate growth across various sectors.

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