



ROLE OF HUMAN CAPITAL DEVELOPMENT TO ECONOMIC GROWTH IN NIGERIA.

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ABSTRACT

This study examines the role of human capital development to economic growth in Nigeria from 1981 to 2025, using secondary data from the Central Bank of Nigeria (CBN) and the World Development Indicators (WDI 2025). Time series data were analysed through the autoregressive distributed lag (ARDL) technique. The results indicate that government expenditures on education and health in the short run are negatively associated with GDP growth, with coefficients of -0.000114 and -0.009070, respectively, but neither is statistically significant. In contrast, life expectancy significantly impacts economic growth in the previous period, with a coefficient of 5.184831 and a p-value of 0.0194. Long-run analysis reveals that government expenditures on education and health maintain negative relationships with GDP, with coefficients of -0.021412 and -0.001299, respectively. At the same time, life expectancy shows a positive but non-significant coefficient of 1.229152. The model is robust, exhibiting no serial correlation or heteroskedasticity, and the residuals are normally distributed. The findings suggest a need to re-evaluate expenditure allocations, focus on long-term health improvements, and adopt an integrated policy approach to enhance the effectiveness of public investments in education and health, thereby fostering sustainable economic growth in Nigeria.

Keywords: Economic Growth, Government Expenditure, Education, Health, and Life Expectancy

JEL Classification: E31, I32, H53



Introduction

The role of human capital in economic growth cannot be overemphasised. Economists have recognised human capital development as a key prerequisite for a country's socio-economic and political transformation. Among the generally agreed causal factors behind the impressive performance of the economies of most developed and newly industrialising countries is a strong commitment to human capital formation. This can largely be achieved through increased knowledge, skills, and capabilities acquired through education and training by all people in these countries (Anyaanwu et al. 2015). Human development refers to increasing the number of people with the skills, education, and experience critical to a country's economic and political development. Human capital development is thus associated with investment in individuals and their development as creative and productive resources (Adeyemi & Ogunsola, 2016).

Human capital is an important factor in converting all resources into benefits for humanity. Human capital development is strategic to a nation's socio-economic development and includes investment in education, health, skills acquisition, labour, employment, and women's affairs. Investing in human capital development is therefore critical, as it aims to ensure that the nation's human resources endowment is knowledgeable, skilled, productive, and healthy, enabling the optimal exploitation of other resources to produce growth and development (Demining, 2022). In a nutshell, investment in human capital development refers to expenditure on health, education, and social services. In a broader sense, it includes all expenditure on social services. For this study, the two basic objectives of human capital development will be the centre of focus: Education and Health. They are important ends in themselves. Health is central to well-being, and education is essential for a satisfying and rewarding life: both are fundamental to the broader notion of expanding human capability, which lies at the heart of the meaning of development (Todaro & Smith, 2020).

The expansion of the educational system in Nigeria was accompanied by structural defects, inefficiency, and ineffectiveness, which affected the development and utilisation of human capital. Nigeria's educational system tends to produce graduates who lack the job skills required for employment, rather than those the economy needs to remain vibrant. This inadequacy resulted in decreasing industrial capacity utilisation, rising unemployment, and threats of social insecurity by jobless youths. Despite efforts to build human capital through education, the impact of human capital investment on Nigeria's economic growth remains unclear (Shobande, 2014).

Furthermore, notwithstanding Nigeria's abundant natural resources and vast human population, the country's economic growth remains slow and unsustainable, largely due to the inadequate development of its human capital, resulting in a significant gap between Nigeria's potential and actual economic performance, and highlighting the urgent need to prioritise human capital development as a critical driver of sustainable economic growth and development. This study examines the role of human capital development to economic growth.

Literature Review

This section comprises conceptual reviews, theoretical review, and empirical literature reviews.

Concept of Human Capital Development

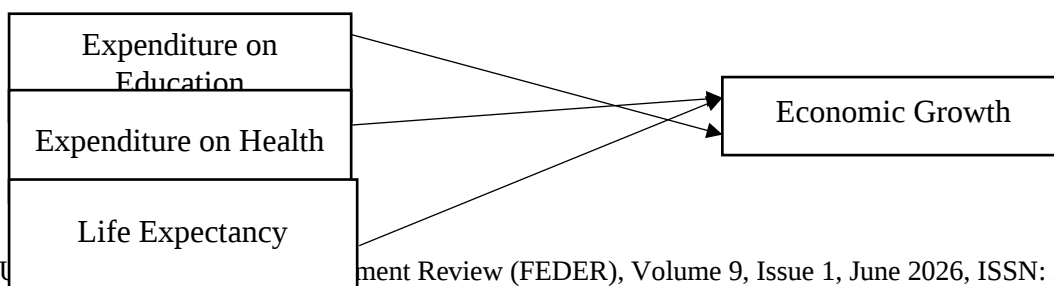
The concept of human capital refers to the abilities and skills of a country's human resources. In contrast, human capital development refers to the process of acquiring and increasing the number of individuals with the skills, education, and experience that are critical to economic growth and development (Oluwatoyin, 2020). Human capital consists of the knowledge, skills, competencies, and abilities of the workforce to undertake daunting tasks in an economy. Human beings are the only factor of production among others that is capable of learning, adapting, changing, innovating, and being creative (Anigboro, 2024). Human capital development, according to Harbison (1973), is a deliberate, continuous process of acquiring the knowledge, skills, and experience necessary to produce economic value and drive sustainable national development. The significance and relevance of human capital development in achieving meaningful and sustainable economic growth and development have been widely recognised in the literature (Iganiga & Obafemi, 2014). They stated that without substantial investment in developing human capital in any country, sustained economic growth and development would remain only a wish, never a reality.

Human capital development is the process of acquiring and increasing the number of individuals with the skills, education, and experience critical to a country's economic and political development. It involves providing opportunities for all citizens to develop to their fullest potential through education, training, and motivation, while also creating an enabling environment for everyone to participate in national development fully. According to (Deming, 2022), any effort to increase human knowledge, enhance skills and productivity, and stimulate citizens' resourcefulness is an integral part of human capital development. The process of developing human capital includes expenditures on educational and training institutions, health and skills-acquisition programs, information and communication technologies (ICT), and research and development initiatives. Economic growth is a sustained increase in per capita income over a long period (Musa & Ali, 2020).

Concept of Economic Growth

Economic growth is a sustained quantitative increase in a country's per capita income, accompanied by expansion in its labour force, consumption, capital, and trade volume. It is considered a long-term process of sustainable growth in a nation's capacity to supply an increasingly diverse range of economic goods and services to its growing population. An important thing to note about the concept of economic growth is that the increase in per capita income must be sustained to be called economic growth. It is conventionally measured as the percentage rate of increase in real Gross Domestic Product (GDP), or the GDP growth rate (Musa & Ali, 2020).

Conceptual Framework



Source: Authors' design (2025).

Theoretical Literature

This aspect highlights theories of human capital development and their relevance to economic development.

Human Capital Theory

Human Capital theory, as postulated by Paul Romer (1986), emphasises how education increases workers' productivity and efficiency by raising their cognitive skills. Schultz (1961) introduced the notion that people who invest in education increase their stock of human capital. Examples of such investments include expenditure on education, on-the-job training, health, and nutrition. Such expenditures increase future productive capacity at the expense of current consumption. However, the stock of human capital increases only when gross investment exceeds depreciation over time, due to intense or infrequent use. The provision of education is considered a productive investment in human beings, an investment that proponents of human capital theory consider equally, if not more, worthwhile than investment in physical capital.

Modernisation Theory

This theory focuses on how education transforms an individual's values, beliefs, and behaviour. Exposure to modernisation institutions, such as schools, factories, and mass media, inculcates modern values and attitudes. The attitude includes openness to new ideas, independence from traditional authorities, a willingness to plan and address further exigencies, and a growing sense of personal and social efficacy. According to modernisation theorists, these normative and attitudinal changes continue throughout the life cycle, permanently altering the individual's relationship with the social structure. The greater the number of people exposed to modernising institutions, the higher the level of individual modernity attained by society. Once a critical segment of a population changes in this way, the pace of society's modernisation and economic development quickens. Thus, educational expansion, through its effects on individual values and benefits, lays the necessary building blocks for a more productive workforce and sustained economic growth. It is on these premises that this paper is based. This is because of the theory's concept. Human transformation will promote creativity, potentially leading to development and modernisation, the dream of any nation (Chijioke & Amadi, 2019).

Empirical Literature

This section examined relevant literature on the role of human capital development in Nigeria's economic growth. Many empirical studies have supported the assertion that human capital development plays a role in Nigeria's economic growth.

Akinlosotu (2020) examined the relationship between human capital development and economic growth in Nigeria using annual data from 1981–2017. The study adopted an Autoregressive Distributed Lag (ARDL) approach after conducting unit-root tests to establish the time-series properties of the variables. Human capital development was represented using the Human Development Index, together with other relevant economic variables. The findings showed that human capital development had a positive, significant effect on long-run economic growth. The study argued that improvements in the quality of human resources can raise labour



productivity and contribute to higher economic output. It therefore recommended greater attention to policies that improve education, health and the productive capacity of the Nigerian workforce.

Keji (2021) investigated the relationship between human capital and economic growth in Nigeria using annual data from 1981 to 2017. The study employed the Johansen cointegration technique and an Error Correction Model to examine both the long-run and short-run relationships between human capital and economic growth. The results indicated that a long-run relationship existed between the variables. In particular, education-related indicators, labour force participation and labour force growth were found to have important implications for economic performance. The study concluded that Nigeria's ability to achieve sustained economic growth depends partly on its capacity to develop an educated, skilled and economically active population. The findings therefore support increased investment in human capital as part of Nigeria's long-term growth strategy.

Law-Biaduo (2022) examined the effect of human capital development on economic growth in Nigeria over the period 1981–2020. The study used secondary data from relevant national and international sources and applied the ARDL technique to estimate the short- and long-run effects of human capital development on economic growth. The results indicated a long-run relationship between human capital development and economic growth. Government expenditure on education and health, life expectancy and capital formation were among the factors found to influence economic performance. The study maintained that sustained public investment in education and healthcare is important because a healthier, better-educated population is more capable of participating productively in the economy. It recommended strengthening government investment in the social sectors to improve Nigeria's growth prospects.

Eniekezimene et al. (2023) examined the relationship between human capital development and economic growth in Nigeria using data covering 1981–2021. The study employed the ARDL technique to investigate the relationship between selected human capital indicators and economic growth in both the short and long run. The findings showed that expenditure on education and health, together with education-related indicators, contributed to economic performance. However, the magnitude and significance of individual variables differed across the estimated models. The authors observed that investment in human capital is particularly important in an economy such as Nigeria, where a large proportion of the population depends on its skills and knowledge for productive employment. They consequently recommended greater investment in education, healthcare and related infrastructure to strengthen productivity and support sustained economic growth.

Ogbonnaya et al. (2024) investigated the dynamics between human capital development and economic growth in Nigeria using annual data from 1981–2022. The study adopted a Vector Error Correction Model to examine the interaction between human capital variables and economic growth over the short and long run. The findings indicated that education-related expenditure and tertiary education enrolment were positively associated with economic

growth. However, the effect of health expenditure was less consistent across the different periods considered. The study explained these results in terms of the quality and effectiveness of human capital investment, noting that increased expenditure alone may not automatically yield stronger economic outcomes unless resources are used efficiently. The authors therefore emphasised the need for policies that improve the quality of education, strengthen skills development and ensure that human capital expenditure translates into higher labour productivity.

Jerry et al. (2025) examined the relationship between human capital development, poverty reduction and economic growth in Nigeria using time-series data. The study drew its data from recognised secondary sources and employed econometric techniques to assess the relationship among the variables. The findings showed that improvements in education, healthcare and related human development indicators were associated with better economic outcomes and poverty reduction. The study further suggested that human capital development can influence economic growth by improving workers' productivity, employment opportunities, and household welfare. The authors concluded that policies in education, healthcare, and social development should be an important part of Nigeria's strategy for achieving inclusive and sustainable economic growth.

Madueke et al. (2026) examined the relationship between human capital development and economic growth in Nigeria using the ARDL methodology. The study incorporated indicators of human capital, government expenditure on education, and labour force participation, and examined their effects on economic growth in the short- and long-run. The findings indicated that human capital development was positively related to economic growth, with the Human Capital Index contributing significantly to short-run growth. Education expenditure and labour force participation were also found to have important effects over the periods examined. The study argued that improving the quality of education and increasing labour force participation and productivity are necessary for Nigeria to derive greater benefits from its human resources. It therefore recommended structural and institutional reforms to improve the quality, relevance, and utilisation of human capital in the Nigerian economy.

Methodology

Sources of Data

In this study, time series data from 1981 to 2025 on real gross domestic product (GDP), proxied by economic growth; government expenditure on education (GEXPE); government expenditure on health (GEPH); and life expectancy (LEXP) were analysed. The data were obtained from the Central Bank of Nigeria Statistical Bulletin (CBN, 2025), the National Bureau of Statistics (NBS, 2025), and the World Development Indicators (WDI, 2025). The data were analysed using the autoregressive distributed lag (ARDL) technique.

Model specification

The study employed multiple regression models and used econometric procedures to evaluate the role of human capital development in economic growth in Nigeria.

The model for the study is as follows:

$$GDPG = F(GEXPE, GEXPH, LEXP) \quad (1)$$

The above functional relationship has been transformed into an econometric linear model as follows:

$$GDPP = \beta_0 + \beta_1 GEXPE + \beta_2 GEXPH + \beta_3 LEXP + U_t \quad (2)$$

Then, the ARDL model is specified as follows:

$$\begin{aligned} \Delta \text{Log}(GDP) = & \beta_0 + \alpha_1 \text{Log}(GEXPE)_{t-i} + \alpha_2 \text{Log}(GEXPH)_{t-i} + \alpha_3 \text{Log}(LEXP)_{t-i} \\ & + \sum_{t=i}^k \beta_1 \Delta \text{Log}(GDP)_{t-i} + \sum_{t=i}^k \beta_2 \Delta \text{Log}(GEXPE)_{t-i} \\ & + \sum_{t=i}^k \beta_3 \Delta \text{Log}(GEXPH)_{t-i} + \sum_{t=i}^k \beta_4 \Delta \text{Log}(LEXP)_{t-i} + \gamma ECM_{t-1} \\ & + U_t \end{aligned} \quad (3)$$

Where β_0 is the intercept, $\beta_1 - \beta_4$ and $\alpha_1 - \alpha_4$ are the short-run and long-run parameters, respectively. β_i and α_i are greater than zero, γ is the speed of adjustment, and U_t is the error term.

GDP = Real Gross Domestic Product Per Capita Income

GEXE = Government Expenditure on Education

GEPH = Government Expenditure on Health

LEXP = Life Expectancy

Results and Discussions

Table 1: Descriptive Statistics

	GDP	GEXPE	GEXPH	LEXP
Mean	2.343875	270.9946	17.46955	50.85525
Median	2.791716	330.4950	16.15021	51.42700
Maximum	12.27614	485.3600	26.89141	53.63300
Minimum	-4162059	57.96000	13.02093	47.19300
Std. Dev.	3.451791	164.9935	4.077262	1.852743
Skewness	0.474776	-0.013789	1.097028	-0.533579
Kurtosis	4.490045	1.374981	3.177452	2.128933
Jarque-Bera	3.121884	2.641448	4.845372	1.897585
Probability	0.209938	0.266942	0.088683	0.387208
Sum	56.25301	6503.870	419.2692	1220.526
Sum Sq. Dev.	274.0419	626125.9	382.3516	78.95111
Observations	24	24	24	24

Source: Researchers' Computation Using EViews Version 10 (2025).

From Table 1, the mean values of the variables exceed their standard deviations, indicating that the data points tend to be closer to their means, except for gross domestic product (GDP), which has a standard deviation greater than its mean. The skewness values for gross domestic product (GDP) and government expenditure on health (GEXPH) are positive, indicating that both are

positively skewed. Government expenditure on education (GEXPE) and life expectancy (LEXP) is negatively skewed. The kurtosis of government expenditure on education (GEXPE) and life expectancy (LEXP) is less than 3 (< 3), indicating they are platykurtic and suggesting the data are approximately homogeneous. While the gross domestic product (GDP), and government expenditure on education (GEXPE) are greater than three (> 3), indicating that they are leptokurtic. The Jarque-Bera probability values are greater than 0.05 (> 0.05), indicating that the variable is normally distributed.

Table 2: Augmented Dickey-Fuller Test Result

Variables	Level		1 st Difference		Order of Int.
	Critical Value @5%	Prob.	Critical value @5%	Prob.	
GDP	-3.52326	0.1770	-3.523623	0.0000	I (1)
GEXPE	-3.520787	0.6851	-3.529758	0.0002	I (1)
GEXPH	-3.548490	0.0001			I (0)
LEXP	-3.529758	0.0518	-1.949609	0.0358	I (1)

Source: Researchers' Computation Using EViews Version 10 (2025).

From Table 2, the results of the augmented Dickey-Fuller test indicate that gross domestic product (GDP), government expenditure on education (GEXPE), and life expectancy (LEXP) are not stationary at the level but are stationary at the first Difference I (1). At the same time, government expenditure on health is stationary at level I (0).

Table 3: ARDL Short Run Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.091977	0.866983	0.106089	0.9161
D(GDP (-1))	-0.547134	0.138852	-3.940403	0.0004
D(GEXPE)	-0.000114	0.007265	-0.005237	0.9959
GEXPH	-0.009070	0.007265	-1.248379	0.2202
D(LEXP)	-0.591046	1.782040	-0.331668	0.7421
D(LEXP (-1))	5.184831	2.114798	-2.451691	0.0194
ECT (-1)	-0.618927	0.129834	-4.767062	0.0000

Source: Researchers' Computation Using EViews Version 10 (2025).

Adjusted $R^2 = 0.566281$

Table 3 displays that the parameter estimates for the first lag of log government expenditure $\Delta \text{Log}(\text{GDP}(-1))$, real gross domestic product, are correctly signed and significant at 5% with a coefficient of 0.547, a t-value of 3.940403, and a p-value of 0.0004. The role of government expenditure on education in the short run is negative and non-significantly related to growth, with a coefficient of -0.000114, a t-value of -0.005237, and a probability of 0.9959. The role of government expenditure on health in economic growth is also negative and non-significantly related to gross domestic product at 5% in the short run, with a coefficient of -0.009070, a t-value of -1.248379, and a p-value of 0.2202. The role of life expectancy in short-run economic growth is negative and non-significant, with a coefficient of -0.591046, a p-value of 0.331668, FUDMA Economic and Development Review (FEDER), Volume 9, Issue 1, June 2026, ISSN: 2616-0846

and a probability value of 0.7421. Still, it turns out to be positive and significant at lag one D (LEXP (-1)), with a coefficient of 5.18431, a t-value of 2.45 1691, and a probability of 0.0194, which is less than 0.05.

The result shows that the coefficient of the lagged error correction term (ECT (-1)), which is the speed of adjustment, has the anticipated negative sign with a coefficient of -0.618927, a t-value of -4.767062, and a P-value of 0.0000, and is statistically significant at the 1% level. This indicates the presence of a steady long-run relationship and highlights a long-term cointegration between human capital and economic growth in Nigeria.

Moreover, the model has a good fit, having the coefficient of determination (Adjusted R-square) of 0.50, which measures the goodness of the fit of the assessed model. This indicates that the model is reasonably well fit for prediction; that is, it explains about 50% of the variability in gross domestic product. The F-statistic of 5.875378 and the probability of 0.003311 indicate that the explanatory variables were jointly significant in determining variation in gross domestic product.

Table 4: ARDL Long Run Form and Bounds Test

Test Statistic	Value	Sig.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	4.06658	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Researchers' Computation Using EViews Version 10 (2025).

From Table 4, the F-statistic is 4.066558, and the lower bound and upper bound are 2.79 and 3.67, respectively, at a 5% level of significance, indicating that the F-statistic is greater than the lower bound and upper bound, meaning that there is a long-run association among the variables of the model.

Table 5: ARDL Long Run Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEXPE	-0.021412	0.021178	-1.011069	0.3191
GEXPH	-0.001299	0.015040	-0.086361	0.9317
LEXP	1.229152	1.446459	0.849766	0.4014

Source: Researchers' Computation Using EViews Version 10 (2025).

From Table 5, the result of the long-run autoregressive distributed lag model presented in the table 5, above reveals the role of government expenditure on education (GEXPE), and government expenditure on health (GEXH) are negative and non-significantly related to the

gross domestic product (GDP) in the long run with coefficient or -0.021412 and -0.001299, t-value of -1.011069 and -0.086361, and probability values of 0.3191 and 0.9317 respectively. However, the coefficient of life expectancy (LEXP) is 1.229152, which is positive, with a t-value of 0.849766, and 0.4014 indicates a positive but non-significant relationship.

Discussion of Major Findings

The short-run results show that government expenditure on education (-0.00114) and health (-0.009070) had negative but statistically insignificant effects on economic growth. This suggests that increased public spending did not immediately improve productive capacity. The finding is consistent with Azike et al. (2022), who reported positive but insignificant effects of education and health expenditure on growth. The weak short-run effects may reflect inefficient resource allocation, poor implementation, leakages and the time required for human-capital investments to generate productivity gains.

The positive and significant effect of life expectancy indicates that improvements in population health can enhance economic performance by increasing labour productivity, participation, and accumulated work experience. This finding agrees with Ogunbadejo et al. (2020), who found that life expectancy significantly promoted economic growth in Nigeria. It is also consistent with Lawal et al. (2023), who reported a positive relationship between life expectancy and economic growth, whereas government health expenditure was negatively associated with life expectancy.

Table 6: Breusch-Godfrey Serial Correlation L.M. Test Results

F-statistic	0.469190	Prob. F (2,31)	0.6299
Obs*R-squared	1.204618	Prob. Chi-Square (2)	0.5475

Source: Researchers' Computation Using EViews Version 10 (2025).

The result from Table 6, which measures the serial author correlation, has an F-statistic of 0.469190, an observed R-squared of 1.204618, and Probability values of 0.6299 and 0.5475, respectively. These values are greater than 0.05, indicating that the model residuals are free of serial correlation.

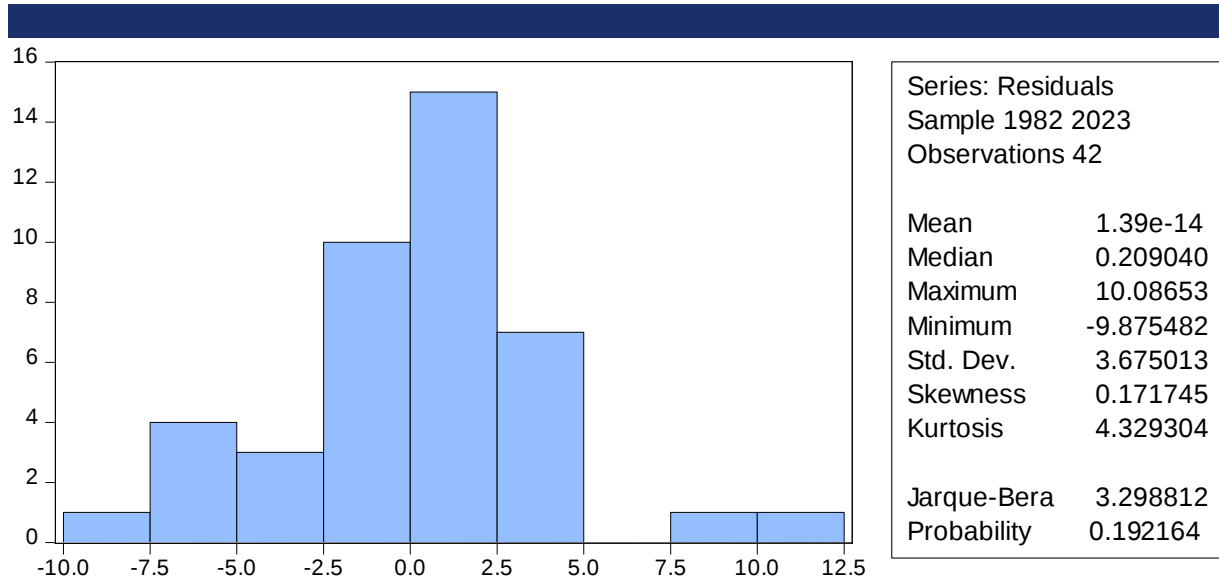
Table 7: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.765688	Prob. F (7,33)	0.6197
Obs*R-squared	5.728718	Prob. Chi-Square (16)	0.5718
Scaled explained SS	4.691834	Prob. Chi-Square (16)	0.6975

Source: Researchers' Computation Using EViews Version 10 (2025).

The result from Table 7, which measures Heteroskedasticity, has an F-statistic of 0.765688 and a probability of 0.6197, an observed R-squared of 5.728718, a p-value of 0.5718, and a scaled explained of 4.691834 with a p-value of 0.6975, all of which are greater than 0.05, indicating the absence of Heteroskedasticity.

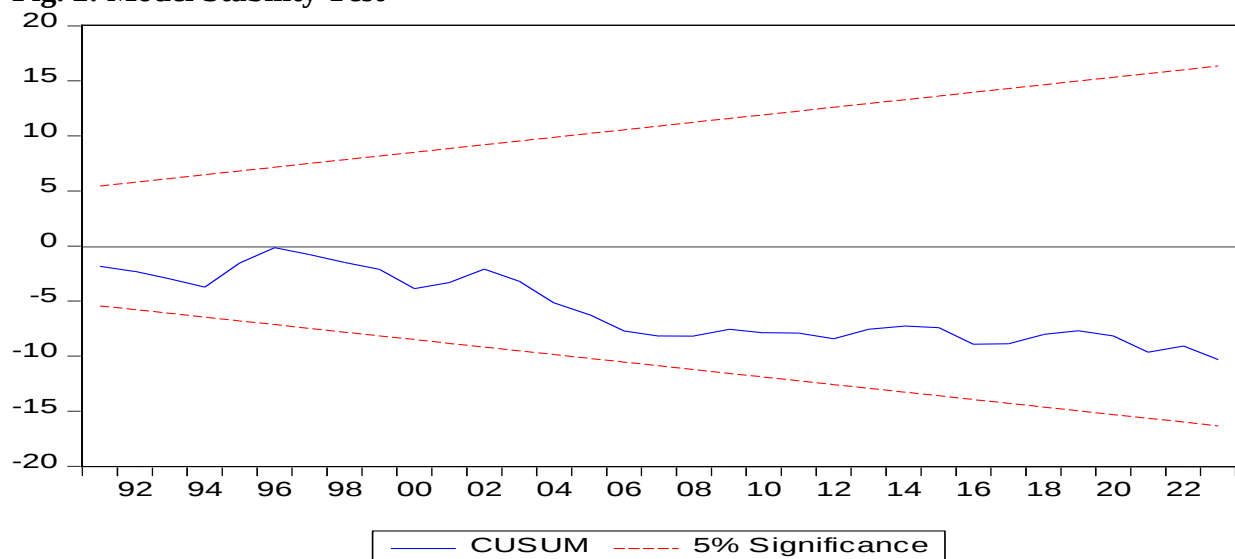
Fig. 1: Stability of the Variables



Source: Researchers' Computation Using EViews Version 10 (2025).

Figure 3 shows that the series residuals were normally distributed, with a Jarque-Bera value of 3.298812 and a p-value of 0.192164, which is greater than 5%.

Fig. 2: Model Stability Test



Source: Researchers' Computation Using EViews Version 10 (2025).

From Figure 1 above, the blue line between the two red dotted lines indicates that the model is stable at a 5% significance level.

Conclusion and Recommendations

This study examines the role of human capital development in economic growth in Nigeria from 1981 to 2023, using time-series data analysed with the autoregressive distributed lag (ARDL) technique. The findings reveal that, in the short run, government expenditures on



education and health have a negative, non-significant relationship with GDP growth. This suggests that increases in these expenditures do not immediately translate into economic growth. Conversely, life expectancy shows a significant positive impact in the previous period, indicating that improvements in health outcomes can contribute to better economic performance. Long-run analysis indicates that, while government expenditures on education and health remain negatively associated with GDP, life expectancy shows a positive association. However, these relationships are not statistically significant, suggesting that other factors may substantially influence economic growth over time.

Consequently, the paper recommended that, given the negative short-run effects of government expenditures on education and health, policymakers conduct a thorough evaluation of how these funds are allocated. Strategies should be developed to enhance the efficiency and effectiveness of these expenditures, ensuring they contribute positively to economic growth. Since life expectancy shows a potentially positive impact on GDP, government initiatives should prioritise long-term health improvements. This can include investing in preventive healthcare, nutrition, and maternal health programs to enhance productivity and economic output. An integrated approach that combines education, health, and economic policies could yield better results. For instance, improving health outcomes can enhance educational attainment, which in turn can drive economic growth.

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FUDMA ECONOMIC AND DEVELOPMENT REVIEW (FEDER)

Vol. 9 Issue 1, June, 2026 | ISSN: 2616-0846



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