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HUMAN CAPITAL DEVELOPMENT AND ECONOMIC GROWTH IN NIGERIA

Collins Chidubem UMEGHALU, Ignatius Okoye MACHI and Irene Nkechi ONWUKA
Department of Economics, Nnamdi Azikiwe University, Awka, Nigeria

Corresponding Author: cc.umeghalu@unizik.edu.ng

Abstract

This study aims to clarify the inconsistencies surrounding the connection between human capital development and economic growth, particularly in the context of Nigeria. Despite claims of a positive influence, evidence supporting the purported positive effect of human capital development on economic growth is sparse. This study focuses on the long-term effects of human capital development on economic growth from 1990 to 2022, employing the Autoregressive Distributed Lag (ARDL) model to analyze the secondary data used for the study. The findings of the study indicate a positive relationship between human capital and economic growth, while human capital development appears to negatively impact economic growth. Furthermore, the relationships identified were found to be statistically insignificant. To enhance human capital development, the study suggests that increasing labor wages could be a viable strategy.

Keywords: Human capital development, Economic growth, Nigeria
JEL Codes: E64, E32

INTRODUCTION

On the flip side, an increase in labor can be viewed through two lenses. The first pertains to the quantity of personnel, indicating a rise in the number of workers available to provide their services and expertise. The second focuses on enhancing the productivity of these workers. Human capital encompasses the collective knowledge, skills, experience, and social attributes that empower individuals to perform work effectively and generate economic value. It refers to the workforce or those qualified to contribute to an organization. The development of human capital involves activities aimed at nurturing individuals with the necessary skills, knowledge, attitudes, and experiences vital for national progress (Beach, 2009).

Enhancing human capital can lead to higher productivity, even without an increase in the workforce size. However, an increase in aggregate supply driven by a larger workforce will require a corresponding boost in aggregate demand for the added output to be sustainable. In contrast, when aggregate supply rises due to improvements in workforce quality through human capital development, this typically results in an automatic increase in aggregate demand. A performing economy is characterized by a strong growth in gross domestic product (GDP), particularly when this growth outpaces population growth. It fundamentally hinges on the dynamics of aggregate demand and supply (Okeke & Elegbede, 2024).

The relationship between human capital development and aggregate demand often goes unnoticed, primarily due to the narrow understanding of what constitutes human capital development. People typically associate it with education, healthcare, and training. However, an essential factor often overlooked is the price of labor. The effectiveness of labor can be gauged not only by the amount and quality of work performed but, more importantly, by the price at which this labor is offered. An increase in labor costs is a clear indicator of human capital development, often leading to higher personal incomes, which in turn boosts consumption and aggregate demand.

The tendency to disregard labor price in discussions of human capital development underscores the necessity for this study, especially since many prior studies have primarily focused on government spending on education, health, and training. Improvement in human capital cannot be claimed if the compensation for labor remains unchanged or declines over time. While the government plays a role in human capital development, neglecting labor price and its relationship to productivity reveals a significant gap in existing literature, one that is important to address (Uzoh, 2012).

Many economic growth models analyze changes in the growth rate of gross domestic product (GDP) primarily through supply-side activities. These models suggest that factors such as capital and labor play crucial roles in driving economic growth, along with various other elements highlighted in differing economic theories. For instance, Harrod-Domar and Neoclassical growth theories emphasize that growth is linked to increased savings and capital stock, as well as advancements in technology (Maku, Ajike, & Chinedu, 2019).

On the other hand, some scholars argue that economic growth is influenced by total economic activities from the demand side. This perspective posits that fluctuations in components of aggregate demand are what ultimately dictate an economy's growth rate. Interestingly, both views hold validity and often coexist; a rise in aggregate demand alone may not lead to a corresponding increase in output without an accompanying rise in aggregate supply, and the reverse is also true (Adeleke & Anuolam, 2023; Okeke & Elegbede, 2024; Oluwatoyin, 2013; Uzodigwe, Umeghalu & Ozoh, 2019).

The criticisms of these contrasting perspectives focus less on whether increases in aggregate demand or supply contribute to economic growth, and more on which components within these categories drive growth in output. For example, the notion that only government spending increases and tax reductions can elevate aggregate demand overlooks the significant role of personal income. Similarly, the belief that merely boosting labor and capital leads to higher total output fails to address how exactly labor and capital can be augmented. Many empirical studies have assessed labor through measures like the size of the labor force and government investments in training, skills development, and various human capital initiatives (Adeleke & Anuolam, 2023; Oluwatoyin, 2013; Okeke & Elegbede, 2024).

This study contends that the price paid for labor services serves as a more effective gauge of labor value. Interestingly, the price of labor not only logically links an increase in aggregate demand to a rise in total output, but it also elucidates how aggregate output can be organically enhanced. When the price of labor increases, it boosts productivity through heightened motivation, as supported by Maslow's theory. Additionally, higher labor costs lead to increased savings, which, when invested, contribute to a boost in overall output. From the demand perspective, rising labor costs—akin to an increase in personal income—generate higher tax revenues and government spending (Adeleke & Anuolam, 2023).

In essence, the price of labor is not just a prominent indicator of improvements in human capital; it also assigns value to it. Moreover, it acts as a marketplace for enhanced production, facilitating sustainable increases in output. This study aims to substantiate this viewpoint, which promises to significantly enrich the existing literature. The argument hinges on the recognition that current measures of human capital development, particularly those based on government spending on education and health, are significantly inadequate. This research introduces innovative metrics that more accurately reflect documented advancements in human capital development, which have seldom been utilized in prior studies.

The primary objective of this study is to assess the impact of human capital development on economic growth, utilizing a distinctive quantitative measure that adeptly quantifies the value of human capital. More specifically, the research seeks to analyze the effects of human capital and its development on economic growth in Nigeria from 1990 to 2023. This timeframe is ample for evaluating the perceived impact of changes in human capital on Nigeria's economic growth, both in the short and long term.

STYLIZED FACTS

Human Capital and Economic Development

Human capital refers to the individuals who possess the essential skills, knowledge, and attitudes necessary for achieving national development. These human resources may be part of various work organizations or may choose to work independently. Their contributions are integral to fulfilling organizational goals, ultimately fostering growth and development at the national level. The skills and knowledge acquired through the process of human capital formation stem from intentional investments made in individuals. As a fundamental component of development, human capital stands out as a nation's most valuable asset (Oluwatoyin, 2013).

Other elements of production, like land, unskilled labor, financial resources, and physical capital, rely on skilled human resources to generate wealth. Countries that have successfully attained sustainable development have notably prioritized investment in their people. Even nations rich in natural resources cannot reach their full potential without a workforce equipped with the necessary

skills.

The technical advancements seen in both developed nations and some emerging economies are largely the fruits of human capital development. By nurturing the creative abilities of individuals, we enhance their capacity to engage in the development process. While human capital development also emphasizes individual growth, helping people realize their potential and aspirations, its primary aim is to transform the social, political, economic, and technological fabric of society. The goal is to boost the workforce's ability to engage in productive endeavors and act as catalysts for national growth and development (Ogunleye, Sanyaolu, & Lawal, 2017).

From an alternative viewpoint, human capital development encompasses all efforts aimed at cultivating individuals with the requisite skills, knowledge, attitudes, motivation, and job-related experience necessary for national advancement. Human development is interlinked with the fulfillment of national development objectives, acknowledging that individuals are the core beneficiaries of such progress.

The importance of human resources in the development process has driven significant progress in this area. Consequently, the federal government of Nigeria identifies investment in its citizens as a crucial objective. Since gaining political independence in 1960, human capital development has been a priority in the policies and programs initiated by the federal government. This includes investments in formal education, on-the-job training, adult education, health services, and support for migration, all aimed at enhancing human capital across Nigeria (Uzodigwe, Umeghalu & Ozoh, 2019).

In the field of development economics, human capital is recognized as a key component in the production function. A substantial portion of developmental goals is intertwined with human capital and its various elements. Research has identified two primary components of human capital: (i) Health Human Capital (HHC) and (ii) Education Human Capital (EHC). Both HHC and EHC are crucial to achieving development objectives at both the household and broader economic levels. Their significance integrates them as essential inputs into the production function or the development process. It is essential to comprehend that these components are not merely inputs in the development process; they are also viewed as investments made in individuals, households, or an entire population (Uzodigwe, Umeghalu & Ozoh, 2019).

Investing more in Health Human Capital (HHC) might lead to better returns on investments in Education Human Capital (EHC). Likewise, putting more resources into EHC could enhance returns from HHC investments. This premise hinges on the idea that increased efficiency stemming from EHC investments can boost the returns associated with critical HHC investments. Nonetheless, there are ongoing debates regarding how income levels and investments interact in both HHC and EHC. For example, in less developed countries, a rise in income does not always

correspond to a significant boost in investment in health or education. This phenomenon is often linked to market failures and the poor condition of health facilities in many least developed countries (Todaro & Smith, 2011).

While various methods can be used to analyze investments in HHC and EHC, the human capital approach stands out as being particularly effective. Its uniqueness lies in several key aspects: (i) it outlines the expected pattern of initial investments in EHC that should result in increased future income; (ii) it considers the discounted value of future income streams in comparison to the initial investment costs in either type of human capital; and (iii) it provides essential insights into the private returns associated with EHC, which tend to grow with higher levels of education. Development literature suggests that these private returns are significantly high, often exceeding social returns for EHC (Todaro & Smith, 2011).

Human Capital Investment Decisions

Investment decisions typically involve an upfront cost that is anticipated to yield returns over time. When it comes to choices related to labor supply, current wages and working conditions are not the sole factors influencing these decisions. To gain a deeper insight into this process, it is essential to establish a behavioral framework that encompasses investment patterns. Each worker tends to engage in three primary forms of investment: (i) Education and Training; (ii) Migration; and (iii) Job Searching.

These investments require initial expenditures, with the expectation that they will provide benefits in the future. To highlight their distinct nature, we refer to them as investments in human capital. Another important aspect of human capital investment includes health facilities and services, which contribute to better medical care, adequate housing, and improved nutrition. These factors enhance the quality of labor available and can increase the overall workforce by minimizing health-related absences or reducing mortality rates among workers.

Human Capital: This refers to the productive skills and knowledge that each worker possesses. While labor is a valuable resource, its productivity can vary significantly. For instance, managerial roles typically generate greater value than routine manual labor. To excel in high-level positions, such as a managing director, individuals must possess specialized skills gained through formal education or on-the-job training. Consequently, the skills and knowledge that a worker accumulates are integral to their human capital. Investment in human capital often involves monetary expenditures related to education and training, encompassing both formal learning and community services provided by the government and other organizations.

Non-Human Capital: Classical economists define capital as any stock available at a specific time that generates a flow of services over time. They assert that all income flows stem from a particular form of capital, whose value can be determined by capitalizing the income stream with a suitable

discount rate. Capital goods are the physical items that serve as inputs for further production. This can encompass tools, machinery, buildings, and other items involved in the production process. Essentially, capital represents society's tangible means of production, including factories, machinery, tools, and inventories of goods on hand.

Understanding the anticipated returns from investments in human capital is crucial; these returns typically manifest as higher earnings, increased job satisfaction throughout a person's life, and alignment with market demands. Investment expenditures can generally be divided into three categories: (i) Direct Expenses, (ii) Forgone Earnings, and (iii) Psychic Losses.

Direct expenses cover costs like tuition, textbooks (for education), travel expenses (related to migration), and fuel (for job searches). Forgone earnings represent the costs associated with the inability to work full-time during the investment phase. Psychic losses refer to the emotional and mental toll associated with education, as it can often be challenging and tedious; job searching can be stressful; and migration involves saying goodbye to familiar friends and environments.

Workers and those aspiring to enter the workforce have numerous options to boost their earning potential through education. They can pursue secondary education, attend Colleges of Education, or enroll in universities. Alternatively, vocational routes like trade schools or technical institutes are available. Another avenue is joining an apprenticeship program or gaining skills directly through on-the-job training. To illustrate this, we will focus on university education as an example of human capital theory. Individuals tend to seek university education when they believe it will lead to better opportunities for them (Nwogwugwu & Umeghalu, 2021).

For some, the rewards are immediate—they may be attracted to the specific courses offered or enjoy the student lifestyle. Their primary motivation is the fulfillment they experience while attending. In contrast, others view university education as an investment for the long term. They anticipate benefits such as higher income, more engaging and rewarding job prospects, or even a sense of prestige associated with their degree.

In Nigeria today, educational economics has become a vital area of focus for professional economists. A common question that arises is: Does education really pay off? If so, to what extent and for whom? Notable economists like Adam Smith, David Ricardo, Thomas Malthus, Alfred Marshall, and Karl Marx recognized the significance of education and training in enhancing labor as a key factor of production. However, none provided a detailed analysis of the rate of returns on this investment.

Today, economists have started to assess the value of education through cost-benefit analysis. In essence, this approach allows for a systematic evaluation of public programs or policy changes by weighing the benefits against the costs from an economic standpoint. Both benefits and costs

should be analyzed in marginal terms, making this method particularly suited for examining the additional advantages of a program or policy relative to its expenses. Such comparisons are essential for the public sector to make economically sound resource allocation decisions. However, this does not mean the model is exclusive to the public sector; it can certainly be applied in private contexts as well, but its prevalence is noted primarily in public sector applications.

Human Capital Measurement

Recognizing the significance of human capital, numerous countries have undertaken efforts to measure it effectively and efficiently. This allows them to assess their current status and implement various strategies for improvement. Human capital measurement, therefore, serves as a crucial resource for formulating diverse policies related to human resources. However, traditional methods of measuring human capital do come with limitations.

For instance, Wolf (2002) points out that some indicators may actually be incomplete. He illustrates this by noting that a worker's wage, often used as a proxy for human capital, fails to capture the true essence of 'authentic human capital.' This limitation underscores the need to develop more accurate measures of human capital beyond mere proxies like income and productivity.

Additionally, it is challenging to assert that human capital alone contributes to individual development and national economic growth. Ashton & Green (1996) argue that the relationship between human capital and economic performance must be understood within a broader social and political context to accurately gauge human capital. Furthermore, various empirical studies indicate that financial, human, and social capital significantly impact aspects like individual health.

Wolf's inability to proffer better measures of human capital than the ones he has reservations for makes the raised concern more abstract than real. Identifying the best measure among the existing measures would have been more impactful. The true essence of human capital as opined by Wolf is most effectively captured by workers' average real wage; this measure is better appreciated when evaluating human capital from different countries with varying wage rates (Blakey, Lochner, & Kawachi, 2002; Veenstra, 2001; Veenstra et al., 2005; Wilson et al., 2004).

REVIEW OF RELATED LITERATURE

In exploring foundational growth theories, three prominent models stand out: endogenous growth theory, Harrod-Domar theory, and neo-classical growth theory. The endogenous growth theory suggests that economic growth primarily stems from internal factors rather than external influences. In contrast, the Harrod-Domar model posits that a country's savings and capital stock directly drive its economic growth. The neo-classical growth theory, closely related to Harrod-Domar, argues that while capital and labor contribute to economic growth in the short term, long-

term growth relies on capital accumulation. Additionally, human capital theory highlights that enhancing the quality of labor can boost productivity, emphasizing that education fosters greater efficiency and cognitive skills among workers.

Empirical Literature Review

A study by Okeke and Elegbede (2024) examined how human capital development, employee coaching, and career support influence organizational commitment at Union Bank Plc in Lagos, Nigeria. Utilizing a cross-sectional design and random sampling, the research analyzed responses from 169 participants through descriptive statistics. Multiple regression analysis using SPSS was employed to test the hypotheses. The findings revealed that while human capital development and coaching did not have a significant impact on organizational commitment, career development played a crucial role.

Adeleke and Anuolam (2023) conducted a comprehensive analysis on how human capital development affects economic growth in Nigeria, utilizing secondary data sourced from the Central Bank of Nigeria's Statistical Bulletin for the years 1999 to 2022. Their study adopted the Autoregressive Distributed Lag Regression Estimate (ARDL) for the analysis. The results indicated that government spending on education has a positive and statistically significant effect on Real Gross Domestic Product (RGDP), while spending on health also shows a statistically significant impact. Conversely, factors such as life expectancy and school enrollment rates displayed positive impacts but were not statistically significant. The researchers concluded that human capital development exhibits a significant short-term and long-term relationship with economic growth in Nigeria.

The research conducted by Bachama, Hassan, and Ibrahim (2021) delves into the influence of human capital development on Nigeria's economic growth over the period from 1970 to 2019. The Ordinary Least Squares (OLS) method was used to analyze the secondary data employed in the study. Their findings reveal a significant and positive correlation between economic growth and investments in health and education, both in the short and long term. However, they also highlighted a detrimental effect that labor has on economic progression.

In a separate study, Ojima and Anyanwu (2021) explored the relationship between human capital development and economic growth in Nigeria from 1989 to 2019. Their goal was to assess how factors such as life expectancy, public spending on education and health, primary school enrollment, and the Human Development Index (HDI) – which serves as a proxy for human capital development – influence economic growth during that timeframe. The study employed dynamic Ordinary Least Squares (OLS) and the Error Correction Model (ECM) techniques to investigate both short- and long-term relationships among these variables. The results indicated a generally positive relationship, with the exception of the HDI and primary school enrollment, which were

found to have a negative impact on Nigeria's economic growth. Consequently, the researchers concluded that life expectancy, primary school enrollment, the Human Development Index, and public expenditure on education have impact on long-term economic growth in Nigeria.

Keji (2021) explored the connection between human capital and economic growth in Nigeria using vector autoregressive and Johansen methods. The findings indicate that human capital exerts a significant long-term influence on Nigeria's economic growth. Notably, the normality test results, as well as the VEC residual serial correlation LM and heteroskedasticity tests, support the reliability of the study's findings.

In another study, Maku et al. (2019) investigated how human capital development influences macroeconomic performance in Nigeria via the ARDL approach. They analyzed annual data on GDP per capita, government expenditures on education and health, and secondary and tertiary school enrollment rates from 1986 to 2015. By using GDP per capita as an indicator of macroeconomic performance, they assessed human capital development through government spending on education and health, as well as enrollment figures in secondary and tertiary institutions. Their analysis revealed that human capital development negatively but insignificantly affects macroeconomic performance in the short term, whereas only tertiary education enrollment showed a positive and significant impact on GDP per capita. The study concluded that human capital development has not effectively driven growth in Nigeria’s macroeconomic performance.

Imide and Dania (2019) explored how human capital development affects economic growth in Nigeria, focusing on two main objectives: assessing the impact of government spending on education and understanding its effect on overall economic growth. The research covered the period from 1991 to 2017 and utilized an ex post facto research design. The data analysis employed the Autoregressive Distributed Lag model. Empirical findings reveal that spending on health has negative and insignificant impact on Nigeria’s economic growth. In contrast, spending on education significantly contributes to economic advancement, particularly when paired with health expenditure.

In another study, Charles, Nenbee, and Krama (2018) investigated how government spending in the social sector influenced job creation in Nigeria from 1980 to 2016. To estimate their model, the researchers applied Stock and Watson’s Dynamic OLS technique. Their findings indicate that government expenditure on education has statistically significant positive effect on job creation, whereas spending on health and other social/community services have significant negative effect on job creation in Nigeria.

In another study, Okumoko, Omeje, and Udoh (2018) delved into the relationship between human capital development and industrial growth in Nigeria from 1976 to 2016, employing both descriptive and econometric methods to analyze time series data. Stationarity of the variables was

assessed using ADF techniques, revealing that, over the long term, the variables tended to reach equilibrium. The study found that recurrent expenditures on education and health have a detrimental effect on industrial growth.

Akaakohol and Ijirshar (2018) explored the connection between human capital development and economic growth in Nigeria over the period from 1981 to 2015 utilizing the Ordinary Least Squares (OLS) analytical method. Their findings revealed a long-term relationship involving government spending on education and health, gross fixed capital formation, and the labor force. Conversely, they found no significant short-term relationship.

Ogunleye et al. (2017) employed the OLS method to analyze the effect of human capital development on Nigeria's economic growth, using annual time series data from 1981 to 2015. The results of the study reveal that Life Expectancy Rate, Primary School Enrollment, and Secondary School Enrollment have statistically insignificant negative impact on economic growth. In contrast, Total Government Expenditure on Education, Total Government Expenditure on Health, and Tertiary School Enrollment were found to have statistically significant positive impact on economic growth in Nigeria.

Ajakaiye, Afeikhena, David, and Olufunke (2016) investigated the relationship between employment and growth in Nigeria to clarify the apparent contradiction between robust economic growth and persistent poverty and inequality in the country. They utilized the World Bank's stepwise decomposition methodology, along with the Shapley decomposition method to estimate their model. The results suggested that Nigeria's growth over the past decade has been largely 'jobless,' driven more by reallocating factors than by improvements in productivity. While the employment elasticity of growth was positive, it was relatively low, highlighting the country's inadequate job creation performance, particularly in the manufacturing sector.

Okafor et al. (2016) explored how investing in human capital affects economic growth in Nigeria using an OLS data analysis. Their findings indicated that government spending on education and health—both recurrent and capital expenditures—positively influences GDP per capita in Nigeria. However, they found that government recurrent spending on health has a negative effect on GDP per capita.

Lastly, Uzoh (2012) looked into the connection between human capital development and the knowledge economy in Nigeria. He pointed out several barriers hindering human capital advancement in the country. Notably, Nigeria allocated less than 1% of its GDP to education during the 1980s and 1990s, a stark contrast to Ghana's 4% of GDP and 20% of its budget. Additionally, he highlighted the issue of low enrollment rates in schools. For instance, countries like Malaysia, South Korea, and Singapore have achieved enrollment levels of 100%, while Nigeria lags behind with only 60% in primary education, 30% in secondary, and 40% in tertiary

education.

RESEARCH METHODS

Theoretical Framework

This study is anchored on the Neoclassical growth theory, which argues that steady economic growth arises from the interplay of three essential economic forces: labor, capital, and technology. The theory asserts that technology enhances labor productivity, leading to increased overall output through improved efficiency. It suggests that short-term economic equilibrium results from varying levels of labor and capital, along with technological advancements that are crucial in the production process. Notably, the theory distinguishes between short-term and long-term equilibrium, emphasizing that the latter does not necessarily depend on any of these three factors.

According to the Neoclassical Growth Model, the accumulation of capital and the ways in which it is utilized are key determinants of economic growth. It further posits that the interaction between capital and labor is vital for determining total output. The general production function associated with this model can be expressed as:

$$Y = AF(K, L) \quad (1)$$

Where Y = Income or the economy's Gross Domestic Product (GDP); K = Capital; L = Amount of unskilled labor in the economy; A = Determinant level of technology

Empirical Model Specification

Building on the work of Adaleke and Anuolam (2023), who estimated economic growth as a function of labor and capital, this study follows a similar approach with a slight adjustment to accommodate the arguments presented here. In this context, economic growth is expressed as a function of aggregate supply and technology, consistent with the principles of Neoclassical growth theory. Given the interconnectedness of labor and technology, the production function of an economy can be mathematically expressed as:

$$Y = F(K, AL) \quad (2)$$

Equation (2) illustrates that capital, labor, and technology collectively impact labor productivity, with each of these elements being derived from human efforts. The capability to generate capital, manage labor, and implement technology stems from education and skill development. Thus, improvements in productivity are closely linked to human capital development. While labor output serves as a measure of human capital, the cost of labor often provides a more precise valuation. By substituting the price of labor as a proxy for human capital and total production output for economic growth, we can reformulate and present the model's equation in a linear form as follows:

$$GDPG = f(HMC, HCD, GDS) \quad (3)$$

The econometric form is specified thus:

$$GDPG = a_1 + a_2HMC + a_3HCD + a_4GDS + a_5EXC + U_t \quad (4)$$

Where GDPG = Economic growth; HMC = Human capital; HCD = Human capital development; GCF = Gross domestic saving; EXC = Exchange rate; U_t = Stochastic Variable (Error term); a_1 = Intercept; and a_2, a_3, a_4 & a_5 = slope.

Data and Data Sources

This study utilized annual time series data spanning from 1990 to 2022. The data are secondary and have been obtained from various reputable sources, including the Central Bank of Nigeria (CBN) Annual Statistical Bulletin, the National Bureau of Statistics, and the World Bank's Development Indicators.

Economic Growth (GDPG): Economic growth is defined as the rate at which the total economic activities of a specific geographic area increases. It encompasses the total gross added value produced by all resident producers within the economy, factoring in product taxes while excluding subsidies not included in the product valuation. This growth is expressed as the annual percentage growth in Gross Domestic Product (GDP).

Human Capital (HMC): Human capital represents the collective knowledge, skills, experience, and social attributes that enhance an individual's capacity to perform economically valuable work. It is quantified through wage rates, where the minimum wage serves as a proxy for the average wage, particularly since it aligns closely with the earnings of the lowest-earning 40% of the populace. The minimum wage is defined as the least amount an employer must pay for work during a specific period, which cannot be lowered by any collective agreement or individual contract (International Labour Organization, 2022). Real minimum wage is calculated by adjusting the nominal minimum wage to account for inflation. It is measured by the US Dollar equivalent of Nigeria's officially approved minimum wage rates over the years.

Human Capital Development (HCD): Human capital development involves investing in education, enhancing skills, and promoting health, all of which contribute to a more productive labor force and the overall well-being of individuals in society. It was measured using the growth rate of wage levels, particularly since the average income for the lowest-earning 40% of the population tends to align with minimum wage. The growth rate of minimum wage signifies how much minimum wage increases each year, calculated as the annual change in minimum wage relative to the previous year's wage. Given the high depreciation rate of the Naira, we used the dollar equivalent of the minimum wage, which allows us to create a comprehensive set of time

series data along with annual real values for the various minimum wage rates that have been approved.

Gross Domestic Saving (GDS): Gross domestic saving represents the portion of total earnings that is not spent. This figure is derived by subtracting final consumption expenditure (total consumption) from GDP. It is then expressed as a percentage of gross domestic product (GDP).

Exchange Rate (EXC): Exchange rate refers to the amount of a domestic currency that is equal to the one unit of another country's currency. It is measured by the official exchange rate of the Naira against the US Dollar, which is determined by national monetary authorities or by the market forces in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages.

Estimation Techniques and Procedures

To assess key properties of the study's data, initial tests were conducted. The Augmented Dickey-Fuller (ADF) unit root test was used to check for the stationarity of the time series data. Additionally, the ARDL bounds test was applied to explore the long-term relationship between the dependent and independent variables. Testing for stationarity is crucial to confirm that the data used in the analysis is reliable and not spurious. A co-integration test followed, to ascertain whether a meaningful long-run relationship exists among the variables, ensuring that the regression results are valid.

The autoregressive distributed lag (ARDL) model was selected to estimate the coefficients of the regressing variables. This approach is particularly advantageous when handling variables integrated at different orders—either I(0) or I(1), or a combination thereof. The ARDL model effectively captures both the long-term and short-term effects of the regressing variables on the dependent variable. Given that ARDL models are estimated using standard least squares techniques, they have become the preferred method of estimation for those who wish to maintain a neutral stance.

DATA ANALYSES AND DISCUSSION OF FINDINGS

Augmented Dickey Fuller Unit Root Test

This section focuses on the unit root test. Time series data typically displays unit roots, making the Augmented Dickey-Fuller unit root test essential for verifying stationarity. This verification is necessary to avoid misleading conclusions. The outcomes of this test are detailed in Table 1.

Table 1: Summary of Augmented Dickey-Fuller Unit Root Test Results

Variables	ADF Statistics	Critical Value @5%	Order of Integration	Remarks
GDPG	-9.2940	-2.9604	I(1)	Stationary
HMC	-7.8989	-2.9604	I(1)	Stationary
HCD	-5.6808	-2.9571	I(0)	Stationary
GDS	-7.4207	-2.9604	I(1)	Stationary
EXC	-5.7220	-2.9604	I(1)	Stationary

Source: Researcher's compilation using E-views 12.0, 2025

Table 1 outlines the stationarity characteristics of the analyzed variables. The decision-making rule stipulates that if the ADF statistic falls below the critical threshold, we reject the null hypothesis, indicating no unit root is present; conversely, if it exceeds this level, a unit root is indicated. The results from the ADF unit root test show that economic growth (GDPG), human capital (HMC), gross domestic saving (GDS), and the exchange rate (EXC) exhibit stationarity at first difference, denoted as I(1). In contrast, human capital development (HCD) is stationary at level, classified as I(0). Further supporting evidence for stationarity is provided by the p-values for all the variables, which are below 0.05, signifying significance at the 5% level. Consequently, we can reject the null hypothesis proposing the existence of a unit root in favor of the alternative hypothesis. Given that the variables are of mixed order, employing the bounds test ARDL is warranted.

Lag Selection Criteria

Before estimating the Autoregressive Distributed Lag Modelling, it is essential to determine the appropriate number of lags to use in regression. The optimum number of lags can be selected by using the available lag length criteria as presented in Table 2. The rule of thumb is to select the model that gives the lowest value of these criteria.

Table 2: Summary of Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-246.7029	NA	7.764957	16.23889	16.47018	16.31429
1	-150.6437	154.9342*	0.081250*	11.65443*	13.04216*	12.10679*
2	-138.3041	15.92197	0.210799	12.47123	15.01540	13.30057

Source: Researcher's compilation using E-views 12.0, 2025

Table 2 outlines the criteria for model lag selection. Following standard practice, we opted for the Akaike Information Criterion (AIC) since it yields the lowest absolute value of 11.65443 compared to the other criteria. Consequently, this study utilized a lag of 1 for the ARDL regression model.

Bounds Test for Cointegration

Once the order of integration of the variables was established, the next step was to conduct a bound F-test to determine if there is a long-run relationship between the variables. The results of the bounds test using the ARDL co-integration approach, along with the critical values, can be found in Table 3.

Table 3: Summary Result of the ARDL Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	3.499983	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
			Finite Sample: n=35	
Actual Sample Size	32			
		10%	2.46	3.46
		5%	2.947	4.088
		1%	4.093	5.532
			Finite Sample: n=30	
		10%	2.525	3.56
		5%	3.058	4.223
		1%	4.28	5.84

Source: Researcher's compilation using E-views 12.0, 2025

The results of the ARDL bounds tests, as shown in Table 3, indicate that the F-statistic calculated as 3.499983, approximately 3.50, exceeds the upper critical value at the 5% significance level. This finding suggests a long-run relationship between the dependent and independent variables, allowing us to reject the null hypothesis of no co-integration.

Autoregressive Distributed Lag Model

With the cointegrating status confirmed, the next step involves applying the Autoregressive Distributed Lag Model (ARDL) test to derive the coefficients for the regression model. Given the established long-run relationship among the variables, we now present the outcomes of both the long-run and short-run analyses.

Table 4: Summary of ARDL Estimates

Long Run Estimate

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
HMC	0.324788	3.813655	0.347380	0.7312
HCD	-0.068008	0.014435	-0.554728	0.5840
GDS	0.120498	8.261172	3.961583	0.0010
EXC	0.157740	4.130938	3.732715	0.0055
C	-36.51379	18.21221	-2.004907	0.0559

Short Run Estimate

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-24.11917	11.98638	-2.012215	0.0551
D(GDPG(-1))	0.660550	0.161053	4.101453	0.0004
D(HMC)	0.875088	2.581525	0.338981	0.7375
D(HCD)	-0.045289	0.009273	-0.570414	0.5735
D(GDS(-1))	0.170419	5.506702	3.943848	0.0033
(EXC)	0.728043	2.490964	3.898077	0.0093
CointEq(-1)	-0.660550	0.131585	-5.019948	0.0000
R-squared	0.553965	Mean dependent var		-0.266563
Adjusted R-squared	0.535763	S.D. dependent var		3.858095
S.E. of regression	2.898035	Akaike info criterion		5.026404
Sum squared resid	251.9582	Schwarz criterion		5.118013
Log likelihood	-78.42247	Hannan-Quinn criter.		5.056770
Durbin-Watson stat	2.042036			

Source: Researcher's compilation using E-views 12.0, 2025

From Table 4, we can see that the regression lines have positive intercepts, as indicated by the constant (c). The values are -36.5138 in the long run and -24.1192 in the short run. This suggests that if all other variables are held constant, the Nigerian economy would face negative growth rates of 36.5138 percent in the long run and 24.1192 percent in the short run.

The coefficient for human capital (HMC) is positive, coming in at 0.3245 for the long run and 0.8751 for the short run. This means that, assuming other factors remain unchanged, a one percent increase in HMC would result in a growth rate increase of 0.32 percent in the long run and 0.88 percent in the short run. However, it is important to note that this effect is statistically insignificant at the 5 percent level for both time frames. On the other hand, human capital development (HCD) has a negative coefficient of -0.0680 in the long run and -0.0453 in the short run. This indicates

that, keeping other variables constant, a one percent rise in HCD would lead to a decrease in GDP growth of 0.07 percent in the long run and 0.05 percent in the short run. Again, this result is statistically insignificant at the 5 percent level for both periods.

Looking at the regression results in Table 5, the coefficient of determination (R^2) is 0.5539, suggesting a strong explanatory power for the model, with 55 percent of the variations in GDP growth (GDPG) attributable to HMC, HCD, GDS and EXC in Nigeria. The remaining 45 percent can be attributed to other unmeasured factors. The adjusted R^2 value of 0.5358 further confirms that approximately 54 percent of the total variation in GDPG is explained by the regressors.

The F-statistic was used to evaluate the overall significance of the estimated model. Since the F-calculated value is greater than the F-tabulated value, as observed in Table 4, we reject the null hypothesis and accept the alternative hypothesis, indicating that the model's impacts are statistically different from zero. This signifies that the independent variables do have a significant effect on the dependent variable.

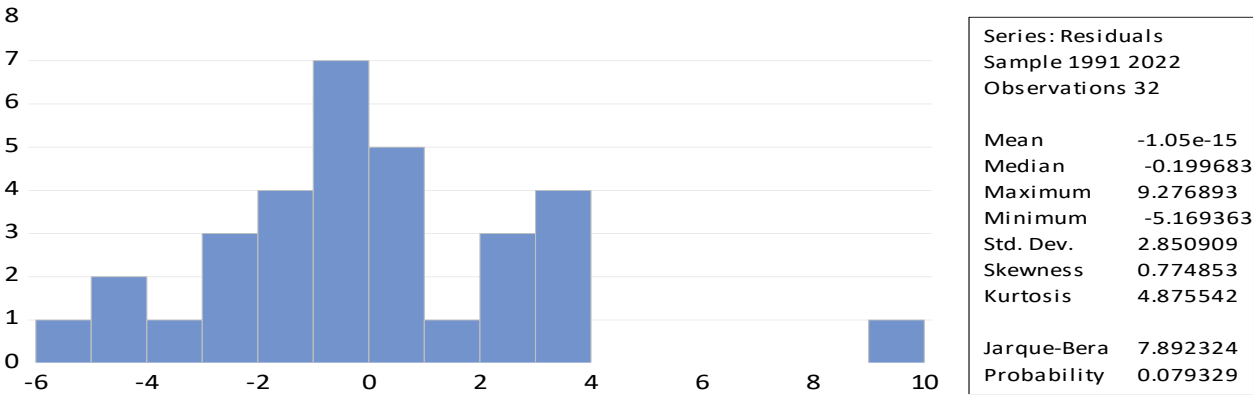

Figure 1: Histogram Normality Test
Source: Researcher's computation using E-view 12.0

The normality test results presented in Figure 1 show a Jarque-Bera probability value of 0.0793, which exceeds the critical threshold at the 5 percent significance level. Thus, we accept the null hypothesis stating that the residuals follow a normal distribution, concluding that the model maintains a normal distribution.

Based on the results of the Breusch-Pagan-Godfrey heteroscedasticity test presented in Table 5, we find that the F-statistic has a probability value of 0.9585, which exceeds the critical value at the 5 percent significance level. Therefore, we accept the null hypothesis, indicating that the model does not exhibit heteroscedasticity in its residuals. This outcome suggests that the data is suitable for making reliable predictions.

Table 5: Breusch-Pagan-Godfrey Heteroscedasticity Test

Null hypothesis: Homoscedasticity			
F-statistic	0.240939	Prob. F(6,25)	0.9585
Obs*R-squared	1.749261	Prob. Chi-Square(6)	0.9413
Scaled explained SS	2.068889	Prob. Chi-Square(6)	0.9133

Source: Researcher's computation using E-view 12.0, 2025

To assess the presence of serial correlation within the model, we utilized the Breusch-Godfrey serial correlation test. The findings in Table 6 reveal that the F-statistic's probability value of 0.5464 is also greater than the critical value at the 5 percent significance level. Consequently, we accept the null hypothesis that asserts there is no serial correlation in the model.

T able 6: Summary of Serial Correlation Test

Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.620490	Prob. F(2,23)	0.5464
Obs*R-squared	1.638192	Prob. Chi-Square(2)	0.4408

Source: Researcher's computation using E-view 12.0, 2025

Evaluation of Estimates

The t-test was employed to determine the statistical significance of the individual parameters. Two-tailed tests were conducted at a 5% significance level, and the results are summarized in Table 7.

Table 7: Summary of t-statistic

Variable	t-calculated (t_{cal})	t-tabulated ($t_{\alpha/2}$)	Conclusion
HMC	0.3389	2.045	Statistically insignificant
HCD	0.5704	2.045	Statistically insignificant
GDS	3.9438	2.045	Statistically significant
EXC	3.8981	2.045	Statistically significant

Source: Researcher's Computation using E-view 12.0, 2025

Based on the estimates presented in Table 7, it is evident that all regressing variables have significant positive impact on the dependent variable, with the exception of human capital (HMC) and human capital development (HCD).

Discussion of Findings

While the findings of this study do not align with some established theoretical frameworks, they strongly reflect the realities observed in Nigeria. The analysis indicates that while human capital contributes positively to economic growth, the development of human capital appears to have a

negative impact. However, these effects were deemed statistically insignificant.

This implies that although human capital has the potential to significantly enhance Nigeria's economic growth, various existing challenges hinder its effectiveness. Conversely, human capital development seems more detrimental than beneficial to the economy. The issues that limit the potential of human capital and its development stem largely from the low cost of labor in the country; essentially, the price of labor represents the true value of human capital, regardless of the investments made in its development. In Nigeria, where average real income is on the decline, it is difficult to argue that human capital is genuinely improving when the financial rewards for services rendered continue to diminish.

These findings not only reaffirm widespread concerns but also shed light on the mixed outcomes of related research. Many studies that examined human capital tend to have relied on measures that do not accurately capture its true value—such as government spending on education, healthcare, and vocational training. Such metrics can be misleading, as the amounts allocated for human capital development do not necessarily reflect its genuine worth or lead to meaningful enhancements. Moreover, any improvements in human capital resulting from skills training cannot be considered genuine when their real monetary values are eroding.

CONCLUSION

This study seeks to address the theoretical and empirical questions surrounding the connection between human capital development and economic growth in Nigeria. Various growth theories, particularly the Neoclassical and Keynesian approaches, offer differing perspectives on the relationship between these two variables. While both theories acknowledge that economic growth is influenced by capital and labor, the Neoclassical theory posits that this relationship primarily holds only in the short run, with long-term growth being driven by capital accumulation. Interestingly, a considerable number of empirical studies support the short-run assertion of the Neoclassical theory, even when examining long-term trends.

In our analysis, we aimed to uncover the long-term effects of human capital development on economic growth in Nigeria, using labor prices as a key indicator of human capital. The Autoregressive Distributed Lag (ARDL) model was applied to quantify the relationships among the studied variables. The findings revealed a positive correlation between human capital and GDP growth rate in both the short run and long run. Conversely, human capital development appeared to have a negative relationship with the GDP growth rate across both time frames, although these estimated relationships were deemed insignificant.

The study concludes that the current quantity and quality of human capital in Nigeria do not significantly enhance the country's economic performance. This situation is predominantly linked

to the alarmingly low price of labor, which adversely affects both aggregate demand and capital accumulation. If the focus of human capital development remains on simply increasing government expenditure for educational enrollment, hospital construction, and infrastructure projects—while the average price of labor stagnates or declines—then these initiatives are unlikely to lead to substantial improvements in productivity.

We recommend that government efforts to bolster human capital should emphasize raising the price of labor, as this is a more practical measure of its value. Furthermore, it dictates how much can be spent versus how much can be saved. Implementing an increase in the minimum wage could effectively raise the price of labor in a balanced manner. By viewing human capital and its development through the lens of labor pricing, the government can better understand the drivers behind the recent wave of emigration from the country and take decisive action to combat the detrimental effects of brain drain.

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