Financial Deepening and Human Capital Development in Nigeria

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Abstract
This study investigated the influence of financial deepening on human capital development in Nigeria from 1981 to 2023. The data used came from reports by Nigeria's central bank and United Nation Development Programme, and included information on human development index, credit given to the private sector as a ratio of the country's economic output - GDP in percentage, the broad money supply as a ratio of GDP in percentage, and monetary policy rate. The study employed an Autoregressive Distributed Lag - ARDL method to ascertain how the above-mentioned variables are related in both the long and the short terms. The results revealed that in both the short and long run, the amount of credit given to the private sector as a ratio of GDP in percentage has a positive but insignificant effect on human development. However, broad money supply as a ratio of GDP in %, has a negative influence on human development, although significant in both the long and short terms. Regarding the control variables, this study discovered in both the long and short terms a significant negative influence of monetary policy rate on human development in Nigeria during the period of study. Based on the findings, the study suggested that the managers of the economy should focus not only on increasing the quantity of credit but also on enhancing its accessibility, efficiency, and developmental orientation to ensure that financial deepening translates into meaningful improvements in human development. They should adopt a cautious approach to monetary expansion, emphasize price stability, improve the efficiency of financial intermediation, and ensure that financial resources are directed toward productive sectors capable of enhancing human capital development. Such measures would enable financial deepening to contribute positively to sustainable improvements in the quality of life of Nigerians. At the same time, policymakers should pursue a balanced monetary policy framework that achieves price stability while simultaneously supporting investment, employment creation, and human development. Such a strategy would enhance the contribution of monetary policy to Nigeria's long-term developmental goals.

Keywords: Financial Deepening, Human Capital Development, ARDL and Nigeria

1. Introduction

The expansion and efficiency of financial institutions, financial markets, and financial services within an economy plays a significant role in improving the quality of life of individuals through better access to education, healthcare, income, and social opportunities. In Nigeria, financial deepening can help enhance human development through several connected ways. One major pathway through which financial deepening influences human capital development is credit allocation to productive sectors of the economy (George-Anokwuru, 2026).

A developed financial system improves the ability of banks and other financial institutions to provide loans and credit facilities to individuals, households, and businesses. Access to credit enables households to finance education, healthcare services, and entrepreneurial activities that improve living standards and human welfare. In Nigeria, increased access to bank credit can support small and medium-scale enterprises, enhance productivity, and generate income that improves access to basic social services (Akinlo & Egbetunde, 2010). Consequently, efficient credit allocation contributes significantly to human development by promoting economic opportunities and reducing financial constraints.

Financial deepening encourages businesses and individuals to save through formal financial institutions such as commercial banks, microfinance banks, and cooperative societies. Increased savings provide financial institutions with more resources for lending and investment activities. In addition, savings help households manage future uncertainties and finance expenditures on education, healthcare, and housing. In Nigeria, improved savings culture through financial inclusion initiatives and banking reforms can strengthen capital accumulation and improve the welfare of individuals and families (George-Anokwuru, 2026). Therefore, savings mobilization serves as an important mechanism through which financial deepening improves people's welfare.

Financial inclusion also represents a major pathway through which financial deepening affects human development. Financial inclusion involves providing affordable and accessible financial services to all segments of society, especially low-income earners and rural populations. Through financial inclusion, individuals gain access to savings accounts, loans, insurance services, digital payment systems, and investment opportunities. In Nigeria, initiatives such as mobile banking, agent banking, and microfinance institutions have improved access to

financial services among previously excluded populations. Access to these services enables individuals to invest in education, healthcare, and income-generating activities, thereby improving their quality of life and overall human development outcomes (Demirgüç-Kunt et al., 2018).

Investment financing is another important pathway linking financial deepening to human development. Financial institutions and capital markets facilitate the mobilization and allocation of funds for public and private investments. Governments can raise funds through financial markets to finance infrastructural development, schools, hospitals, and social welfare programmes. Similarly, private investors can access financial resources for productive ventures that generate employment and income. In Nigeria, financial deepening supports investment in sectors such as education, healthcare, agriculture, manufacturing, and technology, which contribute directly to human development and economic growth (King & Levine, 1993; George-Anokwuru, 2026).

Employment generation constitutes another significant channel through which financial deepening influences human development. A developed financial sector promotes investment and business expansion, which in turn create employment opportunities for the population. Employment increases household income and enhances access to necessities such as food, education, healthcare, and shelter. In Nigeria, improved access to finance for entrepreneurs and businesses can stimulate industrialization and support the growth of small and medium enterprises, thereby reducing unemployment and poverty levels. Increased employment opportunities improve living standards and contribute positively to human development indicators.

Financial deepening enables low-income households to access financial services that improve their economic activities and income levels. Access to credit, savings, and insurance services helps vulnerable groups manage risks, invest in productive ventures, and improve their welfare. In Nigeria, poverty remains a major obstacle to human development, particularly in rural communities. Through enhanced financial inclusion and access to affordable financial services, financial deepening can contribute to poverty alleviation and improve socio-economic conditions (Todaro & Smith, 2020).

Furthermore, financial deepening influences human development through technological innovation and digital financial services. Technological advancements such as internet banking, mobile money services, automated teller machines, and electronic payment systems have improved the efficiency and accessibility of financial services. These innovations reduce transaction costs, promote financial inclusion, and enhance economic participation.

In recent years, the Central Bank of Nigeria (CBN) has implemented several financial sector reforms aimed at promoting greater financial inclusion and strengthening access to financial services. These initiatives include the 2012 National Financial Inclusion Strategy, the expansion of mobile banking and digital financial services, and efforts to strengthen microfinance institutions (Abili, 2020; CBN, 2023).

Although financial deepening is generally expected to contribute to human capital development by improving access to savings, credit, investment, and other financial services, the extent to which these benefits have translated into improved human capital outcomes in Nigeria remains uncertain. Aggregate measures of financial deepening, such as the ratio of broad money supply to GDP and private sector credit to GDP, indicate some progress in the development of the financial system. However, the benefits have not been adequately reflected in the standard of living of many Nigerians. According to George-Anokwuru (2026), Nigeria still has poor results when it comes to human development. This is shown by its Human Development Index (HDI), which looks at life expectancy, education, and how well people live (UNDP, 2023; George-Anokwuru, 2026). For example, Nigeria's HDI in 2023 was 0.560 (UNDP, 2024; George-Anokwuru, 2026), which means the country has low human development.

Empirical studies on the association between financial deepening and human development have produced mixed and inconclusive results. Some studies established that financial deepening exerts a positive influence on human development by improving access to financial services, stimulating investment, and enhancing welfare outcomes (Kilic & Ozcan, 2018; Sarwar, Khan, Sarwar, & Khan, 2021).

Conversely, other studies reported a negative relationship between certain indicators of financial deepening and human development, suggesting that inefficiencies within the financial system, unequal access to financial services, and macroeconomic instability may hinder improvements in human welfare (Ehiedu, Onuorah, & Mbagwu, 2022; Adeniyi, Akanbi, &

Olayinka, 2023). The divergent findings in the empirical literature have generated significant concern among researchers and policymakers regarding the nature of the relationship between financial deepening and human development in Nigeria. This inconsistency in findings raises an important research question: what is the relationship between financial deepening and human development in Nigeria? To provide an answer to this question was the central focus of this study. The rest of the paper is organised into sections on literature review, materials and methods, results and discussion, and finally, conclusion and recommendations.

2. Literature Review

Conceptual Clarifications

Financial Deepening

Financial deepening refers to the expansion, development, and increased efficiency of a country's financial system in mobilizing savings and allocating financial resources to productive investments. It involves the growth of financial institutions, financial markets, and financial instruments that improve access to financial services within an economy (Shaw, 1973; George-Anokwuru, 2026). Financial deepening is often measured using indicators such as money supply to gross domestic product ratio (M2/GDP), domestic credit to the private sector, banking sector assets, stock market capitalization, and financial inclusion levels.

The concept emphasizes the importance of a well-developed financial sector in promoting investment, economic growth, and overall development. The concept originated from the works of Ronald McKinnon and Edward Shaw who argued that financial repression, characterized by excessive government control of the financial sector, limits savings mobilization and investment activities (McKinnon, 1973; Shaw, 1973). According to their argument, economies with underdeveloped financial systems often experience low investment, inefficient allocation of resources, and slow economic growth. They therefore advocated for financial liberalization policies that would encourage savings, increase credit availability, and improve financial intermediation within the economy.

Financial deepening enhances the ability of financial institutions such as banks, insurance companies, microfinance institutions, and capital markets to provide financial services to individuals and businesses. As financial systems become deeper, more people gain access to

banking services, credit facilities, savings opportunities, and investment instruments. This increased accessibility encourages savings mobilization and investment activities, thereby stimulating economic growth and development (Levine, 1997). A deep financial system also improves liquidity within the economy and facilitates efficient resource allocation among productive sectors.

Another important dimension of financial deepening is financial inclusion. Financial inclusion refers to the provision of affordable and accessible financial services to all segments of society, particularly low-income earners and rural populations. Financial deepening promotes financial inclusion by expanding banking networks, introducing mobile banking services, and supporting microfinance institutions. Through these mechanisms, individuals who were previously excluded from the formal financial system are able to access savings accounts, loans, insurance services, and payment systems that improve their economic opportunities and standard of living (Demirgüç-Kunt et al., 2018).

Financial deepening is also associated with capital market development and technological advancement in the financial sector. The growth of stock markets, bond markets, and digital financial services contributes to increased investment opportunities and improved financial intermediation. Technological innovations such as electronic banking, internet banking, mobile money services, and automated payment systems have further strengthened the efficiency and accessibility of financial services. These developments reduce transaction costs, increase financial transactions, and improve the overall performance of the financial sector (King & Levine, 1993).

In Nigeria, financial deepening has become an important policy objective aimed at promoting economic growth and human development. Over the years, the Nigerian government and the Central Bank of Nigeria have introduced several reforms to strengthen the financial sector. These reforms include banking sector consolidation, financial liberalization, cashless policy initiatives, microfinance banking, and financial inclusion programmes. The objective of these reforms is to improve access to financial services, enhance credit allocation, mobilize savings, and stimulate productive investments within the economy (Sanusi, 2012).

Financial deepening contributes to human development by improving access to financial resources needed for education, healthcare, housing, and entrepreneurial activities. Individuals

and businesses with access to financial services are better positioned to invest in productive ventures, improve their living conditions, and increase their income levels. Furthermore, governments can utilize financial markets to raise funds for infrastructural development and social services. Consequently, financial deepening has the potential to improve human development indicators such as literacy rates, life expectancy, employment generation, and poverty reduction in Nigeria.

Despite these potential benefits the level of financial deepening in Nigeria remains constrained by several challenges. These include poverty, unemployment, inadequate financial literacy, weak institutional frameworks, corruption, poor infrastructure, and limited access to banking services in rural areas. A large proportion of the population still operates outside the formal financial system, limiting the effectiveness of financial deepening policies. In addition, high lending rates and limited access to credit continue to hinder investment and economic participation among small businesses and low-income households.

Therefore, the concept of financial deepening highlights the importance of a developed and efficient financial system in promoting economic growth and human development. The expansion of financial institutions, increased access to financial services, and improved financial intermediation are essential for mobilizing savings, supporting investments, and enhancing the welfare of the population. In Nigeria, achieving sustainable financial deepening requires effective financial sector reforms, improved financial inclusion, and policies that encourage equitable access to financial resources across all sectors of the economy.

Human Capital Development

Human capital development refers to the process of improving the knowledge, skills, competencies, health, and productive capacities of individuals within an economy. It involves investments in education, healthcare, vocational training, and other forms of capacity building that enhance the efficiency and productivity of the labour force (Schultz, 1961). The concept is based on the idea that human beings are valuable assets whose abilities and talents can be developed to contribute meaningfully to economic growth and societal progress. Human capital development therefore focuses on improving the quality of human resources to achieve higher productivity and better living standards.

The concept gained prominence through the contributions of Theodore Schultz and Gary Becker, who argued that expenditures on education and health should be regarded as investments rather than mere consumption expenses (Becker, 1964; Schultz, 1961). According to their view, investment in human capital increases the knowledge and efficiency of individuals, thereby improving their earning capacity and contribution to economic development. The theory further suggests that countries with high levels of human capital development are more likely to achieve sustainable economic growth and technological advancement.

Education is considered one of the major components of human capital development because it equips individuals with the knowledge and technical skills required for productive activities. Formal education, vocational training, and professional development programmes enhance the ability of individuals to adapt to technological changes, improve innovation, and increase labour productivity. An educated workforce is also more capable of utilizing available resources efficiently and contributing to national development (Todaro & Smith, 2020). Consequently, investment in education is regarded as a critical strategy for reducing poverty, unemployment, and inequality.

Healthcare is another essential component of human capital development because healthy individuals are generally more productive and efficient in economic activities. Improved healthcare services, nutrition, sanitation, and disease prevention programmes contribute to increased life expectancy and labour productivity. Poor health conditions reduce the capacity of individuals to work effectively and negatively affect economic performance. Therefore, investment in healthcare enhances the physical and mental well-being of the population, which in turn supports economic growth and development (Bloom, Canning, & Sevilla, 2004).

Human capital development is also linked to skill acquisition and technological advancement. In modern economies, the demand for skilled labour continues to increase due to industrialization, globalization, and technological innovation. Skill acquisition programmes, entrepreneurship training, and research development initiatives help individuals acquire specialized competencies needed in the labour market. These skills improve employability, productivity, and income generation while encouraging innovation and competitiveness within the economy (Lucas, 1988). Thus, human capital development serves as a catalyst for economic transformation and sustainable development.

In the context of Nigeria, human capital development remains a major policy concern due to the country's developmental challenges. Despite its large population and abundant natural resources, Nigeria continues to face problems such as poor educational infrastructure, inadequate healthcare services, unemployment, poverty, and low technological development. These challenges have limited the productive capacity of the labour force and hindered economic growth. Consequently, successive governments have introduced policies and programmes aimed at improving education, healthcare delivery, and vocational training to strengthen human capital development in the country.

Human capital development is closely associated with economic growth because the quality of human resources determines the productive potential of an economy. A skilled and healthy workforce contributes to higher productivity, increased innovation, improved industrial output, and better public service delivery. Countries with strong human capital bases are often characterized by higher income levels, lower poverty rates, and improved standards of living (Romer, 1986). Therefore, investment in human capital is considered an essential requirement for achieving sustainable economic development and global competitiveness.

Furthermore, human capital development contributes significantly to human development by improving the welfare and quality of life of individuals. Human development focuses on expanding people's choices and capabilities through access to education, healthcare, income opportunities, and social services. Through effective human capital development, individuals acquire the capacity to participate actively in economic and social activities, thereby improving their overall well-being. This relationship explains why countries that invest heavily in human capital often record higher Human Development Index (HDI) rankings and better socio-economic outcomes.

However, the process of human capital development in Nigeria is constrained by several factors, including inadequate funding of the education and health sectors, corruption, poor infrastructure, insecurity, unemployment, and weak institutional frameworks. These challenges reduce the effectiveness of government policies aimed at improving human capital formation. In addition, many individuals lack access to quality education and healthcare services, particularly in rural communities. Consequently, the level of human capital development in Nigeria remains relatively low compared to many developing and emerging economies.

Therefore, the concept of human capital development emphasizes the importance of investing in people through education, healthcare, skills acquisition, and capacity building. Human capital development enhances labour productivity, promotes innovation, reduces poverty, and improves overall human welfare. In Nigeria, sustained investment in human capital is essential for promoting economic growth, improving living standards, and achieving long-term national development goals.

Theoretical Review

Human Capital Theory

This theory was propounded by Theodore Schultz in 1961 and subsequently advanced by Gary Becker in 1964. The theory suggests that spending on education, healthcare, training, and learning new skills constitute investments in human beings. These investments are capable of enhancing productivity and promoting economic growth (Schultz, 1961; Becker, 1964). The central argument of the theory is that when people are properly trained and healthy, they become important resources for a country. They help increase what the country produces and bring about positive changes in society. In this regard, education and health are not merely social services but productive investments that improve labour efficiency, innovation, and income generation.

The theory also highlights that the quality of human capital plays a key role in how productive an economy can be. When people are healthy, well-educated, and skilled, they can use resources better, keep up with new technologies, and help drive economic growth. Because of this, countries that focus on building human capital by investing more in education, healthcare, research, and job training are more likely to see steady economic growth and better living conditions (Becker, 1993). The theory shows that investing in people is closely linked to long-term economic progress.

Human capital theory is closely connected to financial deepening because the financial system serves as a major channel through which resources are mobilized and allocated for human capital investment. Financial deepening means that financial institutions, markets, and services become more developed and efficient. This makes it easier for people to get loans, save money, and invest in opportunities. (Shaw, 1973; McKinnon, 1973). A strong financial system facilitates the provision of loans for educational, healthcare financing, scholarships, and business credit that

enable individuals and households to invest in health education and entrepreneurial activities. Thus, financial deepening helps build up human capital by reducing the financial barriers that stop people from accessing important opportunities for growth.

In Nigeria, the importance of human capital theory stands out because of the country's challenges in development. Even though Nigeria has plenty of human and natural resources, it still faces low levels of human development. This is shown through poor education systems, weak healthcare services, high unemployment, and widespread poverty. To improve these situations, better financial systems are needed. This would help more people, especially those in poor areas and low-income families, to access banking and financial services. With more access to money, people can invest in education, health, and other things that can improve their lives and work better (Akinlo & Egbetunde, 2010).

Furthermore, the theory explains that how well financial deepening helps human development depends a lot on how easy it is to access and how well financial institutions work. In Nigeria, changes were made in the banking sector, microfinance institutions, mobile banking services, and the capital market to make financial services more available and help the country grow in a fair way. These changes are expected to help people save more money, get credit more easily, and invest in things like education and health. When money is properly used in education and health, it is likely to lead to better literacy, longer life expectancy, higher incomes, and more job opportunities (Sanusi, 2012).

However, the application of human capital theory in Nigeria faces several challenges because of the country's structure and institutions. Problems like poverty, corruption, lack of financial knowledge, income inequality, weak systems, and limited access to banking services make it hard to build human capital effectively. Many people, especially in rural areas, don't have access to financial tools or affordable loans that help with education and health. Because of this, the benefits of having more financial services supporting human development haven't really happened in Nigeria (Todaro & Smith, 2020).

Therefore, human capital theory helps explain how financial growth relates to human development in Nigeria. This theory shows that when the financial system improves, it can help people invest more in education, health, and learning new skills, which makes life better for

individuals. It also says that for Nigeria to grow its economy in a lasting way, it needs a financial system that can collect and use resources well to support the development of human capital.

Endogenous Growth Theory

This theory emerged as a response to the limitations of the neoclassical growth model, particularly the inability of the model to adequately explain the sources of long-run economic growth. The theory was principally developed by Paul Romer and further expanded by Robert Lucas. The theory explained that economic growth is generated from within the economy through investments in human capital, innovation, technological progress, and knowledge accumulation rather than relying solely on external factors (Romer, 1986; Lucas, 1988). Unlike the exogenous growth theory which treats technological progress as external to the economic system, the endogenous growth model maintains that government policies, institutional quality, and investment decisions can directly influence long-run growth.

The theory emphasizes that human capital development plays a central role in sustaining economic growth. According to the theory, investments in education, research, training, and healthcare increase the productive capacity of labour and stimulate innovation and technological advancement. Human capital accumulation generates positive externalities because educated and skilled individuals contribute to knowledge diffusion, improved productivity, and increased efficiency across different sectors of the economy (Lucas, 1988). Consequently, economies that prioritize investment in human capital are more likely to achieve sustainable economic development and higher standards of living.

Endogenous growth theory is closely associated with financial deepening because the financial system provides the necessary mechanism for mobilizing savings and allocating resources efficiently to productive sectors. Financial deepening, which involves the expansion and sophistication of financial institutions, markets, and instruments, enhances the availability of credit and investment opportunities needed to support innovation, entrepreneurship, and human capital formation (Levine, 1997). A well-developed financial system facilitates access to loans, educational financing, healthcare funding, and investment capital, thereby promoting productivity and long-term economic growth. The theory therefore suggests that financial

development is essential for creating the conditions necessary for continuous economic expansion.

In the context of Nigeria, endogenous growth theory provides a useful framework for understanding the relationship between financial deepening and human development. Nigeria's economic growth and human development performance depend largely on the ability of the financial sector to support investments in education, healthcare, infrastructure, and productive activities. Through financial deepening, individuals and businesses gain greater access to banking services, credit facilities, insurance products, and capital market instruments that can improve living standards and productive capacity. Increased access to finance can therefore enhance educational attainment, healthcare delivery, employment generation, and income levels within the economy.

Furthermore, the theory explains that financial deepening contributes to human development by improving the efficiency of resource allocation and encouraging investments in sectors that directly affect human welfare. In Nigeria, reforms such as banking consolidation, financial inclusion initiatives, microfinance banking, and digital financial services were introduced to strengthen the financial sector and stimulate inclusive growth. These reforms are expected to improve savings mobilization, increase credit accessibility, and support investments in human capital development. Where financial resources are effectively utilized, improvements in literacy rates, life expectancy, poverty reduction, and overall human development outcomes are likely to occur (Sanusi, 2012).

The theory also highlights the importance of innovation and technology in promoting sustainable development. Financial deepening supports technological advancement by providing entrepreneurs and firms with access to investment capital required for research, innovation, and business expansion. In Nigeria, improved financial intermediation can enhance the growth of small and medium enterprises, encourage industrialization, and create employment opportunities that improve human welfare. Therefore, the financial sector serves as a catalyst for endogenous growth by facilitating investments that generate productivity improvements and socio-economic development.

However, despite the potential benefits of financial deepening, several structural challenges continue to limit its contribution to human development in Nigeria. These challenges

include poverty, weak financial institutions, inadequate infrastructure, corruption, unemployment, low financial literacy, and unequal access to financial services, particularly in rural areas. The persistence of these problems reduces the ability of the financial system to effectively support investments in education, healthcare, and technological innovation. Consequently, the expected positive relationship between financial deepening and human development has not been fully achieved in Nigeria.

Therefore, endogenous growth theory provides the theoretical foundation for examining how financial deepening influences human development in Nigeria. The theory supports the argument that sustainable economic growth and improved human welfare can be achieved through continuous investment in human capital, innovation, and efficient financial systems. It further suggests that strengthening Nigeria's financial sector is essential for enhancing productivity, reducing poverty, and promoting long-term human development.

Empirical Review

Studies linking financial deepening with human capital development in Nigeria are not very common, and most research on this topic has been done in developed countries. Scholars like Beck, Fuchs, and Uy (2009), Levine (1997), Demirguc-Kunt and Levine (2009), and Galor (2011) have shown that financial deepening helps improve human welfare by boosting economic growth and lowering income inequality. Recently, studies across the continent have supported the idea that financial deepening plays a key role in improving human welfare. For example, Osuka, Ihejirika, and Chinweze (2018) looked at how financial deepening affected human capital development in Nigeria from 1981 to 2015 using an Error Correction Model. Their findings showed that financial deepening is important and beneficial for improving human capital in Nigeria.

Kilic and Ozcan (2018) looked at how financial development impacts human capital in emerging market economies between 1990 and 2015.They used two different panel data models with various ways to measure human capital. Both models showed that financial development has a positive effect on human capital in these economies.

In Turkey, Kaya (2018) studied how changes in financial markets affect human development.

They used the Johansen-Juselius Cointegration test to check if there is a long-term relationship between the variables, and the Granger Causality test to find out if there is a cause-and-effect link between the variables. The study found that the variables are connected in the long run and that the human development index influences the BIST index.

Arif and Khan (2019) looked at how financial development affects human capital in Pakistan using three different methods: DOLS, FMOLS, and system GMM. They used yearly data from 1991 to 2016.Their study found that strong financial institutions help improve human capital in Pakistan. Also, when more money comes in from abroad, like remittances, it helps develop human capital. However, high unemployment and a large population make it harder to develop human capital.

In addition, Abili (2020) looked into how financial deepening relates to socioeconomic development in Nigeria. The study aimed to look at the effects of broad money supply, private sector credit, and financial openness on the human development index in Nigeria between 1991 and 2018.They used two statistical methods: Fully Modified Least Squares and Granger Causality test. The results showed that broad money supply had a significant negative effect on HDI. However, private sector credit and financial openness had a significant positive impact on HDI. The causality tests showed that there was one-way causality from broad money supply and credit to the private sector, and then to HDI. It was also found that there was two-way causality between financial openness and HDI, and that all the variables together had a causal link to HDI. This means that these factors together can help predict changes in HDI.

Tekin (2020) looked into how financial development and human development are connected, using health and welfare measures in developing countries. The goal was to see if a country's financial growth affects the basic development of its people, and also whether human development has an effect on financial development. The data used in the study was from 1970 to 2016.The researcher used Pedroni and Kao tests to check for long-term connections and Dumitrescu and Hurlin analysis to study causality in a group of countries. The findings showed that there is a long-term connection between financial development and human development, and a cause-and-effect relationship in developing nations.

Sarwar, Khan, Sarwar and Khan (2021) looked at how financial development and human capital affect economic growth in emerging economies. They used a two-step system generalized method of moments. They argued that financial development and human capital have a positive and significant impact on the economic performance of developing countries, which in turn affects economic well-being.

Asongu and Rexon (2021) used several statistical methods like Two-Stage Least Squares, Fixed Effects, Generalized Method of Moments, and Tobit regressions to look at how financial development connects to inclusive human development in African countries. They used panel data and regression analysis. Their findings showed that having strong financial institutions and efficient financial markets helps improve inclusive human development. However, when banks fail to act as intermediaries by not properly directing savings into loans for individuals and businesses, mainly because of information gaps, it harms inclusive human development.

Afolabi (2022) looked into how financial deepening and human development are connected in Nigeria using a non-Linear Autoregressive Distributed Lag (Asymmetry ARDL) method. The study found that the positive impact of credit supply and money supply on human development in Nigeria is not very strong. It also showed that the link between financial deepening and development is not always straight forward. The study also found that expanding bank branches in Nigeria has a negative effect, which is probably because there are not enough banking products or services available.

Ehiedu, Onuorah, and Mbagwu (2022) studied the connection between financial deepening and human capital development in Nigeria from 1981 to 2020. They used descriptive statistics, correlation, and multiple regression methods. Their results showed that commercial bank deposits as a share of GDP and market capitalization as a share of GDP have a positive and significant effect on human development in Nigeria. However, money supply as a share of GDP and credit to the private sector as a share of GDP have a negative and insignificant effect on human development in Nigeria.

Adeniyi, Akanbi, and Olayinka (2023) looked at how financial development indicators connect with human development in Nigeria between 1990 and 2019.They used an Autoregressive Distributed Lag (ARDL) model for their study. Their findings showed that in the

long term, the amount of broad money supply compared to GDP has a positive and significant effect on human development in Nigeria. However, credit given to the private sector compared to GDP has a negative but not significant effect. Market capitalization, when compared to GDP, has a positive but not significant effect on human development. In the short term, broad money supply compared to GDP has a negative and significant effect on human development. On the other hand, credit to the private sector and market capitalization both have positive but not significant effects on human development in the short term.

Gaps in Literature

Existing research on financial deepening in Nigeria has mostly looked at how it affects economic growth, reduces poverty, and improves financial inclusion. However, it hasn't paid much attention to human capital development. Also, different studies have used various methods, variables, and time periods, which has led to mixed results. Because of this, this study filled the gaps by looking at how financial deepening relates to human capital development in Nigeria. This study employed more recent data and better econometric methods to make the analysis more accurate for policy recommendation.

3. Materials and Methods

The study adopted an ex-post facto research design and employed annual time-series data covering the period from 1981 to 2023. Although the study initially intended to examine a longer period, from 1960 to 2025, data limitations and the unavailability of consistent and reliable information for the earlier years necessitated the adoption of the 1981–2023 period. The data used for the analysis were obtained from the Central Bank of Nigeria (CBN) and the United Nations Development Programme (UNDP).

To examine the effect of financial deepening on human capital development in Nigeria, the study adapted and modified the model developed by Adeniyi, Akanbi, and Olayinka (2023), which investigated the relationship between financial development and human capital development in Nigeria over the period 1990–2019.

In their model, human development index which is a proxy for human development was used as a dependent variable, whereas the ratio of broad money to gross domestic product, the ratio of

credit to the private sector to gross domestic product and ratio of market capitalization to gross domestic product (GDP) were used as independent variables. This study replaced ratio of market capitalization to GDP with monetary policy rate. Therefore, the model for this study is presented thus:

$$HDI = f(M_3/GDP, CPS/GDP, MPR) \quad (1)$$

The linear form of equation (1) produced;

$$HDI_t = \alpha_0 + \alpha_1 M_3/GDP_t + \alpha_2 CPS/GDP_t + \alpha_3 MPR + e_t \quad (2)$$

Where: HDI = human development index, M_3/GDP = broad money supply as a ratio of GDP in %, CPS/GDP = private sector credit as a ratio of GDP in %, MPR = monetary policy rate, α_0 = intercept parameter, e = error term, α_1 - α_4 = slope parameters.

On the apriori, it is expected that; α_1-$\alpha_2 > 0$ and $\alpha_3 < 0$.

Techniques of Data Analysis

The study employed the Augmented Dickey-Fuller (ADF) unit root test and the Autoregressive Distributed Lag (ARDL) approach for the analysis of the data. The ADF test was conducted to determine the stationarity properties of the variables and to establish whether their statistical characteristics remain stable over time. This test is essential in time-series analysis because the use of non-stationary variables may produce misleading or spurious regression results. The general specification of the ADF test is presented as follows:

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \Sigma\alpha_1 \Delta y_i + \delta_t + u_t \quad (3)$$

Where (y) represents the time-series variable, (t) denotes the linear time trend, Δ is the first-difference operator, α_0 represents the constant term, (n) denotes the optimal lag length of the explanatory variables, and (u) is the stochastic error term. To examine both the short-run and long-run dynamics between financial deepening and human capital development in Nigeria, the study employed the Autoregressive Distributed Lag (ARDL) approach. The ARDL technique is appropriate because it allows for the estimation of both short-run and long-run relationships

within a single framework and can be applied when the variables are integrated at different orders, provided none is integrated of order two, I(2).

The ARDL approach also incorporates appropriate lag structures to account for dynamic adjustments and reduce potential serial correlation problems. The ARDL model specified for the study is presented as follows:

$$\Delta HDI_{t,j} = C_0 + C_1 HDI_{t-1,j} + C_2 CPS/GDP_{t-1,j} + C_3 M3/GDP_{t-1,j} + C_4 MPR_{t-1,j} + \sum_{i=1}^{n1} a_{1i,j} \Delta HDI_{t-1,j} + \sum_{i=0}^{n2} a_{2i,j} \Delta CPS/GDP_{t-1,j} + \sum_{i=0}^{n3} a_{3i,j} \Delta M3/GDP_{t-1,j} + \sum_{i=0}^{n4} a_{4i,j} \Delta MPR_{t-1,j} + \lambda ECMt - 1 + \mu_t \; - - \; - - - \; (4)$$

Where; Δ denotes the first-difference operator, μ_t denotes stochastic error term or white-noise disturbance, n represents the optimal lag length, α_1, α_2, α_3, α_4 represents the short run dynamics of the model and c_1, c_2, c_3, c_4 represents long run elasticities. ECM_{t-1} denotes the lagged error correction term derived from the long-run cointegration relationship. The coefficient of the error correction term, commonly denoted by coefficients (λ1) measures the speed at which deviations from the long-run equilibrium are corrected following a short-run disturbance.

It indicates the proportion of the disequilibrium from the previous period that is adjusted in the current period. For the model to exhibit a stable long-run relationship, the coefficient of ECM_{t-1} is expected to be negative and statistically significant. A negative and significant error correction coefficient confirms the existence of a long-run equilibrium relationship and implies that deviations from this equilibrium are gradually corrected over time, with the system converging back toward its long-run path.

4. Results and Discussion

Appraising the trends of human development index (HDI), broad money supply as a ratio of GDP in % (M_3/GDP), private sector credit as a ratio of GDP in % (CPS/GDP), monetary policy rate (MPR) in Nigeria from 1981 to 2023

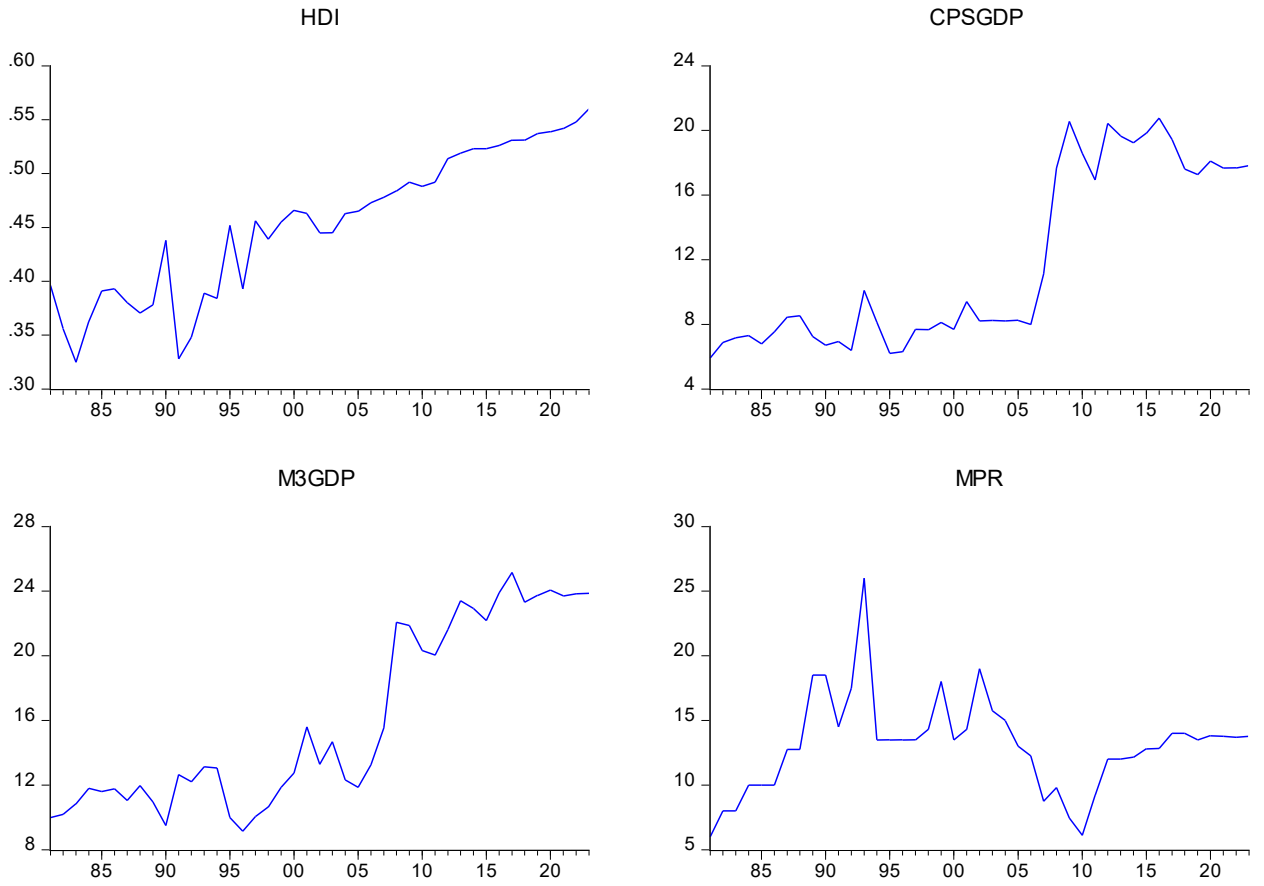

Figure 1: The trends of the human development index (HDI), broad money supply as a ratio of GDP in % (M_3/GDP), private sector credit as a ratio of GDP in % (CPS/GDP), monetary policy rate (MPR) in Nigeria from 1981 to 2023

Human Development Index (HDI)

The Human Development Index (HDI) exhibits a long-run upward trend throughout the study period, increasing from approximately 0.35 in the early 1980s to about 0.56 in 2023. Despite this general improvement, the series is characterized by episodes of instability, particularly during the late 1980s and early 1990s when HDI fluctuated significantly. These fluctuations coincided with periods of macroeconomic instability, declining real incomes, structural adjustment policies, rising poverty, and inadequate investment in social infrastructure. The temporary decline in HDI during this period suggests that economic reforms did not immediately translate into improvements in welfare indicators such as education, healthcare, and living standards.

From the late 1990s onward, HDI began to rise more consistently, reflecting gradual improvements in social and economic conditions. The most notable feature of the graph is the

sustained and uninterrupted increase observed after 2005, indicating improvements in educational attainment, life expectancy, and per capita income. This period coincides with stronger economic growth, banking sector reforms, increased public spending, and expansion of social intervention programmes. Nevertheless, the relatively moderate level of HDI compared with global standards indicates that substantial gaps remain in human capital development.

Credit to Private Sector as a Ratio of GDP (CPS/GDP)

The CPS/GDP series reveals important developments in Nigeria's financial sector. Between 1981 and 2007, private sector credit remained relatively low, fluctuating mostly between 6% and 10% of GDP. This pattern indicates a shallow financial system with limited capacity to channel financial resources to productive sectors. The low credit penetration suggests that businesses, particularly small and medium enterprises (SMEs), faced considerable constraints in accessing finance. Consequently, investment, productivity growth, and employment generation may have been adversely affected during this period. A major structural shift occurred around 2008–2009 when CPS/GDP increased sharply from approximately 8% to over 20%. This dramatic rise reflects the impact of banking consolidation reforms, financial sector liberalization, and enhanced financial intermediation. The banking sector became more capable of mobilizing deposits and extending credit to businesses and households. However, the graph also shows considerable fluctuations after the surge, with the ratio oscillating between 17% and 21%. This instability may reflect economic recessions, rising non-performing loans, exchange rate pressures, and periodic tightening of monetary policy. The trend suggests that while financial deepening has improved significantly, the ability of the financial system to sustain stable credit growth remains limited. The decline observed after the peak periods indicates that the expansion of credit has not been consistently maintained.

Broad Money Supply as a Ratio of GDP (M3/GDP)

The M3/GDP graph demonstrates a clear long-term upward trend, indicating progressive financial deepening in Nigeria. During the 1980s and early 1990s, the ratio remained relatively low, fluctuating between 8% and 13%. This reflects a period of limited financial market development, low banking penetration, and a relatively weak capacity of the financial system to

mobilize savings and support economic activity. Beginning in the early 2000s, the series exhibits stronger growth, with a particularly sharp increase occurring between 2007 and 2009 when M3/GDP rose from approximately 12% to over 22%. This period coincides with significant banking reforms, increased monetization of the economy, expansion of financial services, and growing public confidence in the banking system. The sustained high levels observed after 2010 suggest that the Nigerian financial sector became substantially deeper and more capable of mobilizing financial resources. However, the graph also indicates occasional declines and fluctuations, suggesting periods of monetary contraction or economic uncertainty. While an increase in money supply relative to GDP is generally viewed as evidence of financial development, excessively rapid monetary expansion may generate inflationary pressures if it is not matched by corresponding growth in productive output. The overall pattern suggests that Nigeria has experienced significant financial deepening over the study period. The increase in monetary depth may have enhanced investment opportunities, improved liquidity conditions, and facilitated economic transactions.

Monetary Policy Rate (MPR)

The Monetary Policy Rate (MPR) displays substantial volatility throughout the study period, reflecting the active use of monetary policy as a stabilization tool. During the 1980s and early 1990s, the MPR increased sharply, reaching a peak of over 25%. This period was characterized by high inflation, exchange rate instability, fiscal imbalances, and macroeconomic uncertainty. The aggressive monetary tightening adopted by the Central Bank was intended to curb inflationary pressures and restore economic stability. Following this peak, the MPR experienced significant fluctuations, moving between approximately 13% and 19% during much of the 1990s and early 2000s. These movements indicate frequent policy adjustments in response to changing macroeconomic conditions. The sharp decline observed around 2008–2010 reflects efforts to stimulate economic activity following the global financial crisis and domestic banking sector challenges. From 2012 onward, the MPR became relatively stable, fluctuating within a narrower range of approximately 11%–14%. This suggests improved monetary policy management and greater emphasis on maintaining price stability. However, the persistence of relatively high interest rates indicates the continuing challenge of controlling inflation in Nigeria. The graph

highlights a fundamental policy trade-off. While high policy rates can help reduce inflation and stabilize the exchange rate, they may simultaneously discourage private investment by increasing borrowing costs. Conversely, lower interest rates may stimulate investment and growth but can contribute to inflationary pressures if not carefully managed.

Integrated Interpretation of the Four Variables

When viewed together, the four graphs reveal a compelling development narrative. The sustained increase in human development index (HDI) occurred alongside substantial growth in M3/GDP and CPS/GDP, suggesting that financial deepening may have contributed positively to human development in Nigeria. As the financial sector expanded, more financial resources became available for investment, production, income generation, and welfare improvement. Nevertheless, the relationship does not appear to be automatic or linear. The substantial rise in financial deepening indicators after 2008 was not matched by an equally dramatic improvement in HDI. This suggests that financial development alone is insufficient to achieve significant human development gains. The effectiveness of financial deepening depends on how efficiently financial resources are allocated, the quality of institutions, and the extent to which economic growth is inclusive. Furthermore, the persistent volatility in MPR indicates that macroeconomic instability remains a challenge. Frequent monetary policy adjustments can affect credit availability, investment decisions, and economic performance, thereby influencing the capacity of financial deepening to improve human welfare. Generally, the graphical evidence suggests that while financial deepening and monetary policy have played important roles in Nigeria's development process, their contribution to human development is maximized when supported by sound institutions, macroeconomic stability and targeted social investments.

Unit Root Test Result

To ensure reliable and valid inferences, the study employed the Augmented Dickey-Fuller (ADF) test to examine the stationarity properties of the variables. The ADF test is based on two hypotheses: the null hypothesis (H_0), which states that the variable has a unit root and is therefore non-stationary, and the alternative hypothesis (H_1), which states that the variable has no unit root and is stationary. The results of the ADF unit root test are presented in Table 1.

Table 1: Unit Root Test Outcome via Augmented Dickey-Fuller

Variables	Level form		First difference		Order of integration
	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value	
HDI	-0.664821	-2.935001	-10.32714	-2.935001	1(1)
CPS/GDP	-0.980213	-2.933158	-5.334850	-2.935001	1(1)
M3/GDP	-0.739509	-2.933158	-6.204884	-2.935001	1(1)
MPR	-3.389303	-2.933158	-	-	1(0)

Recall: HDI, CPS/GDP, M3/GDP and MPR as defined previously.
Source: Author 2026.

The ADF test results presented in Table 1 indicate that, at the 5% significance level, MPR is stationary at level, I(0), as its ADF test statistic exceeds the corresponding 5% critical value. In contrast, HDI, CPS/GDP, and M3/GDP become stationary after first differencing, indicating that they are integrated of order one, I(1). The variables therefore exhibit a mixed order of integration, I(0) and I(1), which satisfies the prerequisite for applying the ARDL approach to examine the existence of a long-run relationship among the variables.

Table 2: ARDL Bounds Test for Co-integration

Model		**F-Statistic =** 9.600318
HDI= F(CPS/GDP, M3/GDP, MPR)		K = 3
Critical Values	Lower Bound	Upper Bound
5%	3.38	4.23

Recall: HDI, CPS/GDP, M3/GDP and MPR as defined previously.
Source: Author 2026.

The ARDL bounds test for cointegration indicates the existence of a long-run relationship among HDI, CPS/GDP, M3/GDP, and MPR. This conclusion is supported by the calculated F-statistic of approximately 9.6, which exceeds the upper-bound critical value at the 5% significance level. Consequently, the null hypothesis of no long-run relationship is rejected, providing sufficient evidence of cointegration among the variables. Given the presence of a long-run equilibrium relationship, the study proceeds to estimate both the long-run and short-run effects of the explanatory variables on human development.

Table 3: Estimated ARDL Long Run Coefficients. Dependent Variable: HDI (1, 0, 0, 3)

Regressors	Coefficient	t-Statistic	P-Value
CPS/GDP	0.002727	1.057859	0.2983
M3/GDP	-0.006923	-2.399597	0.0226
MPR	-0.003342	-2.288407	0.0291

Recall: CPS/GDP, M3/GDP and MPR as defined previously.
Source: Author 2026.

The long-run coefficients presented in Table 3 indicate that private sector credit as a percentage of GDP is positively associated with human development in Nigeria. In contrast, broad money supply as a percentage of GDP and the monetary policy rate exhibit negative relationships with human development. The results further reveal that the monetary policy rate and broad money supply have statistically significant effects on human development, whereas private sector credit does not have a statistically significant influence on human capital development. These findings suggest that, in the long run, changes in the monetary policy rate and broad money supply are more influential in determining human development outcomes in Nigeria than changes in private sector credit.

Table 4: Error Correction Representation for the Selected ARDL Model ARDL (1, 0, 0, 3)

Regressors	Coefficients	t-Statistic	P-Value
CPS/GDP	0.002764	1.086551	0.2856
M3/GDP	-0.007015	-2.566000	0.0153
MPR	-0.003509	-2.826167	0.0082
ECM (-1)	-1.013337	-7.361749	0.0000
R-squared = 0.653677		**D-W stat.** = 1.926452	
Adjusted R-squared = 0.614097		**Akaike info criterion** = -5.061138	
Schwarz criterion = -4.850028		**F-statistic** = 16.51543	
		Prob(F-statistic) = 0.000000	

Recall: CPS/GDP, M3/GDP and MPR as defined previously.
Source: Author 2026.

Table 4 presents the short-run dynamic coefficients associated with the long-run relationship estimated through the error correction model (ECM). The Error Correction Term (ECT) carries the expected negative sign and is statistically significant, indicating that deviations

from the long-run equilibrium are corrected over time. This implies that the model has a stable adjustment mechanism through which short-run disequilibria in human development gradually converge towards the long-run equilibrium. Thus, any temporary deviations in human development arising from short-run changes in the explanatory variables are eventually corrected. Furthermore, the Durbin-Watson (DW) statistic of 1.926452 suggests that the model is free from serious autocorrelation problems. Moreover, the model demonstrates a strong explanatory power, as indicated by an R-squared value of approximately 0.65. This implies that about 65% of the variations in human capital development during the period under investigation are explained by the variables included in the model, while the remaining 35% is attributable to other factors not captured in the model and is represented by the error term. Overall, the ECM results indicate a good fit and provide evidence of meaningful short-run dynamics alongside the established long-run relationship.

Importantly, the short-run coefficient of private sector credit as a percentage of GDP is positive, indicating that a one-percent increase in private sector credit relative to GDP is associated with an approximately 0.002764 percent increase in the Human Development Index (HDI). This finding suggests that increased access to credit by the private sector may contribute positively to human development in Nigeria over the period studied. However, the coefficient is statistically insignificant, implying that the observed positive relationship is not sufficiently strong to establish a statistically significant effect. Therefore, private sector credit as a percentage of GDP does not appear to have a significant short-run influence on human development in Nigeria. This finding is consistent with Adeniyi, Akanbi, and Olayinka (2023), who examined the effect of financial development indicators on human development in Nigeria over the period 1990–2019 using the Autoregressive Distributed Lag (ARDL) approach. Their findings similarly revealed that private sector credit relative to GDP had a positive but statistically insignificant relationship with human development.

The ARDL result showing a positive but statistically insignificant relationship between private sector credit as a ratio of GDP (CPS/GDP) and human development index (HDI) implies that although increases in credit to the private sector tend to improve human capital development, the effect is too weak or inconsistent to be considered statistically reliable. In other words, while the coefficient suggests that greater access to credit may contribute to

improvements in education, health, income, and overall welfare, the evidence indicates that this contribution has not been strong enough to meaningfully influence human development outcomes in Nigeria during the period examined.

In addition, the result suggests that the expansion of private sector credit has not adequately translated into broad-based welfare improvements. One possible explanation is that a substantial proportion of bank credit may be concentrated in a few sectors such as oil and gas, telecommunications, and large corporations, rather than reaching sectors that directly affect human development, including agriculture, manufacturing, healthcare, education, and small and medium enterprises (SMEs). Consequently, increases in credit availability may stimulate economic activities without necessarily generating substantial improvements in living standards. The insignificant relationship may also reflect structural challenges such as high lending rates, stringent collateral requirements, financial exclusion, poor infrastructure, and weak institutional frameworks. These constraints limit the ability of households and businesses to utilize credit effectively for productive purposes.

Moreover, the result suggests that human development in Nigeria may be influenced more strongly by other factors such as government expenditure on education and health, income growth, employment opportunities, institutional quality, and macroeconomic stability. This implies that financial sector policies should be complemented by investments in social infrastructure and human capital development. Credit expansion alone cannot significantly improve human welfare unless it operates within an environment characterized by quality public services and inclusive economic opportunities.

In terms of monetary policy, the finding implies that efforts by the Central Bank of Nigeria (CBN) to increase lending to the private sector should be accompanied by measures that ensure that such credit is directed toward productive and socially beneficial activities. Development finance initiatives, intervention funds, and sector-specific lending programmes should prioritize sectors with strong linkages to employment creation, poverty reduction, and improvements in health and education outcomes. Overall, the positive but insignificant coefficient suggests that private sector credit has the potential to improve human development in Nigeria, but the existing level, allocation, and effectiveness of credit have been insufficient to generate a statistically significant impact on welfare outcomes.

The short-run coefficient of broad money supply as a percentage of GDP is negative, contrary to the expected a priori relationship. This indicates that a one-percent increase in broad money supply relative to GDP is associated with an approximately 0.007015 percent decline in the Human Development Index (HDI). The negative coefficient suggests that, during the period under consideration, increases in broad money supply did not translate into improved human development outcomes in Nigeria. Rather, the relationship appears to have been adverse in the short run. Furthermore, the coefficient is statistically significant, indicating that broad money supply as a percentage of GDP has a significant short-run effect on human development in Nigeria. This finding is consistent with the results of Adeniyi, Akanbi, and Olayinka (2023), who investigated the influence of financial development indicators on human development in Nigeria over the period 1990–2019 using the Autoregressive Distributed Lag (ARDL) approach. Their study similarly found that broad money supply relative to GDP had a negative and statistically significant relationship with human development in Nigeria. The ARDL result showing a negative and statistically significant relationship between broad money supply as a ratio of GDP (M3/GDP) and human development (HDI) implies that increases in broad money supply relative to GDP are associated with significant declines in human development in Nigeria. The statistical significance of the coefficient indicates that the relationship is not due to random variation but reflects a systematic pattern in the Nigerian economy during the study period.

This finding also suggests that although financial deepening through monetary expansion is expected to promote economic activities, excessive growth in money supply may have generated adverse macroeconomic consequences that ultimately undermined human welfare. In Nigeria, rapid increases in money supply have often been associated with inflationary pressures. When inflation rises, the purchasing power of households declines, making it more difficult for individuals to afford essential goods and services such as food, healthcare, and education. Consequently, living standards deteriorate, negatively affecting human development outcomes.

The result further implies that monetary expansion may not have been adequately matched by growth in productive sectors of the economy. Instead of stimulating productive investment, excess liquidity may have been directed toward consumption, speculative activities, foreign exchange markets, or non-productive investments. As a result, the benefits of increased money supply may not have translated into improvements in employment, income generation,

healthcare, or educational attainment, which are the key components of human development. The negative relationship also indicates that financial deepening measured solely by monetary aggregates may not necessarily translate into development gains. An increase in M3/GDP may reflect greater liquidity in the banking system, but if access to financial services remains limited or if financial resources are concentrated among a small segment of the population, the developmental benefits may be weak or even negative. This underscores the importance of inclusive financial development rather than merely expanding monetary aggregates. Overall, the negative and significant coefficient implies that monetary expansion, as measured by M3/GDP, has adversely affected human development in Nigeria during the study period. The result suggests that increases in money supply have likely contributed to inflation, macroeconomic instability, and inefficient resource allocation, thereby reducing welfare outcomes.

Regarding the covariate variable, this study discovered a significant negative influence of monetary policy rate on human development in Nigeria during the period of study. The ARDL result showing a negative and statistically significant relationship between the Monetary Policy Rate (MPR) and Human Development Index (HDI) implies that increases in the monetary policy rate significantly reduce human development in Nigeria. The negative coefficient indicates an inverse relationship, while the statistical significance suggests that the effect is systematic and robust rather than occurring by chance. In practical terms, a rise in MPR tends to worsen human development outcomes by reducing improvements in income, education, health, and overall welfare.

This finding suggests that a contractionary monetary policy stance, characterized by high policy interest rates, may have adverse consequences for human development. When the Central Bank of Nigeria raises the MPR, commercial banks typically increase their lending rates. Higher borrowing costs discourage households and businesses from obtaining credit for consumption, investment, and productive activities. As a result, investment declines, business expansion slows, and employment opportunities become limited. Reduced economic activity ultimately lowers household income and weakens living standards, thereby negatively affecting human development.

The result further implies that high interest rates may constrain access to financing for critical sectors such as agriculture, manufacturing, healthcare, and education. These sectors play

a vital role in generating employment, improving productivity, and enhancing welfare. When borrowing becomes expensive, firms may postpone investments, reduce production, or cut employment. Consequently, the economy experiences slower growth, which limits improvements in human development indicators

Another important implication is that persistent increases in MPR may disproportionately affect low-income households. High interest rates often reduce economic opportunities and increase the cost of credit for small businesses and entrepreneurs. Since vulnerable groups rely heavily on income-generating activities for their livelihood, tighter monetary conditions may worsen poverty and inequality. Such outcomes can adversely affect access to education, healthcare services, and adequate nutrition, all of which are critical components of human development.

The significant negative relationship also suggests that the cost of maintaining price stability through aggressive monetary tightening may be relatively high in terms of welfare outcomes. While the Central Bank may increase the MPR to combat inflation and stabilize the exchange rate, excessively high interest rates can suppress economic growth and reduce the capacity of the economy to create jobs and improve living standards. This finding therefore highlights the existence of a trade-off between inflation control and human development objectives. Generally, the negative and significant coefficient implies that higher monetary policy rates have significantly undermined human development in Nigeria by increasing borrowing costs, discouraging investment, reducing employment opportunities, and constraining income growth. The result suggests that while monetary tightening may help achieve macroeconomic stability, excessive reliance on high interest rates can hinder improvements in education, health, and living standards.

Post Estimation Diagnostic Tests Results

The study conducted a series of diagnostic tests to assess the reliability and adequacy of the estimated model and determine its suitability for policy analysis and recommendations. Specifically, the Wald test was employed to examine the validity of the imposed coefficient restrictions, while the Breusch-Godfrey (B-G) Lagrange Multiplier (LM) test was applied to

detect the presence of serial correlation in the model residuals. The results of these diagnostic tests are presented in Tables 5 and 6.

Wald Test

The Wald test is used to check if the coefficients of the causal variables in the ECM model are jointly significant. The F-statistic in Tables 5 was used to find out this.

Table 5 Wald Test Result

Wald Test:

Equation: Untitled

Test Statistic	Value	Df	Probability
F-statistic	246.7417	(4, 31)	0.0000
Chi-square	986.9668	4	0.0000

Source: Author 2026.

The results presented in Table 5 indicate that the F-statistic is approximately 247, with a probability value of 0.0000, which is below the 5% significance threshold. This implies that the explanatory variables, when considered jointly, have a statistically significant effect on human development in Nigeria over the period under investigation. Consequently, the model provides evidence that the variables collectively contribute significantly to explaining variations in human development.

Table 6: Breusch-Godfrey Test for Serial Correlation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.189178	Prob. F(2,29)	0.8287
Obs*R-squared	0.515151	Prob. Chi-Square(2)	0.7729

Source: Author 2026.

The results presented in Table 6 indicate that the error correction model is free from serial correlation. This conclusion is supported by the chi-square statistic and its associated probability value, both of which exceed the 5% significance level. Therefore, the null hypothesis of no serial correlation cannot be rejected, confirming that serial autocorrelation is not a concern in the estimated model.

5. **Conclusion and Recommendations**

This study investigated the influence of financial deepening on human capital development in Nigeria from 1981 to 2023. The data used came from reports by Nigeria's central bank and United Nation Development Programme, and included information on human development index, credit given to the private sector as a ratio of the country's economic output - GDP in percentage, the broad money supply as a ratio of GDP in percentage, monetary policy rate. The study used an Autoregressive Distributed Lag - ARDL technique to examine how the above-mentioned variables are related in both the long and the short terms.

The results revealed that in both the long and short terms, the amount of credit given to the private sector as a ratio of GDP in percentage has a positive but insignificant effect on human development. From a policy perspective, the finding indicates that merely increasing the volume of credit in the economy is insufficient to enhance human development. Policymakers should focus on improving the quality, accessibility, and distribution of credit. Financial institutions should be encouraged to extend affordable credit to SMEs, rural entrepreneurs, and productive sectors that have greater employment-generating and poverty-reducing effects. Such targeted credit allocation would strengthen the transmission mechanism between financial development and human welfare. Therefore, policies aimed at reducing borrowing costs, strengthening credit guarantee schemes, improving financial literacy, and expanding financial inclusion are necessary to maximize the developmental impact of private sector credit.

Meanwhile, broad money supply as a ratio of GDP in %, has a negative influence on human development, although significant in both the long and short terms. From a policy perspective, the finding suggests that the Nigerian financial system may not be efficiently channeling increased liquidity into sectors that directly improve welfare. The expansion of money supply without corresponding improvements in productive capacity can create macroeconomic

instability, exchange rate depreciation, and inflation, all of which disproportionately affect low-income households. Therefore, policymakers should focus not only on increasing liquidity but also on ensuring that financial resources are allocated efficiently to productive sectors such as agriculture, manufacturing, education, healthcare, and infrastructure. For the Central Bank of Nigeria (CBN), the result highlights the need for prudent monetary management. Excessive monetary expansion should be avoided, especially when inflationary pressures are already present. Monetary policy should prioritize price stability because stable prices enhance the real value of incomes, encourage savings, and improve household welfare.

Maintaining inflation within acceptable limits is crucial for sustaining improvements in education, health, and living standards. The finding suggests that development-oriented monetary policies should be complemented by structural reforms. Increasing money supply alone cannot improve human development unless accompanied by investments in infrastructure, institutional quality, productivity enhancement, and human capital development. The government should therefore strengthen fiscal and monetary coordination to ensure that liquidity expansion supports productive economic activities rather than fueling inflation. Regarding the control variables, this study discovered in both the long and short terms a significant negative influence of monetary policy rate on human development in Nigeria during the period of study. From a policy perspective, the result indicates that monetary authorities should adopt a balanced approach to interest rate management. Although controlling inflation remains important, policymakers should avoid maintaining excessively high policy rates for prolonged periods. Monetary policy should be designed in a manner that supports both macroeconomic stability and sustainable improvements in welfare.

This may involve adopting moderate interest rate policies that encourage productive investment while keeping inflation within acceptable limits. The finding also underscores the need for complementary fiscal and structural policies. Since high interest rates can hinder development outcomes, government intervention through public investment in education, healthcare, infrastructure, and social protection programmes becomes even more important. Such investments can offset the negative effects of restrictive monetary policy and sustain progress in human development. Also, improving the efficiency of financial intermediation can reduce the adverse impact of high policy rates. Financial sector reforms that lower transaction costs,

improve credit access, and enhance financial inclusion can help ensure that productive sectors continue to receive financing even during periods of monetary tightening.

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