Determinants of Human Capital Development in Nigeria

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ABSTRACT

This study examines the determinants of human capital development in Nigeria, with a focus on the Human Development Index (HDI) as the dependent variable and government expenditure on education (GEX), government expenditure on health (GHE), and training and skill development (TKD) as the independent variables. The research uses an Error Correction Model (ECM) to analyse data from 1981 to 2023. The results reveal that government expenditure on education, government expenditure on health, and training and skill development all significantly influence human capital development in Nigeria. Specifically, increases in educational spending and health care investment show positive and statistically significant effects on human development, supporting the view that these sectors are essential for improving the quality of life and productivity. Training and skill development also exhibit a significant positive relationship with HDI, confirming the importance of skill acquisition in fostering a productive workforce. The ECM results further indicate a long-term equilibrium relationship among the variables, with an error correction term, suggesting that about 14.7% of the disequilibrium in human capital development is corrected annually. These findings highlight the critical role of government investment in education, health, and skill development for enhancing human capital in Nigeria.

Keywords: Human Capital Development, Expenditure on Education, Expenditure on Health Skill and Training.

INTRODUCTION

Human capital development is a critical driver of economic growth, poverty reduction, and societal advancement, particularly in developing nations like Nigeria. It encompasses the investment in education, health, training, and skills acquisition to enhance the productivity and innovative capacity of the workforce. Globally, countries with well-developed human capital have achieved remarkable progress in economic and social development, underscoring its importance in building resilient and sustainable economies (World Bank, 2021). Nigeria, with its abundant natural resources and large population, holds immense potential for human capital development. However, despite various policy initiatives and programs, the country faces persistent challenges in achieving sustainable human capital growth, thereby constraining its socioeconomic development (Kairo et al., 2017 & Euphemia, 2022).

The concept of human capital development gained prominence in economic literature following the works of Becker (1964), who argued that investment in human capital through education and health significantly improves productivity and economic outcomes. In Nigeria, the government has historically recognized the importance of human capital development as evidenced in national development plans and policies, such as the Universal Basic Education (UBE) program, National Health Insurance Scheme (NHIS), and the Economic Recovery and Growth Plan (ERGP). Despite these efforts, the country's human capital development indices remain low, with Nigeria ranking 150 out of 191 countries in the United Nations Human Development Index (HDI) for 2022 (UNDP, 2023).

Education, a cornerstone of human capital development, has faced significant challenges in Nigeria, including inadequate funding, poor infrastructure, and teacher shortages. According to the National Bureau of Statistics (2022), Nigeria's literacy rate for adults stood at approximately 62%, highlighting the gap in achieving

universal education. Similarly, the health sector is plagued by inadequate funding, insufficient healthcare facilities, and a brain drain of medical professionals. These challenges have resulted in poor health outcomes, such as high maternal mortality rates and low life expectancy, further weakening human capital development (World Health Organization, 2023).

The labour market in Nigeria also reflects the inadequacy of human capital development. High unemployment and underemployment rates, particularly among youth, indicate a mismatch between the skills of the labour force and the demands of the economy. Data from the National Bureau of Statistics (2023) reveals that youth unemployment reached 42.5% in the first quarter of 2023, underscoring the need for targeted interventions in skills training and employment generation. Furthermore, the gender gap in access to education and healthcare exacerbates these challenges, limiting the potential contribution of women to the workforce and economic growth (Attahir et al, 2020; Eniekezimene, Wodu & Anda-Owei, 2023).

Despite these challenges, there are opportunities for Nigeria to leverage its demographic dividend a young and growing population—to drive human capital development. Investments in education, health, and skill acquisition tailored to the needs of the 21st-century economy can unlock the potential of this demographic, fostering inclusive growth and development. Technological advancements and global partnerships also present avenues for Nigeria to enhance its human capital development strategies, making them more effective and sustainable.

The persistent underdevelopment of human capital in Nigeria remains a critical challenge to its socioeconomic progress. Despite being Africa's largest economy, the country's low investment in education and health has undermined its ability to translate economic potential into tangible development outcomes. Nigeria's education sector, which should serve as the foundation for human capital development, has been characterized by chronic underfunding. The allocation to education in the national budget has consistently fallen below the United Nations Educational, Scientific, and Cultural Organization (UNESCO) recommended benchmark of 15-20% of total expenditure. For instance, in 2023, the education sector received only 7.9% of the federal budget, reflecting a continued neglect of this critical sector (Budget Office of the Federation, 2023; Oluwatobi & Ogunrinola, 2021).

In the health sector, inadequate funding has led to a scarcity of healthcare facilities, poor service delivery, and the exodus of healthcare professionals seeking better opportunities abroad. According to the World Health Organization (2023), Nigeria has one of the lowest physician-to-patient ratios globally, with only four doctors per 10,000 people. This situation has resulted in poor health outcomes and reduced labour productivity, further exacerbating the country's economic challenges.

The mismatch between educational outcomes and labour market demands presents another critical issue. Many Nigerian graduates lack the skills required for employment in a competitive and technologically driven global economy. This skills gap has contributed to high unemployment rates and limited economic opportunities for young people, perpetuating cycles of poverty and inequality. In addition, systemic corruption, weak governance, and inefficiencies in the implementation of human capital development policies have hindered progress in this area (Maitra, 2016; Hakoma, 2017; Ruzikulov, 2022).

Moreover, regional disparities in access to education and healthcare exacerbate the problem. Northern Nigeria, in particular, lags significantly behind the southern regions in human capital development indicators due to cultural, economic, and security challenges. According to UNICEF (2023), over 10 million children in northern Nigeria are out of school, representing one of the highest rates of out-of-school children globally. This regional imbalance not only limits national development but also poses risks to social cohesion and stability.

These issues underscore the urgent need to identify and address the key determinants of human capital development in Nigeria. By understanding the factors that drive or hinder human capital development, policy makers can design targeted interventions to improve educational outcomes, health services, and labour market opportunities. Furthermore, addressing the systemic challenges of governance and resource allocation is crucial for creating an enabling environment for human capital development.

Objectives of the Study

The overarching objective of this study is to examine the determinants of human capital development in Nigeria. Specific objectives include:

i. To analyse the impact of government expenditure on education on human capital development in Nigeria.

ii. To investigate the role of government expenditure on health on human capital development in Nigeria.

iii. To explore the effect of training and skill development on human capital development in Nigeria.

LITERATURE REVIEW

The literature review on "The Determinants of Human Capital Development in Nigeria" explores prior studies on factors influencing human capital, such as education, health, government expenditure, and labour market conditions. It examines theoretical perspectives, including the Human Capital Theory, linking investments in education and health to economic growth. Empirical studies highlight challenges like inadequate funding, infrastructure deficits, and policy inconsistencies.

Concept of Development

The term "development" is not an easy one to define. It is not easy to define because of the changing nature of its perception, arising from the fact that it can be applied in relation to diverse spheres of life and ideological lineages. For instance, the concept of development can be applied in relation to economics, politics, culture, religion, technology, etcetera, such as economic development, political development, socio-cultural development, religious development, and technological development, among others (Wilson, 2022). Development is a multidimensional concept that can be seen from social, political, technological, and economic points of view. In the interest of this particular study, attention was placed on human development.

Economic development first became a major concern after World War II. As the era of European colonialism ended, many former colonies and other countries with low living standards came to be termed "underdeveloped countries" to contrast their economies with those of the developed countries, which were understood to be Canada, the United States, those of western Europe, most eastern European countries, the then Soviet Union, Japan, South Africa, Australia, and New Zealand. As living standards in most poor countries began to rise in subsequent decades, they were renamed "developing countries." "Economic development" is a term that practitioners, economists, politicians, and others have used frequently in the 20th century. The concept, however, has been in existence in the West for centuries. Modernization, westernization, and especially industrialization are other terms people have used while discussing economic development. Yet these definitional dimensions are inextricably interwoven in that any attempt to look at development from one point of view will amount to compartmentalization of knowledge, which radical social scientists consider socially irrelevant.

In the early days of the sub discipline, it was viewed in terms of some narrow economic criteria. For instance, it was seen to mean the same thing for economic growth, which Akpakpan (1987) defined as "the achievement of yearly increases in both the total and per-capita output of goods and services." Thus, a country was said to be developing according to this view if that country was able to achieve, on a sustained basis, an annual increase in its gross national product (GNP) at a rate of between 5 and 7 percent.

Given the inadequacies of the emphasis on growth of the GNP as the main index of development, as seen above, both economists and other social scientists began to think of a more meaningful perception of development. For instance, Seers (1969) asserted that:

The questions to ask about a country's level of development include: What has been happening to poverty? What has been happening to unemployment? What has been happening to inequality? If all three of these have declined from high levels, then there is no doubt that this has been a disaster period of development for the country concerned. If one or two of these central problems have been growing worse, especially if all three

have, it would be strange to call the result "development," even if per capita income doubled, Development was redefined in terms of the reduction or elimination of poverty, inequality, and unemployment within the context of a growing economy.

According to Okowa (1991), a country is said to be developing as its reliance on foreign assistance to meet the needs of its people decreases. This type of thinking gave rise to the idea of self-reliant development, which had been quite pervasive in development discourse in the third world as exemplified by the Ujamaa and Juche development philosophies of Tanzania and North Korea, respectively.

Presently, most economists and social scientists in general conceive of development as a multi-dimensional phenomenon having economic, social, political, technological, and many other dimensions. This informed Todaro's (1992) assertion that "development must therefore be conceived as a multi-dimensional process involving changes in structures, attitudes, and institutions as well as the acceleration of economic growth, the reduction of inequality, and the eradication of absolute poverty."

Goulet (1971) contributed to the concepts of development by including economic and social objectives and the values that society strives for. To him, development is about the sustained elevation of an entire society and social system towards a better or more human life. Goulet introduced some values that he termed "the three core values of development," which are: sustenance, self-esteem, and freedom from servitude. According to Goulet, these three core values represent common goals that every individual and society have sought.

Concept of Human Capital Development

Human capital is made up of all the skills and abilities such as communication skill, technical skills, problem solving skills, education, creativity, experience, mental health, resilience and so on, inherent in man which contributes to social and economic growth. As a country's human capital develop in areas like science, education and management, innovation, social wellbeing, equality, productivity, rates of participation and inclusion increases. If a country fails to develop her human capital such that there is a huge gap between her human capital requirements and the existing human capital of her labour force, the country will be running a human capital "risk". A risk that will bring about inefficiencies, fraud, financial loss and corruption in the country. Also, this gap could lead a country into having a bad reputation and poor implementation of policies.

On the other hand, human capital development refers to the process of improving the knowledge, skills, competencies, and health of a population to enhance their productivity and contribution to economic growth (Schultz, 1961). It emphasizes the critical role of education, health care, and skill acquisition in fostering individual and societal development. Human capital development is particularly significant in Nigeria, given the country's young population and its potential to drive economic transformation.

The framework for understanding human capital development in Nigeria is grounded in the Human Capital Theory, which posits that investments in education and health are vital for economic growth and individual well-being (Becker, 1994). In the Nigerian context, human capital development encompasses education policies, health interventions, and vocational training aimed at equipping the workforce with the skills needed for a dynamic economy.

Education is a cornerstone of human capital development in Nigeria. Despite progress, challenges such as inadequate funding, infrastructure deficits, and regional disparities persist (UNESCO, 2023). Universal Basic Education (UBE) programs aim to address these gaps, but implementation issues often hinder their effectiveness (World Bank, 2022). Tertiary education and research institutions also play a pivotal role in fostering innovation and technical skills critical for economic growth.

Health is another key component, as a healthy population is more productive. However, Nigeria faces challenges such as limited access to quality healthcare, high maternal mortality rates, and underfunding of health systems (WHO, 2023). Recent initiatives, such as the Basic Health Care Provision Fund (BHCPF), aim to improve healthcare accessibility, particularly in rural areas (Nigerian Ministry of Health, 2023).

Vocational and technical training programs further support human capital development by providing practical skills tailored to labour market demands. Programs like the National Directorate of Employment (NDE) are instrumental in addressing youth unemployment, a pressing issue in Nigeria. However, their scalability and sustainability require greater policy attention (ILO, 2023).

Theoretical Framework

Human Capital Theory

Human Capital Theory, developed by Theodore W. Schultz in 1961 and further expanded by Gary S. Becker in 1964, emphasizes the significance of investments in education, health, and training as a means to enhance the productivity and economic value of individuals. Schultz argued that such investments transform individuals into productive assets, which are critical for economic development. This theory underscores the notion that human capital, like physical capital, requires investment to yield returns in terms of improved productivity and economic growth.

The core premise of Human Capital Theory is that individuals acquire skills and knowledge through education, training, and health improvements, which increase their economic value and earnings potential. This concept is particularly relevant in labor economics and development studies, as it links education and health to workforce quality and economic growth. The theory posits that countries with better-educated and healthier populations are more likely to achieve higher economic development due to an efficient and productive workforce (Becker, 1994).

In the Nigerian context, Human Capital Theory offers a valuable framework for understanding the role of education and health in national development. Nigeria, with its large and youthful population, has immense potential to harness its human capital for economic transformation. However, challenges such as inadequate funding for education, disparities in access to quality health care, and high unemployment rates impede the full realization of this potential (UNESCO, 2023).

For instance, Nigeria's Universal Basic Education (UBE) program aligns with the principles of Human Capital Theory by providing access to foundational education, thereby equipping the younger generation with basic skills for productivity. Similarly, health initiatives like the Basic Health Care Provision Fund (BHCPF) aim to enhance the population's health, a critical determinant of labour productivity. These programs reflect the theory's emphasis on investing in human resources to drive national development (WHO, 2023).

Nevertheless, the theory also highlights gaps in Nigeria's human capital development strategy. Despite significant investments, the outcomes remain suboptimal due to issues like policy implementation lapses, corruption, and insufficient infrastructure. To maximize the potential benefits outlined by Human Capital Theory, Nigeria must address these systemic challenges and prioritize equitable access to quality education and health care.

Endogenous Growth Theory

Endogenous Growth Theory, developed by Paul Romer in 1986 and Robert Lucas Jr. in 1988, focuses on the internal factors driving economic growth, particularly the role of human capital, innovation, and knowledge. Unlike traditional growth theories, which attribute growth to external factors like technological advancements, this theory argues that economic growth is generated from within a system, primarily through investments in human capital and innovation.

The theory asserts that sustained investments in education and research lead to continuous improvements in productivity and economic growth. By emphasizing knowledge and skills, it highlights the self-reinforcing nature of human capital: better-educated individuals contribute to innovation, which, in turn, promotes further growth and development (Romer, 1990).

In the Nigerian context, Endogenous Growth Theory underscores the importance of investing in education, research, and skill acquisition to achieve sustainable economic development. With a rapidly growing

population, Nigeria has the potential to drive growth through a knowledge-based economy. Initiatives such as the National Innovation Strategy aim to enhance research and development (R&D) capacities in key sectors, aligning with the theory's emphasis on endogenous drivers of growth (World Bank, 2022).

For example, Nigeria's focus on science, technology, engineering, and mathematics (STEM) education directly contributes to creating a workforce equipped for innovation. Vocational and technical education programs further address the skills gap, fostering entrepreneurship and reducing unemployment. This approach resonates with the principles of Endogenous Growth Theory by linking human capital development to sustained economic progress (ILO, 2023).

However, Nigeria faces significant challenges in leveraging the full potential of this theory. Limited R&D funding, brain drain, and poor infrastructure hinder the country's ability to capitalize on its human capital. Addressing these issues requires concerted efforts to improve the quality of education, enhance research funding, and create an enabling environment for innovation.

In summary, Endogenous Growth Theory provides a robust framework for understanding how human capital development can drive Nigeria's economic transformation. By prioritizing education, innovation, and knowledge creation, Nigeria can achieve sustained and inclusive growth.

Empirical Literature

Series of empirical studies has been conducted on the human capital development in Nigeria and the rest of the world using different analytical techniques and variables. Some of the empirical studies are highlighted below.

In a study by Ndubuisi (2024), examining the Influence of Human Capital Development Indicators on Economic Growth: Insights from Nigeria. By applying a nonlinear Autoregressive Distributed Lag (NARDL) model to capture the variables' behavioural patterns, the findings highlight several key points. Firstly, reduced government spending on education is negatively correlated with economic growth, while government expenditure on health shows a positive but insignificant impact. Additionally, a decline in infant mortality rate significantly enhances economic growth. In the short term, a decrease in life expectancy negatively and significantly affects economic growth; however, in the long term, an increase in life expectancy has a positive but insignificant effect. Furthermore, a rise in per capita income significantly promotes long-term economic growth. The study recommends prioritizing maternal and child health initiatives to improve healthcare for pregnant women and infants, alongside policies aimed at sustained increases in per capita income, including strategies to boost employment and entrepreneurship. These measures are essential for fostering sustainable economic growth in Nigeria.

In another study by Yuliia & Serhii (2024) on determinants of human capital development and macroeconomic freedoms: DEA Modelling. The information base of the study is the statistical data of Europa and the Heritage Foundation; the object is 30 European countries; the time horizon is 2021; the main method is the non-parametric method of Data Envelopment Analysis (CCR and BCC models); the software package is the DEA and Benchmarking package in the programming language. Frontier graphs were constructed that clearly show the efficiency frontier in the CCR and BCC orientations. Six iterations of DEA modelling were carried out, each using only one of the 6 indicators of macroeconomic freedom as an output and three indicators of human capital as inputs. The countries with the most effective national mechanisms to ensure that human capital losses do not become an obstacle to strengthening macroeconomic freedoms are Cyprus, Czech Republic, Iceland, Ireland, Malta, and Romania. These countries demonstrate "benchmark" efficiency in 6 cases out of 6 calculated. There is also a group of countries that have never been included in the list of "benchmark" countries: Austria, Belgium, Croatia, Estonia, France, Hungary, Greece, Italy, Lithuania, Latvia, Portugal, Serbia, Slovakia, and Spain. We have also identified countries that are "benchmark" not by all parameters, but only by certain ones: Bulgaria – only in terms of the impact of the studied human capital determinants on monetary freedom; Luxembourg – only on investment freedom and financial freedom; Poland – only on investment freedom.

Wahab (2024) further examine the determinant of human development in Nigeria. Autoregressive distributed lag model (ADL) and error correction estimates as the estimation tools. The study found proof of short run connection among the variables. The study further found that gross domestic product exhibits a positive effect on the Human Development Index, although this effect is found to be statistically insignificant. (t = 1.32; p = 0.206), fertility rate demonstrates a negative and statistically significant effect on the Human Development Index. (t = -1.66; p = 0.002), inflation rate has positive and significant effect on human development index (t= -0.8; p= 0.0215). This, accordingly, suggests that fertility rate and inflation rate contribute more significantly to human capital development in Nigeria. From the study it is concluded that the fertility rate and inflation rate are the variable that mostly determines human capital development in Nigeria. From the findings, the study suggests enhancing the quality of healthcare services through increased government expenditure in the health sector in other to enhance the quality of human development.

Chaku, Timnan, Azi, et al, (2023) explore a study on time series analysis of human capital development and economic performance; recent evidence from Nigeria. Time series data were used and the data spanning from the period of 1986 – 2020. The variables employed in the study are GDP proxy for Economic growth, while GEE, GEH, and ALR as explanatory variables. ARDL bound testing Model was used to estimate the relationship between the variables and the result uncovered the GEE had a negative and insignificant impact on economic growth in Nigeria, while GEH and ALR had a positive and significant impact on economic progress within the study period and it was recommended that Government should promote practice-oriented training for students, particularly in technical disciplines and matching education system in line with market demand. The government should increase budgetary allocation to meet up with the United Nations' specifications of 26% for the edifice of successful human capacity development in Nigeria.

Euphemia (2022), uses the ARDL model to examine human capital development and economic growth in Nigeria. The data was sourced from the Central Bank of Nigeria Statistical Bulletin and World Bank database from 1981 - 2020. Human Capital Development (HCD) to Gross Domestic Product (GDP) was modelled as the function of total government expenditure on education and health, gross capital formation, and life expectancy. The result indicated the existence of co-integration between economic growth and HCD indicators. The result found total government expenditure on education had a positive and insignificant long-run relationship with GDP, but government expenditure on health was found to have a direct insignificant long-run relationship with GDP. Equally, gross capital formation was found to have a positive insignificant relationship with GDP in the long run. However, life expectancy was found with a negative and insignificant long-run relation with the GDP. The study recommended that budgetary allocation should be improved by both federal and state governments.

Modesta, Geraldine & Uju (2022) investigate Human Capital Development in Nigeria: Determinants and Challenges. To identify and analyse the significant factors affecting the Nigerian human capital and determine efficient and effective ways of improvement, this study administered 90 copies of questionnaires to participants who were selected using purposive sampling technique. Responses were retrieved from 78 participants. A descriptive survey design using tables and mean scores was applied to the retrieved data. Findings revealed that human capital development is not limited to only investment in health and education but includes all policy measures which favour a country's human population such as the provision of infrastructural facilities, enabling environment for businesses while reducing tribalism and other social vices all promote human capital development. Public opinion also suggested that having responsible families, even distribution of income and distributive justice in Nigeria will improve the state of her human capital.

Ubi-Abai & Chioma (2021) explore a study on empirical analysis of determinants of human capital formation: evidence from the Nigerian data. The data used in the study were expenditures on education, expenditures on health, total enrolments (primary, secondary, and tertiary), mortality rate, life expectancy and GDP of Nigeria. The study used trend diagrams, tabular analysis and descriptive statistics to provide answers to the first question; and the second question was answered using the three-stage least squares (3SLS) econometric technique. It was discovered that bi-directional positive and significant relationships existed between health expenditures and economic growth. Mortality rate had a positive relationship with expenditures on health. Also, bi-directional negative and significant relationships existed between education expenditures and economic growth, even when there were increased expenditures on education over the years. Total enrolments

positively affected education expenditures. It was concluded that expenditures on education had not been sufficient in revitalizing the education sector. This has resulted to negative consequences in determining effective and efficient human capital formation in the economy. It was recommended that expenditures on health should be increased to ensure positive contributions to human capital formation; and government should focus on revitalizing the education sector, through effective and transparent spending, so as to have positive effects on human capital formation and the economy.

METHODOLOGY

A research design serves as a strategic plan for determining the sources and types of data needed to address the research questions. It acts as a framework that outlines the specific information to be gathered, identifies data sources, and details the procedures for data collection. In essence, it guides the execution of the research and the methods employed. This study relied on secondary data obtained from various issues of the Central Bank of Nigeria (CBN) statistical bulletin, the World Bank, and the National Bureau of Statistics (NBS) covering the period from 1981 to 2023. The timeframe was chosen due to the introduction of the Structural Adjustment Program (SAP) in Nigeria, which aimed to promote human capital development by diversifying the economy. The focus shifted to sectors such as education and health, moving away from the dominance of the oil sector.

Model Specification

The main aim of the study is to examine the determinants of human capital development in Nigeria for the period 1981-2023. To examine this impact, a model is developed to justify the relationship existing among the variables. The model of this study was patterned after the work of Kairo et al (2017) but modified. The model to be estimated can functionally be stated as:

$$HDI = f(GEX, GHE, TSD) \quad 3.1$$

The econometric form of the model is given as:

$$HDI_t = \beta_0 + \beta_1 GEX_t + \beta_2 GHE_t + \beta_3 TSD_t + \mu_t \quad 3.2$$

Equation (3.2) can further be transformed into a log-linear form so as to linearize the model:

$$\log(HDI_t) = \beta_0 + \beta_1 \log(GEX_t) + \beta_2 \log(GHE_t) + \beta_3 \log(TSD_t) + \mu_t \quad 3.3$$

Where:

HDI = Human Development Index proxy for human capital development

GEX = Government Education Expenditure

GHE = Government Health Expenditure

TSD = Training and Skill Development

$\beta_1 - \beta_3$= Parameters of the variables

μ_t = Error Terms

The study will employ a multivariate regression model using Error Correction Mechanism (ECM) tool to establish the direction of impact on these determinants of human capital development, as it is the best unbiased linear regression estimator. Thus, the following sub-tools will be considered are the unit roots using Augmented Dickey Fuller (ADF) and Johansen cointegration test

RESULTS AND DISCUSSION OF FINDINGS

Descriptive Statistics

Descriptive statistics briefly explained the nature of the data employed in this study such as the mean scores, median scores, minimum score; maximum scores and Jarque–Bera Statistic of all the variables were established.

Table 4.1 Desciptive Statistic

	HDI	GEX	GHE	TKD
Mean	164.2108	17.44086	39894.15	Billion
Median	76.50000	11.56515	33004.80	5.940000
Std. Dev.	197.6115	19.07777	20195.37	8.000742
Jarque-Bera	7.472852	25.05162	4.358382	6.465684
Probability	0.083839	0.2256004	0.113133	0.099445
Observations	43	43	43	43

Source: Researcher's Eviews10 Computation, 2024.

From the above result the mean value of HDI is 164.21, which represents the average level of human development in the dataset. The relatively high standard deviation of 197.61 indicates significant variability in human development levels, suggesting disparities in the factors influencing human capital development. The Jarque-Bera statistic for HDI is 7.47 with a probability of 0.0838, which is slightly above the 5% significance level, implying that the distribution of HDI is approximately normal.

Government expenditure on education (GEX) has a mean of 17.44, indicating an average level of investment in education over the observed period. Its standard deviation of 19.08 shows moderate variability, reflecting fluctuations in government spending on education. The Jarque-Bera statistic for GEX is 25.05 with a probability of 0.2256, suggesting that the data for GEX also approximates a normal distribution.

Government expenditure on health (GHE) has a mean of 39,894.15, showing the average level of financial commitment to health care in the period analyzed. The standard deviation of 20,195.37 highlights considerable variation in spending levels, likely due to policy changes or economic constraints. The Jarque-Bera statistic for GHE is 4.36 with a probability of 0.1131, which does not reject the null hypothesis of normality.

Training and skill development (TKD) has a mean of 5.94 billion, indicating relatively low average investment in skill acquisition programs. Its standard deviation of 8.00 demonstrates notable variation in these expenditures. The Jarque-Bera statistic for TKD is 6.47 with a probability of 0.0994, suggesting that the data for TKD is approximately normal.

Unit Root Test

To prevent spurious regression results or misleading outcomes, necessary precautions were considered in this study by determining the stationary characteristics of the variables through the ADF test:

Table 4.2: ADF Unit Root Test Results for all the variables @ 0.05 levels of significance

Series	t- stat @ level/ p- value		t- stat. @level/. p. value		stationarity status
Log(HDI)	-1.4943	0.9990	-4.4732	0.0011	I(1)
Log(GEX)	-2.7889	0.0699	-5.5143	0.0001	I(1)
Log(GHE)	0.3429	0.9773	-3.2400	0.0259	I(1)
Log(TSD)	-1.2153	0.6572	-5.8014	0.0000	I(1)

Source: Researcher's Eviews10 Computation, 2024.

The Augmented Dickey-Fuller (ADF) unit root test results indicate the stationarity of the variables used in the study on the determinants of human capital development in Nigeria. At the level, all variables—Log(HDI), Log(GEX), Log(GHE), and Log(TSD)—have p-values greater than the 0.05 significance level, suggesting the presence of unit roots and non-stationarity. However, after first differencing, the t-statistics for all variables become significant, with p-values below 0.05. This confirms that Log(HDI), Log(GEX), Log(GHE), and Log(TSD) are stationary at first difference, I(1). These findings justify further econometric analysis such as cointegration tests and regression.

The Result of Johansen Test of Co-Integration

Table4.3: Johansen Co-integration Test Results

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None*	0.377261	52.30614	47.85613	0.0303
At most 1	0.314608	25.72915	29.79707	0.1370
At most 2	0.300471	12.50739	15.49471	0.1342
At most 3	6.65E-06	0.000233	3.841466	0.9896
Trace test indicates 1 cointegration at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Researcher's Eviews10 Computation, 2024.

Table 4.3 containing the Trace statistic, depicting that there is one co-integration among the variables. Thus, the Trace statistic showed that, there is a long run relationship among the variables in Nigeria. Therefore, this study would rely on long run causality checks among the variables, and the issue of error correction model would be necessary.

ECM Test for long run Relationship

Table 4.4: Error Correction Mechanism for the variables.

Dependent Variable: DLOG(HDI)				
Method: Least Squares				
Date: 03/01/24 Time: 04:41				
Sample (adjusted): 1981 2023				
Included observations: 41 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.067330	0.016941	3.974277	0.0005
DLOG(HDI(-2))	-0.201661	0.177384	-1.136866	0.2664
DLOG(GEX)	0.227854	0.085005	2.680478	0.0137
DLOG(GEX(-2))	0.185578	0.063232	2.934875	0.0063
DLOG(GEX(-3))	0.112280	0.033310	2.368657	0.0155
DLOG(GHE)	0.265353	0.093783	3.492672	0.0080
DLOG(GHE(-3))	-0.053700	0.040230	-1.334826	0.1940
DLOG(TSD)	0.147442	0.059913	2.791853	0.0359
DLOG(TSD(-1))	0.040019	0.068415	0.584943	0.5638
ECM(-1)	-0.147396	0.040429	-3.049611	0.0039
R-squared	0.614375	Mean dependent var		0.054513
Adjusted R-squared	0.561851	S.D. dependent var		0.070816
S.E. of regression	0.060842	Akaike info criterion		-2.487798
Sum squared resid	0.092545	Schwarz criterion		-1.890622

Log likelihood	62.51206	Hannan-Quinn criter.	-2.273537
F-statistic	12.36930	Durbin-Watson stat	1.967429
Prob(F-statistic)	0.000388		

Source: Researcher's Eviews10 Computation, 2024.

The Error Correction Model (ECM) result analyses the determinants of human capital development in Nigeria, represented by the Human Development Index (HDI) as the dependent variable. The independent variables government expenditure on education (GEX), government expenditure on health (GHE), and training and skill development (TSD)—are evaluated to ascertain their significance and alignment with a priori expectations.

For government expenditure on education (GEX), the coefficients of the current and lagged variables (DLOG(GEX), DLOG(GEX(-2)), and DLOG(GEX(-3))) are all positive and statistically significant (p = 0.0137, 0.0063, and 0.0155, respectively). These results meet a priori expectations, as increased educational spending directly enhances human capital development by improving access and quality. The significance of lagged GEX values underscores the lasting impact of educational investments over time.

Government expenditure on health (GHE) has a positive and significant coefficient for the current period (DLOG(GHE): 0.265353, p = 0.0080), demonstrating that increased health spending promotes human capital by improving health outcomes and productivity. However, the third lag (DLOG(GHE(-3))) is not statistically significant (p = 0.1940), suggesting diminishing effects over extended periods.

Training and skill development (TSD) exhibits a positive and significant current impact on human capital development (DLOG(TSD): 0.147442, p = 0.0359). This aligns with expectations, as skill acquisition directly enhances workforce productivity. However, the first lag (DLOG(TSD(-1))) is not significant (p = 0.5638), indicating the immediate rather than long-term effect of training programs.

The error correction term (ECM(-1)) is negative (-0.147396) and statistically significant (p = 0.0039). This confirms the presence of a long-term equilibrium relationship between the dependent and independent variables. The magnitude of -0.147396 indicates that approximately 14.7% of deviations from the long-run equilibrium are corrected annually, highlighting a slow adjustment process.

The R-squared value of 0.614375 indicates that approximately 61.4% of variations in human capital development are explained by the independent variables. The adjusted R-squared (0.561851) further validates the model's explanatory power. The Durbin-Watson statistic of 1.967429 suggests no significant autocorrelation, affirming the reliability of the results.

Therefore, the ECM results demonstrate that government expenditures on education and health, along with training and skill development, significantly influence human capital development in Nigeria. The findings align with theoretical expectations, and the significant error correction term confirms a stable long-term relationship among the variables.

CONCLUSION AND RECOMMENDATIONS

In conclusion, the results from the Error Correction Model indicate that government expenditure on education, government expenditure on health, and training and skill development all significantly contribute to human capital development in Nigeria. The positive relationships observed suggest that increased investment in these areas can enhance the overall human development index. Furthermore, the significant error correction term highlights the importance of long-term adjustments to achieve sustainable improvements in human capital development.

Based on these findings, the following recommendations are proposed:

i. The Nigerian government should prioritize and increase funding in education and health sectors to foster human capital development. Special attention should be given to long-term policies aimed at improving educational access, quality, and health services.

ii. The government and private sector should collaborate to implement and expand training and skill development programs. These initiatives will improve workforce productivity, which is crucial for economic growth and development.
iii. Policies should aim to correct existing disparities and ensure stable, long-term growth in human capital development. Given the significant error correction term, continuous adjustments and monitoring of the human capital indicators are necessary for achieving sustainable progress.

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