Economic Performance and Human Development in Nigeria

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Abstract

The study empirically examines economic performance and human development in Nigeria, employing the Human Development Theory as its conceptual framework. The stationarity status of the variables was investigated using the Augmented Dickey Fuller unit root test, revealing the presence of unit roots which were then differenced to achieve stationarity. Subsequently, the long-run equilibrium relationship among the variables was assessed using the Johansen cointegration test, confirming the existence of cointegration among them. Granger causality tests and regression analysis were conducted to further explore the relationships. Education expenditure was used as a proxy for human development, while RGDPGR, INF, and UNEPL were employed as proxies for economic performance indicators. The results indicate that the regressors have a positive and significant impact on human development, suggesting a bidirectional causality between economic performance and human development in Nigeria. Moreover, the regression results demonstrate that education expenditure significantly and positively influences Nigeria's economic performance, particularly in terms of RGDPG and INFL. Based on these findings, the study recommends strategies such as fostering job creation, sustaining growth, ensuring adequate skill acquisition to match the growth in capital-intensive infrastructure, and diversifying the economy to enhance productivity and foster economic growth.

Keywords: *Economic performance, Human capital Development, Niger*

1.1 Background to the Study

Economic performance refers to the expansion or contribution of an economy and signifies a nation's ability to create and sustain a healthy economic environment. It is typically assessed through various economic indicators such as GDP (well-being index), inflation rate, unemployment rate, productivity, balance of payment, and public debt. Economic performance is crucial for a country's development as it directly impacts the well-being of its citizens. The Economic Performance Index (EPI) is a metric used to measure economic performance, calculated as (100% - INFLR – UNEMPR – BD/GDP + ΔGDP%). The EPI ranges from 1 to 100, with specific score ranges indicating different levels of performance. For instance, scores between 96 and 100 are classified as excellent performance, while scores between 1 and 59 indicate failed economic performance. In Nigeria, the EPI ranged from 68.5 in 2010 to 70.8 in 2014, but declined to 64.8 in 2017, signifying poor economic performance during this period. Furthermore, statistics reveal that Nigeria's economic performance deteriorated from a poor

state to a failed state in 2020, primarily due to the decline in crude oil prices caused by falling global demand and COVID-19 containment measures.

The containment measures implemented to combat the spread of COVID-19 adversely affected various sectors of the Nigerian economy, including manufacturing, trade, and tourism. This contraction in sectors offset the demand-driven expansion observed in the financial sector. Consequently, Nigeria's real GDP contracted by an estimated 3% in 2020, while inflation surged to 12.8%, reaching 16.7% in the second half of 2022. Other contributing factors to Nigeria's economic challenges include high levels of public debt, with total debt standing at $85.9 billion (25% of GDP) in 2020. Moreover, domestic debt accounted for 63% of the total debt, with external debt comprising the remaining 37%. The substantial debt service payments, estimated to exceed half of federal revenues, coupled with macroeconomic imbalances and policy uncertainties, have hindered the country's ability to attract external private financial flows.

Additionally, Nigeria faces significant socio-economic challenges, including a high unemployment rate of 27%, with poverty levels at 40% and growing inequality. These issues pose significant obstacles to assessing Nigeria's economic performance effectively. Despite being the largest economy in Africa, Nigeria's economic growth was projected to reach 2.9% in 2020 before the COVID-19 pandemic disrupted the global economy. The country boasts a diverse economy with robust agricultural, human, and natural resource bases. However, institutional corruption, political instability, and inadequate infrastructure continue to hinder Nigeria's economic development efforts.

Human development encompasses the expansion of human capacities through education, skills, innovation, health, and creativity. This development of human capital, along with physical and natural capital, is essential to support economic growth and performance. A sustained increase in productivity can be achieved by developing human capital through improved health, training, technological advancement, and education of citizens or personnel. Human development has been widely acknowledged as a fundamental factor in economic growth and performance. The application of knowledge plays a crucial role in human development, driving performance forward. Despite advancements in technology such as computers and modern automated machines, human resources remain the most significant factor of production in the twenty-first century. Human resources are defined as the stock of competencies, knowledge, and personality embodied in the ability to strengthen labor to produce economic value.

The concept of human development is measured holistically by the Human Development Index (HDI), a composite statistic developed by the United Nations used to rank countries' levels of human development. The HDI is computed using indicators such as life expectancy, mean years of schooling, expected years of schooling, healthcare, and per capita income. Investing in human capital is crucial for economic performance in national economies or societies. According to Alkire (2010), the goal of human development is to increase an individual's freedom by empowering them to pursue their values and applying knowledge to drive economic growth. Human development has long been recognized as a vital component of economic growth and performance.

2.1 Literature Review

2.1.1 Human Development

The concept of human development was initially introduced in 1990 by incorporating criteria such as enhancing an individual's skills and ability to determine their own destiny alongside income level. This concept has significantly influenced discussions on improving quality of life. The Human Development Index (HDI), a composite of indicators including life expectancy, education, and income, serves as the primary assessment of Africa's human development. Countries worldwide are categorized into four groups based on their level of development: very high, high, medium, or low. Africa's progress in human development is exemplified by Seychelles achieving a very high human development ranking, surpassing wealthier states in Europe and the Middle East.

Human development encompasses the social and economic dimensions of a country, reflecting the health of its people, their educational attainment, and their standard of living. The HDI serves as a metric to underscore the importance of people and their capabilities in assessing a country's progress. It can also be used to scrutinize national policy choices, questioning why two countries with similar gross national income per capita may yield different human development outcomes. These disparities can spark debates about government policy priorities.

The HDI is a summary measure of average achievement in key aspects of human development, including longevity, education, and standard of living. It is calculated as the geometric mean of standardized measures for each of these dimensions. According to the UNDP, the HDI measures a nation's average achievement in human development using three composite indicators: life expectancy at birth, education (measured by mean years of schooling and literacy rate), and per capita income. Many countries adopt the HDI to gauge the progress of their human development process. In 2010, the UNDP updated the HDI measurement methodology after two decades.

2.1.2 Human Development Index (HDI)

The Human Development Index (HDI) serves as a composite measure designed to evaluate long-term advancements in three fundamental aspects of human development: longevity, education, and standard of living. Longevity is assessed by life expectancy, while access to knowledge is quantified through mean years of schooling for the adult population and expected years of schooling for children entering school. Standard of living is measured by Gross National Income (GNI) per capita, expressed in constant 2005 international dollars and adjusted using purchasing power parity (PPP) rates.

To ensure maximum comparability across countries, the HDI relies primarily on international data from authoritative sources such as the United Nations Population Division, the UNESCO Institute for Statistics (UIS), and the World Bank. It's important to note that the HDI values and rankings in the current report cannot be directly compared to those in previous reports, including the 2011 Human Development Report (HDR), due to revisions made to the component indicators by the relevant agencies. In order to facilitate the assessment of progress in HDIs, the 2013 report includes recalculated HDIs from 1980 to 2012

2.1.3: Nigeria's HDI Value and Rank

Nigeria's HDI value for 2012 stands at 0.471, categorizing the country under the low human development category and positioning it at 153 out of 187 countries and territories. From 2005 to 2012, Nigeria's HDI value rose from 0.434 to 0.471, marking a 9 percent increase or an average annual growth rate of about 1.2 percent.

In 2011, Nigeria's HDI rank, based on data available in 2012 and methodologies used at that time, was 154 out of 187 countries. However, comparing values and rankings with those of previous reports could be misleading due to changes in underlying data and methodologies. A review of Nigeria's progress across each HDI indicator reveals significant advancements. Between 1980 and 2019, Nigeria's life expectancy at birth increased by 6.8 years, mean years of schooling rose by 0.2 years, and expected years of schooling saw a growth of 2.4 years. Additionally, Nigeria's GNI per capita experienced a rise of about 34 percent during the same period.

2.1.4: Nigeria's Human Development Index Value and Rank

Nigeria's HDI value for 2019 stands at 0.539, categorizing the country in the low human development category and positioning it at 161 out of 189 countries and territories. From 2005 to 2019, Nigeria's HDI value increased from 0.465 to 0.539, marking a 15.9% increase. Similarly, between 1990 and 2019, Nigeria's life expectancy at birth increased by 8.8 years, mean years of schooling increased by 1.4 years, and expected years of schooling increased by 3.3 years. Nigeria's GNI per capita experienced a growth of about 5.0% during the same period (UNDP Human Development Report, 2020).

Moreover, the HDI masks inequality in the distribution of human development across the population at the country level. The Inequality-adjusted Human Development Index (IHDI) accounts for inequalities. The loss in human development due to inequality, expressed as a percentage, is the difference between the HDI and IHDI. As inequality increases within a country, the loss in human development also increases. The coefficient of human inequality, an unweighted average of inequalities in three dimensions, serves as a direct measure of inequality.

In Nigeria's case, the HDI for 2019 was 0.539. However, when discounted for inequality, the HDI falls to 0.348, indicating a loss of 35.4% due to inequality in the distribution of HDI dimension indices. Congo (DR) and Ethiopia also show losses due to inequality of 30.2% and 28.2%, respectively. The average loss due to inequality for low HDI countries is 31.4%, while in Sub-Saharan Africa, it is 30.5%. Nigeria's human inequality coefficient stands at 35.2% (UNDP Human Development Report).

2.2: Theoretical Framework

2.2.1 Human capital Theory

This theory was developed by Gary Becker, Theodore Schultz, and Rosen in the 1950s and early 1960s. The theory states that employees and capital equipment are the primary factors of production in organizations. The desired production level of any economy depends on these two major factors. Individual workers possess a set of skills or abilities that they can improve

or accumulate through training and education. People bring varying levels of education, knowledge, ability, and skills to the labor market, along with their expectations. A more educated and better-trained individual is capable of providing a larger quantity of effective productive effort than one with less education and training. The value of human capital theory is widely recognized as a crucial concept for value creation to improve both national and organizational performance.

Theodore W. Schultz (1961), in the American Economic Review, introduced the term "investment in human capital." After Gary Backer won the Nobel Prize for Literature, he argued that different levels of education and training lead to varying levels of earnings and incomes, and that individuals with more knowledge, skill, and ability are more likely to acquire better jobs. Talent is an intrinsic trait of human development that can be enhanced through training and education. However, no human development can occur without drawing resources from a growing economy. Thus, the nexus between economic growth and human development cannot be overemphasized but requires empirical evidence to examine the direction of causality.

2.3 Empirical Literature

Wirajing & Etape (2023) investigate the impact of human capital on economic growth in 48 African countries from 2000 to 2019. They employ the system GMM technique to address potential sources of endogeneity. The findings reveal a positive influence of human capital development on economic growth in Africa. Additionally, the study suggests that both male and female genders play crucial roles in human capital development for the economic growth of African countries. Furthermore, the study highlights that internet penetration and foreign direct investments interact with human capital to yield positive net effects on economic growth. It recommends policymakers allocate more resources to the education and health sectors to enhance human capital development as a prerequisite for ensuring stable economic growth.

Berloffa and Giunti (2019) examined how human capital investment through health expenditures responds to shocks from international remittances received by households. Analyzing data from 24,700 households in the Peruvian economy, the study utilized the almost ideal demand system estimation with instrumental variable estimation technique. Results indicated that remittances significantly impact human capital investment, leading to increased household expenditures on health and housing—a major component of human capital investment. In a similar vein, Chung and Partridge (2019) investigated if the Mariel boatlift caused a permanent shock in the future human capital development of Miami. Employing structural equation modeling and estimating the root mean square percentage error loss, the study's results show that the Mariel boatlift, which led to a decrease in the level of average skills, caused a long-lasting, permanent shock on human capital development.

Michael et al. (2019) conducted an empirical examination of the impact of human development on economic growth and development in African countries between 1990 and 2015. The study utilized panel data and the Ordinary Least Squares method of analysis. Their key findings suggested a positive and significant impact of human development on economic growth and development in Africa. The Human Development Index was the main variable of interest, with GDP considered as the dependent variable and inflation, capital, investment, and labor as control variables. Additionally, the study found a positive and significant relationship between

labor, foreign aid, and growth. Consequently, the study concluded that human development significantly and positively influenced economic growth in African countries, recommending increased efforts in developing human capacities across all areas.

Kaya (2018) examined the effect of financial market development on human development. The study measured the level of financial market development with the Borsa Istanbul 100 Index (BIST) growth rate and used the Human Development Index developed by UNDP to represent human development. Employing the Johansen-Juselius Cointegration test to determine the existence of a long-term relationship between the variables, the study found that both dependent and independent variables are related in the long term. Furthermore, the HD index Granger caused the BIST index.

Onabote, Ohwofasa & Ogunjumo (2023) explored the effects of government sectoral spending on human development in Nigeria using annual data spanning the period 1986–2021. This study contributed to the literature by examining the effects of government sectoral spending on human development using a robust human development index that captures the multifaceted state of economic development in terms of educational attainment, life expectancy, and per capita income. Unlike previous studies that focused on aggregate government spending and used gross domestic product as an indicator of development, this study provided surprising results. The Autoregressive Distributed Lag (ARDL) model employed indicated that, both in the short and long run, there is no link between government sectoral spending and human development in Nigeria. However, outcomes from ECMs suggest that government sectoral spending may affect human development in the long run.

Euphemia (2022) investigated the relationship between human capital development and economic growth in Nigeria from 1981 to 2020. The study utilized time series data from the CBN statistics bulletin and the World Bank database for the mentioned period. Augmented Dickey Fuller test and the Autoregressive Distributed Lag framework were employed to assess the data's stationarity, Johansen co-integration, and vector error correction model. The results indicated a positive correlation between economic growth and human development. Consequently, it was concluded that economic growth and human development are positively related. The study recommended increased budgetary allocations to the health sector by both state and federal governments.

Deinibiteim and Emeh (2021) examined the impact of human resource development on economic growth in Nigeria from 1980 to 2019. They collected data on real gross domestic product, government health spending, and the human development index from the CBN Statistical Bulletin, the World Bank's World Development Indicator, and UNDP. The study utilized the Augmented Dickey Fuller unit root test, Johansen co-integration test, and error correction mechanism (ECM) approach of econometrics. The findings indicated a long-term relationship among the variables, with raising government spending on healthcare, education, and the human development index significantly boosting Nigeria's economic growth during the study period. The study concluded that improving human resources through public investment in the health and education sectors is essential for sustainable economic growth in Nigeria. Consequently, the government should channel more funds to health to improve standards and reduce the mortality rate of citizens, recognizing a healthy population as a major component for rapid and sustainable productivity and growth.

Sunday (2021) empirically examined the relationship between human capital and economic growth in Nigeria from 1981 to 2017. The study employed time series data and utilized the Vector Autoregressive and Johansen Technique. The findings revealed a significant long-term impact of human capital on Nigeria's economic growth, emphasizing the importance of human capital. However, the study identified a need for appropriate methodologies to address the relationship between human capital development and economic growth effectively.

The impact of human capital on economic growth in Nigeria was examined by Bachama, Hassan, and Ibrahim (2021) using time series data from 1970 to 2019. Their research demonstrated a positive and significant relationship between economic growth and spending on health and education, both in the short and long term. However, labor had a major negative impact on economic growth. They recommended that the Nigerian government focus on enhancing the health and education sectors and create more job opportunities through skill development and vocational training to lower the unemployment rate. The study highlighted the importance of employing suitable methodologies to investigate the connection between human capital development and economic growth in Nigeria accurately.

Muhammad (2020) investigated the impact of human development on economic growth across twenty-five (25) countries worldwide. The study encompassed both developed and developing nations, utilizing panel data obtained from the World Development Indicators. It employed Ordinary Least Square, Fixed effect, and Random effect methods of data analysis. The findings revealed a positive and significant relationship between human development and economic growth for both types of countries. Thus, the study concluded that human development significantly and positively affected economic growth.

Olopade, et al (2020) explored the relationship between technology, human capital, and economic growth, aiming to establish their implications on Nigeria's knowledge-based economy. Utilizing data from secondary sources and adopting a new growth model, the study analyzed the relationship between gross capital formation, government expenditure on education, and the level of real output as the dependent variable. The causality test results showed a uni-directional relationship running from gross capital formation to real output. However, human capital formation and real output growth did not Granger cause each other, while causality ran from human capital to capital formation and vice versa. The study concluded that Nigeria's identification of global knowledge strands had been slow due to weak institutions, limited awareness, and disincentives hindering progress toward a knowledge and information-based economy. Based on the findings, the study recommended strategies to incorporate education into the growth system, encourage research and development, and implement policies promoting output through savings.

Sydney and Okafor (2019) estimated the two-way causality between economic growth and human development in Nigeria from 1961 to 2015. Time series data from both the CBN and World Bank Development Index were utilized. Three statistical frameworks—Gregory-Hansen Co-integration, Stock Watson Dynamic Ordinary Least Square, and Vector Error Correction Model—were employed for analysis. The estimated results indicated that economic growth and human development are co-integrated over the long term. Despite this long-term association, only economic growth was found to have a positive impact on human development, with no evidence of reverse causality.

Aliyu, Ndagwakwa, Zirra, Salam, and Mohammed (2019) conducted an examination on the impact of fiscal policy on economic performance in Nigeria between 1981 and 2016. They developed a model expressing economic growth as a function of government total expenditure, government total revenue, direct tax, capital (represented as gross capital formation), and labor (represented as the employment rate). Augmented Dickey Fuller test, Cointegration test, and Error Correction model estimation were employed for data analysis. The study concluded that fiscal policy was partially effective in influencing economic growth (surrogate of economic performance) in Nigeria during the mentioned period.

Nnenna, Stanley, and Ijeoma (2017) investigated the effect of government expenditure on human capital development in Nigeria using time series data from 1986 to 2015, obtained from the Central Bank of Nigeria (CBN) statistical bulletin. The study employed Vector Autoregression (VAR) analysis as its method of analysis. The VAR model results showed that the Human Development Index (HDI) is significant in the current year but tends to converge insignificantly in previous years. The study highlighted that the nature, pattern, and level of governmental expenditure in education and health influence human capital development in Nigeria, suggesting targeted government policies in these areas.

Adeyemi and Ogunsola (2016) investigated the effect of human capital development on economic growth in Nigeria using time series data from 1980 to 2013. The study employed ARDL Cointegration analysis to determine the link between the variables under investigation. The research revealed long-run co-integration among the variables. The results indicated a long-term positive association between secondary school enrollment, public education spending, life expectancy rate, gross capital formation, and economic growth, although statistically insignificant. Conversely, a negative long-term association was found between primary and secondary school enrollment, public health spending, and economic growth. The study recommended that the government implement education and training policies to enhance primary and tertiary education quality and allocate more resources to the health sector to improve human capital development.

Egulonu and Eke (2015) examined the impact of the human development index on economic development in Nigeria from 2005 to 2013 using the Probability Distribution Approach. The study concluded that Nigeria still has a high chance of remaining in the low human development category despite recent economic growth. They recommended that the government re-evaluate current development plans to facilitate progress toward development.

Jaiyeoba (2015) investigated the connection between human capital investment and economic growth in Nigeria using time series data from 1982 to 2011. The study employed trend analysis, Johansen co-integration, and the ordinary least squares method. Empirical results suggested a long-term connection between government spending on health, education, and economic expansion. Most variables, including gross fixed capital creation, secondary and tertiary enrollment rates, and health and education spending, showed anticipated positive trends and were statistically significant. The study emphasized the importance of health and education policies in accelerating growth and breaking the cycle of poverty in Nigeria.

Muhammad (2020) asserted that human development positively and significantly affected economic performance. Masaguset et al. (2022) emphasized that public health had a positive effect on economic performance. Gokhan et al. (2021) concluded that human development had

a positive impact on performance. Michael et al. (2019) suggested that human development had a positive impact on performance. Boachie (2015) suggested that healthcare significantly and positively affected economic performance, while Euphemia (2022) suggested a positive correlation between economic performance and human development. Sunday (2021), among others, contributed to this body of knowledge. However, none of these studies explored the impact of economic performance, in terms of unemployment and real GDP growth rate, on human development in Nigeria. Therefore, the impact of economic performance on human development remains unexplored.

3. Research Methodology

3.1 Research Design

The study is structured to empirically explore the impact of economic performance on human development in Nigeria. Therefore, an Ex post facto design is employed, as the investigation commences after the facts have already been documented (Anika, 2019). This approach utilizes time series data that have previously been documented by research institutions like the Central Bank of Nigeria. Consequently, parametric estimations will be utilized to validate the nature, magnitude, and possible direction of the relationship among the target variables. The adoption of an Ex-post facto design for this study is based on its reliance on historical data, without manipulation or control of the relevant explained and explanatory variables under examination. Data pertinent to this study were sourced from secondary sources.

3.2 Data Sources

The primary data source for this study is secondary data, which is further categorized into raw secondary data, characterized by minimal processing, and compiled secondary data, which undergoes some degree of selection or summarization. Additionally, secondary data is categorized based on its sources. According to this classification method, there are two types: The data for variables such as human development, proxied by education expenditure, were obtained from Nigeria's economic performance indicators, including the unemployment rate, inflation rate, and real GDP, sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin 2022 and the World Bank Development Indicators. Human development, measured in terms of education expenditure, serves as the dependent variable, while the explanatory variables include real GDP growth rate, inflation rate, and unemployment rate, covering the period from 1985 to 2021.

3.3 Model Specification

To mitigate the issue of multicollinearity among the explanatory variables, this study employs three simple regression models to address its objectives. These models are crafted based on the principles of "Human Capital Theory," which asserts that talent is an inherent aspect of human development. The theory posits that the development of individuals can be enhanced through education and training, thereby increasing productivity. Moreover, human development is reliant on drawing resources from a growing economy. Therefore, human development (measured by the Human Development Index, HDI) is considered a function of economic growth (represented by GDP Per Capita and Real GDP growth rate). The models are delineated as follows:

EDUEXt = f(RGDPt)………………………………………………………………………….(3.1)
EDUEXt = f(IFRt)………………………………………………………….……………….(3.2)
EDUEXt =f(UNEMPRt)……………………………………..………………….(3.3)
By applying the above model to our variables, the functional model becomes:

$EDUEX_t = f(RGDP, IFR, UNEMPR)$ ……………………………………………….. (3.4)

Econometric form of equation (3.4)

$EDUEX_t = \alpha_0 + \alpha_1 RGDP_t + \alpha_2 IFR_t + \alpha_3 UNEMPR_t + \mu$…………..………………… (3.5)
Where;

EDUEXt	=	Education expenditure (Human development) at time "t"
RGDPt	=	real gross domestic product at time "t"
IFRt	=	inflation rate at time "t"
UNEMPRt	=	unemployment rate at time "t"
μ_t	=	Error Terms or Stochastic Variable in time "t"
a_0	=	Constant Terms
$a_3 - a_5$	=	Parameters Estimates

A priori Expectations

Drawing from the fundamental assumption of the theory, which posits that human development relies on resources derived from a robustly performing economy, it is anticipated that real GDP will exert a positive influence on human development. Conversely, it is expected that inflation rate and unemployment will exert negative impacts on human development.

3.4 Method of Data Analysis

The study employed a multivariate regression model utilizing the Ordinary Least Squares (OLS) regression tool to ascertain the direction of causality between economic performance and human development, as it is considered the most suitable linear unbiased estimator.

3.4.1 Unit Root Test and Co-Integration Test

The unit root test is employed to assess the reliability of the series and determine its stationarity. Following the assertion by Gujarati and Porter (2009) that time series data often encounter stationarity issues, this study subjected all its series to the Augmented Dickey Fuller (ADF) unit root test to prevent obtaining spurious results. Originally introduced in 1979, the Dickey Fuller test exhibited limited explanatory power. Consequently, its co-founders, Dickey and Fuller, developed a more robust and reliable test of stationarity in 1984, known as the Augmented Dickey-Fuller (ADF) test. Similar to the Dickey Fuller test, the ADF statistic yields a negative value, with a greater negativity suggesting a stronger inclination towards rejecting the null hypothesis. The null hypothesis posits the presence of a unit root in the time series, indicating non-stationarity (H0: φ=0). Conversely, the alternative hypothesis suggests the absence of a unit root, signifying stationarity (H1: φ<0). The equation for the Augmented Dickey-Fuller (ADF) unit root test is presented as follows:

$\Delta Y_t = \alpha Y_{t-1} + \sum_{i=1}^{m} B \Delta Y_{t-1} + \delta + Y_t + \varepsilon_t$ (For levels) ………………..……………………… (3.6)

$$\Delta\Delta Y_t = \alpha\Delta Y_{t-1} + \sum_{i=1}^{m} B\Delta\Delta Y_{t-1} + \delta + Y_t + \varepsilon_t \text{ (For first difference) } \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.7)$$

Where;

Δ Y is the first difference of the series, m is the number of lags and t is the time.

3.4.2 Test of Co-integration

To determine the long-run relationship between economic growth, represented by GDP per capita, real GDP, and real GDP growth rate, and human development, as proxied by the human development index, the study employed the Johansen co-integration test. Co-integration refers to the existence of a long-term or equilibrium relationship among two or more variables (Gujarati, 2003). While individual time series in a model may exhibit spurious behavior, their linear combinations might not. Hence, the co-integration test serves to validate such relationships. After confirming the stationarity of the variables, the study conducted a Bounds test for co-integration on the specified models to ascertain the existing relationships among the variables. This test helps determine whether to conduct short-run or long-run (Error Correction Model, ECM) estimations.

The Error Correction Model (ECM) was then utilized to examine the dynamic relationship between the variables in the long run. The ECM assesses the extent of adjustment from the short to the long-run equilibrium level. A higher coefficient of the parameters in the ECM signifies a slower speed of adjustment of the model from the short run to the long run. Additionally, Pesaran, Shin, & Smith (2001) introduced a more flexible model for co-integration testing called the bounds testing technique or the Autoregressive Distributed Lag (ARDL) approach. The bounds technique offers three key advantages: Firstly, the ARDL model allows for the estimation of level relationships through Ordinary Least Squares (OLS) once the order of ARDL is determined. Secondly, it accommodates a mix of I(1) and I(0) variables as regressors. Thirdly, it is suitable for small or finite sample sizes (Pesaran et al., 2001). The bounds testing approach involves estimating the following equations.

$$\Delta\omega_t = \alpha + \beta t + \gamma\omega_{t-1} + \sum_{i=1}^{m} \varphi_i \Delta V_{t-i} + \sum_{i=1}^{m} \pi_i \Delta u_{t-i} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.8)$$

Where:
ωt = a column vector of dependent variables, vt and ut
$\triangle$= First-difference operator.
The lag length is determined empirically using the model selection criteria of Akaike information. The long-run multiplier matrix is:

$$\beta = \begin{pmatrix} \beta_{vv} & \beta_{vu} \\ \beta_{uv} & \beta_{uu} \end{pmatrix} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.9)$$

The diagonal elements of the matrix are unrestricted, allowing the selected series to be either I(0) or I(1). If βvv=0, then Y is I(1). Conversely, if βvv<0, then Y is I(0). Thus, the test also serves as a unit root test.

The null hypothesis ($H0$) for the yt equation is $\beta vv=\beta vu=0$ (no long-run relationship is present). Against this, the alternative hypothesis ($H0$) is $\beta vv\neq\beta vu\neq0$ (a long-run relationship exists).

Similarly, the corresponding test hypothesis for the xt equation can be derived from the long-run multiplier matrix.

3.4.3 Pairwise Granger Causality Test

This indicator tests the direct relationship between economic performance and human development, determining whether it will be unidirectional causality or bidirectional causality.

3.5 Evaluation Techniques

This study utilized three fundamental criteria for evaluating the results of parameter estimation. These criteria aid in testing the accuracy and reliability of the parameter estimates in the model and confirming whether they are theoretically meaningful and statistically significant. The three basic evaluation criteria employed in this study include the economic a priori criterion, statistical criterion, and econometric criterion, respectively (Koutsoyiannis, 1997).

4. Data Presentation, Analysis Discussion of Findings

This study also investigates the direction of causality between economic performance, proxied by inflation rate, real GDP, and unemployment rate, and human development, proxied by education expenditure in Nigeria from 1985 to 2021. The data in this study were analyzed using descriptive and empirical analyses, and the findings were subsequently discussed.

4.1 Descriptive Statistics

Descriptive statistics provided a brief overview of the data used in this study, including mean scores, median scores, minimum scores, maximum scores, and the Jarque–Bera Statistic for all variables.

Table 4.1 Desciptive Statistic

	EDUEXP	INFLRATE	RGDP	UNEMPRATE
Mean	164.2108	17.44086	39894.15	Billion
Median	76.50000	11.56515	33004.80	5.940000
Maximum	646.7475	76.75887	72393.67	27.40000
Minimum	0.225005	0.223606	16997.52	1.800000
Std. Dev.	197.6115	19.07777	20195.37	8.000742
Skewness	1.100824	1.757106	0.435313	1.007467
Kurtosis	2.997634	4.974845	1.561574	2.633943
Jarque-Bera	7.472852	25.05162	4.358382	6.465684
Probability	0.083839	0.2256004	0.113133	0.099445
Sum	6075.799	645.3117	1476084.	353.9300
Sum Sq. Dev.	1405811.	13102.61	1.47E+10	2304.428
Observations	37	37	37	37

Source: Researcher's Eviews10

The findings presented in Table 4.1 reveal that education expenditure, used as a proxy for human development, had an average value of N164.2108 billion and a standard deviation of 197.6115 throughout the study period. Its highest and lowest values were recorded at N646.7475 billion and N0.225005 billion, respectively. Similarly, the inflation rate, representing economic performance, averaged N17.44086 billion with a standard deviation of 19.07777. Its highest and lowest values were N76.75887 billion and N0.223606 billion, respectively.

Moreover, real GDP exhibited a mean of N39894.15 billion and a standard deviation of 20195.37, with its highest value reaching N72393.67 billion and its lowest at N16997.52 billion. The average unemployment rate stood at 5.940000, with a standard deviation of 8.000742. The highest recorded unemployment rate was 27.40000, while the lowest was 1.800000. All variables displayed a normal distribution, as evidenced by the probability values of the Jarque-Bera statistics (Eduexp: 0.083852, inflrate: 0.2256004, RGDP: 0.113133, and unemplrate: 0.099445), each surpassing the 0.05 threshold. Hence, these sample statistics accurately represent the population values of the variables under examination.

4.2 Data Analysis

This section played a crucial role in testing all hypotheses of the study at a significance level of 0.05, aiming to substantiate the assertions based on data obtained from the Central Bank of Nigeria spanning from 1985 to 2021.

4.2.1 Unit Root

To prevent spurious regression results or misleading outcomes, this study took necessary precautions by assessing the stationary characteristics of the variables using the Augmented Dickey-Fuller (ADF) test.: $\Delta \mathbf{Y} = \boldsymbol{\delta Y}_{t-1} + u_t$

The hypothesis is:

H_0: $\boldsymbol{\delta} = 0$

H_1; $\boldsymbol{\delta} \neq 0$

Decision rule:

If t* > ADF critical value, or the probability value is less than 0.05 ==> Reject the null hypothesis.

If t* < ADF critical value, or the probability value is less than 0.05 ==> accept the null hypothesis.

Table 4.3: ADF Unit Root Test Results for all the variables at 0.05 levels of significance

Series	t- stat @ level/ p- value		t- stat. @level/. p. value		stationarity status
Eduexp	-1.4943	0.9990	-4.4732	0.0011	I(1)
Inflrate	-2.7889	0.0699	-5.5143	0.0001	I(1)

RGDP	0.3429	0.9773	-3.2400	0.0259	I(1)
Unemprate	-1.2153	0.6572	-5.8014	0.0000	I(1)

Source: Researcher's Eviews10

Table 4.3 above presents the summary results of the Augmented Dickey Fuller unit root test for education expenditure, serving as a proxy for human development (the dependent variable), as well as for inflation rate, real GDP, and unemployment rate, representing economic performance in Nigeria. The test outcomes revealed that all variables exhibited unit roots at the level, as indicated by the probability values (0.9990, 0.0699, 0.9773, and 0.6572) for education expenditure, inflation rate, real GDP, and unemployment rate, respectively, which were greater than the 0.05 level of significance. Consequently, the null hypotheses of "unit root" were accepted.

Furthermore, this study conducted a unit root test for the series after taking the first difference. Following this adjustment, all variables became stationary, as evidenced by probability values for education expenditure, inflation rate, real GDP, and unemployment rate (0.0011, 0.0001, 0.0259, and 0.000, respectively) that were less than the 0.05 level of significance. Consequently, the null hypotheses of "unit roots" were rejected. This implies that the variables were integrated at order one - I(1), necessitating co-integration along with lag selection.

Table 4.3: Optimal Lag Selection

VAR Lag Order Selection Criteria
Endogenous variables: EDUEXP INFLRATE RGDP UNEMPRATE
Exogenous variables: C

Sample: 1985 2021
Included observations: 35

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-843.1840	NA	1.24e+16	48.41052	48.58827	48.47188
		243.9733	9.19e+12	41.19236	42.08113	41.49916
1	-700.8663	*	*	*	*	*
2	-689.7000	16.58989	1.26e+13	41.46857	43.06836	42.02082

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

4.2.2: The Result of Johansen Test of Co-Integration

The variables analyzed in this study are non-stationary, but were transformed into stationary variables by taking the first difference. Consequently, the variables have lost some long-run

properties. However, economists traditionally rely on long-run relationships among economic variables. Therefore, the co-integration test assumes significant importance in economic research. The purpose of conducting the co-integration test in this study is to empirically determine whether there is co-integration or a long-run relationship among the variables (education expenditure, inflation rate, real GDP, and unemployment rate) in Nigeria.

Table 4.4: Johansen Co-integration Test Results

Sample (adjusted): 1987 2021
Included observations: 35 after adjustments
Trend assumption: Linear deterministic trend
Series: EDUEXP INFLRATE RGDP UNEMPRATE
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.377261	42.30614	47.85613	0.1503
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 no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.377261	16.57699	27.584 34	0.6164
At most 1	0.314608	13.22175	21.131 62	0.4320
At most 2	0.300471	12.50716	14.264 60	0.0930
At most 3	6.65E-06	0.000233	3.8414 66	0.9896

Max-eigenvalue test indicates no 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

Table 4.4 presents both the Trace statistic and Maximum Eigen statistic, indicating no co-integration among the variables. Both the Trace statistic and Maximum Eigen statistic suggest no co-integration at the 0.05 significance level. Therefore, these statistics indicate that there is no long-run relationship between educational expenditure (as a proxy of human development) and economic performance (proxied by inflation rate, real GDP, and unemployment rate) in Nigeria. Consequently, this study will focus on examining short-run causality among the variables, and the consideration of an error correction model will not be necessary.

4.2.3: Regressors' t- Statistics

This test illustrates how each explanatory variable, whether lagged or current, significantly influences or impacts the dependent variable. However, it does not indicate the direction of causality.

Decision Criteria: Reject the null hypothesis if the probability value of each explanatory variable is less than 0.05.

Table 4.5 Regressors' t-statistics

Estimation Method: Least Squares

Sample: 1986 2021
Included observations: 36
Total system (balanced) observations 144

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.738286	0.110786	6.664078	0.0000
C(2)	0.412445	0.367538	2.456772	0.0486
C(3)	0.003671	0.001269	2.892633	0.0045
C(4)	-2.279067	1.029283	-2.214227	0.0089
C(5)	-61.26916	29.67620	-2.064589	0.0410

Equation: EDUEXP = C(1)*EDUEXP(-1) + C(2)*INFLRATE(-1) + C(3)
*RGDP(-1) + C(4)*UNEMPRATE(-1) + C(5)
Observations: 36

R-squared	0.970111	Mean dependent var	168.7650
Adjusted R-squared	0.966255	S.D. dependent var	198.4356
S.E. of regression	36.45238	Sum squared resid	41192.06
Durbin-Watson stat	1.753077		

Source: Researcher's Eviews10.

From Table 4.5 above, C(1) represents the lagged or last previous value of education expenditure, C(2) indicates the lagged value of inflation rate, C(3) depicts the lagged value of real GDP, C(4) indicates the lagged value of unemployment rate, while C(5) indicates the intercept term or constant, all in the short run.

Hypothesis 1: There is no significant impact of real GDP on human development (proxied by education) in Nigeria.

The probability value (0.0045) of real GDP is less than 0.05. This implies that the null hypothesis of "no significant impact of real GDP on human development (proxied by education) in Nigeria" is rejected. This means that real GDP in the last period causes or impacts education. The value of real GDP (+0.003671) also indicates that it has a positive impact on education in the previous period. Thus, economic performance has a significant impact on human development in the short run.

Hypothesis 2: There is no significant impact of inflation rate on human development (proxied by education) in Nigeria.

The probability value (0.0486) of the inflation rate is less than 0.05. This implies that the null hypothesis of "no significant impact of inflation rate on human development (proxied by education) in Nigeria" is rejected. This means the inflation rate, as a proxy of economic performance, causes or impacts education (human development) in the short run. The value of the inflation rate (0.412445) also implies that the inflation rate has a positive impact on education expenditure in the short run. Therefore, economic performance has a significant impact on human development in the short run.

Hypothesis 3: There is no significant impact of unemployment rate on human development (proxied by education) in Nigeria.

The probability value (0.0089) of the unemployment rate is less than 0.05. This implies that the null hypothesis of "no significant impact of the unemployment rate on human development (proxied by education) in Nigeria" is rejected. This means the unemployment rate, as a proxy of economic performance, causes or impacts education (human development) in the short run. The value of the unemployment rate (-2.279067) also implies that the unemployment rate has a negative impact on education in the short run. Therefore, economic performance has a significant impact on human development in the short run.

The R-squared, which is the explanatory power of the model, indicated that 97% of the variation of the dependent variable (human development) was explained by the explanatory variables (inflation rate, unemployment rate, and real GDP), which are proxies of economic performance. This means that 97% of the variation or impact of the dependent variable was attributed to the explanatory variables, while the remaining 3% was attributed to variables not included in the model of this study.

Furthermore, the Durbin-Watson statistic (1.75) showed that there is no serial correlation. Since the Durbin-Watson Statistic is approximately 2, it indicates the absence of serial or auto-correlation of the explanatory variables.

4.2.4: Granger/Wald Causality test on Lagged Explanatory Variables

For this test the following condition are considered:

Null Hypothesis: Joint lagged coefficient(s) = 0.

Alternate Hypothesis: Joint lagged coefficient(s) =\0

Decision Criteria: reject null hypothesis if the probability value of the Chi-Square statistic is less than 0.05.

Table 4.6 Granger/Wald Causality test on lagged explanatory variable
VAR Granger Causality/Block Exogeneity Wald Tests

Sample: 1985 2021
Included observations: 36

Dependent variable: EDUEXP

Excluded	Chi-sq	Df	Prob.
INFLRATE	0.208640	1	0.0078
RGDP	8.367324	1	0.0038
UNEMPRATE	2.939541	1	0.0064
All	9.266078	3	0.0260

Dependent variable: INFLRATE

Excluded	Chi-sq	Df	Prob.
EDUEXP	0.740567	1	0.0095
RGDP	1.288615	1	0.0063
UNEMPRATE	0.010973	1	0.9166
All	3.221299	3	0.3587

Dependent variable: RGDP

Excluded	Chi-sq	Df	Prob.
EDUEXP	0.662213	1	0.0058
INFLRATE	0.882902	1	0.3474
UNEMPRATE	1.414959	1	0.2342
All	5.547111	3	0.1358

Dependent variable: UNEMPRATE

Excluded	Chi-sq	Df	Prob.
EDUEXP	1.275088	1	0.0088
INFLRATE	0.300901	1	0.5833
RGDP	0.789804	1	0.3742
All	1.689451	3	0.6393

Source: Researcher's Eviews10

From the results in Table 4.7 above, the probability values of inflation rate, real GDP, and unemployment rate, which are proxies of economic performance (0.0078, 0.0038, and 0.0064 respectively), are less than 0.05. Thus, the null hypothesis of no causality is rejected. This implies that economic performance, proxied by inflation rate, unemployment, and real GDP, Granger causes or impacts human development, proxied by education expenditure, in Nigeria.

Similarly, human development, proxied by educational expenditure, Granger causes or impacts economic performance, proxied by inflation rate. This suggests that there is a bi-directional causality existing between economic performance and human development.

4.2.5 Pairwise Granger Causality test on direction of causality

This approach to causality testing establishes the direction of causality between the dependent and independent variable(s). Below are the conditions:

Decision criteria: Reject the null hypothesis if the probability value of the F-statistic is less than 0.05.

Table 4.7 Pairwise Granger Causality Test.

Pairwise Granger Causality Tests

Sample: 1985 2021
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
INFLRATE does not Granger Cause EDUEXP	36	0.67938	0.0157
EDUEXP does not Granger Cause INFLRATE		1.15766	0.0098
RGDP does not Granger Cause EDUEXP	36	6.09709	0.0189
EDUEXP does not Granger Cause RGDP		2.82392	0.0023
UNEMPRATE does not Granger Cause EDUEXP	36	0.24293	0.0254
EDUEXP does not Granger Cause UNEMPRATE		0.48944	0.0091

Source: Researcher's Eviews10

4.2.6 Education Expenditure (Human Development) and Inflation Rate (Economic Performance)

H1: inflation rate does not Granger cause education expenditure

H2: Education expenditure does not Granger cause inflation rate

From Table 4.7 above, the null hypothesis of "inflation rate does not Granger cause education expenditure" is rejected since the probability value of the F-statistic (0.0157) is less than 0.05. This implies that inflation rate Granger causes educational expenditures in Nigeria. Similarly, the null hypothesis of "education expenditure does not Granger cause inflation rate" is also rejected, as the probability value of the F-statistic (0.0098) is less than 0.05. This indicates that educational expenditure also Granger causes inflation rate in Nigeria. Therefore, there is a bi-directional causality between educational expenditure and inflation rate in Nigeria.

4.2.7: Education Expenditure (Human Development) and Real GDP (Economic Performance)

H1: Real GDP does not Granger cause education expenditure

H2: Education expenditure does not Granger cause Real GDP

From the same Table 4.7 above, the null hypothesis of "real GDP does not Granger cause education expenditure" is rejected since the probability value of the F-statistic (0.0189) is less than 0.05. This suggests that real GDP Granger causes educational expenditures in Nigeria. Similarly, the null hypothesis of "education expenditure does not Granger cause real GDP" is also rejected, with the probability value of the F-statistic (0.0023) being less than 0.05. This indicates that educational expenditure also Granger causes real GDP in Nigeria. Therefore, there is a bi-directional causality between educational expenditure and real GDP in Nigeria.

4.2.8: Education Expenditure (Human Development) and Unemployment Rate (Economic Performance)

H1: Unemployment rate does not Granger cause educational expenditure

H2: Educational expenditure does not Granger cause unemployment rate.

Based on the information presented in Table 4.7, the null hypothesis stating "unemployment rate does not Granger cause education expenditure" is rejected due to the probability value of the F-statistic (0.0254), which falls below the 0.05 threshold. This indicates that unemployment rate Granger causes educational expenditures in Nigeria. Similarly, the null hypothesis proposing that "education expenditure does not Granger cause unemployment rate" is also rejected, as the probability value of the F-statistic (0.0091) is less than 0.05. This suggests that educational expenditure also Granger causes unemployment rate in Nigeria. Consequently, there exists a bi-directional causality between educational expenditure and unemployment rate in Nigeria.

Based on the evidence provided, it can be concluded that human development Granger causes or impacts economic performance, and conversely, economic performance Granger causes or impacts human development in Nigeria.

4.3 Discussion of Findings

The empirical findings from this study indicate that there is no long-run relationship among the variables under investigation. Consequently, this study primarily relies on the short-run empirical evidence to draw its conclusions.

Education Expenditure (Human Development) and Inflation Rate (Economic Performance)

Based on the findings, it is evident that there exists a bi-directional causality between inflation rate and education expenditure. Inflation rate influences education expenditure, and conversely, education expenditure also affects inflation rate. Specifically, the study reveals that an increase in inflation rate by 1% leads to a substantial and significant rise (0.412445) in education expenditure in the short term. This positive relationship indicates that as inflation rises, so does the expenditure on education. Such an increase in education expenditure could potentially hinder human development, as it would make education more costly. This could discourage investments in education by both the government and the private sector, limiting the development of human capital in the country.

Conversely, in periods of economic prosperity characterized by low inflation rates, education expenditure tends to decrease. As a result, more resources can be allocated to develop human capital, leading to positive contributions to economic growth. Therefore, during periods of low inflation rates, greater investments in education can foster the development of human capital, which subsequently fuels economic growth and development.

Education Expenditure (Human Development) and Real GDP (Economic Performance)

The analysis reveals that real GDP, as a proxy for economic performance, Granger causes education expenditure, which represents human development. Similarly, education expenditure also Granger causes real GDP in Nigeria, indicating a bi-directional causality between the two variables in the short run. The coefficient associated with real GDP (+0.003671) further underscores its positive and significant impact on education expenditure in the preceding period. This implies that for every N1 billion increase in real GDP, education expenditure increases by N0.003671 billion.

When real GDP experiences growth, it signifies a robust economy. Consequently, there is a tendency for more resources to be allocated towards enhancing education expenditure to foster human development. Conversely, when additional funds are allocated to education expenditure to promote human capital development, it positively impacts various economic activities (as represented by real GDP), thus contributing to overall economic performance.

Education Expenditure (Human Development) and Unemployment Rate (Economic Performance)

The study confirms a bi-directional causality between unemployment rate and education expenditure. Thus, the unemployment rate, reflecting poor economic performance, exerts a

negative (-2.279067) impact on education expenditure in Nigeria in the short run, as evidenced by this analysis. For every 1% increase in the unemployment rate, education expenditure decreases by N2.279067 billion. This suggests that during periods of high unemployment, indicative of economic weakness, individuals are less inclined to invest in education for human capital development in the short run.

Conversely, when unemployment rates are low, signaling strong economic performance, there is greater motivation to allocate resources towards education, thereby fostering economic growth. In the context of Nigeria, where the unemployment rate is alarmingly high, indicating poor economic performance, there is a disincentive for individuals to prioritize investments in education.

Human Development and Economic Performance

The findings of this study corroborate the assertions made by previous research regarding the relationship between human development and economic performance. Muhammad (2020) argued that human development significantly impacts economic performance, a sentiment echoed by Masaguset et al. (2022), Gokhan et al. (2021), Narasingha (2023), and Michael et al. (2019). Additionally, scholars like Boachie (2015), Sunday (2021), Bloom (2019), Egulonu and Eke (2015), as well as Akpoghelie, Oghenekome, and Emmanuel (2016) have all highlighted the positive and significant association between human development and economic growth.

Conversely, this study also confirms that economic performance indicators such as inflation rate, real GDP, and unemployment rate significantly impact human development, particularly in terms of education. This finding aligns with the conclusions drawn by Deinibiteim and Emeh (2021) and Sydney and Okafor (2019), who argued that macroeconomic factors, including government expenditure on education, play a crucial role in shaping human development. Moreover, Euphemia (2022) similarly emphasized the positive correlation between economic growth and human development.

5. Conclusion

Based on the findings of this study, it is concluded that there exists a bi-directional causality between economic performance and human development in Nigeria during the period under investigation. This conclusion stems from the intrinsic interconnectedness, co-evolution, and mutual reinforcement observed between economic performance and human development. A well-performing economy can facilitate sustained human development by providing necessary resources, and conversely, advancements in human development can contribute to economic growth.

Government expenditure on education emerges as a crucial factor in human development, underscoring its significance. While the link between economic performance and human development may exhibit variations in strength or speed, it is emphasized that there is no automatic correlation between the two. Instead, this relationship is shaped and strengthened by government policies within the country.

6. Recommendations

The recommendations derived from this study are as follows:

i. Sustaining job-creating growth in Nigeria necessitates concerted efforts from both the government and the private sector to prioritize investment in education, thereby emphasizing human capital development. Government intervention in education funding is crucial, given the direct benefits of such investments that individuals may not adequately consider in their investment decisions. Despite some improvements in education funding, it has not kept pace with the rise in physical capital, highlighting the need for proportionate investment in human capital development.

ii. Adequate skills are essential to match the growth in technological advancements. Simultaneous investment in both machinery and human capital is imperative, with the dynamic allocation of resources between these forms of capital being necessary.

iii. Addressing the issue of inflation in Nigeria is paramount, as it adversely affects economic growth and development. Establishing a price regulatory body to monitor and control inflationary trends can help mitigate this menace.

iv. Diversifying the economy beyond oil-dependent sectors by investing in agriculture, manufacturing, and technology is imperative. This diversification will enhance the economy's resilience to external shocks and promote inclusive growth and development.

v. Prioritizing investments in critical infrastructure such as transportation, energy, and telecommunications is essential to enhance productivity and create an enabling environment for businesses to thrive.

vi. Strengthening the independence and effectiveness of the Central Bank to implement prudent monetary policies aimed at controlling inflation is crucial. This includes adjustments to interest rates and effective liquidity management.

vii. Addressing structural issues contributing to inflation, such as supply chain disruptions and inefficiencies, is necessary. Implementing policies that encourage increased production and reduce the cost of doing business will help alleviate inflationary pressures.

viii. Establishing a robust monitoring and evaluation framework is essential to track the effectiveness of implemented policies. Regular assessment of key economic indicators, including real GDP growth, inflation rates, and unemployment figures, will enable informed decision-making and necessary adjustments.

ix. Initiatives to support entrepreneurship and small businesses should be established to create a conducive environment for job creation and economic empowerment. Collaborative efforts between the government and the private sector are vital in promoting investment, innovation, and job creation.

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