Effect of Formal Education on Standard of Living in Nigeria

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Abstract: *This study investigates the relationship between formal education and the standard of living in Nigeria by analyzing the impact of government expenditure on education and school enrolment on the country's GDP per capita as a proxy for standard of living. Using 30 years of annual time series data and employing the ordinary least square (OLS) method, the study evaluates the time series properties of the variables with Augmented Dickey-Fuller (ADF) and Philip Peron unit root tests, and tests hypotheses using F-tests and t-tests. The findings reveal that school enrolment and government expenditure on education jointly explain a significant portion (93.33%) of the variation in GDP per capita, highlighting the vital role of education in driving economic growth and improving the standard of living in Nigeria. Specifically, higher enrolment rates in secondary and tertiary education exhibit positive and significant effects on GDP per capita, indicating that investments in higher education lead to increased productivity, higher incomes, and improved economic outcomes and living standards. However, a notable finding shows that government expenditure on education has a negative and insignificant effect (-27.45) on GDP per capita, calling for further exploration into the effectiveness and allocation of education spending for sustainable economic growth. As a result, several recommendations are proposed, including prioritizing investment in secondary and tertiary education to enhance individuals' skills and job opportunities, improving education quality and access, optimizing government spending on education, fostering collaboration between the public and private sectors in education, and combining education initiatives with poverty alleviation programs to address root causes of poverty and improve living standards for vulnerable populations, contributing to Nigeria's long-term economic development and prosperity.*

Keywords: *School Enrolment; Government Expenditure; Poverty, Standard of living, ADF Model.*

Introduction

Nigeria, as the largest economy in Africa, faces the challenge of fostering sustainable economic growth and enhancing the standard of living for its citizens. Formal education plays a vital role in shaping the nation's Gross Domestic Product (GDP) per capita, as it is recognized as a fundamental pillar of human development and societal advancement. Extensive research highlights the paramount importance of human capital in driving sustainable growth and development in Nigeria. Education equips individuals with knowledge and skills, enhancing their productivity and employability, leading to higher-paying jobs and contributing to economic output. Additionally, education fosters innovation and technological advancements, facilitating economic diversification and higher productivity, ultimately benefiting the overall well-being of the population (Robert, 1956). Investments in education are crucial for unlocking Nigeria's human capital potential and driving sustained economic growth. Prioritizing education and addressing access and quality challenges are essential steps to elevate the standard of living for its people (Psacharopoulos & Patrinos, 2018).

Recognizing the importance of improving the standard of living, the Nigerian government has implemented significant initiatives, including poverty alleviation programs, education reforms, healthcare interventions, infrastructure development, agricultural support, social intervention programs, and job creation initiatives. These efforts aim to enhance access to basic necessities and improve the quality of life for citizens, driving sustainable economic growth, reducing poverty, and empowering vulnerable groups and the youth (World Bank, 2019; Aregbeshola, 2021; Eyo & Ibietan, 2017; FGN, 2020; Oduwole & Adetoro, 2020; Ajayi & Falola, 2020). However, despite these efforts, challenges persist in fostering sustainable economic growth and improving the standard of living for Nigerians. The relationship between formal education and economic growth requires deeper understanding, and addressing issues related to access and quality of education delivery is crucial to unlocking Nigeria's human capital potential fully. By examining the current state of education in Nigeria and its impact on economic growth and the standard of living, the nation can make strides towards achieving long-term prosperity for its people.

This paper aims to investigate the effect of government expenditure on education and its relationship with Gross Domestic Product (GDP) per capita, serving as a proxy for the standard of living in Nigeria. Additionally, it explores the influence of secondary school enrolment and tertiary education enrolment on the Gross Domestic Product (GDP) per capita as indicators of standard of living.

Literature Review

Conceptual Framework

In Nigeria, education is considered a public endeavor with active government involvement aimed at achieving national development objectives. It is a deliberate and meaningful process that fosters individual and societal growth, contributing to well-being and success (Kumar & Ahmad, 2008). Nobel laureate economist Robert Solow (1956) emphasized the importance of investments in education and research as pivotal drivers of economic growth, leading to increased productivity and rising GDP per capita.

Formal education, encompassing primary, secondary, and tertiary levels, is considered a potent catalyst for societal progress and economic development in Nigeria. It empowers individuals, enhances their skills, and creates opportunities for socio-economic advancement. The impact of education on the standard of living within the country is crucial, making the link between formal education and the standard of living of paramount significance.

Education equips individuals with knowledge, critical thinking abilities, and technical skills essential for employability and productivity (Psacharopoulos & Patrinos, 2018). Higher educational attainment is associated with increased wages and greater opportunities for social mobility, thereby contributing to an improved standard of living (Haveman & Wolfe, 1984). Education also has profound social implications, fostering informed and engaged citizens who actively participate in democratic processes and advocate for better governance (Brunner & Ross, 2019). Additionally, education plays a pivotal role in promoting gender equality, with educated women exhibiting positive outcomes for themselves and their families (Kabeer, 2012).

Nigeria faces challenges in providing quality education due to its large population. According to UNESCO Institute for Statistics (UIS) data, school enrolment rates have improved over the years, with primary education enrolment at approximately 78.9% and secondary education at around 54.1% as of 2019 (UIS, 2021). Despite efforts to allocate a significant portion of its budget to education, the level of investment in Nigeria's education system has not always been sufficient to meet the needs of the growing population. In 2019, the government expenditure on education as a percentage of GDP was 0.8% (World Bank, 2021).

GDP per capita serves as a useful metric for assessing the economic performance and prosperity of a nation (World Bank, 2021). Higher GDP per capita generally indicates greater economic growth and a higher level of economic activity within the country. This, in turn, can lead to improved living standards for citizens as resources are distributed and access to essential goods and services, such as education, healthcare, and housing, increases (Barro & Sala-i-Martin, 1995).

However, it is essential to recognize that while GDP per capita is often used as a proxy for the standard of living, it is based on the assumption that higher GDP per capita corresponds to a higher standard of living for the population (Smith, 2022). The relationship between GDP per capita and the standard of living is often assumed to be positive, with increasing GDP per capita expected to result in improved living conditions for the population (Jones & Brown, 2021).

As Nigeria strives for sustainable economic growth and an improved standard of living for its citizens, it must not only focus on increasing GDP per capita but also address income inequality and ensure equitable distribution of resources and opportunities for all segments of the population. By adopting a comprehensive approach that considers both economic growth and broader well-being measures, Nigeria can work towards enhancing the standard of living and fostering inclusive development for its people (World Bank, 2021).

Empirical Reviews

The perspectives of other researchers on the topic are critically analyzed in this part, laying the foundation for the current study.

Kenneth et al.'s study (2020) on Nigeria explored the effects of government education spending and school attainment on Nigerian per capita income. The results showed that factors like gross fixed capital formation, government capital expenditure on education, and enrolment rates in secondary and tertiary schools had significantly positive effects on GDP per capita.

Altinay and Karagol's research (2004) on Turkey investigated the relationship between education and economic growth. The study found a positive relationship, indicating that increased investment in education contributes significantly to fostering economic development.

Nwadiani (2018) studied the relationship between secondary education and economic growth in Nigeria, highlighting a positive association. Secondary education equipped individuals with essential skills for active workforce participation, leading to increased productivity and overall economic growth.

Aina and Oyelola (2018) examined the impact of secondary education on income distribution and poverty reduction in Nigeria. Their research showed that secondary education plays a positive role in reducing income inequality and poverty levels in the country.

Awoyemi, Afolabi, and Adesoye (2016) explored the relationship between government expenditure on education and economic growth in Nigeria, finding a positive association, emphasizing the role of education in developing human capital and enhancing overall economic growth.

Akande and Rashidat (2016) analyzed the relationship between education and the standard of living in Nigeria using real GDP per capita as a proxy. Their research indicated a long-run positive relationship, with government expenditure on health and education positively affecting the standard of living.

Edo and Odion (2016) investigated the relationship between tertiary education enrolment and economic growth in Nigeria, revealing a positive association, particularly with GDP per capita, highlighting the importance of tertiary education in driving innovation and productivity.

Okafor (2016) conducted an empirical study on the relationship between tertiary education and economic growth in Nigeria, finding that increased investment in tertiary education significantly contributes to economic development, as measured by indicators like GDP and GDP per capita.

Theoretical Framework

This paper is based on the Human Capital Theory, Capability Approach, and Social Mobility Theory, which all support the positive impact of education on the standard of living. According to the Human Capital Theory proposed by Becker and Schultz, education is an investment in individuals' skills and knowledge, leading to higher productivity, earning potential, and an elevated standard of living (Becker, 1964; Schultz, 1961). The Capability Approach, developed by Sen and Nussbaum, emphasizes education's role in expanding individuals' capabilities and opportunities, empowering them to lead more fulfilling lives and improve their well-being (Sen, 1992; Nussbaum, 2000). Social Mobility Theory highlights education's significance in promoting upward socio-economic mobility, enabling individuals to escape poverty, access better job prospects, and enhance their standard of living (Blanden, Gregg, & Machin, 2005).

In Nigeria, these theoretical frameworks align with the impact of education on individuals and society. Education enhances human capital, providing better job opportunities and improved living conditions for Nigerians. It empowers individuals to pursue diverse careers, actively participate in society, and make informed choices, all of which positively influence their standard of living. Additionally, education serves as a pathway to social mobility, allowing individuals from disadvantaged backgrounds to break free from poverty and improve their socio-economic status.

Methodology

The paper utilized secondary data from various sources, including the CBN annual statistical bulletin (2019), National Bureau of Statistics publications, World Bank's World Development Index (WDI), and the FATFISH for the period of 1990-2020. The study employed the Ordinary Least Square (OLS) method and econometric e-view software to conduct the analyses. To assess the time series properties of the variables, the Augmented Dickey-Fuller (ADF) and Philip Peron unit root tests were used. Hypotheses were tested using the F-test for overall significance of the estimated regression line and t-test for individual significance of estimated partial regression coefficient. The first step involved testing the stationarity of the series to avoid

spurious regression results. Estimation was carried out using the econometric computer software package, E-Views 10.

Model Specification

This study adapted the model of James (2016) to examine the effect of school enrolment, government education expenditure on gross domestic product per capita in Nigeria. The model is augmented in terms of variables and objective. The model is stated in implicit form as thus:

$$PCG = f(SES, SET, GEE) \qquad (1)$$

The explicit multiple linear regression is stated as thus:

$$PCG = \beta 0 + \beta 1 ESS + \beta 2 SET + \beta 3 GEE + e \qquad (2)$$

Where:

PCG = per capita gross domestic product proxy for standard of living;

ESS = Enrolment in Secondary School;

SET = School Enrolment in Tertiary;

GEE = Government Expenditure on Education;

β_0 = constant;

β_1, β_2, and β_3 = Coefficients;

e = error term.

Results and Discussions

The variables are tested for order of integration and stationarity to make sure the estimations do not result in erroneous output. The unit root testing is required to ascertain the variables' stationarity property and to avoid spurious regression in view of the previous discussions and the ARDL model specification that contains time series variables. For the purpose of this paper, Augmented Dickey-Fuller (ADF) and Philip Peron unit root tests is employed in order to ensure the reliability of the findings. Hence, the result is presented in Table 1.

Table 1. Result of unit root test for variables with intercept and trend

Variables	Philip Perron test			
	Level	1st Diff	2nd Diff	Order of Integration
Gross domestic product per capita (GDPC)	-1.8072	-1.8070	-8.5097	I(2)
Enrolment in secondary school, (ESS)	-2.2817	-6.3637	-	I(1)
School enrolment, tertiary (SET)	-2.3933	-5.6054	-	I(1)
Government expenditure on education (GEE)	*-1.6048*	*-8.1549*	*-*	*I(1)*

Source: Computed by author with extracted from e-view output, 2022. Note: at level, critical value at 1% = -4.2968, 5% = -3.5684, and 10% = -3.2184; at various difference, critical values at 1% = --4.4407, 5% = -3.6329 and 10% = -3.2547, respectively GEE = Government expenditure on education; ESS= School enrolment, secondary School; SET = School enrolment, Tertiary; GDPC= Gross domestic product per capita.

The result of Philip Perron unit root tests of the time series data is presented in Table 1. The result showed that labour force participation (LFP) is stationary at their second difference with the order of integration I(2) while some variable such as school enrolment, secondary (ESS),

school enrolment tertiary(SET) and government education expenditure on education(GEE) were stationary at first difference with order of integration I(1).

The normality test result presented in Table 2 indicates that all the variables were positively skewed with values below zero (0). However, all of the variables had kurtosis values below 3. The Jarque-Bera values were all greater than one, indicating that the variables were not normally distributed, and the error term did not follow a normal distribution. These statistics provide insights into the distribution of the data around the mean and help determine the appropriate statistical tests and analytical methods suitable for the models.

Table 2. Result of normality test of variables used in the analysis

	GDPC	GEE	ESS	SET
Mean	1881.917	16993.97	35.16700	9.345583
Median	1848.194	8375.868	34.45698	9.930780
Maximum	2550.470	53290.64	56.20540	15.30681
Minimum	1341.616	32.31710	23.55180	4.343314
Std. Dev.	449.9888	17299.26	9.023523	3.451945
Skewness	0.129855	0.726133	0.437261	0.019820
Kurtosis	1.372818	2.074571	1.993896	1.621725
Jarque-Bera	3.507097	3.830429	2.295337	2.455734
Probability	0.173158	0.147310	0.317376	0.292917
Sum	58339.44	526813.1	1090.177	289.7131
Sum Sq. Dev.	6074696.	8.98E+09	2442.719	357.4778
Observations	31	31	31	31

Source: Computed by author with extracted from e-view output, 2022GEE = Government expenditure on education; ESS= Enrolment in secondary school; SET = School enrolment in Tertiary; GPC= Gross domestic product per capita.

The result of the estimated regression of the effect of government expenditure on school and school enrolment on gross domestic product per capita in Nigeria from 1990-2020 is presented in Table 3. The ordinary least square regression result showed the selection criteria that gave the best fit. Two of the variables and the constant term were significant at 5% and 1% level, coefficient of determination, R2 is 0.9366, the Adj. R2 is 0.9295, F-stat = 132.8986 and Durbin-Watson stat. is 1.2085.

Table 3. The effect of government expenditure on education and school enrolment on gross domestic product per capita in Nigeria from 1990-2020

Variable	Coefficient	t-Statistic
government expenditure education GEE	-27.45074	-1.243622
enrolment, secondary school ESS	36.54572	10.37178
school enrolment, tertiary SET	50.49720	3.986623
Constant	364.5240	2.709686
R-squared	0.936574	
Adjusted R-squared	0.929527	
S.E. of regression	119.4573	
Sum squared resid	385291.1	
Log likelihood	-190.1175	
F-statistic	132.8986	
Prob(F-statistic)	0.000000	
Durbin-Watson stat	1.208450	
Wald F-statistic	117.0624	
Prob(Wald F-statistic)	0.000000	

Source: Author's computation (2022). The estimation of the model by the author was aided by the use of e-view software. Tableted t-value where a is prob.=1% significant, b is prob.=2.5% sign., c is prob.=5% sign., n.s = not significant.

The coefficient of determination (R^2) is 0.9366 implying that 93.33% variation in gross domestic product per capita was explained by school enrolment and government expenditure on education while about 6.67% is explained by the error term (μ). The variables have the expected signs except education government expenditure.

The coefficient of government expenditure on education is negative and insignificant (-27.45) in explaining gross domestic product per capita. This shows that a unit increase in education government expenditure will lead to decrease in gross domestic product per capita by about 27.45 units during the period under review. This finding aligns with studies conducted by Chuku and Aja-Okorie (2014), Awoyemi, Afolabi, and Adesoye (2016), and Obi and Obi (2014), which suggest no significant correlation between education expenditure and economic growth in Nigeria. However, it contrasts with the findings of Akande and Rashidat (2016), who argue that there is a significant long-term relationship between education and standard of living, using real GDP per capita as a proxy for standard of living. This difference may be due to the use of different proxies by the researchers.

The absence of a significant relationship between education expenditure and economic growth in Nigeria could be attributed to various factors. For instance, government expenditure on education may not be effectively allocated and utilized to address critical issues affecting the education sector, such as inadequate infrastructure, insufficient teacher training, and limited access to quality education. Without proper utilization of funds and targeted interventions, the impact of education spending on economic outcomes, including GDP per capita, may be limited.

Furthermore, the relationship between education and economic growth is complex and influenced by various factors beyond government expenditure. While education is a crucial driver of human capital development and economic productivity, it operates within a broader context that includes political stability, infrastructure development, trade policies, and macroeconomic stability. Neglecting these influential factors while focusing solely on government expenditure on education may lead to an insignificant impact on GDP per capita.

To achieve meaningful improvements in GDP per capita through education spending, a comprehensive approach is necessary. This approach should address not only the allocation and utilization of education funds but also the broader economic and social factors that contribute to long-term economic growth and development (cite the sources for the mentioned studies).

The coefficient of enrolment, secondary school were positive and significant (36.56) at 1% level of probability, in explaining gross domestic product per capita. This shows that a unit increase in enrolment, secondary school will lead to increase in gross domestic product per capita by about 36.56 units on the average during the period under review. The present finding aligns with Kenneth, Kenneth, and Chris (2020) and Nwadiani (2018), who indicate that secondary education positively influences economic growth by increasing labour force participation, productivity, and incomes. Aina and Oyelola (2018) also found evidence that secondary education plays a positive role in income distribution, leading to reduced poverty rates in Nigeria.

Secondary education equips individuals with higher levels of knowledge, skills, and competencies, enabling them to participate more effectively in the workforce and contribute to economic productivity. A larger pool of educated individuals results in a more skilled and productive labour force, driving overall economic growth. Moreover, secondary education expands opportunities for entrepreneurship and innovation, fostering economic development and increasing GDP per capita. Additionally, secondary education's positive spill-over effect on other sectors, such as healthcare and technology, allows for better adoption and adaptation to advancements in these fields. As a result, the positive impact of secondary education on human capital development and economic productivity contributes to higher GDP per capita in Nigeria.

The coefficient of school enrolment, tertiary was positive and significant (50.50) at 1% level of probability, in explaining gross domestic product per capita. This shows that a unit increase in school enrolment, tertiary will lead to increase in gross domestic product per capita by about 50.50 units during the period under review. The current finding aligns with Kenneth, Kenneth, and Chris (2020), Fajana (2016), and Edo and Odion (2016) in Nigeria, establishing a positive relationship between tertiary education enrolment rates and GDP per capita growth.

The positive effect can be attributed to the crucial role of tertiary education in equipping individuals with specialized knowledge and advanced skills essential for driving innovation, productivity, and economic growth. Tertiary graduates possess expertise in fields like technology, engineering, business, and healthcare, contributing significantly to various sectors of the economy. Additionally, higher education enhances employability and income potential, leading to higher household incomes, increased consumer spending, and overall economic prosperity. Ultimately, the positive impact of tertiary education enrolment on human capital development and economic productivity contributes to the growth of GDP per capita in Nigeria.

Test of hypothesis: the test of hypothesis is conducted using Table 3. Critical t value ($\alpha = 0.05$; 0.01, $df = 30$) = 2.042; 2.750.

Since t_{cal} (1.2436) < t_{tab} (2.042; 2.750) at 5% level of probability, the study fails to reject the null hypothesis (H_{01}) which stated that government expenditure on education has no significant effect on gross domestic product per capita in Nigeria. It, therefore, concluded that government expenditure on education has no significant effect on gross domestic product per capita.

Since t_{cal} (10.37) > t_{tab} (2.042; 2.750) at 1% level of probability, the study fails to accept the null hypothesis (H_{01}) which stated that enrolment, secondary school has no significant effect on gross domestic product per capita in Nigeria. It, therefore, concluded that enrolment, secondary school has significant effect on gross domestic product per capita.

Since t_{cal} (3.99) > t_{tab} (2.042; 2.750) at 1% level of probability, the study fails to accept the null hypothesis (H_{01}) which stated that school enrolment, tertiary has no significant effect on gross domestic product per capita in Nigeria. It, therefore, concluded that school enrolment, tertiary has significant effect on gross domestic product per capita.

Conclusion and Recommendations

The findings reveal that school enrolment and government expenditure on education jointly explain a significant portion (93.33%) of the variation in GDP per capita, underscoring the vital role of education in driving economic growth and development and standard of living in Nigeria. Notably, higher enrolment rates in secondary school and tertiary education exhibit positive and significant effects on GDP per capita, indicating that investing in higher levels of education leads to increased productivity, higher incomes, improved economic outcomes and standard of living.

However, an intriguing discovery emerges, showing that government expenditure on education has a negative and insignificant effect (-27.45) on GDP per capita, necessitating further exploration to understand the effectiveness and allocation of education spending for sustainable economic growth.

The study's findings emphasize the significance of promoting access to quality education, especially at the secondary and tertiary levels, to drive economic prosperity and improve living standards. The study's findings also raise questions about the efficacy of government expenditure on education, urging policymakers to carefully assess and optimize education spending strategies for a more meaningful impact on economic growth. By addressing these considerations, Nigeria can better harness the potential of its education system to foster lasting economic development and prosperity for its citizens.

Based on the research findings, the study proposes recommendations to explore the link between education and economic development in Nigeria.

1. Prioritize investment in secondary and tertiary education to equip individuals with essential skills and knowledge for higher productivity and better job opportunities, ultimately enhancing the standard of living.
2. Improve education quality across all levels and ensure equitable access, especially for marginalized communities, to reduce income inequality and enhance social mobility.
3. Carefully assess and optimize government spending on education, ensuring resources are allocated to initiatives that have a meaningful impact on economic growth, while promoting transparency and accountability in education spending.
4. Foster collaboration between the government and private sector in education to generate innovative solutions, increased resources, and improved infrastructure, leading to enhanced educational outcomes and economic growth.
5. Combine education initiatives with targeted poverty alleviation programs to address the root causes of poverty and improve living standards for vulnerable populations, contributing to long-term economic development.

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