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DETERMINANTS OF EDUCATIONAL OUTCOMES IN NIGERIA: DOES INSTITUTIONAL QUALITY MATTER?

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Abstract

This study examined the determinants of educational outcomes in Nigeria with particular emphasis on the role of institutional quality over the period 1986 to 2022. Using the Autoregressive Distributed Lag (ARDL) modeling framework, the study analyzes the impact of per capita income, government expenditure on education, corruption index, fiscal freedom index, and gross enrolment rates at the primary, secondary, and tertiary levels on literacy rate, which serves as a proxy for educational performance. The empirical findings revealed that secondary and tertiary school enrolments, public expenditure on education, and fiscal freedom significantly and positively influence educational outcomes in the short and long run. In contrast, corruption exerts a consistently negative and significant effect, while per capita income shows a short-run positive but long-run negative impact, possibly due to income inequality. Primary school enrolment does not exhibit a statistically significant effect, highlighting foundational challenges at the basic education level. The error correction term is negative and significant, confirming the existence of a stable long-run relationship among the variables. The study underscores the importance of strengthening institutional quality, promoting inclusive economic growth, increasing access to post-primary education, and combating corruption as essential strategies for enhancing educational outcomes in Nigeria.

Keywords: Educational Outcomes, Institutional Quality, Literacy Rate, Government Expenditure on Education, Corruption, Fiscal Freedom, School Enrolment, Human Capital Development

INTRODUCTION

This study is a review of the literature on the determinants of educational outcomes in an emerging economy like Nigeria and the role of institutional quality. In the 21st century, getting citizens of any nation educated is the primary objective and target of any government so as to ensure that they complete their educational cycle (primary, secondary and tertiary education) and attain the basic knowledge and skills needed for personal well-being and national development. An imminent step towards achieving sustainable growth and development in Nigeria is through investment in human capital which is education and health. Education and health are the basic objectives of economic growth and development. According to Todaro (2009), health and education are necessary ends in themselves and in developing countries such as ours, to absorb modern technology and to develop capacity for self-sustainable growth and development and as such the inhabitants of the country need to be educated. Furthermore, improvement in education helps families escape the vicious cycle of poverty in which they are trapped and the cause of poverty in Nigeria is poor educational outcomes.

Olayemi (2012) and Obi, Ekesiobi, Dimnwobi and Mgbemena (2016) observed that education increases the number of knowledgeable workers by improving their skills and competency which prepares them adequately for new technological challenges and innovation. It also enhances professional mobility, reduces the level of unemployment in the economy, increases the earning capacity and productivity of the country's work force, improves access to health information which will increase life expectancy and reduce infant motility rate, maternal and morbidity rate, enhances social and political participation and, at the same time manage the fertility rate. Therefore, education is capable of enhancing the efficient production of goods and services by ensuring thorough screening whereby the best people are selected and made available for the world of research and development.

Racci and Zachariah (2006) postulated that education has two different roles in the aggregate production function of health services. First, the level of education of a household enhances the longevity of its members. This means that education influences crucial factors such as understanding treatment or feeding children healthily. Second, the average level of education in the economy improves its absorption capacity for health-related technology and ideals and concludes that tertiary education has a great impact on health outcomes compared to primary education. Health is wealth and educated citizens of a country are the wealth of the nation. There is increasing empirical evidence that education engineers the economic growth and development. Babatunde and Adefabi (2005), Omojimite (2010), Lawal (2011), Isola and Alani (2015), Adesina, Owolabi and Ojeka (2017) Idris and Abdulsalam (2019), Irughe, Edafe

and Eregha (2020) and Onwioduokit (2020) reveal that education has a direct and significant effect on economic growth.

Acknowledging this and the externality associated with education on the economy, successive government in Nigeria have increased their budget outlay to the educational sector to enhance educational outcomes in Nigeria. Obi, Ekesiobi, Dimnwobi, and Mgbemena (2016) revealed that government expenditure has a direct and significant effect on educational outcomes. Furthermore, the World Bank (1990), Fadiya (2010), and Imoughele and Ismali (2012) identifed five main contributors to education effectiveness, which include curriculum, learning materials, instructional time, classroom teaching, and student learning capacity. Fadiya (2010) studying the determinants of educational outcomes in Nigeria from 1975 to 2008, showed that income, life expectancy, primary, secondary and tertiary enrollment are the major determinants of educational outcomes in the country. Also, Ayanwu and Erhijakpor (2007) examined the effect of public education expenditure on educational enrollment in Africa and found that educational expenditure had a direct and significant impact on the educational enrollment rates.

Fadiya (2010) observed that despite the geometric progression in educational enrollment and the increase in schooling in Nigeria, the country is yet to benefit from such development in terms of an increase in economic growth. No wonder Yaque (2011) classified Nigeria's economic growth to be sluggish and predicted the country would experience recession in the year 2016. Furthermore, the Nigerian economy experienced a decline in economic growth for the year 2020. In the third quarter of 2019, the growth of the Nigerian economy was 2.5% and diminished to 1.87% in the first quarter of 2020. The second and the third quarter of the same year recorded -6.1% and -3.62% respectively which portrays that the country is in recession. Also, Nigeria, Africa's largest economy, has been ranked third on a list of countries with the highest unemployment rate globally. Studies have revealed that the failures of Nigeria's educational system to propel her economic growth are a result of the poor educational system in Nigeria. for instance, according to Webometrics (2023), the University of Ibadan was ranked 18th among African universities, falling behind institutions such as Cairo University in Egypt (ranked 5th), Makerere University in Uganda (13th), the University of Nairobi in Kenya (14th), and the University of Cape Town in South Africa, which was ranked 1st. Babatunde and Adefabi (2005) observed that the education received by Nigerian citizens is inadequate, while Kudaisi (2024) attributed this to weak institutional quality.

Recent literature (Uberti & Knutsen, 2021; Uddin, Ali & Masih, 2021; Ouedraogo, Tabi, Ondoa & Jiya, 2022; Kudaisi, 2024) has increasingly emphasized that institutional quality plays a pivotal role in shaping educational outcomes. Institutional quality encompasses the

effectiveness of governance systems, regulatory oversight, adherence to the rule of law, and control of corruption. High-quality institutions facilitate the efficient allocation of resources, ensure accountability in education service delivery, uphold standards, and implement policies effectively. Conversely, weak institutions are characterized by policy inconsistency, mismanagement of resources, corruption, and inadequate oversight, all of which undermine educational performance.

In Nigeria, institutional weaknesses are evident in several areas of the education sector. Public education budgets are often mismanaged or underutilized, resulting in deteriorating infrastructure and insufficient learning materials. Recruitment and promotion of educators are frequently compromised by nepotism and favoritism, undermining instructional quality and teacher motivation. Corruption in administrative and examination processes further cause damage to the integrity of the system. Moreover, poor policy implementation such as underperformance of the Universal Basic Education (UBE) programme, has contributed to persistent disparities in access and learning outcomes, particularly in rural and underserved regions.

An empirical survey shows that educational outcomes across Nigerian states vary significantly with differences in institutional quality. NBS (2020), World Bank (2021) ICPC (2022) and UNDP (2020) revealed that states with better governance and stronger anti-corruption frameworks report higher enrollment, retention, and students' performance in standardized assessments. In contrast, states with weaker institutions tend to have lower literacy rates, inadequate infrastructure, and reduced access to quality education. Despite the growing consensus on the importance of institutional quality, there remains a dearth of empirical research focusing specifically on its impact on education in Nigeria. Most studies emphasize funding, infrastructure, or socio-cultural factors, with limited attention paid to the institutional context of education delivery. This study, therefore, sought to fill this critical gap by empirically examining the determinants of educational outcomes in Nigeria, with an emphasis on institutional quality. The rest of the paper is organized as follows: Section 2 presents the literature review; Section 3 discusses the research methodology; Section 4 provides the empirical analysis and results; and Section 5 concludes with key findings and policy recommendations.

LITERATURE REVIEW

The term education has been conceptualized in several ways: according to the Oxford dictionary of economics (2002), while Okoh (2003) defined Education as the knowledge and skills that you gain from being taught. In the same light, Ilechukwu, Njoku and Ugwuozor (2014)

professed education as the development of the cognitive, affective and psychomotor domain and abilities of an individual for optimal function and performance in the society while Emehelu and Oboreh (2023) conceptualized education as how knowledge, skills, values, beliefs, and habits can be learned or acquired. The individual has to be helped to maximize his mental, emotional and psychological abilities, which will be beneficial to him and the society at large. Onwioduokit (2020) noted that education facilitates the creation of a more productive labour force, and equips the labour force with knowledge and skills. Also, it produces a body of sophisticated leaders in both the private and public sectors of the economy to drive the economy in the desired direction. Education is key to the development of people's ability to manage and induce change required to confront the task of making choices and of broadening the range of choices. Furthermore, education is any process by which an individual gains knowledge, insight, or develops aptitudes. It is a process to achieve acculturation through which the individual is helped to attain the development of his potentialities.

On the determinants of education, Ude and Ekesiobi (2014) empirically investigated the states social spending and social outcomes with specific emphasis on education in Nigeria. The study employed panel data from 36 states of the federation. The panel data covered from 2009 through 2013. The study applied fixed effects and random effects models. Each of the education outcomes was modelled against states spending on education and controlled for states spending on health and states per capita expenditure. Their results showed that states spending on education have a significant impact on total primary enrolment, total secondary enrolment and adult literacy enrolment in Nigeria using fixed and random effects but is significant using only fixed effects on total tertiary enrolment in Nigeria. Obi and Obi (2014) examined the impact of government expenditure on education in Nigeria. The paper focused on the impact of education expenditure on economic growth as a means of achieving the desired socio-economic change needed in Nigeria. The study used time series data from 1981 to 2012. Johansen’s co-integration analysis and ordinary least square (OLS) econometric techniques were used to analyze the relationship between gross domestic product (GDP) and recurrent education expenditure. Findings indicated a positive relationship between education expenditure and economic growth, although a long run relationship does not exist over the period under study. The paper recommended for improvement of the education system through efficient use of public resources through good governance, accountability and transparency.

Obi, Ekesiobi, Dimnwobi and Mgbemena (2016) studied on government education spending and education outcome in Nigeria. Employing Augmented Dickey Fuller (ADF) unit root test and Ordinary Least Square (OLS) technique, the study revealed that public education spending has a positive and significant effect on education outcome in Nigeria. Public health

expenditure and urban population growth were also found to have positive effects on education outcome but are non-significant in determining education outcome. The study recommended that the government should spend more on education which needs to be targeted for the desired effects to be realized. Also, government should monitor spending given the history of corruption and embezzlement of public funds in Nigeria.

Dauda (2011) look at the effect of government educational spending and macroeconomic uncertainty on schooling outcomes in Nigeria using the econometric methods of cointegration and error correction mechanism jointly with the vector auto- regression methodology. The results indicate that schooling outcome cointegrated with all the identified explanatory variables. The study found that public educational spending has a positive impact on schooling outcomes, while macroeconomic instability has negative. The variance decomposition analysis shows that "own shocks" constitute the predominant source of variation in schooling outcomes. The impulse response analysis shows that any unanticipated increase in the macroeconomic uncertainty rate will have a contractionary impact on literacy rate. The policy implication of this study is that the government should pay attention to policies that enhance educational attainment through adequate public social investment under a stable macroeconomic environment.

Obi, Ekesiobi, Dimnwobi and Mgbemena (2012) noted that expenditure on education is regarded as investment in human capital because it helps in skill formation and thus raises the ability to work and produce more and is of great importance to national development and plays a critical role in promoting growth and knowledge deepening. They examined government education spending and education outcome in Nigeria from 1970 – 2013. Employing Augmented Dickey Fuller (ADF) unit root test and Ordinary Least Square (OLS) technique, the study revealed that public education spending has a positive and significant effect on education outcome in Nigeria while public health expenditure and urban population growth were also found to have positive effects on education outcome but are non-significant in determining education output. The study recommended that the government should spend more on education which needs to be targeted for the desired effects to be realized. Again government should monitor spending given the history of corruption and embezzlement of public funds in Nigeria.

Gajderowicz, Grotkowska, Mycielski and Wincenciak (2014) evaluate social and economic determinants of higher education choices in Poland for the period 1997-2010. In the empirical study they applied conditional multinomial logit model in order to find predictors of choices of different study profiles. Unobservable characterizes for alternatives, regarding wages and probabilities of employment, were estimated using standard linear regression with Heckman

selection procedure. The study concluded that economic factors are insignificant predictors of choice of the type and profile of a higher education institution. Instead, social aspects, particularly related to the family background, seem to be key factors driving decisions of those individuals who decided to continue their education beyond secondary level.

Mania, Hoddinot and Straus (2013) examined the determinants of current enrolment status and relative grade attainment among primary school children in rural Ethiopia. We us repeated cross-sectional data from 15 rural villages in Ethiopia to capture the impact of changing household and child characteristics on enrolment status and relative grade attainment between 1994 and 2004. Using instrument variable (IV) estimation, we find, first, a positive income effect on schooling enrolments and an even stronger effect for relative grade attainment. Second, the effect of income is larger for girls compared to boys. Third, OLS estimates of the impact of household income are biased downwards relative to IV results. Finally, observable community characteristics have little role in explaining schooling. These finding suggest that policies that address the demand-side constraints with a special focus on girls will have the potential to improve schooling attainments as well as to reduce gender differences in schooling attainments found in Ethiopia and elsewhere in sub-Saharan Africa.

Olaniya (2011) explored the determinants of child schooling in Nigeria and took current enrolment and delayed entry into schools as measures of schooling outcome. The study utilized reduced-form relationships for male and female children within urban and rural households. Using data from the 1999 Multiple Indicator Cluster Survey (MICS) of Nigeria, the study found that socioeconomic backgrounds of children are significant determinants of schooling with the education of parents being the most important determinant. The study concluded that educated parents desire more schooling for their children. Furthermore, our decomposition analysis revealed that the way a household treats boys and girls in urban areas contracts the gender gap in enrolment, while it widens the gap in rural areas.

Emehelun and Oboreh (2023) examined the public sector financing of education and educational outcomes in Nigeria from 1981 to 2022. The study was based on human capital theory. The study adopted the Autoregressive Distributed lag (ARDL) bounds testing approach in estimating the relevant relationship, while the ECM captured the speed of adjustment to the long run. The result of the study showed a positive, but insignificant relationship between public education expenditure and educational outcome in Nigeria while primary school enrolment rate, secondary school enrollment rate and tertiary enrollment rate all have negative impact on educational outcome in Nigeria and recommended that adequate and prudent financial policy for the educational sector as it will guarantee increased educational outcome in the country.

Studies focusing on Nigeria reveal that institutional weaknesses severely undermine educational outcomes.

Jatau and Abubakar (2024) conducted a study to examine the impact of corruption on educational development in Nigeria. The study employed the Ordinary Least Squares (OLS) regression technique for analysis. Findings revealed that the Corruption Perception Index has a significant inverse relationship with educational development, indicating that a 1% increase in the CPI corresponds to an approximate 4% decline in educational development. Although the poverty rate (POV) also exhibited a negative relationship with educational development, this result was statistically insignificant. Based on these findings, they recommended that all levels of government implement effective mechanisms to ensure that funds allocated to the education sector are properly managed and reach the intended schools and beneficiaries.

RESEARCH METHODS

Theoretical Framework and Model Specification

The human capital and investment theories provide the theoretical foundation for this study. According to Fagerlind and Saha (1997), the Human Capital Theory justifies significant public and private investments in education across both developing and developed nations. It posits that a nation's progress in human development is largely dependent on its accumulation of physical and human capital. Education, in this context, is viewed as a key driver of economic growth and national development; thus, expenditures on education are considered strategic investments rather than mere consumption. To foster human development and improve societal outcomes, both the government and the private sector need to prioritize increased investment in education. Furthermore, this study draws on the Education Production Function as an extension of the theoretical framework. As outlined by Hanushek (2020), the education production function views educational outcomes, particularly student achievement, as a function of various inputs, including school resources, teacher quality, and family background. Together, these frameworks underscore the critical role of institutional quality in ensuring that educational investments translate into tangible learning outcomes.

This study follows the approach and model of Gupta, Verhoeven, and Tiongsan (1999), Fadiya (2010) and Dauda (2011) who specified the education production function given as:

$$Y_n = f\ (X_{1n}, X_{2n}, Z_n) \qquad (1)$$

Where Y_n, is a social indicator replicating education attainment for a country *n*as measured by adult literacy, which is a function of aggregate public spending on education as a share of GDP, X_{1n} represents the allocations to different programs within the sector, X_{2n}; and a vector of socioeconomic variables Z_t.

This study therefore, modifies and incorporates additional variables to achieve the objective of the study. The model is specified thus;

LIT = *f* (TSE, SSE, PSE, PIC, GEE, COR, FFI) (2)

Re-specifying the model in econometric form and taking the logs except those variables that are in ratio and percentage, the model is expressed as

LIT = β_0 + β_1LOGTSE + β_2LOGSSE + β_3LOGPSE + β_4PIC + β_5GEE + β_6FFI+ β_7COR+ α (3)

β_0, β_1, β_2, β_3, β_4 β_5, β_6 and β_7> 0

Where Per capita income (PCI), Primary school enrollment (PSE), Secondary school enrollment LOG(SSE), Tertiary school enrollment (TSE), Corruption ranking index (COR) and percentage of government expenditure on education to GDP (GEE), β_0, β_1, β_2, β_3, β_4 β_5, β_6 and β_7 represent the slope or parameters of coefficient of the model

Equation (3) is then specified using the Autoregressive Distributed Lag (ARDL) model of order k as follows

The ARDL model for equation 3 is expressed as follows:

$$\Delta LIT_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta LOG(TSE)_{t-i} + \sum_{i=1}^{p} \alpha_2 \Delta LOG(SSE)_{t-i} + \sum_{i=1}^{p} \alpha_3 \Delta LOG(PSE)_{t-i} + \sum_{i=1}^{p} \alpha_4 \Delta(PIC)_{t-i} + \sum_{i=1}^{p} \alpha_5 \Delta(GEE)_{t-i} + \sum_{i=1}^{p} \alpha_6 \Delta(FFI)_{t-i} + \sum_{i=1}^{p} \alpha_7 \Delta(COR)_{t-i} + \delta_1 LOG(TSE)_{t-1} + \delta_2 LOG(SSE)_{t-1} + \delta_3 LOG(PSE)_{t-1} + \delta_4 (PIC)_{t-1} + \delta_5 (GEE)_{t-1} + \delta_6 (FFI)_{t-1} + \delta_7 (COR)_{t-1} + \upsilon_t \quad (4)$$

The coefficients from α_1 to α_7 represent the short-run coefficients, whereas the coefficients from δ_1 to δ_7 represent the long-run coefficients of the ARDL model. Also, α_0 is the drift component, "n" is the maximum lag length, while v_t is the stochastic error term. The bounded F-statistic test was used to check the existence of a stable, long-run relationship among the variables in the model. If the bound test shows evidence of co-integration among variables specified, for example, as in equation 3, the long and the short-run (an error correction model (ECM)) models are specified as follows;

The long-run model:

$$TGH_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 (DDG)_{t-i} + \sum_{i=0}^{p} \alpha_2 (DSR)_{t-i} + \sum_{i=0}^{p} \alpha_3 (EXG)_{t-i} + \sum_{i=0}^{p} \alpha_4 (FFI)_{t-i} + \sum_{i=0}^{p} \alpha_5 In(COR)_{t-i} + \sum_{i=0}^{p} \alpha_6 (NBS)_{t-i} + \sum_{i=0}^{p} \alpha_7 (NPH)_{t-i} + \upsilon_t \text{--------}(3.5)$$

The short-run model (ECM model):

$$\Delta(TGH)_t = \delta_0 + \sum_{i=1}^{p} \delta_1 \Delta(DDG)_{t-i} + \sum_{i=0}^{p} \delta_2 \Delta(DSR)_{t-i} + \sum_{i=0}^{p} \delta_3 \Delta(EXG)_{t-i} + \sum_{i=0}^{p} \delta_4 \Delta In(FFI)_{t-i}$$

$$+ \sum_{i=0}^{p} \delta_5 \Delta(COR)_{t-i} + \sum_{i=0}^{p} \delta_6 \Delta(NBS)_{t-i} + \sum_{i=0}^{p} \delta_7 \Delta(NPH)_{t-i} + \beta ECM_{t-1} + \upsilon_t \text{----------} (3.6)$$

Where β is the error correction term, which measures the speed of adjustment towards the long run equilibrium, and the remaining coefficients provide the short-run dynamics.

Sources of Data

This study employed annual time series secondary data spanning the period from 1986 to 2022. The data were primarily sourced from reputable secondary sources, including various editions of the Central Bank of Nigeria (CBN) Statistical Bulletin, publications by the National Bureau of Statistics (NBS), and the World Bank Development Indicators.

Method of Data Analysis

This study employed the Autoregressive Distributed Lag (ARDL) modeling technique developed by Pesaran and Shin (1999), and Pesaran et al. (2001), to examine both the short-run and long-run relationships between institutional quality and educational outcomes in Nigeria. The ARDL bounds testing approach is particularly suitable for this analysis due to its ability to accommodate variables with mixed orders of integration i.e., a combination of I(0) and I(1) without necessitating that all variables be integrated of the same order.

The ARDL method is also well-suited for studies with relatively small sample sizes, as it provides consistent and efficient estimates of both short-run dynamics and long-run relationships (Harris & Sollis, 2003). Once the optimal lag structure is identified, the bounds testing procedure facilitates the estimation of cointegration using ordinary least squares (OLS), thereby simplifying the process compared to traditional multivariate cointegration techniques such as the Engle-Granger or Johansen approaches. To ensure the robustness and reliability of the model, several post-estimation diagnostic tests were conducted. These include the Ramsey RESET test for functional form misspecification, the Breusch-Godfrey LM test for serial correlation, the Jarque-Bera test for normality of residuals, and the White test for heteroscedasticity. In addition, model stability was assessed using the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMQ) tests.

RESULTS AND DISCUSSION

Unit Root Test

The Augmented Dickey-Fuller Unit root test was used to assess whether the variables are stationary or not and their order of integration. The test involved testing the null hypothesis of non-stationarity of variables against the alternative hypothesis of stationarity. The result of the ADF Unit root test is shown in Table 1.

Table 1: Results of Augmented Dickey Fuller (ADF) Unit Root Test

Variable	ADF Calculated Value in Level	ADF Calculated Value at 1st Difference	Mckinnon 5% Critical Value	Order Of Integration
LIT	-2.072	-10.544*	-2.957	1(1)
LOG(SSE)	-1.373	-7.020*	-2.957	1(1)
LOG(PCI)	-0.423	-4.779*	-2.957	1(1)
GEE	-1.969	-6.101*	-2.957	1(1)
FFI	-5.443*		-2.951	1(0)
COR	-2.128	-5.385*	-2.957	1(1)
LOG(TSE)	-2.036	-12.576*	-2.957	1(1)
LOG(PSE)	-2.090	-4.532*	-2.957	1(1)

Source: Regression Output using EViews (2025)

Note: *Significant at 5 per cent

The unit root test in Table 1 shows Per capital income LOG(PCI), Primary school enrollment LOG(PSE), Secondary school enrollment LOG(SSE), Tertiary school enrollment LOG(TSE), Corruption ranking index (COR) and percentage of government expenditure on education to GDP (GEE) are stationary at first difference since the calculated ADF Statistics is greater that the McKinnon 5% critical values while corruption index ranking (COR) is stationary at level because the ADF value of the variable at level is greater than the McKinnon 5% critical values.

Lag Length Criteria

The lag-length selection criteria, such as sequential modified LR test statistic (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hanna-Quinn information criterion (HQ) were employed to determine the appropriate lag length of the models. The test results of the different lag selection methods are reported in Table 2. After a meticulous examination of the different lag lengths by estimating the VAR at

each lag length and diagnosing the whiteness of resulting residuals, two (2) lag lengths was recommended by Aikaike Information Criteria AIC statistic, was selected for the model.

Table 2: VAR Lag Order Selection Criteria

Endogenous variables: LIT LIF LOG(SSE) PIC GEP FFI COR LOG(PSE) LOG(TSE)

Exogenous variables: C

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Sample: 1986 2022 Included observations: 32

Lag	LogL	LR	FPE	AIC	SC	HQ
0	353.8568	NA	3.53e-21	-21.55355	-21.14131	-21.41691
1	533.7269	247.3213	8.87e-24	-27.73293	-23.61055	-26.36648
2	677.5765	116.8778*	7.22e-25*	-31.66103*	-23.82850*	-29.06477*

* 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

Source: Regression Output using Eview (2025)

Bounds Test for Co-Integration

The next step after determining the order of integration and lag length of the variables was to apply the bound F-test to establish the existence or otherwise of a long-run relationship among the variables. The summary results of the bounds test for co-integration for the model is shown in Table 3 below alongside critical values. The F-Bounds test statistic (F = 9.481) exceeds the upper bound critical value of 3.21 at a 5% significance level. This confirms that a long-run relationship exists among the variables. This justifies the use of the ARDL framework and affirms that the selected variables jointly determine literacy outcomes in Nigeria.

Table 3: Summary of ARDL Bound Test Results

Models	**Test statistic**	**Computed F-statistic**	**Lag**	**Significance level**	**Bound Critical values**	
					Lower Bounds I(0)	Upper Bounds I(1)
Model 1	F-statistic	9.482	2	5%	2.17	3.21

Source: Regression Output using EViews (2025)

Long Run Regression Results of the ARDL Model

The results of the estimated long-run coefficients using the ARDL approach are presented in Table 4. The models selected by AIC are (1,2,1,1,2,1,1,1).

Table: 4. Summary of the Long Run ARDL Regression Results

Dependent Variable: LIT

Variable	Coefficient	Standard Error	t-Statistic	Prob.
LOG(SSE)	0.2932*	0.052	5.630	0.000
LOG(PCI)	-0.081*	0.021	-3.791	0.002
GEE	0.033*	0.011	2.978	0.009
FFI	0.285*	0.062	4.566	0.000
COR	-0.135*	0.042	-3.215	0.006
LOG(PSE)	-0.123	0.112	-1.088	0.294
LOG(TSE)	0.045*	0.014	3.250	0.005
Constant	1.198*	0.225	5.332	0.000

Note: * is significant at 5% level of significance.

Source: Regression Output using EViews (2025)

From Table 4, the results show that secondary school enrollment (LOG(SSE)) has a direct and significant impact on literacy rate, with a coefficient of 0.293, which implies that a one percent increase in secondary school enrollment leads to a 0.293 percent increase in literacy rate. These findings align with the broader literature, which posits that investment in post-primary education raises higher educational outcomes in Nigeria. These findings are consistent with Fadiya (2010) who reported that secondary school enrollment has a significant effect on educational outcomes in Nigeria. However, this is contrary to Uzonwanne, Nzeribe, Ezenekwe and Ukeje (2020) who stated that secondary school enrollment has an inverse and insignificant impact on educational outcomes in Nigeria

Similarly, tertiary education enrollment (LOG(TSE)) also has a direct and significant determinant of educational outcome in Nigeria. The coefficient is 0.045, which implies that a one percent increase in tertiary school enrollment leads to a 0.045 percent increase in literacy rate. This suggests that higher education enrollment contributes to the literacy rate in Nigeria. These findings are contrary to Fadiya's (2010) results, which revealed that tertiary school gross enrolment has a direct but insignificant determinant of educational outcome in Nigeria but not in line with Uzonwanne, Nzeribe, Ezenekwe and Ukeje (2020) findings that tertiary school enrollment has a significant effect on educational outcomes in Nigeria. This study implies that

higher education significantly improve literacy and cognitive skills among Nigerians and as student progress beyond primary school and secondary school, they are more likely to master reading and writing, leading to sustainable literacy development.

The result indicates that primary school gross enrolment has an inverse but insignificant determinant of educational outcome in Nigeria. The result shows that a one percent increase in primary school gross enrolment leads to about a 0.212 percent increase in literacy rate in Nigeria. This is not consistent with the a priori expectation. This counterintuitive finding suggests that primary education alone may not sufficiently improve literacy unless complemented by quality instruction, retention, and progression to higher educational levels. This result is contrary to Fadiya's (2010) findings, which revealed that the primary school gross enrolment has a positive and significant effect on educational outcomes in Nigeria.

The result also shows that the coefficient of per capita income has a negative and significant effect on literacy rate (-0.081, $p = 0.002$). A one percent increase in per capita income leads to about a 0.081 percent decrease in Nigeria's literacy rate. This result may be attributed to income inequality, where increases in average income do not necessarily translate into broader human development. This result is contrary to the findings of Fadiya's (2010), which show that per capita income is a direct and significant determinant of educational outcomes in Nigeria. This result implies that Nigerian low economic position of the households resulted in the reduction of literacy rate in the country.

In the result, the share of education in government expenditure (GEE) positively and significantly affects literacy (coefficient = 0.033, $p < 0.01$). One percent increase in government expenditure on education leads to a 0.033 percent increase in educational outcomes (literacy rate) in Nigeria. The result revealed that increased public investment in education enhances access, improves infrastructure, and supports teacher training—all crucial for literacy advancement. This aligns with the findings of Uzonwanne, Nzeribe, Ezenekwe, and Ukeje (2020) who reported that public educational expenditure positively and significantly influences adult literacy rate. In other words, increased government spending on education is likely to enhance educational outcomes in Nigeria. This also supports the findings of Baldacci et al. (2008), who concluded that public spending on education is positively associated with human capital accumulation and improved educational attainment in developing countries.

The coefficient of the fiscal freedom index (FFI) as an institutional quality variable has a direct and significant impact on the Nigerian education outcomes (coefficient = 0.285, $p < 0.01$). This suggests that improved fiscal governance, marked by reduced bureaucratic control and better budgetary efficiency, promotes better educational outcomes. Furthermore, Corruption (COR) as an institutional quality variable negatively influences literacy rate in Nigeria (coefficient

= -0.135, p < 0.006). A higher corruption index (worsening corruption) is associated with a 0.135 percent decrease in literacy rate. Suggests corruption negatively impacts educational outcomes. This affirmed the widely held view that corruption undermines public service delivery, including education. This is in line with Anakudo, Okafor and Ezenekwe (2022) who stated that corruption negatively and insignificantly affects education outcomes in Nigeria.

Short Run Parsimonious Estimation of the ARDL Model

In order to capture the short-run deviations that might have occurred in estimating the long run co-integration equation, a dynamic parsimonious error correction estimate is reported in Table 5.

Table 5: Summary of Short Run Parsimonious Estimations of the ARDL Model

Dependent Variable: LIT				
Variable	**Coefficient**	**Standard Error**	**t-Statistic**	**Prob.**
D(SSE)	0.202462	0.046530	4.351254	0.0006
D(SSE(-1))	-0.130949	0.042518	-3.079872	0.0076
D(PIC)	0.120933	0.028561	4.234164	0.0007
D(GEP)	0.028342	0.010941	2.590474	0.0205
D(FFI)	0.148159	0.018880	7.847450	0.0000
D(FFI(-1))	-0.144198	0.020656	-6.980897	0.0000
D(COR)	-0.304583	0.050172	-6.070777	0.0000
D(PSE)	0.082768	0.078337	1.056565	0.3074
D(TSE)	0.015998	0.008532	1.875058	0.0804
ECM	-0.498395	0.130991	-11.43892	0.0000
		R-squared	0.881	
		Adjusted R-squared	0.834	

Note: * is significant at 5% level of significance.

Source: Regression Output using EViews (2025)

Table 5 indicates that the first-difference of secondary school enrollment (D(SSE)) is positive and significant (coefficient = 0.202, p = 0.0006), implying that increases in secondary education enrollment immediately improve educational outcome, indicating that increased enrollment at the secondary level directly improves educational outcomes. However, its one-period lag (D(SSE(-1))) is negative and significant (-0.130, p = 0.0076) possibly due to adjustment costs, school dropout effects, or delays in translating enrollment into educational

outcomes gains. Primary School Enrollment (LOG(PSE)), represented as D(PSE), shows a positive but statistically insignificant impact on educational outcomes (coefficient = 0.083, p-value = 0.3074). Although primary education is foundational, this result suggests that other factors such as quality of education, retention rates, or progression to higher education, may mediate its direct impact on educational outcomes in the short term. Tertiary School Enrollment (LOG(TSE)), represented by D(TSE), has a positive but marginally significant effect (coefficient = 0.016, p = 0.0804). This suggests that higher education contributes to educational outcomes, albeit with a smaller immediate impact compared to secondary education.

The difference in per capita income D(PIC) has a positive and statistically significant effect on educational outcomes, with a coefficient of 0.121 and a p-value of 0.0007. This implies that increases in income per person enhance access to education, learning materials, and better living conditions, all of which contribute to improved educational outcomes. Government Expenditure on Education as a Percentage of GDP (GEE) is approximated through the variable D(GEE), which has a positive and statistically significant impact on educational outcomes (coefficient = 0.028, p = 0.0205). This highlights the importance of public investment in education in enhancing educational outcomes, especially when funds are effectively allocated and managed in the educational sector.

Corruption Ranking Index (COR) is one of the most influential variables in the model. The coefficient of -0.305 and its high level of significance (p = 0.0000) underscore the detrimental effect of corruption on educational outcomes. Corruption likely impedes educational service delivery, diverts funds, and weakens institutional effectiveness, undermining educational outcomes and development. The Fiscal Freedom Index (FFI) is another critical institutional variable in this model. FFI reflects the extent of government influence on economic activity through taxation and government spending. A higher index score indicates lower tax burdens and greater economic freedom. The contemporaneous value of FFI (D(FFI)) is positive and highly significant (coefficient = 0.148, p = 0.0000), meaning that improvements in fiscal freedom strongly enhance literacy outcomes in the short run. This may occur because reduced tax burdens and improved fiscal management free up household and national resources, allowing for increased investment in education and literacy programs. In contrast, the lagged value of FFI (D(FFI(-1))) is negative and also highly significant (coefficient = −0.144, p = 0.0000). This suggests that fiscal policy reforms may have an initial cost or adjustment period that temporarily reduces literacy gains before positive effects are realized. Alternatively, this lag effect could reflect implementation delays in policy changes or temporary disruptions in public service delivery during fiscal restructuring. This dual effect of FFI points to the dynamic complexity of

fiscal policy, where immediate improvements support educational development, but the benefits may wane or temporarily reverse in the following period if not well sustained.

The error correction term (ECM (-1)) is negative and statistically significant (-0.498, $p < 0.01$), indicating the presence of a long-run equilibrium relationship among the variables. The coefficient of -0.498 implies that approximately 50% of the deviation from long-run equilibrium is corrected each year, meaning the system adjusts rapidly toward stability. This supports the suitability of the ARDL model in capturing both immediate and enduring effects on literacy. The model demonstrates strong explanatory power, with an R-squared value of 0.881 and an adjusted R-squared of 0.834, indicating that over 83% of the variation in literacy rate is explained by the independent variables. Furthermore, the Durbin-Watson statistic (2.002) suggests no evidence of autocorrelation, lending credence to the reliability of the estimates.

Diagnostic statistical testing

The results of the ARDL estimation for the model are subjected to statistical diagnostic tests. The diagnostic test results are reported in Table 6.

Table 6: Diagnostic tests on the real estimated model

Purpose of test	Test	Test statistic	Probability	Conclusion
Normality	Jarque-Bera	3.0459	0.2131	Normal
Heteroscedasticity	Breusch–Pagan-Godfrey Heteroskedasticity Test	0.369	0.975	No heteroscedasticity
-Serial correlation	Breusch–Godfrey serial correlation LM test	1.595	0.240	No serial correction
Ramsey RESET	Model Specification fitness	1.022	0.324	Correctly Specified

Source: Author's Compilation with Information from Regression Output (2025)

From table 6, all the tests as captured by Jarque-Bera, Breusch-Godfrey LM test, Breusch–Pagan–Godfrey Heteroskedasticity and Ramsey RESET test, among others, reveal the fines of the estimated equation results and the desired properties of an econometric model. The diagnostic tests confirm the suitability of the estimated model. Thus, the model residual series are normally distributed as suggested by the Jarque–Bera statistics, while the Breusch–Godfrey LM test statistics indicate that the model does not have a significant serial correlation problem. Moreover, the Breusch–Pagan–Godfrey test shows that the residuals are

homoscedastic and the model has correct functional form, while the Ramsey RESET test) shows that the ARDL models are correctly specified.

SUMMARY OF FINDINGS

This study investigated empirically the determinants of educational outcomes and the role of institutional quality in Nigeria between 1986 and 2022. The study was conducted with a view to identifying the factors that can promote educational outcomes in Nigeria. In order to achieve the objective of the study, an ARDL econometric model was formulated. Literacy rate, a measure of educational outcome, was regressed on income, government expenditure on education, corruption index, and fiscal freedom index, primary. secondary and tertiary gross enrolment. These variables were included in the econometric model based on review of past studies. The study used ARDL methodology to estimate the literacy rate and all independent variables after conducting stationarity test. The major findings of the study are summarized both in short and long run below:

Primary school gross enrolment has an inverse and insignificant impact on educational outcomes in Nigeria in the long run, while in the short run, the variable has a direct and insignificant impact. Secondary school enrolment has a direct and significant effect on educational outcome in the long run, and also a direct and significant effect in the short run; however, its lagged value shows an inverse and significant impact, possibly due to short-term adjustment costs or implementation lags. Tertiary school enrolment exerts a direct and significant influence on educational outcome in the long run, while in the short run, it has a direct but marginally significant effect.

Per capita income shows an inverse and significant relationship with educational outcome in the long run, which may reflect the effects of income inequality, whereas in the short run, it demonstrates a direct and significant impact, indicating that short-term income gains may support access to education. Government expenditure on education has a consistent direct and significant effect on educational outcome in both the long and short run, emphasizing the importance of public investment in the sector.

The fiscal freedom index, as a measure of institutional quality, has a direct and significant effect on educational outcomes in the long run. In the short run, its contemporaneous value also has a direct and significant effect, while its lagged value shows an inverse and significant relationship, possibly reflecting temporary disruptions associated with fiscal reforms. Corruption has an inverse and significant impact on educational outcomes in both the long and short run, highlighting the detrimental role of poor governance and misallocation of resources in the education sector. Finally, the error correction term is negative and statistically significant,

confirming the presence of a long-run equilibrium relationship among the variables and indicating that deviations from this equilibrium are gradually corrected over time.

CONCLUSION

In the study, the researchers examined the determinants of educational outcomes in Nigeria. From the findings, it can be reasonably concluded that the main determinants of educational outcomes in Nigeria are secondary and tertiary school enrolments, government expenditure on education, fiscal freedom, corruption, and per capita income. Among these, secondary and tertiary enrolments, along with effective government spending and improved fiscal governance, have a positive and significant impact on literacy and overall educational performance. Conversely, high levels of corruption and income inequality undermine these gains, highlighting the critical role of institutional quality and equitable resource distribution. Therefore, improving educational outcomes in Nigeria requires a multifaceted approach that combines increased access to post-primary education, sustained public investment, strong institutional reforms, and effective anti-corruption measures.

RECOMMENDATIONS

To improve educational outcomes in Nigeria, several key policy actions are recommended based on the study's findings. First, there is an urgent need to expand access to post-primary education. Since both secondary and tertiary school enrolments have been shown to significantly influence literacy rates, government efforts should be focused on increasing the availability and quality of education at these levels. This includes building more schools, enhancing infrastructure, and improving teacher training and curriculum relevance.

Secondly, increasing and effectively managing education funding is critical. While government expenditure on education has a positive impact, the effectiveness of this spending depends on transparency, accountability and efficient allocation of resources. Thus, it is essential for the government to not only raise the education budget but also ensure that funds are properly utilized to address the most pressing needs in the sector.

Furthermore, promoting inclusive economic growth is vital. Although rising per capita income can improve educational access in the short term, long-term benefits require reducing income inequality so that economic growth benefits all segments of society. Policies aimed at equitable wealth distribution and support for low-income families can enhance educational opportunities for vulnerable populations.

Institutional reforms are also necessary to strengthen the governance system within the education sector. Enhancing fiscal freedom through reforms that reduce bureaucratic

inefficiencies and improve public financial management can foster a more conducive environment for educational development. Alongside this, combating corruption is crucial. Since corruption negatively affects education outcomes, strict enforcement of anti-corruption measures and transparent monitoring of education-related projects must be prioritized.

Improving primary education is another area that requires attention. Although primary school enrolment alone may not significantly impact literacy, it forms the foundation of learning. Efforts should focus on improving retention, learning outcomes, and facilitating progression to higher educational levels.

Lastly, education policies should be grounded in evidence. The government and stakeholders should adopt data-driven approaches for planning, monitoring, and evaluating educational programs. This will help ensure that policies are responsive to actual needs and capable of delivering measurable improvements in literacy and human capital development.

SCOPE FOR FURTHER STUDIES

This study has laid a solid foundation for understanding the key determinants of educational outcomes in Nigeria, with a focus on institutional quality, enrolment rates, and government expenditure from 1986 to 2022. Nevertheless, there remains considerable scope for further inquiry. Future research is encouraged to delve deeper into the specific dimensions of institutional quality, such as regulatory quality, the rule of law, and political stability, and their differentiated effects on educational outcomes across Nigeria's geopolitical zones. Moreover, subsequent studies could explore the influence of socioeconomic factors, including household income, parental education, child labour, and poverty. Geographic and regional dynamics, particularly the urban-rural divide and the persistent disparities between northern and southern Nigeria, also warrant detailed investigation. The role of religious and cultural factors in shaping educational access and attainment could provide additional depth to existing knowledge.

Further research might also consider gender-based disparities, as well as differences across income groups and rural-urban settings, to present a more nuanced picture of educational inequality. Employing panel data techniques or mixed-methods approaches that incorporate qualitative insights could enhance understanding of the pathways through which institutional and contextual factors shape educational outcomes in Nigeria.

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