IMPACT OF HEALTH AND EDUCATION EXPENDITURES ON POVERTY REDUCTION IN NIGERIA

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ABSTRACT
Nigerian governments have continued to make concerted efforts on providing community goods and services to enhance welfare at the same time reduce poverty through its expenditures, yet no significant results as these expenditures are regularly influenced by factors such as corruption. Hence, this study look at the effect of health and education spending by government in reducing poverty in Nigeria spanning from 1996-2021 employing the ARDL bounds test methodology. Results of the analysis showed that spending on education and health expenditures are all significant at a 5 percent level of significance and are positively related to the dependent variable implying that on average, the higher the education and health expenditure, the higher the poverty reduction, ceteris paribus. While the short run results revealed that health expenditures negatively relate with poverty at the conventional level of significance, i.e 5 percent On the other hand, a positively significant association exists between spending on education and corruption with poverty reduction at a conventional level of 5 percent significance. The study suggested that the Nigerian government need to concentrate on improving the quality of health care services and that of education by spending more on policies and programme that are pro-poor via increasing investments in health and education, while the government implements anti-corruption measures to reduce all forms of corruption to the barest minimum.

Keywords: Health expenditure, education expenditure, poverty reduction, ARDL, Nigeria
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1. INTRODUCTION
In Nigeria, severe poverty is a reality that is manifested in inadequate quality food, clothing, good housing, education, healthcare and other essential services. Health and education are vital in enhancing a satisfactory and rewarding life and they both lie down at the fulcrum of meaningful development (Kur et al, 2020). National Bureau of Statistics (NBS) reports that, 4 out of every 10 Nigerians are poor while more than 6 out of 10 are facing more than two forms

of deprivation (Multidimensionally poor) (NBS, 2023). Poverty rate reached 46% in 2023, with about 104 million Nigerians estimated to be surviving below poverty line, and it is also regarded as the second poorest country after India. Also, Nigeria's poverty rate increased to 46 percent in 2023 from 40 percent in 2018, while the poor people, to 104 million from 79 million (World Bank, 2024).

However, Keynes advocated for governments to stimulate economic activity by increasing public spending, either through direct spending on things like infrastructure projects or by providing subsidies to businesses in order to increase households' income and achieve reduced poverty. When the government increases its expenses on infrastructural projects, it can arouse economic activities, create employment, and improve productivity (Popogbe & Oluwagbotemi, 2023). Specifically, spending on education and health is regarded as an investment in human capital. because as people are inseparable from their skills, knowledge, values and health in the quest to acquiring their financial and physical assets for the purpose of lifting them out of poverty(Amire, 2020). As such, spending on health and education should be viewed as productive expenditure as it has the potential to catapult Nigeria's growth potential through an increase in productivity and per capita incomes, which in turn help in reducing Nigeria's poverty which is currently a downgraded development. Government spending on education and education is one of the means of reducing poverty, which has been on the increase and complemented by other development partners (World Bank, UNICEF, WHO, UNFPA).

Nigeria is regarded as one of poor countries of the world with 71 million people extremely poor and 133 million classified as multidimensional poor (NBS, 2022). This is despite so many programmes put in place by past and successive governments in various sectors like education, health, agriculture and businesses to equitably distribute resources and reduce poverty. These programmes include Social Investment Programmes (SIP), N-power, School feeding programmes, Agriculture (N-Agro), Unconditional cash transfer (Trade Monies), and Vaccination, among others (Adamu, 2019). Despite all these, factors like inadequacy, untimely release if funds, inconsistency, corruption etc have impeded the impact of these funds in improving the welfare of the poor and reducing poverty.

The sectors of health and education in Nigeria continued to face significant challenges. The country has one of the uppermost rate of maternal and child mortality in the world. The child mortality rate is about 512 deaths per 100,000 live births and about 117 deaths per 1,000 live births. (World Health Organization [WHO], 2023). This statistic was recorded despite spending on health to the tune of N147.77 billion in 2021 (World Bank, 2023). On education, Nigeria's government expenditure on education was reported at 5.14% of its total expenditure in 2021, which is 0.01 percent higher than 5.13% of 2020. Despite these spending, the quality of education remained poor when compared with other countries of the world. However, without good governance (low corruption) and effective implementation of policies, increased spending on health and education may not lead to significant poverty reduction (Edrees et al., 2016; Dankumo et al., 2023, Okechukwu, et al, 2023). Hence, the difficulty in achieving the aim of public spending – poverty reduction.

Although, some studies (Dankumo, et al., 2019; Chude et al., 2019; Yahaya, 2019; Ndanusa, 2019; Edeh et al., 2018; Amire, 2020) have investigated the relationship between governmental spending and both economic growth and poverty. Their conclusions on the effectiveness and impact of spending differed greatly since there are numerous hidden constraints that must be understood. Also while getting acquainted with other actions to be taken by the government to realize poverty reduction.

Therefore, it is pertinent to examine the effect of education expenditure and that of health and Poverty, which is very high and affecting a greater proportion of Nigeria's population together

with the impact of corruption that has eaten bottomless into the fabric of Nigerian state which invariably affects the expenditures' impact.

The literature review, methods, results and discussion, conclusion, and suggestions were all included in the remaining sections of this study.

2. LITERATURE REVIEW

Theoretically, this work is built on the Keynesian theory for government intervention in the economy through its expenditures during times of economic recession and downturn, as experienced by countries of the world during the great depression of 1930s. Keynes advocated for governments to stimulate economic activity by increasing public spending, either through direct spending on things like infrastructural projects or by providing subsidies to businesses. The essence of this increased spending is to artificially raise the demand for goods and services aggregately, which will boost economic activity and promote growth and prosperity (poverty reduction). This was later reiterated by Musgrave's theory of public spending, that the government must play an active task in the economy by providing public goods and services that the private sector cannot or will not provide alone.

Duruh and Chima (2022) analyzed the relationship between education spending and poverty reduction using yearly data from 1980 to 2019. The Granger test and the Autoregressive Distributed Lag model were used in the study's analysis. The result indicates that the growth of population, inflation, and domestic capital formation affected life expectancy negatively, thereby retarding poverty reduction in both the long term and short term. While spending on health and education services positively correlates with life expectancy, this has a favorable long- and short-term impact on reducing poverty. However, education recurrent expenditure negatively affects poverty reduction in the short term. Granger causality outcome shows a one-way causation between spending on education and poverty reduction in Nigeria.

Tubotamuno et al. (2021) examined the relationship between government spending on education and poverty in Nigeria between 1990 and 2020, employing the Autoregressive Distributed Lag (ARDL) model for model analysis. The results demonstrated that government capital spending on education has a negative effect on Nigeria's poverty rate. However, recurrent government expenditure in education has insignificant impact on poverty of Nigeria.

Amire, (2020) studied how government health expenditures and that of education impact on Nigeria's poverty alleviation using the Ordinary Least Square (OLS) technique. The findings show a long-term correlation between government spending on health and education and the reduction of poverty in Nigeria. Similarly, it was found out that both the expenditures exhibits positive relationship on the poverty reduction, this means that increasing spending on health and education translates into improvement in poverty alleviation.

Also, Dankumo, et al. (2019) discovered a long-term negative correlation between public spending and poverty; however, only economic sector's spending is significant, whilst social sector spending is not, illustrating the influence of the former while the latter appears to have no effect. In the case of corruption, it is positively correlated with poverty—that is, poverty increases as a result of increased corruption which affects public spending to have no effect on poverty, but instead exacerbates it.

In another study by Chude et al.(2019), Public spending stimulates real private investment and fixed capital accumulation, which raises capital accumulation, reduces the current deficit, lowers the burden of external debt, and improves household education by raising the standard of human capital, and all of which reduces poverty.

Yahaya (2019) found a negative relationship between trend of poverty trend and that of expenditures on education, health and agriculture of Nigeria. Similarly, Ndanusa (2019) revealed a significantly negative relationship between government education expenditure,

youth training, open apprenticeship scheme, entrepreneurship scheme and small-scale enterprises' loan on economic growth in Nigeria.

Edeh et al. (2018) in their study, found that education expenditure doesn't have any impact on poverty reduction over the period. Ehigiamusoe (2013) revealed that even though a long-run association exist between education, poverty reduction and economic growth in Nigeria, but that both total education expenditure and literacy rate do not cause change in poverty rate in Nigeria.

On expenditures generally, Dankumo *et al* (2023) found that political instability and corruption have significant roles in mediating the impact of government spending on poverty reduction in Sub-Saharan African nations, in which Nigeria is inclusive.

3. METHODOLOGY

This paper used quantitative research design to capture the link between health and education spending by the government, corruption and reducing poverty in Nigeria. The poverty reduction (proxy by GDP per capita) and corruption (control of corruption) were sourced from the World Bank database. Government expenditure in health and education were sourced from CBN statistical bulletin. As recommended by Pesaran and Shin (1995, 1999) and expanded upon by Pesaran et al. (2001), the Autoregressive Distributed Lag (ARDL) approach was employed as the data analysis method to test for the presence of a relationship (cointegration) because, in comparison to other techniques like Engle and Granger (1987), Johansen (1988), and Johansen and Juselius (1990) procedures, it is more powerful if the sample size is small. When all of the variables in the analysis are integrated in mixed order [1(0), 1(1)], or a combination of both, the ARDL limits F test offers further flexibility. One fundamental need for the variables' integration order is that it must be at most one (Pesaran et al., 2001; Acaravci & Ozturk, 2012).

ARDL bounds technique permits for dissimilar optimal lags selection, which is not possible when using other cointegration methods. Lastly, the conventional cointegration procedures estimate the long-run connection within the context of the system equations, but the ARDL bound cointegration test employs only one reduced-form of equation. (Narayan, 2005; Acaravci & Ozturk, 2012).

Model Specification

The study's model is an expansion of the Keynesian model that illustrates how rising government spending promotes economic growth and, ceteris paribus, increases income that leads to the reduction of poverty, but updated to account for corruption. as was used by Dankumo, *et al*. (2019) to look at the impact of public expenditure and corruption on poverty reduction in Nigeria.

We modified the Keynesian model to specify the relationship between government spending, corruption, and poverty as given in the functional form below:

$$POVt = f (GEX, CUR) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots. (1)$$

Equation (1) depicts poverty reduction depending on the government expenditures and corruption that is clearly described as; a differ in the poverty rate is as a result of change in spending on health (EXH) and Government education expenditure (EXE) and Control of Corruption (CUR). Equation (1) can be written in equation form and be transformed to a logged regression model as given below:

$$GDPC_t = \gamma_0 + \gamma_1 EXH_t + \gamma_2 EXE_t + \gamma_3 CUR_t + u_t \qquad (2)$$

$$lnGDPC_t = \gamma_0 + \gamma_1 lnEXH_t + \gamma_2 lnEXE_t + \gamma_3 lnCUR_t + u_t \qquad (3)$$

Where: POVt is the poverty reduction, but proxy by GDP per capita income, such that increase in the value implies reduction in poverty and vice versa. This is because public expenditures impact income in various ways such as through investments, education and training, healthcare, consumption, housing and so on, depending on individual's choices and circumstances. Hence effective and efficient management of resources during budgeting and making informed spending decisions is sacrosanct in achieving a long-term benefit – poverty reduction. y_0 is the constant term, EXH is government expenditure in health and EXE is government expenditure in education, CUR is control of Corruption and μ_t= Error term γ_1, γ_2 and γ_3, are the coefficients of the independent variables. Every variable was transformed to log as extracted, except for CUR was rescaled (Dankumo et al, 2023) before logging, because it is a rate and negatively valued for Nigeria.

Pesaran *et al.,* (2001) model of ARDL is as follows for equation (3):

$$\Delta lnGDPC_t = \alpha_0 + \sum_{i=1}^{\rho} \alpha_1 \Delta lnGDPC + \sum_{i=1}^{\rho} \alpha_2 \Delta lnEXH_{t-1} + \sum_{i=1}^{\rho} \alpha_3 \Delta lnEXE_{t-1} + \sum_{i=1}^{\rho} \alpha_4 \Delta lnCUR_{t-1} + \lambda_1 lnGDPC_{t-1} + \lambda_2 lnEXH_{t-1} + \lambda_3 lnEXE_{t-1} + \lambda_4 lnCUR_{t-1} + \varepsilon_t \qquad (4)$$

The range of values from λ1 to λ4 to the right shows how the relationship of variables in the long run, whereas the range of values from α_1 to α_4 with the summation signs shows how the variables change over the short term. α_0 is the drift constant, while μ_t is the disturbance term when considering the other hand of the equation. H_0: $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = 0$ represents the null hypothesis in equation 4. This suggests that long-term relationships are therefore nonexistent. H_1: $\lambda_1 \neq 0$, $\lambda_2 \neq 0$, $\lambda_3 \neq 0$, $\lambda_4 \neq 0$ represents the alternative hypothesis. This study adopts the critical values of a smaller number of samples derived from Narayan (2005) for bound testing to prevent size bias. If the F-calculated value is greater than the upper value, irrespective of its level of stationarity, that is I(0) or I(1), the no co-integration null hypothesis will be rejected. The error correction model and short-run dynamics are modelled below.

$$\Delta lnGDPC_i = \beta_0 + \sum_{i=1}^{\rho} \delta_i \Delta lnGDPC_{t-1} + \sum_{i=1}^{\rho} \emptyset_i \Delta lnEXH_{t-1} + \sum_{i=1}^{\rho} \omega_i \Delta lnEXE_{t-1} + \sum_{i=1}^{\rho} \lambda_i \Delta lnCUR_{t-1} + \alpha ECM_{t-1} + U_t \qquad (4)$$

The ECM evaluates the long-term rate of equilibrium recovery after the model's short-run abnormality (Onisanwa, Shido-Ikwu & Mercy, 2018). Narayan (2005), states that the system can only eventually find equilibrium if the coefficient of the error correction model has a value that is both negative and smaller than zero.

4. RESULTS AND DISCUSSION
Descriptive Statistics

Table 1, depicts the Nigeria's GDP per capita continued to rise between 1996 and 2021, from N36,825.94M in 1996, reaching a high of N82,5091.0M in 2021, but the average remains at N32,5264.6M indicating that the poverty level ought to be falling. Health Expenditure (EXH) reached N423.33M in 2020 from N3.18M in 1996 with an average N141.05M. Expenditure on Education (EXE) reached its peak of N646.75M in 2020 from N11.67M in 1996, whereas control of corruption reached its uppermost level (least corrupt) of -0.90 in 2008 from -1.50 in 2002, but averaged at -1.17, that is still categorized as being corrupt i.e., having negative values.

Table 1: Descriptive Statistics

Measurement	GDPC	EXH	EXE	CUR
Mean	325264.6	141.05	232.33	**-1.17**
Median	269868.0	94.21	157.38	**-1.16**
Maximum	825091.0	423.33	646.75	**-0.90**
Minimum	36825.94	3.18	11.67	**-1.50**
Std. Dev	24991.8	130.64	199.98	**0.142**

Unit Root Test

The study employed Pesaran et al. (2001) 's ARDL Bound tests to determine the link. But since ARDL is only employed when variable stationarity is at I(0) or I (1) and absent at I(2), testing for stationarity is important. To guarantee the stationarity of the variables, this paper used the Augmented Dickey-Fuller (ADF) unit root test. Table 2 displays the outcomes of the ADF test.

Table 2. Results for Unit Root test

Variable	Constant	Const. & Trend	Without Const. & Trend
		Levels 1(0)	
LGDPC	-2.0978	-0.0360	**1.0653**
LEXE	-1.8103	-2.8880	**1.9221**
LEXH	-4.3188***	-2.3543	**1.8998**
LCUR	**-1.47717**	**-4.2352****	-1.1565
		First Difference 1(1)	
LGDPC	-1.5874	-3.7878**	**-0.5694**
LEXE	-6.0689***	-4.2801***	**-4.8500***
LEXH	-4.1331***	-5.6464***	**-4.3663***
LCUR	**-5.2431***	**-5.1578****	-4.01995***

(*) significant at 1%; (**) 5% significant and (***) 1 % significant levels.
Source: Authors' Computation using Eviews 10

From the above ADF results, LGDPC and LEXE were non-stationary at level for all test, while LEXH and LCUR were found to be stationary at 1 percent and 5 percent when considering constant and constant with trend respectively. The second panel of table 2 reveals that, the variables were all stationary for all test after adjusting for first level difference. While none of the variable data series is I (2), the variables are stationary at I(0) and I(1). Therefore, the ARDL model is a good choice.

Table 3. Bound Test for the long-run cointegration

F-Statistics **11.07702**

Critical Value	Lower Bound	Upper Bound
1%	5.333	7.063
5%	3.710	5.018
10%	3.008	4.150

Note: ***, **, * depict 1%, 5% and 10% levels of significance, respectively. Narayan (2005) critical values

Source: Authors' Computation using Eviews 10

According to Table 3, the computed F-statistic is 11.07, which is greater than the upper bound value of Narayan's (2005) critical value at the conventional significance level of 5%. This suggests that GDPC and its determinants (EXE, EXH, and CUR) have a long-run cointegration relationship. As a result, we reject the null hypothesis that there is no association and proceed to estimate the short- and long-term model parameters.

Table 4. Long-Run Coefficient results

Dependent variable: LGDPC		
Independent variable	**Coefficient**	prob
C	5.350614	0.0088
LEXE	0.327154	0.005
LEXH	0.378063	0.006
LCUR	-0.295656	0.069

Source: Authors' Computation using Eviews 10

Tables 5 explain the long run coefficients of association between GDPC, public spending (education and health) and corruption. It shows that education expenditures and health are all significant at a 1% significance level and are positively related to the dependent variable. Expenditures on education and health increases income which by implication reduces poverty in Nigeria. This positive relationship between the variables indicates that on average, the higher the education and health expenditure, the higher the income and poverty reduction, ceteris paribus. The result are in line with studies (such asAmire, 2020; Chude *et al*, 2019; Yahaya 2019; Ndanusa 2019) whose outcomes suggest that education and health expenditure have impacted poverty significantly in Nigeria.

The connection between corruption control and poverty reduction is negatively significant, which impliedly means an increase in corruption will lead to a fall in income and aggravate the condition of poverty, which is in the affirmative with studies by Dankumo *et al*, 2023 and Dankumo *et al*, 2021) that found corruption to affect expenditures impact on poverty. In this case, a 1 percent unit rise in corruption leads to 29.6% fall in income that is accompanied by fall in poverty reduction.

Table 6 Short-Run Coefficients and Error Correction Regression

Independent variable	Coefficient	prob
DV: LGDPC		
C	**5.350614**	**0.0088**
D (LEXE)	0.463990	**0.0075**
D (LEXH)	-0.217104	**0.0269**
D(LCUR)	0.235560	**0.012**
CointEg (-1) *	-0.714540	**0.008**

Source: Authors' Computation using Eviews 10

Table 6 has the short-run association between per capita income (poverty reduction), expenditures and corruption control including the error correction value. It discovered that spending on health negatively relate with poverty at a conventional level of 5% , while a significant positive relationship exists with expenditure on education and control of corruption with poverty reduction at a 5 percent level of significance. One of the important outcomes of the short-run results, is the error correction value (CointEg (-1)) that has the right value and sign and also significant at 5 percent. This coefficient shows the speed at which the model is adjusted back to the equilibrium state at long run should a shock occur at the short-run. With the value -0.71454, it implies that the last year's shock will be adjusted back to the long-run equilibrium state at the speed of 71.5 % over the period of 1 year 4 months (Dankumo et al 2019).

Table 7 Diagnostics Tests: Second-Order Testing

Test Statistics	Chi-square/LM Test	Probability value
Serial Correlation	0.06757	**0.23800**
Normality	2.41210	**0.29938**
Heteroscedasticity	0.75655	**0.70990**

Note: we used the Lagrange multiplier test of residual to determine the serial correlation, normality based on skewness and kurtosis and Heteroscedasticity based on squared residuals on squared fitted values.
Source: Authors' Computation using Eviews 10

In Table 7, it shows that the regression model specification is well fitted as model passed the diagnostic test of non-normality of residuals, serial correlation and heteroskedasticity. This is because all the p-values are higher than the conventional level of 5% significance level of acceptance of the null-hypothesis.

5. CONCLUSION AND RECOMMENDATIONS
This paper highlights the impact of government spending in health expenditure and that of education on reducing poverty in Nigeria for the period 1996-2021. Based on the results, it indicates that expenditures on education and health are all significant at a 1% significance leve and are positively related to the dependent variable. Expenditures on education and health increases income implying reduction of poverty in Nigeria. This positive relationship between the variables indicates that on average, the higher the expenditures on education and health, the higher the income and poverty will reduce, ceteris paribus. The association between control of corruption and poverty reduction is significantly negative, which by implies an increase in corruption decreases income and by and large increase poverty.

It is in line with the above conclusion; we recommend that the Nigerian government must be proactive in improving the quality of health and education by increasing their spending on programmes and initiatives that have been proven to be effective on reducing poverty. This could include increasing investments in health facilities and improving the availability of medical outcomes, such as teacher training or early childhood education programmes.

Secondly, the government should consider implementing targeted poverty reduction programmes aimed at helping the most vulnerable members of society especially women and children. This could include providing financial assistance to low-income families, implementing programmes to provide job training or providing subsidized health care and housing. Lastly, the government should implement anti-corruption measures aimed at reducing waste, fraud, and abuse in public spending.

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