An Investigation into the Poverty and Education Nexus in Sub-Saharan Africa

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Abstract

Most of the African nations have been handicapped when it comes to educational attainment, simply because of the level of poverty in these countries. This study therefore investigated the relationship between poverty and educational attainment in 31 Sub-Saharan African counties between 2008 and 2021. The Pooled Mean Group estimation technique was employed. The findings revealed that all the dependent variables have a positive long-run relationship with primary school completion in all the counties. The short-run relationship was found to be negative but not significant. The work therefore recommended that policies that will ensure an adequate supply of electricity be designed and implemented and that the government should subsidize the consumption of clean energy to enable poor households to access them

1.0 Introduction

The lifeline for the development of any society or nation is the level of educational status of the citizens of that nation. Investment in human capital development is perhaps one of the most important investments that can translate to multiple streams of benefits for a society. The reason is that education changes perception and improves capabilities and capacities to produce through the channels of skill development, and innovative capabilities leading to entrepreneurial development that eventually translates into higher productivity. A nation that is saddled with high levels of poverty may not be able to experience the transition from educational development to overall development due to the inability of the citizens to access educational facilities and opportunities. Poverty has been a subject of concern in Nigeria for several years now, it was estimated in 2018 that about 40 per cent equivalent to over 80 million people out of the total population of over 200 million are accounted to be poor and this trend is expected to rise between 2019 and 2023 by another 12 million more people (WB, 2021).

Poverty has been conceptualized by the World Bank as a situation where an individual's well-being has been deprived, which manifests in low income, which also results in the inability to access necessary goods and services. It also manifests in low access to quality health care, education, clean portable water, inadequate physical security and inability to speak out in society (WB, 2011). The United Nations similarly conceptualized poverty as a situation where individual choices and opportunities are denied, which implies a situation where human dignity is being violated and where individuals cannot adequately and effectively play their roles in society. It could also mean a situation where individuals lack the means to put enough food on their table and clothing on their backs, no access to education and health facilities, no access to land to grow food or a decent job to earn enough income to access the good things of life (UN, 2011). These two approaches to conceptualizing poverty can be summarized as a situation where individuals are denied access to decent,

qualitative education at every stage of educational development. This implies that children from poor homes cannot get access to good education from primary to tertiary institutions.

The relationship between poverty and education is very strong from research. It has been discovered that children from poor homes have a high chance of achieving very low in terms of educational attainment. Most of the instructions given are to the advantage of fairly well-to-do children, which often starts from primary school, and this tends to affect retention by children from poor homes, facing unpleasant placement in schools and with a high probability of not completing their high school education (Huston, 1991). The work of Garbarino, Dubrow, Kostelny, and Pardo (1992) showed that children from poor homes and poor environments usually have ineffective schools that give rise to inferior academic performance, irregular attendance and unwholesome classroom behaviours. Consequently, children from these backgrounds tend to have between two to four- and ten times the possibility of dropouts than children from middle-income and high-income groups respectively (Lynch, 2015). Between 2004 and 2010, an average of 32 per cent of primary school children dropout was recorded in Nigeria (WBDI, 2022).

The consequence of these negative tendencies on children's education includes low success in academic endeavours, poor mannerisms, low preferences and unwholesome behaviours of these children in society. Solley (2005) stated that children from poor homes are highly prone to suffer hunger, exhaustion, touchiness, headaches, infections in the ear and colds (Winters & Cowie, 2009). The few children that are fortunate to get enrolled find it difficult to sustain themselves and this leads to hunger or invariably doing certain funny things for survival, such as sleeping with men for money (for girls) and joining gangs (for both boys and girls). The consequence of this is detrimental to the general society.

The Sustainable Development goals that have to do with elimination or reduction of poverty and quality education for all have not been actualized, not even near actualization in Nigeria as of today. The rationale for these goals is that poverty should not be allowed to hinder quality education. Even with the removal of school fees in most nations, many families cannot afford the basic expenses of schools like school uniforms, lunch during school hours, textbooks and exercise books (Allington and McGill-Franzen, 2008), extra lessons and examination fees. Many are deprived of going to tertiary institutions just on the grounds of inability to pay for West African Examination Council examination fees and Unified Matriculations examinations and they end up becoming carpenters, mechanics, drivers, hairdressers, roadside hawkers petty traders, etc., which was not originally their desires (Parrett and Budge, 2016). Consequently, they may not give such vocations their best because they are forced into it by poverty. Even after being forced into such vocations, they still cannot succeed because the tools needed for such works are not affordable and they are simply kept in the cycle of poverty perpetually (Hirsch, 2007).

The launch of the National Multidimensional Poverty Index (NMPI) in 2022 (NBS, 2022) in Nigeria showed that 63 per cent of the country's population are multidimensionally poor. This percentage translates to about 133 million people and that is quite alarming. The NMPI revealed that the index for Nigeria is 0.257, and this showed that poor people in Nigeria experience about 25 per cent of all deprivations possible. The index also revealed that about 65 per cent of the poor are in the northern part of the country and the remaining 35 per cent

are situated in the southern part of the country. NMPI is an index that tracks multiple sets of deprivations that have to do with health, education, some basic standards of living, employment, other relevant dimensions of poverty, monetary poverty, etc. It was recorded in the statistics that about two-thirds of all children in Nigeria are multidimensionally poor and this implies that more than half of children lack intellectual stimulation for early child development. Because of this multidimensional poverty index, attainment of educational growth is inhibited and this is further recycled into higher levels of unemployment and poverty.

Figure 1.0: Population below poverty lines
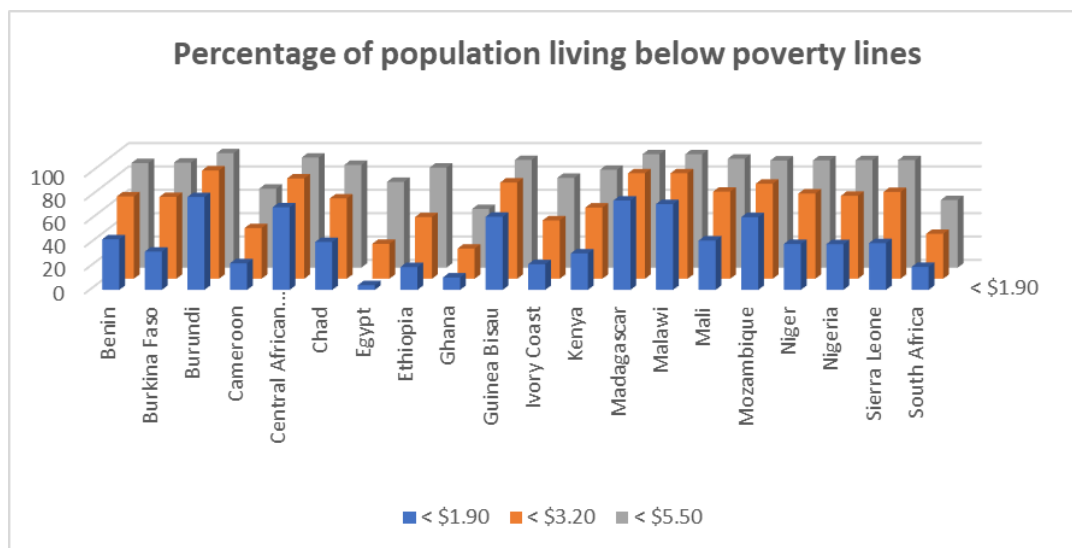
Source: Author generated using Excel 10

Figure 1.0 shows the percentage of the population of selected countries living below the poverty line as defined by the World Bank. Egypt has the lowest population (4.07 per cent) living below the poverty line of less than $1.90, while Burundi has the highest population (79.53 per cent) living below that poverty line. Similarly, Burundi has the largest population (92.77 per cent) living below the poverty line of less than $3.20 a day. Ghana has the lowest population living below the poverty line of less than $5.50 a day and Burundi has the largest population (98.02 per cent) living below that poverty line. Worthy of note is the fact that all the countries captured have more than 50 per cent of their population living below $5.50 per day.

Another form of poverty that could negatively affect education and its benefits is social marginalization. Social seclusion and restriction of freedom to function in certain societies, especially for certain racial immigrants and some minorities could affect their access to adequate education and better jobs even after being educated. Restrictions from full participation will discourage anyone involved in going through the rigour of the educational process (Berg, 2008).

The percentage of people living in poverty in South Africa reduced from 62.1 per cent to 55.5 per cent between 2009 and 2015 (Statistics South Africa, 2017). Poverty seems to affect children who are 17 years and below,

especially those in rural areas who have little or no education. Pretorius (2016) posited that about 63 per cent of children in South Africa live in poverty, which has directly affected their mental, physical and emotional development.

Having seen the potential damaging effects of poverty on education in a society, this work intends to examine the impact of poverty on education in Nigeria in particular. Most of the previous works done on poverty and education (Capra, 2009; Nortje, 2017: Amzat, 2010; Bright and Peace, 2018) employed descriptive statistics methods of evaluation, and that seems insufficient for an empirical analysis. In addition, the latest works did not have a year scope of their study but this work will update the trend of both poverty and education in Nigeria. This work is to examine the impact of poverty on education, by looking at their relationship and causal effect on each other. This work will therefore employing a multivariate regression analysis for the estimation of the parameters and this will help to determine the nature of the relationship and the impact of poverty on education in the sub-region.

The remaining part of this work is divided into five sections. Section two examined the available literature on the subject matter. Section three presented the theoretical framework on which this work is hinged, while section four presented the methodology and model specification. Section five presented the result of the estimation and analyze it while section six summarized and suggested the policy implications of the results.

2.0 Literature Review

This section will explore the recent empirical studies on how poverty affects education across the globe and in Nigeria.

Ingutia, Rezitis and Sumelius (2020) investigated the factors that could lead to primary school enrolment, child mortality and child underweight in 30 Sub-Saharan African countries between 1990 and 2010. Their work employed three three-stage simultaneous equation models and a fixed effect panel model to estimate the relationships. The findings revealed that causality runs in both directions between child poverty and lack of access to education in this region. It was also revealed from the results that the indicator of crop production affects children's access to education rather than poverty. The index of crop production, the underweight of children, and the female-to-male labour force ratio are all indirect ways of influencing a child's access to education. It was revealed therefore that these indirect factors, mostly influenced by child poverty affect children's access to education than the direct factors. It was therefore recommended that policies be designed that can influence the institutional quality that can reduce child poverty giving both children and women access to education and to further reduce poverty in those households.

Gay, Sonnenschein, Sun and Baker (2020) examined how parents' involvement and poverty can influence their children's reading skills using secondary data from the Early Childhood Longitudinal Study for kindergarten between 2010 and 2011. The study examined the effect of low-income household parents' involvement in the learning of their children, how much classroom instructions and first-grade children's reading skills. The findings revealed that the level of poverty in households was significant in affecting the reading skills of children. It was found that children from households that are close to poverty manifested a higher degree of reading skills and

scores than those from very poor households. This finding was predicated on the financial strength of the parents. This is because poor parents usually experience financial strain and may not be able to provide enough resources for their children to learn reading skills. This is expected because the various methods of learning require money to procure, and their capability is low, it must transmit to the learning and reading ability of children.

Silva-Laya, D'Angelo, García, Zúñiga and Fernández, (2020) carried out a literature review that is systematic in the quest to unravel the limitations and opportunities that urban poor children face in education attainment between 1995 and 2017 using a total of 16 articles in the work. The study aimed to explain the level of educational attainment of people who are poor in urban centres and the prevailing conditions under which they learn. The findings of the results indicated that poor people from urban centres find it difficult to catch up with their learning capability and the deficiencies of their poor background still show this is because they are faced with deprivation in school materials and faced with both cultural and other obstacles that could inhibit adequate learning. It was therefore recommended that a multi-sectoral policy approach should be employed to create equity and equal participation of citizens in educational development.

Bright and Peace (2018) investigated the effect of poverty on students' attainment of education in Rivers State, precisely in the Emohua local government area of the state. The study employed a survey using a questionnaire method to extract the data to be used in the descriptive analysis with a sample of eight hundred and sixty-five (865) youths. The study aimed at finding out if the poverty of parents could translate to impacting the performance of their children in examinations as well as the quality of school they attend and the quality of education that is finally transferred to the children. The findings of the research showed that parents' poverty had a significant negative effect on these three variables that measure educational attainment. It was therefore recommended that the government can alleviate this plight of poor families by creating social welfare educational schemes that would ameliorate the children of this segment of people in better educational attainment.

Nortje (2017) carried out an analysis of the effect of poverty on education in South Africa using a qualitative analytical method with secondary data from the country. The findings revealed that there is a strong connection between poverty and education in the country. Poverty denied access to qualitative education in South Africa. It was also shown that as a result of low education, the unemployment rate is on the increase and this spills over to aggravating the poverty level further. It was also discovered that several other factors directly affect education in the country, such as educational cost, teachers' capabilities, inadequate infrastructure and teaching resources. The government can then be better informed on the role to play in reducing poverty and consequently boosting the educational standard in the country.

Pearman II (2017) tested the effect that exposure to poverty has on the ability of children to learn Mathematics in the United States. The study engaged a panel analysis of the dynamics of income and a design of value added. The finding revealed that families that are too exposed to poverty face a challenge of growth in mathematics. Recommendations include enlarging policies that can help low-income families' children to include non-school factors, such as housing policies and reducing the concentration of poverty in certain areas.

Rutkowski, Rutkowski, Wild and Burroughs (2017) attempted to test the effect of poverty on US children's educational attainment by employing the data from the Programme for International Students Assessment (PISA). The authors used the propensity score matching method and it was found that students from the US who are from poor backgrounds have very clear deficiencies in educational attainment when compared to other students who are not from poor backgrounds. The result showed that poor students will perform only about one-quarter lower than that of the standard deviation of the PISA assessment. This result showed that poverty accounts for lower educational achievement in the states and that makes one-third of the population of the country unprepared to compete in the global economy. This consequently results in further poverty and lower earning capability and subsequently cycle of poverty generated.

Hungi and Ngware (2017) carried out a study that investigated the effect of a community-based intervention on students from poor backgrounds in the slums in Nairobi, Kenya with the purpose of testing if the approach will help to bridge the gap in learning mathematics among the girls of these communities and to create a learning incentive for the students from these areas. The intervention was in three forms: giving counsel to the parents of these girls for them to understand the importance of girls' education, secondly, giving subsidy to enable them write their national examination and thirdly, giving them after-school support for their homework. The study employed difference –in- difference-in-difference estimation method with samples of 748 of 12- to 19-year-old students between 2013 and 2015. The findings revealed that two of the intervention packages were effective in improving mathematics learning among children from these slums. It was therefore recommended that to reduce gender inequality in Kenya, community-based policies should be implemented.

Drotos and Cilesiz (2016) engaged in a study to discover the challenges faced by students who come from poor homes in accessing education at higher levels, such as high schools and colleges. The study engaged an analysis resulting from interviews gathered over a year in 6 high-poverty schools. The findings revealed that students from poor homes find it difficult to pay for enrolment because they are expensive and beyond their reach. It was also discovered that the rate of success of students depends highly on the availability of reading space in their homes, books and other relevant materials for references, especially from homes where high value is placed on education. Policies to address this poor funding and poor attainment of education should be geared towards non-psychological, but structural factors that have impaired educational attainment.

Malik (2013) examined the differences in school attendance among different economic conditions of households in India. The economic condition was measured using the wealth index which reflects the economic conditions of households in India. This wealth index was constructed using 33 households' assets and characteristics of their housing in the like of household electrification, the source of drinking water, type of windows, the quality of their toilets, the type of fuel used for cooking, the ownership of house they live in, how many people sleep and live in one room, who owns a bank account, who owns fans, tables, chairs and radio, etc. The findings of the study showed that with all the parameters used to measure poverty level, such as poorest, poor, middle, wealthy and wealthiest, it was discovered that the economically poor states recorded the highest number of children with dropout rates, people that repeat classes, drop out a year or two ago. It was also shown that states with children working recorded the highest number of children who never attended school.

Amzat (2010) embarked on a qualitative analysis with the help of interviews with some of the stakeholders, of the effect of poverty, both in the rural and urban centres on the education of children in Nigeria. The findings of the work revealed that poverty has led to many children dropping out of school and becoming street hawkers, and pick-pocketers because the parents could not afford the school fees due to their low incomes. The public schools that they can afford are poorly furnished, teachers are poorly paid, some have no seats, no books, some have no roof over their heads, especially the rural areas, and all these generally lower the standard of education in the country. It was therefore recommended that the government should embark on policies that will attack the menace of poverty to give meaning to the educational standard in the country.

3.0 Theoretical Framework

This work is hinged on the capability approach proposed by Sen Amartya in 1985 where he posited that individuals' capability to achieve a certain level of well-being is predicated both on the monetary resource and other opportunities available to the individual. In the words of Sen (1985), an individual's achievement is referred to as functioning and capability could refer to several functions the individual could achieve. It is this achievement that Sen used as a measure of well-being. In light of this conceptual clarification, some of the basic functions required for life include health, education, water supply, sanitation, etc, (Darling, 2002). This approach shows that to develop human capital, there is a need for the availability of financial resources and other social factors (Sen, 1985). It was on this basis that Schiller (2008) opined that high educational attainment is a means of reducing poverty in the sense that people who invest in education have a higher propensity of coming out of poverty through higher opportunities to do better work and earn higher income and also reduce the rate of job loss. To buttress this assertion, Duncan, et al (1998) reiterated that if a child is economically deprived, especially for the first five years, it has the potential to result in poor mental and physical development. This position shows that children from poor backgrounds have a high chance of not being properly educated.

4.0 Methodology and Model Specification

From the theoretical framework that links poverty to education and more specifically, the high level of poverty-reducing educational attainment and quality, this work investigates the nexus using an econometric methodology approach and the relationship can be captured as indicated below. The measures of poverty used in this work are access to electricity, access to clean fuels, and primary school enrolment and the measure of education adopted is the primary school completion rate.

$$PSCR = f(ACCE, ACCF, PSER) \tag{4.1}$$

Where PSCR is the Primary School Completion Rate, ACCE is access to Electricity, ACCF is access to Clean Fuels, PSER the primary School Enrolment Rate.

Expressing (1) econometrically, we have:

$$PSCR_t = \beta_0 + \beta_1 ACCE_t + \beta_2 ACCF_t + \beta_3 PSER_t + e_t \tag{4.2}$$

The *a priori* expectation is that $\beta_1 \ to \ \beta_3 < 0$

The variables that are used to capture poverty are access to electricity, access to clean fuel like gas and primary school enrolment rate as recommended by the World Bank. Primary School Completion rate is used to capture the education variable. It is assumed that anyone who has been able to pass through primary school can be recognized as educated in a way, having undergone the foundation laying for higher education.

4.1 Panel ARDL Model Specification

Given the generalized ARDL (p, q, …q) model to be:

$$g_{it} = \sum_{j=1}^{p} \emptyset_i g_{i,t-j} + \sum_{j=0}^{q} \vartheta'_{ij} H_{i,t-j} + \gamma_i + e_{it} \qquad (4.3)$$

Where g_{it} is the dependent variable, $(H_{i,t})'$ is a kx1 vector that is allowed to be purely I(0) or I(1) or cointegrated, $\emptyset_i$ is the coefficient of the lagged dependent variable, called scalars, ϑ'_{ij} are kx1 coefficient vector, γ_i is the unit-specific fixed effect, I =1……N, t = 1. ….T, p, q are optimal lag orders and e_{it} is the error term.

When the ARDL model is re-parameterized, we then specify the error correction model as:

$$\Delta g_{it} = \omega_i[g_{i,t-j} \text{ - } \rho'_i H_{i,t-j}] + \sum_{j=1}^{p-1} \varphi_{ij} \Delta g_{i,t-j} + \sum_{j=0}^{q-1} \vartheta'_{ij} \Delta H_{i,t-j} + \gamma_i + e_{it} \qquad (4.4)$$

Note:

ω_i = -(1- δ_i) group-specific speed of adjustment and it is expected to be < 0

ρ'_i = vector of long-run relationship

ECT = $[g_{i,t-j} \text{ - } \rho'_i H_{i,t-j}]$ = Error Correction Term

φ_{ij} and ϑ'_{ij} are the short-run dynamic coefficients

Equation (4.4) is estimated using the Pooled Mean Group (PMG) estimator introduced by Pesaran and Shin (1999). The assumptions underlying this estimator is that the long-run coefficients are homogenous across groups and the short-run coefficients vary across groups.

The estimator is therefore combines both the Dynamic Fixed Effect and Mean Group estimators, in other words, it is an intermediate approach between the Dynamic Fixed Effect (DFE) and Mean Group (MG) estimators. PMG estimator is therefore based on a lower degree of heterogeneity in the long run and short run heterogeneity. The implication of this is that the estimator allows the short-run slope coefficients to vary and thereby allows dynamic specification, that is, the number of lags included to differ across groups.

Due to the long-run slope homogeneity, PMG seems to be a consistent and efficient estimator. It is also assumed under the PMG estimation that the error term, eit, is uncorrelated and also independently distributed and that implies that the regressors are exogenously determined. It is also further assumed that cointegration exists among both the dependent and independent variables. Before PMG can be applied in the estimation, the variables must be integrated all at I(0), I(1), or a mixture of both.

5.0 Nature and Sources of Data

The nature of data for this work is longitudinal which comprises of both time series and cross-sectional data for each country. Selected 31 Sub-Saharan African countries were used in this work. The selection is based on data availability for the selected ones. The countries include Benin, Angola, Botswana, Burkina Faso, Burundi,

Cameroon, Chad, Central African Republic, Comoros, Cote d'Ivoire, Congo Democratic, Eswatini, Eritrea, Ethiopia, The Gambia, Ghana, Guinea, Liberia, Madagascar, Mali, Mauritius, Mozambique, Namibia, Nigeria, Niger, Rwanda, Senegal, Sierra Leone, Tanzania, Togo and Uganda. The year range covered is between 2008 and 2021. Data for Access to Electricity, Access to Clean fuel, Primary School enrollment rate and Primary School Completion rate are all obtained from the World Development Indicators (WDI) of the World Bank database.

6.0 Presentation and Discussion of Results

This section presents the estimated results and gives both econometric and economic interpretations to all the parameters estimated.

6.1 Unit Root Results

The panel data variables were tested for stationarity and the results are shown in table 6.1

Table 6.1: Panel Unit Root results

	At Level				At First Difference			
Variable	Levin, Lin & Chu t*	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square	Levin, Lin & Chu t*	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
ACCF	0.0000	0.0299	0.0003	0.0000	-	-	-	-
ACCE	0.0000	0.9519	0.882	0.8143	0.0000	0.0000	0.0000	0.0000
PSCR	0.0005	0.3009	0.1092	0.0105	0.0521	0.0000	0.0000	0.0000
PSER	0.0035	0.754	0.8211	0.2624	0.0000	0.0000	0.0000	0.0000

Source: Computed by the author using Eviews 10

The condition that will legitimize the application of the Pooled Mean Group model (4.3) and (4.4) is predicated on the satisfaction that the variables are integrated either all of I(0), I(1) or a mixture of I(0) and I(1). It can be noticed that, according to the four test methods, ACCF is integrated at I(0) and ACCE, PSCR and PSER are all integrated at I(1).

6.2 Pooled Mean Group Results

Model 4.4 was estimated and the outcome produced tables 6.2 and 6.3 that showed the long run and error correction models. That implies that the variables are cointegrated or have a long-run relationship. The lag length was automatically selected by the Akaike selection criterion which chose one lag for the dependent variable and 2 lags for all the independent variables.

Table 6.2 shows the long-run relationship among the variables. Access to electricity, which is the first measure of poverty shows that there is a positive relationship between it and the Primary school completion rate (PSCR), and it is statistically significant. This implies that as access to electricity increases, it is estimated to increase the primary school completion rate by about 23 per cent.

Similarly, access to clean fuel satisfied the a priori expectation by being positively related to primary school completion rate and statistically significant at a 5 per cent level. The implication of this is that as access to clean fuel increases, children who are expected to be in search of wood fuels, are released to be in school and there is the probability of completing their schooling. An increase in access to clean fuel increases the potential of each child to complete their education.

The primary school enrolment rate also has a positive relationship with the completion rate and is statistically significant. This implies that as more children enrol in primary school, the more the completion rate will be.

The economic implication of the results is that in the long run, if access to electricity can be improved, to give pupils room to do their assignments and read at home at night, they are likely going to improve their performance and complete their education at primary school level. The same applies to access to clean fuel. These results support the work of Rutkowski, Rutkowski, Wild and Burroughs (2017) and Bright and Peace (2018) suggest from the findings that poverty in families has a direct impact on the educational attainment of pupils.

Table 6.2 Long Run model

Dependent Variable: PSCR				
Variable	Coefficient	Std. Error	t-Statistic	Prob Value
ACCE	0.22969	0.029936	7.67295	0.0000
ACCF	0.55602	0.057583	9.95592	0.0000
PSER	0.63841	0.043000	14.8467	0.0000

Source: Computed by the author using Eviews 10

Table 6.3 represents the second part of model 4.4, which is the error correction model. It is the short-run section of the model but has built into it the long-run representation that is referred to as the cointegration equation. The cointegration coefficient adjusts the disequilibrium in the long run, and the coefficient parameter must satisfy two conditions: it must be negative and statistically significant. From Table 6.3, it can be seen that the variable is negative 0.48634 and the probability value is less than 5 per cent. The cointegration coefficient is referred to as the speed of adjustment of any disequilibrium in the long run. In this model, the speed of adjustment is 47 per cent per annum, which implies that long-run equilibrium is adjusted at the speed of 47 per cent per annum.

Table 6.3 Error Correction Model (Short run Model)

Dependent Variable: PSCR				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob Value**
COINTEQ01	-0.48634	0.068981	-7.05036	0.0000
D(ACCE)	-0.57419	0.838858	-0.68449	0.4945
D(ACCE(-1))	-4.21947	3.784532	-1.11493	0.2663
D(ACCF)	-3.20597	3.10185	-1.03357	0.3027
D(ACCF(-1))	-0.37802	5.125554	-0.07375	0.9413
D(PSER)	-0.19413	0.192163	-1.01024	0.3137
D(PSER(-1))	-0.11137	0.116312	-0.95749	0.3396
C	-7.72572	4.893205	-1.57887	0.1161

Source: Computed by the author using Eviews 10

The short-run results are in Table 6.3 and they revealed that none of the independent variables is significant to affect education attainment at the primary level in the short run. Similarly, they are all negatively signed and that means that negates the a priori expectation.

The cross-sectional estimation for each country showed that almost all of the 31 countries have their error correction models satisfied the requirement and there exists a long relationship in the models for each country. For example, for Nigeria and Senegal, all the variables are statistically significant in affecting education variables in the short run and the error correction term satisfied the conditions. The error correction term for countries like Central Africa Republic, Mali, Mozambique, Namibia, Sierra Leone and Tanzania did not satisfy the conditions because the coefficients were not statistically significant.

6.3 Wald Causality Test

The test to confirm if the independent variables can cause the dependent variable in the long run was carried out and the result is in Table 6.4. The null hypothesis is that each of the variable's coefficients is equal to zero. If the chi-square probability value is less than 5 per cent, we reject the null and accept the alternative that it is not equal to zero. From the table, all the probability values are less than 5 per cent and that implies that the coefficients are not equal to zero and could cause the dependent variable.

Coefficient causality test	
Variable	Chi-square Prob Value
ACCE	0
ACCF	0.001
PSER	0

Source: Computed by the author using Eviews 10

7.0 Conclusion and Policy Recommendations

This study investigated the relationship between poverty and education in 31 sub-Saharan African countries over the years 2008 and 2021 using annual time series data. The pooled Mean Group estimation technique was employed to estimate the parameter and to determine the long-run relationship among the variables. It was found that there is a long-run relationship and that Access to electricity, access to clean fuels, and primary school enrolment rate relate to education positively in the long run and are also statistically significant in determining the level of primary school completion rate in the countries under study. It was also found that the short-run relationship was negative and not statistically significant. The cross-sectional estimation also showed that most of the countries exhibited long-run relationships among the variables. Based on the findings, the following policy recommendations are therefore put forward.

i. Policies that will ensure an adequate supply of electricity to the localities where the poor are located are highly advocated for.

ii. The government needs to make it a point of duty to subsidize the consumption of clean fuels which seem to be beyond the reach of the poor.

iii. Governments of nations should see to it that education at the primary level is heavily subsidized and made compulsory, not rhetorically, but in practice to prevent dropouts and unwillingness to enroll.

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