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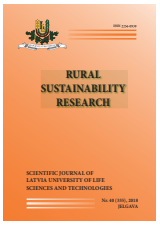

Correlates of human capital expenditure among rural households in Nigeria

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Abstract. Human capital development is increasingly gaining policy relevance especially with the implementation of the Sustainable Development Goals (SDGs). This study examined the correlates of human capital expenditure in rural Nigeria. General Household Survey dataset collected by the National Bureau of Statistics was used for this study. Descriptive statistical tools, principal components analysis and the Heckman selection model were used to analyse relevant data. The study found majority of the households were male-headed, with an average size of 7 people. In terms of access to education, 62.1% of the surveyed households had access to education and spent an average of NGN 12,570.56 on education. The age of household head, access to loans, marital status and household size were the correlates of human capital expenditure in rural Nigeria. Also, school fees and registration accounted for 41.2% of households' expenditure on education. The study found paucity of funds, low priority placed on education and low interest were the main constraints to human capital expenditure. The study recommended the design and implementation of pro-poor educational interventions especially for children from rural households. Also, there is the need for government, multilateral organisations and financial institutions to position rural households for financial inclusion.
Key words: Expenditure on education, socio-economics, rural Nigeria.

Introduction

Education is a veritable tool for developing any nation sustainably as the positive externalities are desirable (Nnamdi, 2006; Olojede, Adekunle, & Samuel, 2013). Nigeria trails other developing countries in terms of key human capital indices. The nation accounts for the highest out-of-school children in the world with 10.5 million children dropped out of school (UNICEF, 2018). Nigeria's investment in education over the years has been consistently lower than the UNESCO's recommendation of 26% of budgetary allocation (Figure 1). The percentage budgetary allocation to education consistently declined from 10.78% in 2015 to 7.04% in 2018. School enrolment has also been declining consistently over the years (Figure 1). This has been attributed to the unrests in North East, Nigeria and incomplete data from some states (Federal Ministry of Education, 2017). Again, availability of schools determines the level of access to education by citizens of any nation. Past studies noted underfunding, dearth of qualified and trained teachers, infrastructure deficits and policy inconsistencies are the constraints to human capital development in Nigeria (Nnamdi, 2006; Ololube, 2013; Asiyai, 2013).

Meanwhile poor financing undermines development in the Nigerian education sector which ranks her 12th in the percentage of budget expenditure on education among sub-Saharan countries, despite her oil boom (Table 1).

Education is both a public good and a private good. As a public good without exclusivity, public education expenditure is pivotal to economic growth because it has social benefits of increasing the number of skilled worker, enhancing occupational mobility, reducing the rate of unemployment in the economy, increasing the earning capacity and productivity of the country's work force, improving access to health information and enhancing social and political participation (Jackson, Rucker, & Persico, 2015; Mook & Jamison, 1988). However, public expenditure on education has been found to have insignificant effect on the level of education attainment in Nigeria (Urhie, 2013). As a private good, households demand for more education because of private economic returns to acquiring human capital, as well as social and cultural benefits.

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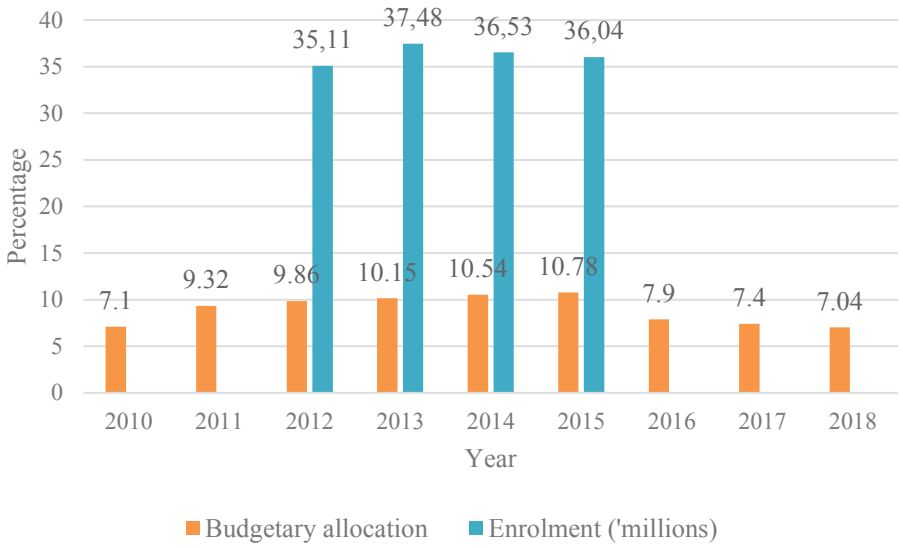

Source: Authors' computation using data from World Bank (2018).

Figure 1. Nigeria's percentage of budget allocation to education (2010-2018) and number of school enrolment (in millions) (2012-2015).

Private investment in education therefore increases the income stream of educated individual (Obi *et al.,* 2016). However, a demand for education has a cost to households, especially poor and rural ones, with low income and deprivation of basic needs.

Meanwhile, the Nigerian population was estimated at 198 million with 50% of Nigerians living in rural Nigeria (Bloch, Fox, & Adegbola, 2015; National Population Commission, 2018). Despite the growing urbanization in Nigeria, the majority of the Nigerian population still resides in the rural areas (UNESCO, 2012). Rural areas in Nigeria are characterized by high prevalence of poverty with poor access to basic needs and infrastructure, low literacy level among others (Obayelu & Awoyemi, 2010; Bello-Schünemann & Porter, 2017). Enrolment in primary and secondary schools is also lower in rural Nigeria than in the urban areas owing to predicaments of rural schools, along with unfavourable government education policies towards the rural areas (Anyaegbu, Christman, & Jingpu, 2004; Uzobo, Ogbanga, & Jackson, 2014). These challenges limit the process

Table 1

Percentage of budget allocation to education in selected African countries in 2014

Serial Number	Country	Budget allocation to education (%)	Rank
1	Zimbabwe	30.00	1st
2	Senegal	24.76	2nd
3	Cote D'Ivoire	21.77	3rd
4	Niger	21.66	4th
5	Ghana	20.99	5th
6	Mauritius	20.91	6th
7	South Africa	19.14	7th
8	Mali	18.22	8th
9	Uganda	17.30	9th
10	Kenya	17.08	10th
11	Malawi	16.33	11th
12	Nigeria	10.54	12th

Source: World Bank (2018).

of educating Nigerian children in the rural areas. Thus, education being the cornerstone of sustainable national development is largely influenced by the level of development as well as the education given to rural child (Haruna & Liman, 2015). Owing high prevalence of poverty in rural Nigeria, most parents may not be able to provide adequately for their wards, which has negative consequences on the quality and quantity of education the child receives. Rural children therefore lag behind their urban counterparts in all key areas of the education (Nworgu & Nworgu, 2013). However, 52.2% of rural populace could not read and write in Nigeria in 2010 (UNESCO, 2012). Therefore, the need to understand the underlying factors influencing human capital development especially in rural Nigeria cannot be over-emphasised. This is particularly relevant to the fourth of the United Nation's Sustainable Development Goals targeting inclusive and equitable quality education that facilitates a life-time learning privileges for all (UNDP, 2018).

Human capital development is the outcome of a deliberate and consistent investment of an individual on his/her intellectual capacity as a productive resource (Adeniyi & Ogunsola, 2013). Human capital investment theory posits that high income allows people spend more money on the quantity and quality of education (Becker, 1975). This is expected to have a long-term effect on both current educational performance and future demand for education. Moreover, children from low-income households may be forced out of school or into child labour in order to contribute to the family expenditure (Dustmann & Micklewright, 2001; Obi *et al.,* 2016). These have possible negative consequences on their future.

Past empirical studies had assessed public expenditure and economic growth in Nigeria (Hinchliffe, 2002; Kabuga & Hussaini, 2015; Omodero & Azubike, 2016). Ogundari and Abdulai (2014) also assessed determinants of household's education and healthcare spending in Nigeria. However, the information on rural households' expenditure on education in Nigeria is scanty. Therefore, correlates of human capital expenditure among rural households in Nigeria were assessed in this study.

Materials and Methods

The study used secondary data from the Nigeria's 2015/2016 General Household Survey (GHS) conducted by the Nigeria National Bureau of Statistics (NBS) in collaboration with the World Bank Living Standard Measurement Study-Integrated Surveys on Agriculture (LSMS-ISA) project. The total sample consists of about 5,000 urban and rural households covering all thirty-six states in the country and the Federal Capital Territory, Abuja. A total of 2, 742 rural households with consistent responses fit for the study were extracted from the data and used for the analyses.

Data were analysed using descriptive statistics, principal component analysis and Heckman two-stage selection model. Descriptive statistics were used to profile access to education in rural areas of Nigeria. Principal components analysis was used to reduce variables and identify a small number of components that explains a large portion of the variation in data. It was employed to identify constraints of access to education. The Heckman selection model was used to determine the factors influencing an access to human capital expenditure in rural Nigeria.

The first stage (selection equation) of deciding whether there is access to education or not is empirically specified as:

$$A_i = \alpha_0 + \sum_{k=1}^{14} \alpha_k X_k + \mu_i \quad (1)$$

The second stage (outcome equation), which assesses the effect of access to education on the volume of expenditure on education, is specified as follows:

$$G_i = \gamma_0 + \sum_{k=1}^{15} \gamma_k X_k + \varepsilon_i \quad (2)$$

where;
A_i = access to education of children in i-th rural household (1 = Yes, 0 if otherwise);
G_i = expenditure made on child's education in i-th rural household;
X_1 = sex of household head (1 = male, 0 if otherwise);
X_2 = age of household head (years);
X_3 = household size (headcount);
X_4 = marital status (1 = married, 0 if otherwise);
X_5 = asset ownership (1=Yes, 0 if otherwise);
X_6 = per capita expenditure (naira);
X_7 = social group membership (1 = member, 0 if otherwise);
X_8 = loan access (1 = Yes, 0 if otherwise);
X_9 = farm size (ha);
X_{10} = geopolitical location (1 = north central, 0 if otherwise);
X_{11} = geopolitical location (1 = north east, 0 if otherwise);
X_{12} = geopolitical location (1 = south east, 0 if otherwise);
X_{13} = geopolitical location (1 = south south, 0 if otherwise);
X_{14} = geopolitical location (1 = south west, 0 if otherwise);

X_{15} = inverse mills ratio (IMR);
α_0 = constant term;
α_k = coefficients of the explanatory variables;
μ_i = random error term;
γ_0 = constant term;
γ_k = coefficients of the explanatory variables;
ε_i = random error term.

Results and Discussion

Access to Education Profile

Household leadership in rural Nigeria was dominated by men (87%) and the majority of them were married (83%) to at least one spouse with a first school leaving certificate (primary education) being the highest educational qualification attained (Table 1a). A typical household head was 53 years old with an average of seven household members. Children in a male-headed (91.3%) rural household had greater access to education than female (8.7%) counterparts. Further, the majority (86.4%) of married households with access to education were married. This is similar to the findings of Namiti (2013) that many orphan caretaker households are unable to pay for school fees and materials owing to financial constraints (Subbarao & Coury, 2004). The highest proportion of household with an access to education

Table 1a

Education access and Socioeconomic Characteristics

Socioeconomic variables	No Access (N=1,039)	Access (N=1,703)	Total (N=2,742)
Sex of household head			
Male	862 (81.09)	1,555 (91.31)	2,417(87.38)
Female	201 (18.91)	148 (8.69)	349(12.62)
Age of household head			
< 30	16 (1.51)	31(1.82)	47(1.70)
39	118 (11.10)	316(18.56)	434(15.69)
40 – 49	214 (20.13)	476(27.9)	690(24.95)
50 – 59	245 (23.05)	417(24.49)	662(23.93)
≥ 60	470 (44.21)	463(27.19)	933(33.73)
Marital status			
Never Married	5 (0.47)	30 (1.76)	35(1.27)
Married	831 (78.17)	1,471 (86.38)	2,302(83.22)
Divorced	8 (0.75)	15 (0.88)	23(0.83)
Separated	15 (1.41)	40 (2.35)	55(1.99)
Widowed	204 (19.19)	147 (8.63)	351(12.69)
Household size			
1 – 4	252 (23.89)	302 (17.85)	554(20.17)
5 – 7	364 (34.50)	607 (35.87)	971(35.35)
8 – 10	243 (23.03)	497 (29.37)	740(26.94)
11 – 13	170 (16.11)	230 (13.59)	400(14.56)
≥ 14	26 (2.46)	56 (3.31)	82(2.99)
Zone			
North Central	208 (19.57)	292 (17.15)	495 (18.05)
North East	220 (20.70)	272 (15.97)	487 (17.76)
North West	347 (32.64)	319 (18.73)	666 (24.29)
South East	146 (13.73)	338 (19.85)	480 (17.51)
South South	77 (7.24)	363 (21.32)	432 (15.75)
South West	65 (6.11)	119 (6.99)	182 (6.64)

Note: Values in parenthesis are %.

were 40 to 49 years old (27.9%) with five to seven members (35.9%), but those with more than 14 members constituted least proportion (3.3%). All the northern geopolitical zones had high percentage of households without access to education with North West having the highest percentage of households without access to education in Nigeria.

Composition of Education expenditure

Table 2a and 2b presents the constituents of expenses made on education in rural Nigeria. The mean expenditure on school fees and registration was NGN 21,616.91 while NGN 4,116.66 was spent as extra tuition. The largest and least expenditures on education were school fees and registration (41.2%) and extra tuition (1.6%), respectively (Figure 2). With respect to the quintiles of each expenditure category, more than two-thirds of total spending occupies the bottom three quintiles. This means that a relatively large number of the rural households spent very little on education. This finding is consistent with findings of Ahmed, Najeemah and Mohammad (2013) that

Table 2a

Quintile distribution of mean expenditure on education (pooled)

Education Expenditure (NGN)	1st	2nd	3rd	4th	5th
School fees and registration	846.80 (2.04) (455.74)	2858.65 (6.89) (796.18)	6907.06 (16.66) (1677.13)	17438.89 (42.06) (4963.36)	81630.00 (196.86) (115052.90)
Share of school fees and registration *expenditure*					41.20%
School repairs/parents-teachers association	198.16 (0.48) (73. 24)	520.93 (1.26) (87.27)	948. 28 (2.29) (89.39)	1705.36 (4.11) (310.85)	5584.30 (13.47) (6253.92)
Share of school repairs/parents-teachers association expenditure					3.23%
School repairs/parents-teachers association	1151.28 (2.78) (355.84)	2136.30 (5.15) (259.04)	3309.22 (7.98) (421.44)	5163.01 (12.45) (675.87)	10733.56 (25.89) (5636.17)
Share of school repairs/parents-teachers association expenditure					9.10%
Books and school supplies	687.40 (1.66) (309.90)	1923.57 (4.64) (387.94)	3665.49 (8.84) (718.00)	7697.18 (18.56) (1875.19)	24112.14 (58.15) (15964.12)
Share of books and school supplies expenditure					16.59%
Transportation to and from school	1004.17 (2.42) (440.83)	2442.00 (5.89) (454.53)	4834.00 (11.66) (884.38)	9859.09 (23.78) (2023.12)	41527.78 (100.15) (34964.89)
Share of Transportation to and from school expenditure					6.47%
Food, board and lodging at school	1463.64 (3.53) (697.53)	4780.00 (11.53) (1227.28)	12261.54 (29.57) (2735.12)	26111.11 (62.97) (4787.86)	103362.50 (249.27) (54934.19)
Share of Food, board and lodging at school expenditure					9.51%
Extra tuition (extra classes)	816.67 (1.97) (285.77)	1400.00 (3.38) (173.20)	2000.00 (4.82) (0.00)	4375.00 (10.55) (1950.00)	14500.00 (34.97) (7088.72)
Share of Extra tuition expenditure					1.63%
Other expenses	4166.67 (10.05) (3752.78)	12000.00 (28.94) (2828.43)	25166.67 (60.69) (1067.27)	33400.00 (80.55) (2262.74)	45500.00 (109.73) (6363.96)
Share of other expenses					12.26%

Values in parentheses are standard deviation and values in bold parenthesis are conversion in Euros. The conversion rate is N414.66= 1Euro.

Table 2b

Regional distribution of Quintile of Expenses made on Education

Location	Education Expenditure (NGN)	1st	2nd	3rd	4th	5th
North Central	School fees and registration	1,313.16 (3.17) (757.89)	4,128.95 (9.96) (974.87)	7,892.10 (19.03) (1,474.25)	15,981.58 (38.54) (5,063.63)	46,147.22 (111.29) (20,064.67)
	School repairs/parents-teachers association	365.22 (0.88) (141.77)	734.37 (1.77) (115.06)	1,242.86 (3.00) (215.47)	1,840.91 (4.44) (165.56)	4,421.05 (10.66) (2,475.79)
	Uniforms and sports clothes	1,082.50 (2.61) (338.06)	2,277.78 (5.49) (365.51)	3,494.74 (8.43) (393.66)	5,002.50 (12.06) (591.71)	8,141.18 (19.63) (1,949.06)
	Books and school supplies	671.48 (1.62) (269.32)	1,675.50 (4.04) (300.78)	2,732.10 (6.59) (423.06)	4,870.91 (11.75) (873.66)	12,434.09 (29.99) (6,065.46)
	Transportation to and from school	800.00 (1.93) (189.74)	1,475.00 (3.56) (50.00)	1,900.00 (4.58) (173.20)	2,975.00 (7.17) (732.01)	9,000.00 (21.70) (3,366.50)
	Food, board and lodging at school	507.14 (1.22) (123.92)	1,142.86 (2.76) (97.59)	1,787.50 (4.31) (322.66)	3,400.00 (8.20) (827.04)	10,250.00 (24.72) (5,583.46)
	Extra tuition (extra classes)	440.00 (1.06) (54.77)	983.33 (2.37) (40.82)	1,100.00 (2.65) (0.00)	2,250.00 (5.43) (288.67)	6,000.00 (14.47) (3,000.00)
	Other expenses	243.33 (0.59) (146.51)	1,100.00 (2.65) (200.00)	3,091.67 (7.46) (905.77)	6,400.00 (15.43) (1,422.67)	21,883.33 (52.77) (14,115.87)
North East	School fees and registration	535.91 (1.29) (288.78)	1,381.03 (3.33) (165.52)	2,770.63 (6.68) (723.17)	7,733.55 (18.65) (2,724.76)	51,351.61 (123.84) (50,755.88)
	School repairs/parents-teachers association	147.00 (0.35) (51.91)	285.26 (0.69) (26.11)	508.00 (1.23) (84.01)	974.19 (2.35) (145.99)	2,285.71 (5.51) (1,080.20)
	Uniforms and sports clothes	714.12 (1.72) (266.27)	1,634.38 (3.94) (223.04)	2,853.82 (6.88) (434.09)	4,483.13 (10.81) (602.89)	8,828.13 (21.29) (5,260.61)
	Books and school supplies	237.71 (0.57) (105.33)	690.59 (1.67) (133.57)	1,402.12 (3.38) (360.22)	3,678.53 (8.87) (889.51)	15,223.53 (36.71) (15,321.76)
	Transportation to and from school	673.08 (1.62) (315.31)	1,414.29 (3.41) (106.90)	2,577.78 (6.22) (630.04)	4,966.67 (11.98) (886.00)	11,722.22 (28.27) (3,649.58)
	Food, board and lodging at school	1,200.00 (2.89) (300.00)	2,333.33 (5.63) (577.35)	5,000.00 (12.06) (1,000.00)	14,300.00 (34.49) (9,315.04)	42,666.67 (102.90) (23,692.47)
	Extra tuition (extra classes)	1,700.0 (4.10) (1,838.48)	4,000.00 (9.65) (0.00)	4,500.00 (10.85) (0.00)	0.00 (0.00) (0.00)	12000.00 (28.94) (0.00)
	Other expenses	69.23 (0.17) (297.35)	1,605.39 (3.87) (324.72)	3,041.18 (7.34) (413.91)	5,710.00 (13.77) (1,893.99)	27,200.00 (65.60) (36,061.60)

Location	Education Expenditure (NGN)	1st	2nd	3rd	4th	5th
North West	School fees and registration	348.08 (0.84) (153.28)	890.91 (2.15) (162.30)	2,381.20 (5.74) (979.97)	6,423.81 (15.49) (1,802.19)	42,906.52 (103.47) (23,200.04)
	School repairs/parents-teachers association	163.61 (0.40) (44.86)	342.38 (0.83) (54.03)	531.85 (1.28) (55.54)	846.15 (2.04) (107.63)	1,907.69 (4.60) (883.48)
	Uniforms and sports clothes	679.55 (1.64) (260.27)	1,385.37 (3.34) (199.45)	2,113.54 (5.10) (225.68)	3,021.77 (7.29) (324.33)	6,029.41 (14.54) (1,880.32)
	Books and school supplies	233.77 (0.56) (116.23)	574.04 (1.38) (77.31)	1,005.93 (2.43) (181.78)	1,981.64 (4.78) (487.67)	9,257.54 (22.33) (11,408.14)
	Transportation to and from school	182.50 (0.44) (151.18)	824.17 (1.99) (220.64)	1,626.36 (3.92) (301.74)	3,458.33 (8.34) (825.13)	25,863.64 (62.37) (30,920.94)
	Food, board and lodging at school	138.35 (0.33) (100.84)	1,238.13 (2.99) (540.67)	4,788.89 (11.55) (1,536.2)	10,850.67 (26.17) (2,788.74)	42,952.50 (103.58) (28,346.33)
	Extra tuition (extra classes)	785.71 (1.89) (376.07)	0.00 (0.00) (0.00)	1,500.00 (3.62) (0.00)	2,000.00 (4.82) (0.00)	7,050.00 (17.00) (7,000.36)
	Other expenses	222.86 (0.54) (86.15)	606.00 (1.46) (154.18)	1,294.44 (3.12) (441.22)	2,964.21 (7.15) (589.21)	21,565.26 (52.01) (25,547.19)
South East	School fees and registration	2,208.40 (5.33) (984.98)	5,160.00 (12.44) (782.70)	8,320.00 (20.06) (1,457.3)	20,847.92 (50.28) (6,054.92)	60,568.42 (146.07) (34,693.00)
	School repairs/parents-teachers association	448.28 (1.08) (140.46)	1,026.67 (2.48) (143.68)	1,995.83 (4.81) (379.54)	3,391.67 (8.18) (466.17)	8,145.83 (19.64) (5,159.79)
	Uniforms and sports clothes	1,151.25 (2.78) (330.79)	2,008.70 (4.84) (266.14)	3,091.38 (7.46) (365.49)	4,427.42 (10.68) (443.63)	9,043.33 (21.81) (5,252.63)
	Books and school supplies	836.84 (2.02) (389.91)	2,194.06 (5.29) (373.95)	4,443.75 (10.72) (1,098.9)	8,813.24 (21.25) (1,774.54)	20,711.76 (49.95) (8,773.77)
	Transportation to and from school	1,166.67 (2.81) (746.30)	3,042.86 (7.34) (386.68)	5,218.18 (12.58) (538.18)	7,400.00 (17.85) (932.74)	29,533.33 (71.22) (45,361.30)
	Food, board and lodging at school	200.00 (0.48) (0.00)	500.00 (1.21) (0.00)	12,250.0 (29.54) (10,242.8)	32,666.67 (78.78) (4,618.80)	100,166.70 (241.56) (79,183.86)
	Extra tuition (extra classes)	433.33 (1.05) (96.61)	915.15 (2.21) (152.32)	1,200.00 (2.89) (0.00)	1,947.37 (4.70) (325.52)	5,531.58 (13.34) (4,776.57)
	Other expenses	322.82 (0.78) (163.15)	755.56 (1.82) (113.04)	1,072.22 (2.59) (125.28)	2,371.11 (5.72) (765.19)	11,700.00 (28.22) (10,187.37)

Location	Education Expenditure (NGN)	1st	2nd	3rd	4th	5th
South South	School fees and registration	2,922.2 (7.05) (1,706.9)	9,657.4 (23.29) (2,130.49)	18,389.66 (44.35) (3,364.24)	40,536.0 (97.75) (10,374.79)	176,659.3 (426.03) (220,101.50)
	School repairs/parents-teachers association	466.67 (1.13) (183.26)	1,000.00 (2.41) (0.00)	1,791.67 (4.32) (282.71)	3,047.06 (7.35) (625.62)	9,023.53 (21.77) (11,301.74)
	Uniforms and sports clothes	1,471.95 (3.55) (540.95)	2,679.17 (6.46) (265.36)	3,829.31 (9.24) (406.97)	5,904.84 (14.24) (818.57)	12,044.83 (29.05) (5,445.22)
	Books and school supplies	1,332.11 (3.21) (731.15)	3,718.18 (8.97) (735.04)	6,598.39 (15.91) (902.45)	12,053.14 (29.07) (2,869.10)	41,604.55 (100.33) (59,311.36)
	Transportation to and from school	2,414.71 (5.82) (678.18)	4,354.67 (10.50) (652.01)	8,000.00 (19.29) (2,110.2)	17,730.77 (42.76) (5,309.64)	47,823.08 (115.33) (30,402.42)
	Food, board and lodging at school	605.56 (1.46) (374.54)	2,800.0 (6.75) (1,086.2)	10,562.50 (25.47) (4,118.2)	25,877.78 (62.41) (8,481.42)	129,237.5 (311.67) (122,571.9)
	Extra tuition (extra classes)	751.11 (1.81) (299.45)	1,500.00 (3.62) (0.00)	2,027.27 (4.89) (90.45)	3,610.71 (8.71) (853.09)	13,422.22 (32.36) (6,087.24)
	Other expenses	984.78 (2.38) (505.30)	2,495.00 (6.02) (524.88)	5,470.48 (13.19) (1,056.36)	13,211.54 (31.86) (4,758.01)	119,225.0 (287.53) (231,349.10)
South West	School fees and registration	1,450.00 (3.50) (601.04)	4,278.4 (10.32) (1,312.5)	8,655.56 (20.88) (1,979.3)	17,622.22 (42.50) (2,987.38)	78,033.33 (188.19) (63,363.57)
	School repairs/parents-teachers association	550.00 (1.33) (64.55)	937.50 (2.26) (118.77)	1,450.00 (3.50) (100.00)	2,800.00 (6.75) (350.00)	4,833.33 (11.66) (1,258.31)
	Uniforms and sports clothes	1,036.36 (2.50) (120.60)	1,555.56 (375) (142.40)	2,240.00 (5.40) (236.64)	3,585.00 (8.65) (610.12)	6,977.78 (16.83) (2,134.70)
	Books and school supplies	1,233.33 (2.97) (537.81)	2,830.00 (6.83) (473.87)	4,941.67 (11.92) (862.04)	8,535.00 (20.58) (1,042.98)	19,609.09 (47.29) (8,672.88)
	Transportation to and from school	2,766.7 (6.67) (1,721.4)	7,333.3 (17.69) (2,516.6)	12,000.00 (28.94) (0.00)	20,000.00 (48.23) (5,656.85)	32,000.00 (77.17) (2,828.43)
	Food, board and lodging at school	925.00 (2.23) (754.43)	3,325.00 (8.02) (970.82)	6,175.00 (14.89) (1,120.6)	11,825.00 (28.52) (1,918.98)	31,700.00 (76.45) (15,108.61)
	Extra tuition (extra classes)	2,357.14 (5.69) (852.17)	0.00 (0.00) (0.00)	4,000.00 (9.65) (326.60)	4,950.00 (11.94) (86.60)	7,500.00 (18.09) (1,500.00)
	Other expenses	840.00 (2.03) (378.15)	1,787.50 (4.31) (247.49)	3,833.33 (9.25) (288.68)	7,737.50 (18.66) (1,960.18)	60,000.00 (144.70) (15,811.39)

Values in parentheses are standard deviation and values in bold parenthesis are conversion in Euros. The conversion rate is N414.66= 1Euro.

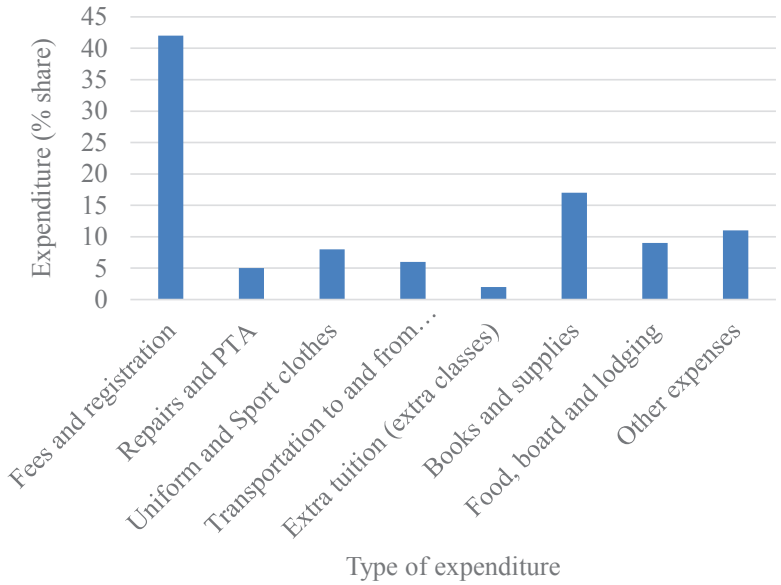

Figure 2. Share of education expenditure categories.

the amount of income earned by household heads in rural areas will determine whether the children will have access to education or not. Further, UNESCO (UNESCO, 2014) found that poverty is the cause of inequality which is why many students that are schooled in urban areas have quality education.

The least expenditure across all quintiles was recorded in North West, while the highest was in South East (Table 2b). This may be due to relatively high cost of education in South East compared to North West, Nigeria where education is largely subsidized.

The largest and lowest form of education expenditures were tuition fees and registration (41.2%) and extra tuition (1.6%) respectively (Figure 2). Cost of books was also high after tuition fee. These suggest that tuition fee and cost of books are the major expenditure made by rural households on education.

Constraints to Education Access

The Bartlett's test for sphericity (χ^2 = 33568.80, $p<0.01$) and the Kaiser-Meyer-Olkin (KMO = 0.610) measure of sampling adequacy yielded desirable results and satisfied the validity of data for principal components analysis. The elucidatory principal components analysis on the items yielded Eigen values that were greater than unity (Table 3). The total variance explained by components 1, 2, and 3 were 39.1%, 32.0% and 28.9% that amount to 100%. On the basis of constituents of the components, paucity of funds was the most significant; explaining over 39% of the constraints to education in rural Nigeria. This finding is in agreement with the findings of Bhuiyan *et al.* (2013) that access to credit increased the borrower's literacy of children in Bangladesh.

Determinants of Education Expenditure in Rural Nigeria

Access to education was conceived to constitute an inherent bias towards expenditure on education in rural Nigeria since parents can only spend on education if, and only if, their children had some kind of access to it. Therefore, the Heckman selection model was fitted using the two-staged

Table 3

Principal components of constraints to education in rural Nigeria

Variables	Component	Eigenvalue	Proportion	Cumulative
Paucity of funds	1	1.56201	0.3905	0.3905
Lack of interest	2	1.28204	0.3205	0.7110
Low priority placed on education	3	1.15595	0.2890	1.0000
Others	4	0	0.0000	1.0000

Bartlett test of sphericity (Chi-square = 33568.804***; Degrees of freedom = 6).
Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO = 0.610).

procedure. An access to education and expenditure on education were the dependent variables for stages one and two respectively. Wald's test (χ^2 = 76.74, p<0.01) of the Heckman model is significant at 1% suggesting that the model has a good fit (Table 4). The Inverse Mills Ratio (IMR) was negative and not significant which implies that there was no selection bias being corrected for between the two equation estimates.

The finding showed that the age, household size, marital status, sex, access to loan and geopolitical location of household heads significantly influence access to education of children in rural areas of Nigeria. Per capita expenditure, access to loan and

Table 4

Determinants of education expenditure

Variables	Education Access	Expenditure on Education
Age	0.0359***	0.0277
	(0.0127)	(0.0923)
Age (squared)	-0.0004***	-0.000055
	(0.0001)	(0.00098)
Household size	-0.0789***	-0.0537
	(0.0085)	(0.1607)
Group membership	0.0677	-0.2093
	(0.0513)	(0.2069)
Asset ownership	0.0025	0.3085
	(0.0681)	(0.2008)
Marital status	0.4326***	-1.2835
	(0.1188)	(1.0815)
Sex	0.2969***	1.0850
	(0.1295)	(0.801)
Per capita expenditure	0.8345	5.70e-06***
	(0.7057)	(1.69e-06)
Loan access	0.2274***	-0.5235***
	(0.0654)	(0.5021)
Farm size	-0.8715	-0.29e-06
	(0.6711)	(3.37e-06)
North central	0.4583***	1.7509 ***
	(0.0869)	(1.0611)
North East	0.0652	-0.4665***
	(0.0775)	(0.2689)
South East	0.2696***	0.2002
	(0.0913)	(0.6263)
South South	0.2137***	0.9533***
	(0.0896)	(0.5252)
South West	0.0050	1.2009
	(0.1218)	(0.3738)
Constant	-1.7810*	10.9933*
	(0.3533)	(6.2537)
Inverse Mills Ratio		-3.3558
		(3.6849)

Observations = 2,742; Wald chi2(15) = 76.74***

****, **, * represent p<0.01, p<0.05 and p<0.1 respectively.*

geopolitical location significantly explain expenditure on education in rural Nigeria. The coefficient of age was positively related to the probability of having access to education suggesting that probably an additional year in the age of the household head would increase the probability of children having education. An additional household member would reduce both probability of access to education. Thus, large household sizes may not enhance access to education. Further, married, male-headed with access loan would increase probability of access to education of children. This is not far reaching from the fact that both parents can easily pool resources together for their children's education unlike being a single parent. This finding is consistent with that of Namiti (2013), Ahmed, Najeemah and Mohammad (2013) that children whose parents are married have more access to education than those from a single-parent family or who are orphans. Conversely, per capita income had a positive influence on households' expenditure on education. Further, being a resident in the South East and the South South geopolitical zones increased the probability of having an access to education, while being a resident in the North Central (0.453), decreased the level of expenditure on education relative to living in the North West. This result is in line with the findings of Umar, Ismail and Abdul-Hakim (2013) that a huge educational gap exists within as well as across regions in Nigeria.

Conclusion

This study assessed the factors influencing human capital expenditure in rural Nigeria. The largest contributor to education expenditure was school fees and registration, while the lowest one was an extra tuition fee. However, a relatively large number of the rural households spent very little on education. The component dubbed as paucity of funds, whose constituents are lack of money, a distant school, death of parents, too expensive education represent the largest portion of the constraints to education. Socioeconomic makeup of household head such as the age, marital status, sex, and an access to loan positively influence the child's access to education although the age has a negative turnover effect on children access to education. Knowledge of determinants of education expenditure suggests that expenditure on education increases as money spent on each member of the household increases. Thus, it is recommended that governments and donor agencies should design pro-poor educational programmes and target children from rural households for educational support/ scholarships. Further, governments, multilateral organisations and financial institutions should position rural households for financial inclusion as an access to loans would positively influence an access to education. Similarly, there is an urgent need to integrate an improvement of household welfare with rural education policy implementation in Nigeria.

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