



DETERMINANTS OF HOUSEHOLD CHOICE OF PRE-TERTIARY EDUCATION IN GHANA

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ABSTRACT

Purpose: This research examined the factors influencing household decisions between public and private pre-tertiary education in Ghana, focusing on the relationship between socioeconomic household variables and school characteristics.

Design/Methodology/Approach: This study employed data from the Ghana Living Standard Survey Round 7 (GLSS7), which comprised a sample of 15,000 households drawn from 1,000 enumeration areas. It employed an explanatory research design and used a binary logistic regression technique for analysis.

Findings: The research found that though higher spending on pre-tertiary education decreases the likelihood of choosing private schools, higher school fees, transportation costs, and proximity to schools increase the likelihood of opting for private schools. It also revealed significant disparities between urban and rural households, with rural families less inclined to choose private schools due to lower income levels and limited access to private schools. Financial inclusion, reflected by households' bank accounts, was a key factor enabling private school choices.

Research Limitation: Although credible, the use of secondary data from the Ghana Statistical Service (GLSS 7) suffers from the usual problem of not asking all the questions that the research would have asked.

Social Implication: This research has the potential to inform the policies of the Ministry of Education and the Ghana Education Service to implement strategies that enhance the accessibility and affordability of quality education nationwide.

Practical Implication: This includes expanding transportation infrastructure in rural areas to reduce distance barriers and improve access to public and private schools. Additionally, efforts to expand financial inclusion should be intensified to empower parents to make school choices for their children.

Originality/ Value: This research focused on socio-economic and school-related factors affecting school choice in Ghana, analysing how financial inclusion and regional disparities influence household educational decisions.

Keywords: *Financial Inclusion. household choice. private. public. school*



INTRODUCTION

Like many African countries, Ghana's pre-tertiary education system features a dual structure of public and private pre-tertiary schools, presenting families with the choice between free or subsidised public education and tuition-based private schools (Yeboah, 2018). Despite government efforts to enhance public education through increased funding and initiatives like the Free Senior High School (FSHS) program launched in 2017, households must choose between free public schools or tuition-based private schools for their wards (Ampiah & Adu-Yeboah, 2011; Eisemon, 2014; Ayuk & Koma, 2019). Public institutions are intended to provide affordable, quality education without financial strain, but the continued demand for private schools, particularly at the primary and junior high school levels, raises concerns about the effectiveness of public education investments (Donkor & Amikuzuno, 2011; Iddrisu, Danquah & Quartey, 2017; Sulemana, 2017; Kutortse, 2018; Yeboah, 2018). This ongoing preference for private education highlights a subtle landscape where families weigh the perceived quality and benefits of private schooling against the cost savings offered by public education (Adam et al., 2016; Adjei, 2021; Abraham, 2023).

Despite the significant financial investments in public education, it is crucial to understand what factors could encourage more households to opt for what choice of school type (Shabbir et al., 2014; Davies, 2016). Research has demonstrated that factors such as nearness of school, educational infrastructure, economic status, perceived quality of teaching and non-teaching staff, academic performance (especially at the JHS level), and security significantly impact school selection (Locatelli & Locatelli, 2019; Rotanova et al., 2021; Subedi, 2021; Awale, 2021; Zuilkowski et al., 2021; Badriyah et al., 2021; Qasim et al., 2021). However, validating these factors within the Ghanaian context is essential because cultural, socioeconomic, and regional differences may affect their importance and interaction. Therefore, this investigated the relative impact of these factors on household decisions regarding pre-tertiary education in Ghana.

THEORIES UNDERPINNING THE STUDY

The research followed the Human Capital Theory and the Household Production Theory, providing crucial insights into household decision-making regarding education.

Human Capital Theory

The Human Capital Theory (HCT) originates from the idea that education is a form of investment in human capabilities, increasing the economic productivity of individuals (Chijioke & Amadi, 2019; Koval et al., 2019; Faggian et al., 2019). The theory, developed by economists like Adam Smith (1776) and Petty (1962) through Krugman's (1994) study, argues that formal education enhances skills, knowledge, and competencies, which in turn raise productivity and income



potential. HCT distinguishes between general human capital, which provides broad, transferable skills applicable across various sectors, and specific human capital, which equips individuals with skills tailored to particular organisations or industries (Solow, 1956; Becker, 1964; Lucas, 1988; Krugman, 1994). The theory assumes that individuals invest in education, anticipating increased earnings and socio-economic advantages (Faggian et al., 2019; Segun & Emmanuel, 2019; Odey et al., 2019; David, 2020). This investment in education, seen as a form of capital accumulation, becomes crucial in determining an individual's success and productivity in the labour market (Rabe, 2020; Ghauri et al., 2020; Chen, 2019; Miele et al., 2019).

In the context of Ghana, this theory implies that households, when choosing between public and private education, are deciding where to invest in their children's human capital to maximise future returns.

Relating to this research, HCT provides a framework for understanding why some households opt for private schooling despite the relatively higher costs (Chetty et al., 2020; Abbott & Gallipoli, 2020; Parker, 2019; Weller et al., 2019). Families with greater financial resources may see private education as a better investment in their children's future, offering higher perceived quality and better opportunities for skill development. Therefore, the decision to invest in private education is aligned with the household's desire to maximise the long-term benefits of education, anticipating higher future earnings and social mobility for their children (Swanson & Holton, 2001; Diemer et al., 2019). Conversely, households with fewer resources may rely on public schools, balancing their financial constraints with the need to invest in education (Gould et al., 2020; Diemer et al., 2019; Blaabæk et al., 2017). HCT helps explain the socio-economic disparities in school choice. It highlights how financial inclusion, as explored in this study, can influence a household's capacity to invest in education, shaping their school preferences.

Household Production Theory

The Household Production Theory, developed by Becker (2009), Mattila-Wiro (1999), Mincer (1970) and Schultz (1961), suggests that households act as rational economic agents, making decisions based on a utility-maximizing framework. The theory posits that households allocate resources, including time, income, and labour, across various activities to produce goods and services that meet their needs (Valiente et al., 2020). In this context, education is a “good” produced through household income, human capital, and other factors. According to HPT, households make decisions on how to invest in education based on a cost-benefit analysis, balancing financial resources with the potential outcomes, such as improved skills and future earning potential (Arora & Rada, 2020; İmrohoroğlu & Zhao, 2020). HPT further distinguishes between unitary and collective models of household decision-making, where the former assumes pooled resources and shared objectives, while the latter considers individual preferences within



the household. This theory highlights the role of household income (financial inclusion), size, and structure in shaping educational investment decisions.

HPT, thus, provides a valuable framework for understanding how households choose between public and private pre-tertiary schools. Investing in education, whether in private or public schools, reflects the household's consideration of how best to use its resources to maximise educational outcomes for its children (Cohen, 2018). Considering the relatively high cost of private education, wealthier households with more resources may choose private education, seeing it as a higher-quality investment that aligns with their long-term goals for human capital development. Conversely, households with limited income may opt for public schooling as a more cost-effective option, even if the perceived quality is lower. Thus, the theory explains how household characteristics, such as size and income distribution, influence educational spending decisions, as larger households may face tighter financial constraints, affecting their ability to invest in private education (Abraham, 2023; Li et al., 2020).

Empirical Review

Awale (2021) examined the factors influencing students' decisions to select private management colleges in Kathmandu, Nepal, focusing on determinants such as location, reputation, facilities, and cost. Utilising a descriptive research design and a quantitative approach, data were gathered from 384 undergraduate management students through questionnaires. Statistical analyses, including ANOVA, correlation, and regression, identified the college's image as the primary determinant, followed by the physical environment, particularly student safety. The study also emphasised that advertising materials in Nepal were underutilised and stressed the school administration's need for more effective marketing approaches.

In a similar study, Subedi (2021) found that class size, a favourable environment (security), and school facilities were the main factors influencing parents' choice between public and private schools. Rotanova et al. (2021) highlighted the importance of information security and protecting students' data in parents' and students' decisions. Zuilkowski et al. (2021) explored why parents in Nairobi, Kenya, favour low-cost private schools despite the availability of free public primary education. The study attributed this preference to concerns over the declining quality of education following the introduction of the Free Primary Education program. Their findings revealed that parents opting for low-cost private schools prioritised perceived quality and the school environment. In contrast, considerations of cost and proximity primarily influenced parents with children in public schools. These studies indicate different parental preferences based on various factors regarding their children's education.



Badriyah et al. (2021) assessed the convenience and commuting time efficacy for students attending schools in Bandung Regency, examining how geographical arrangements of Senior High Schools influence commute times and school choice. Using random and stratified sampling, they selected 31 schools and found that students' travel times were generally efficient, with a consistent distribution of travel durations. However, while the study highlighted the importance of travel time efficiency in school choice, it did not address broader determinants such as supposed value, security, and socio-demographic variables, thus missing a comprehensive understanding of the factors influencing school selection.

Shahzad et al. (2020) investigated the factors affecting parents' decisions when selecting public and private schools for their children's education, employing a descriptive methodology and questionnaires distributed to 300 parents. Key determinants included students' moral development, teacher quality, a nurturing school environment, discipline, and safety. At the same time, factors such as parents' education level, dissatisfaction with class sizes, and profession had less influence. Although these factors were significant for public and private schools, individual interactions, like Parent-Teacher Meetings (PTM), were less common in public school selections.

Magulod (2017) examined the factors affecting the usefulness and achievement of public and private basic schools in the Philippines, intending to identify the key elements of school success and household school choice. The study identified three principal components crucial for school effectiveness: instructional headship, increased prospects for success, and a clear, engrossed mission, all of which significantly influence households' school selection.

Dahari and Ya (2011) examined factors prompting parent's choices in preschool education in Malaysia, aiming to identify critical characteristics affecting parents' preschool choices. The study, which collected data via questionnaires from 162 parents and used multiple linear regression analysis, found that parents' choices were strongly influenced by preschool characteristics such as brand reputation, private ownership, wellbeing and safety procedures, eminence of tuition, social and economic standing, and hygiene. However, the study did not establish a causal relationship between these factors and household educational expenditure.

The literature review highlights several studies investigating factors influencing parental decisions on school choice between public and private schools across various contexts. However, gaps remain that this study aims to address. While previous research has explored factors like school quality, proximity, cost, and parental preferences, there is a need for a comprehensive understanding of how these factors behave within Ghana's specific socio-cultural and economic context. Existing studies primarily focus on regions such as Nepal, Iraq, and the Philippines, which differ from Ghana. Additionally, most research centres on higher education or preschool choices



rather than pre-tertiary education, which is crucial for foundational learning and long-term outcomes. There is also a need for a deeper exploration of socioeconomic variables, such as parental income and occupation, and their interaction with household characteristics in influencing school choice in Ghana. Addressing these gaps will enhance understanding the determinants of pre-tertiary school choice in Ghana and inform policies to improve educational access and equity.

METHODOLOGY

The study uses an explanatory research design to explore the relationships between variables, specifically household preferences for Ghana's public versus private pre-tertiary schools. It aimed to identify school choice drivers and examined household characteristics' influence on choice. Focusing on households with children in pre-tertiary education, the study utilised the nationally representative Ghana Living Standard Survey (GLSS7) dataset, which includes data from 15,000 households. A logistics regression model is employed, where the dependent variable, choice of school, is dichotomous: 1 for a net preference for private schools and 0 for public schools. The study examines three primary drivers (proximity to school, charges, and payment incidence). It categorises household characteristics into inherent traits (gender and age of household head) and acquired characteristics (household size, education level, marital status, financial inclusion, economic status, and location).

A model outlining household decisions regarding pre-tertiary education, to the factors that may influence this choice, is presented as follows:

$E(\text{pre-tertiary education choices} | \text{Expenditure on pre-primary \& primary \& JSS (log), Expenditure on Secondary education (Log), School and Registration fees (Log), Transportation to \& from school (log), Distance of school from household, Basic education of Household Head, Secondary education of Household Head, Tertiary education of Household Head, Age of Household Head, Household Head is Married, Rural Area of Household, Household Size, Household Head is male, Household Head have Bank Account, Household Head does not have an insurance policy, Household Head Age Squared (log), Household Size squared (log), Incidence of fee payment: Supporter})$

$\Rightarrow E(y | \text{Expenditure on pre-primary \& primary \& JSS (log), Expenditure on Secondary education (Log), School and Registration fees (Log), Transportation to \& from school (log), Distance of school from the household, Basic education of Household Head, Secondary education of Household Head, Tertiary education of Household Head, Age of Household Head, Household Head is Married, Rural Area of Household, Household Size, Household Head is male, Household$



Head have Bank Account, Household Head does not have an insurance policy, Household Head Age Squared (log), Household Size squared (log), Incidence of fee payment: Supporter)..... 1(a)

$$\Rightarrow y = \beta_0 + \beta_1 \text{Expenditure on pre-primary \& primary \& JSS (log)} + \beta_2 \text{age_head} + \delta_3 \text{male_head} + \dots + \xi_i \dots \dots \dots I(b)$$

Hence, equation (1b) can be simplified as:

$$\Rightarrow y_i = \beta_p X_i + \xi_i \dots \dots \dots I(c)$$

Where y_i represents the dependent variable pre-tertiary education choice for every household i . β_p is the vector of coefficients of all the independent variables X_i . ξ_i denotes the error term that is a vector of all unobserved variables, and it follows a normal distribution for all independent observations $\xi_i | x \sim N(0,1)$.

Given that the dependent variable is dichotomous, ranging between 0 and 1 to indicate whether a household opts for public or private options, I employed logistic regression. This statistical method is widely used to predict functional relationships and outcomes associated with binary dependent variables (Rodriguez, 2007).

Assuming a linear model in which the probability of y_i is represented as a linear function of its predictors, I estimate the log odds associated with the choice of pre-tertiary education through logistic regression. The logit model can be expressed as follows:

$$\Rightarrow \text{logit}(y_i) = \beta_p X_i + \xi_i \dots \dots \dots 2(a)$$

Where equation (2a) is a logit transformation of equation (1c) given by log-odds

$$\Rightarrow \text{logit}(y_i) = \ln \left(\frac{y_i}{1-y_i} \right)$$

$$\Rightarrow y_i = \frac{e^{\beta_p X_i + \xi_i}}{1 + e^{\beta_p X_i + \xi_i}}$$

Therefore, the model assumes that the linear probability model functions as a representation of the natural log odds:

$$\ln \left(\frac{y_i}{1-y_i} \right) = \beta_p X_i + \xi_i \dots \dots \dots 2(b)$$



RESULTS AND DISCUSSION

Descriptive Statistics of Continuous Variable

From Table 1, the expenditure on pre-primary, primary, and Junior Secondary School (JHS) education in Ghana varies significantly among households, with a mean expenditure of 6.974, indicating a substantial allocation of resources to early education. This suggests a substantial financial commitment to foundational education, reflecting different household priorities and capacities, which could influence their choice of public schools to manage overall educational costs. For secondary education, the mean expenditure is higher at 7.635, showing continued investment as children progress, driven by aspirations for better academic outcomes. The smaller standard deviation (0.771) in secondary education expenditure suggests a more consistent investment pattern, highlighting its perceived importance and fewer available options than in earlier educational stages. School and examination fees vary widely, ranging from 3.807 to 11.225, with a mean of 6.314, indicating that fees make up a significant portion of household expenditures and influence school choice.

Transportation costs significantly impact school choice in Ghana, with a mean expenditure of 5.470, reflecting moderate costs relative to other factors. The wide range (1.099 to 8.882) indicates varying distances between households and schools, affecting overall education expenses. Additionally, the age of the household head varies widely, influencing educational aspirations; younger heads may focus on long-term investments in education, possibly favouring private schools, while older heads may have different financial priorities or constraints. Household size significantly impacts educational decisions, with a mean size of 6.583 reflecting diverse family structures. Larger households often face greater financial constraints and may prioritise cost-effective options like public schools despite potential quality differences. Alternatively, they might selectively invest in private education for certain children, balancing educational priorities with financial capacities.



Table 1: Descriptive Statistics of Continuous Variable

Variable	Obs	Mean	Std. Dev.	Min	Max
Expenditure on pre-primary & primary & JSS (log)	1440	6.974	1.034	2.773	9.586
Expenditure on secondary education (Log)	1440	7.635	.771	5.011	10.699
School and Examination fee (log)	1440	6.314	1.265	3.807	11.225
Transportation to and from school (log)	1440	5.47	1.142	1.099	8.882
Age of head	1440	25.868	16.236	18	99
Distance	1440	15.917	15.385	2	50
HHsize	1440	6.583	2.865	1	24
Household size squared (log)	1440	3.615	.781	2.890	4.595
Age of head squared (log)	1440	5.93	1.773	0	3.178

Summary Statistics of Categorical Variables

From Table 2, the gender distribution among household heads shows a slight majority of male heads (52.08%) compared to female heads (47.92%). Most households (55.56%) reside in rural communities, highlighting the rural-urban disparity in educational access and choices. Rural households may face limited school options, higher transportation costs, and lower access to quality education than their urban counterparts. The majority of household heads are unmarried (97.22%). Financial inclusion varies, with 71.53% having bank accounts, indicating a level of financial stability that influences school choice. Educational attainment among household heads varies, with a significant proportion (45.83%) having no formal education and others having essential (32.64%), secondary (9.03%), or tertiary education (12.50%). Most households (85.42%) opt for public schools, while a minority (14.58%) choose private schools. This distribution may reflect affordability considerations, perceptions of quality, and accessibility of educational options in Ghana.



Table 2: Summary statistics of categorical variables

Variable	Categories	Frequency	Percentage
Gender of Head	Female Head	690	47.92
	Male Head	750	52.08
Location	Urban Community	640	44.44
	Rural Community	800	55.56
Marital status of Head	Unmarried	1400	97.22
	Married	40	2.78
Financial Inclusion	Head has a bank account	1,030	71.53
	Head does not have a bank account	410	28.47
	Head has an insurance policy	230	15.97
	Head does not have an insurance policy	1,210	84.03
Heads educational attainment	No Education	660	45.83
	Basic Education	470	32.64
	Secondary Education	130	9.03
	Tertiary Education	180	12.50
Type of school	Public	1,230	85.42
	Private	210	14.58
Incidence of fee payment	Parents	1,170	81.25
	Supporter	230	15.97

GLSS 7

Figure 1 illustrates the mean expenditure on pre-primary, primary, and junior secondary school (JSS) education, differentiated by urban and rural locations.

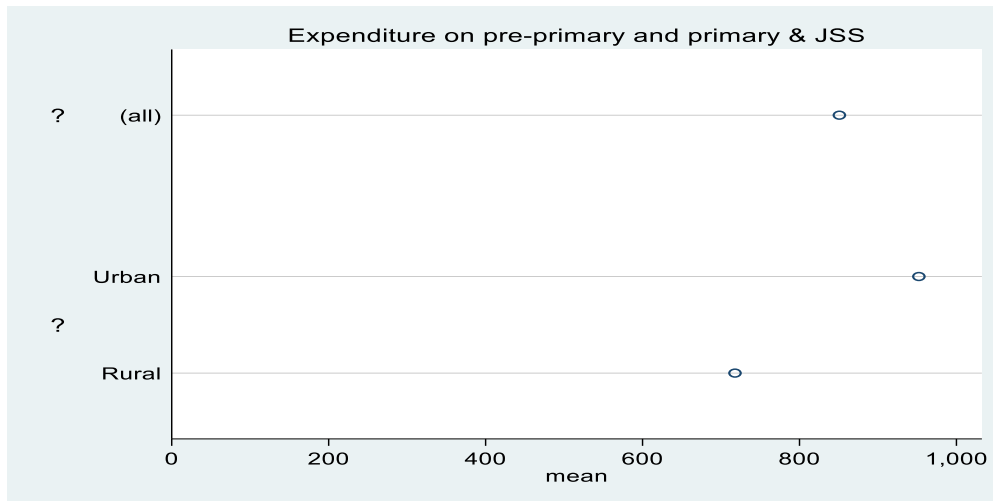


Figure 1: Joint Plot of Location and Expenditure of Households on Basic Education
Source: Author's Estimation from the 2017 GLSS data

The overall mean expenditure, represented as "All," is nearly 1000 units. The mean expenditure for urban households is approximately 900 units, indicating that urban households invest more in education at these levels than rural areas. Figure 1, thus, underscores the economic divide in educational spending based on geographical location.

Figure 2 shows that urban households spend more on Senior Secondary School (SSS) and post-secondary education but non-tertiary education compared to rural households.

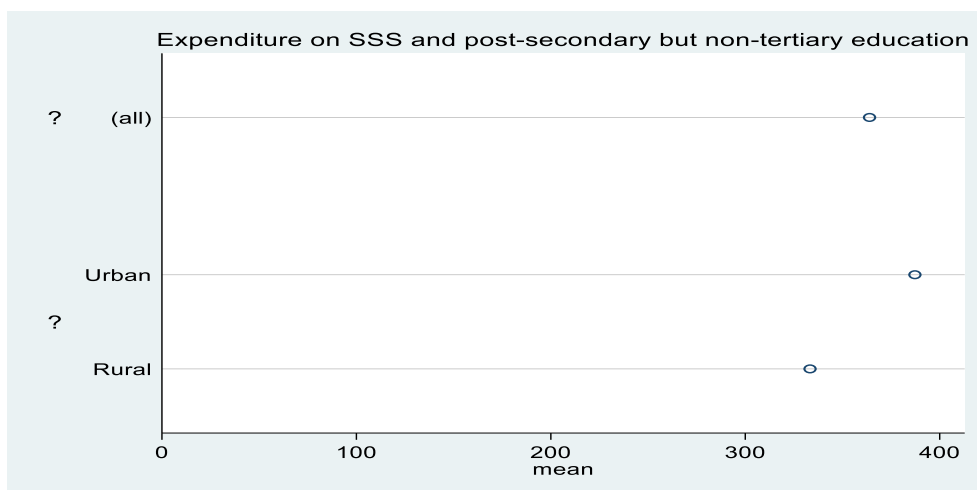


Figure 2: Joint Plot of Location and Expenditure of Households on Secondary Education
Source: Author's Estimation from the 2017 GLSS data

ISSN: 2408-7920

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The overall mean expenditure for SSS and post-secondary, represented as "All," is around 400 units. The mean expenditure for urban households is approximately 380 units, which is higher than that of the rural area (about 340 units). This indicates that urban households invest more in education at these levels. Figure 1, thus underscores the economic divide in educational spending based on geographical location.

Figure 3 displays the mean expenditure on pre-primary, primary, and junior secondary school (JSS) education, categorized by households' poverty status: Very Poor, Poor, and Non-poor.

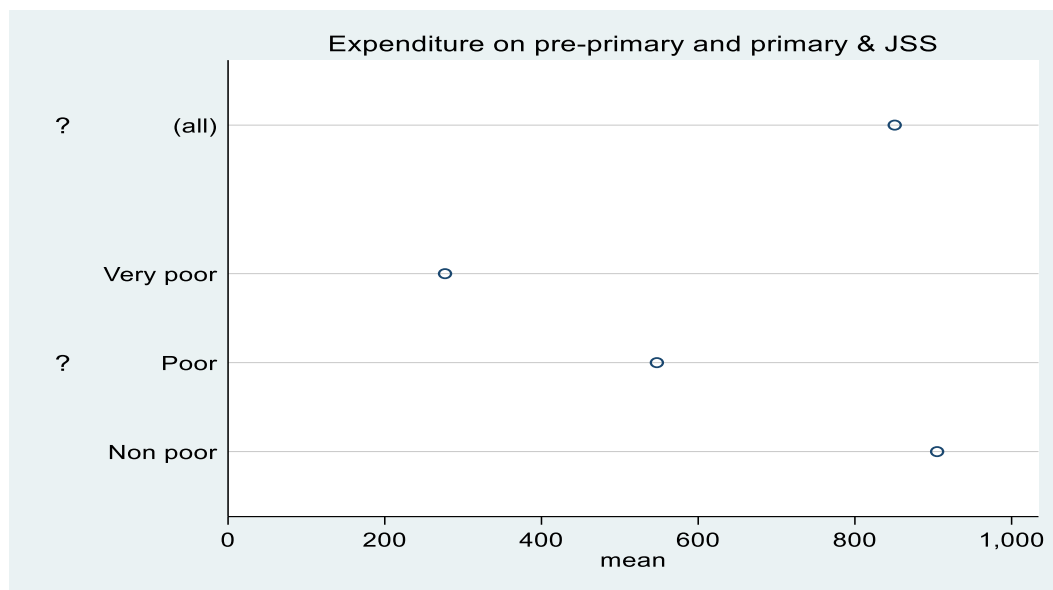


Figure 3: Joint Plot of poverty status and Expenditure of Households on Basic Education
Source: Author's Estimation from the 2017 GLSS data

Non-poor households have the highest mean expenditure on education, around 900 units, indicating a greater investment than poorer households. Poor households spend about 600 units, which is lower than non-poor households but greater than Very Poor households. Very Poor households, with the lowest mean expenditure of around 300 units, demonstrate their limited financial ability to invest in education. This disparity underscores the influence of economic status on households' ability to invest in pre-tertiary education.

Figure 4 displays the mean expenditure on SSS and post-secondary but not tertiary education, categorised by households' poverty status: Very Poor, Poor, and Non-poor.

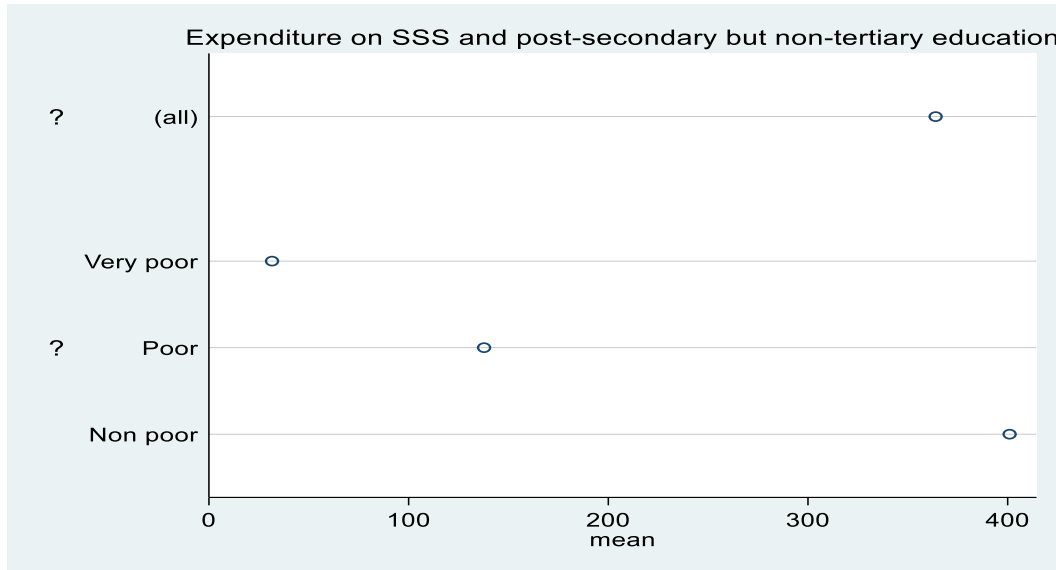


Figure 4: Joint Plot of poverty status and Expenditure of Households on Secondary Education
Source: Author's Estimation from the 2017 GLSS data

Non-poor households invest the most in education, with a mean expenditure of about 400 units. Poor households spend around 150 units, which is lower than non-poor households but greater than Very Poor households. Very Poor households have the lowest mean expenditure, around 50 units, highlighting their limited financial capacity to invest in education.

Figure 5 presents the relationship between household spending on pre-primary, primary, and junior secondary school (JSS) education and the probability of choosing private over public schooling.

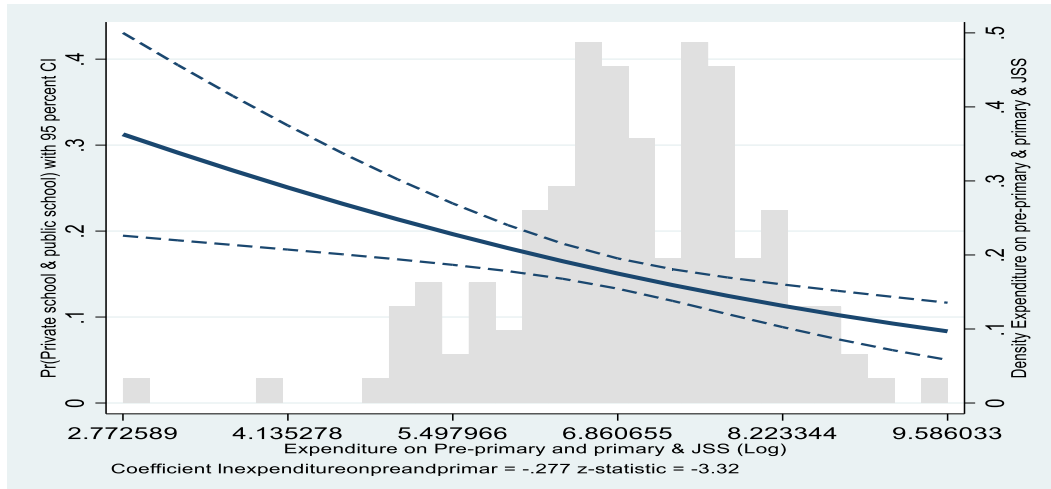


Figure 5: Interaction between the type of school and household expenditure on basic education
Source: Author's Estimation from the 2017 GLSS data

The x-axis shows logged expenditure, the left y-axis represents the probability of selecting a private school, and the right y-axis indicates the density of the expenditure data. The solid blue line, which slopes downward, illustrates that as expenditure on pre-primary and primary education increases, the likelihood of choosing a private school decreases. This is a statistically significant relationship, as denoted by the coefficient of -0.277 and a z-statistic of -3.32. The dashed blue lines mark the 95% confidence interval, which narrows as expenditure rises, indicating greater precision in predicting private school choice for higher expenditures. The grey histogram in the background displays the density distribution of household expenditures, with most households spending within a central range.

Overall, the diagram indicates that higher household expenditure on basic education is associated with a decreased probability of selecting private schooling for pre-tertiary education. This suggests that higher expenditure may reflect greater investment in public education or other factors influencing the choice of public over private schooling.

Figure 6 illustrates the relationship between household expenditure on senior secondary school (SSS) and post-secondary but non-tertiary education and the likelihood of choosing a private school over a public school.

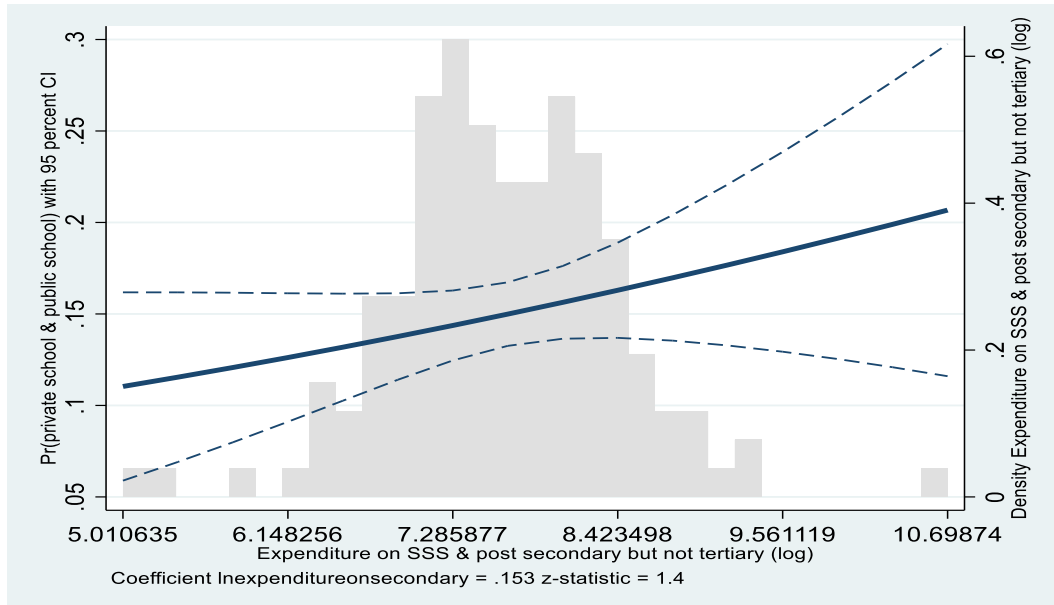


Figure 6: Interaction between the type of school and household expenditure on secondary education.

Source: Author's Estimation from the 2017 GLSS data

The x-axis shows logged expenditure, the left y-axis indicates the probability of selecting a private school, and the right y-axis shows the density of the expenditure data. The solid blue line, which slopes upward, suggests that as expenditure on secondary education increases, the likelihood of opting for a private school also rises. However, this relationship is not statistically significant, as indicated by a coefficient of 0.153 and a z-statistic of 1.4. The dashed blue lines show the 95% confidence interval, which widens with higher expenditure, indicating greater uncertainty in predicting private school choice at higher spending levels. The grey histogram in the background, which visualises the density distribution of household expenditures on secondary education, shows that most expenditures are clustered around the central range of the expenditure spectrum.

Logit Results of the Determinants of Household Choice of Pre-Tertiary Education in Ghana.

The logit regression results analyse the factors influencing a household's decision to choose between public and private pre-tertiary education in Ghana. The coefficients reflect the log odds of selecting private education over public education.

From Table 3, expenditure on pre-primary, primary, and junior secondary education has a significant negative association with the choice of private education, with a coefficient of -0.2771 and a standard error of 0.0835. Conversely, school and registration fees and transportation costs



show positive and significant associations with the choice of private education, with coefficients of 0.15542 and 0.46317, respectively. Distance of the school from the household is inversely related to the choice of private education, with a coefficient of -0.0271. Thus, greater distances reduce the likelihood of selecting private schools.

The level of basic education attained by the household head is positively related to the decision to opt for private education, reflected by a coefficient of 0.3738. In contrast, the household head's secondary and tertiary education levels do not exhibit significant associations with the choice of private education. Additionally, the marital status of the household head demonstrates a strong positive association with the preference for private education, with a coefficient of 1.8262. The gender of the household head is also significant, with male heads more likely to opt for private education, as indicated by a coefficient of 0.4455. Household size negatively impacts the likelihood of choosing private education, with a significant coefficient of -0.6566. However, the squared term for household size shows a significant positive association, with a coefficient of 2.2088, indicating a non-linear relationship where very large households may eventually increase the likelihood of choosing private education.

Financial inclusion, indicated by the household head having a bank account, has a significant positive impact on the choice of private education, with a coefficient of 1.1581. Age of household head and whether the head lacks an insurance policy do not show significant associations with the choice of private education. However, the age squared term is negatively significant, indicating a complex relationship where older heads might initially decrease but eventually increase the likelihood of choosing private education. The incidence of fee payment by a supporter shows a negative but not significant association with the choice of private education. The constant term is significantly negative, with a coefficient of -7.7059, indicating the baseline log-odds of choosing private education when all other factors are zero.

The model yields an LR chi-squared value of 191.78, accompanied by a highly significant p-value ($\text{Prob} > \chi^2 = 0.0000$), indicating that the overall model is statistically significant. Furthermore, the Pseudo R^2 value of 0.1620 denotes that the variables included in the model account for approximately 16.2% of the variability in the choice between private and public education.



Table 3: Logit results of the determinants of household choice of pre-tertiary education

VARIABLES	School type (public=0, private=1)
Expenditure on pre-primary & primary & JSS (log)	-0.2771*** (0.0835)
Expenditure on Secondary education (Log)	0.1529 (0.1092)
School and Registration fees (Log)	0.15542** (0.0736)
Transportation to & from school (log)	0.46317*** (0.0878)
Distance of school from household	-0.0271*** (0.0069)
Basic education of Household Head	0.3738** (0.1968)
Secondary education of Household Head	0.1124 (0.3123)
Tertiary education of Household Head	0.0858 (0.3069)
Age of Household Head	0.0032 (0.0111)
Household Head is Married	1.8262*** (0.3627)
Rural Area of Household	0.0026 (0.1825)
Household Size	-0.6566*** 0.1812
Household Head is male	0.4455** 0.1922
Household Head have Bank Account	1.1581*** (0.2553)
Household Head does not have an insurance policy	-0.1407 0.2520
Household Head Age Squared (log)	-0.2809*** (0.0922)
Household Size squared (log)	2.2088*** (0.6084)
Incidence of fee payment: Supporter	-0.2098 0.2530
Constant	-7.7059*** (1.6554)
Observation	1,400
LR chi2(18)	191.78
Prob > chi2	0.0000
Pseudo R2	0.1620

GLSS 7. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

ISSN: 2408-7920

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Average Marginal Effect of the Determinants of Household Choice of Pre-Tertiary Education in Ghana

The logit model's average marginal effects (AME) provide insights into how each variable affects the probability of a household choosing private education over public education. These effects are represented as changes in probability resulting from a one-unit change in the predictor variable while keeping every other variable constant.

From Table 4, expenditure on pre-primary, primary, and junior secondary education shows a significant negative marginal effect of -0.0299. This indicates that a 1% increase in expenditure on these levels of education decreases the probability of choosing private education by approximately 2.99%. Conversely, school and registration fees have a significant positive marginal effect of 0.0168, suggesting that a 1% increase in these fees raises the probability of choosing private education by 1.68%. Transportation costs also have a significant positive marginal effect of 0.0501, indicating that a 1% increase in transportation costs raises the likelihood of opting for private education by 5.01%. The distance of the school from the household has a significant negative marginal effect of -0.0029, meaning that each additional kilometre of distance reduces the probability of selecting private education by 0.29%.

Basic education of the household head has a significant positive marginal effect of 0.0411, indicating that heads with basic education increase the probability of choosing private education by 4.11%. The marital status of the household head has a substantial significant positive marginal effect of 0.2855, showing that being married increases the likelihood of choosing private education by 28.55%. The gender of the household head significantly influences the probability, exhibiting a positive marginal effect of 0.0479. This indicates that male household heads are 4.79% more expected to select private education. Financial inclusion, measured by whether the household head has a bank account, has a significant positive marginal effect of 0.1069, indicating that having a bank account increases the likelihood of choosing private education by 10.69%.

The squared term for the age of the household head shows a significant negative marginal effect of -0.0304, suggesting a relationship where increased age initially reduces but eventually increases the probability of choosing private education. The squared term for household size has a significant positive marginal effect of 0.2391, indicating that larger households, when squared, significantly increase the likelihood of selecting private education. Other variables, such as expenditure on secondary education, secondary and tertiary education of the household head, age of the household head, living in a rural area, household size, lack of insurance policy, and incidence of fee payment by a supporter, do not show significant marginal effects, indicating they have a less clear impact on the likelihood of choosing private education.



Table 4: Average marginal effect of the determinants of household choice of pre-tertiary education

VARIABLES	School type (public=0, private=1)
Expenditure on pre-primary & primary & JSS (log)	-0.0299*** (0.0089)
Expenditure on Secondary education (Log)	0.0165 (0.0118)
School and Registration fees (Log)	0.0168** (0.0079)
Transportation to & from school (log)	0.0501*** (0.0094)
Distance of school from household	-0.0029*** (0.0007)
Basic education of Household Head	0.0411** (0.0219)
Secondary education of Household Head	0.0219 (0.0326)
Tertiary education of Household Head	0.0087 (0.0317)
Age of Household Head	0.0004 (0.0012)
Household Head is Married	0.2855*** (0.0690)
Rural Area of Household	0.0003 (0.0198)
Household Size	-0.0711 (0.0195)
Household Head is male	0.0479** (0.0204)
Household Head have Bank Account	0.1069*** (0.0194)
Household Head does not have an insurance policy	-0.0156 (0.0287)
Household Head Age Squared (log)	-0.0304*** (0.0099)
Household Size squared (log)	0.2391*** (0.0655)
Incidence of fee payment: Supporter	-0.0219 (0.0254)
Observation	1,400

GLSS 7 Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1



Robustness to the Logit Model: Robit Results

The results from the robustness check, which utilised a robot model to examine the determinants of household choices regarding pre-tertiary education in Ghana, reveal a pattern consistent with that of the logit model.

From Table 5, expenditure on pre-primary, primary, and junior secondary school (JSS) is negatively associated with the choice of private schooling, as indicated by a coefficient of -0.2094 with high statistical significance ($p < 0.01$). Conversely, expenditure on secondary education shows a positive relationship with private school choice, though this effect is only marginally significant ($p < 0.1$) with a coefficient of 0.1112. Additionally, higher school and registration fees (coefficient: 0.1259, $p < 0.05$) and transportation costs (coefficient: 0.3353, $p < 0.01$) both increase the likelihood of selecting a private school. However, the greater the distance from the household to the school, the lower the probability of choosing a private institution, as reflected by a negative coefficient of -0.0202 ($p < 0.01$).

The education level of the household head also plays a role, with basic education positively associated with private school choice (coefficient: 0.2953, $p < 0.05$). However, secondary and tertiary education levels are not statistically significant. The household head's age has no significant direct effect, but age squared is negatively significant (coefficient: -0.1956, $p < 0.01$), indicating a non-linear relationship. Married household heads are significantly more inclined to opt for private schooling. (coefficient: 1.2989, $p < 0.01$). Moreover, male household heads are more likely to do so (coefficient: 0.3501, $p < 0.05$). A bank account is a strong positive predictor (coefficient: 0.8592, $p < 0.01$), while not having insurance is insignificant. Household size has a significant negative effect (coefficient: -0.4637, $p < 0.01$), but the squared term of household size shows a positive relationship (coefficient: 1.5586, $p < 0.01$), suggesting dynamics in larger households. Living in a rural area does not significantly affect the choice or the incidence of fee payment support.



Table 5: Robit results of the determinants of household choice of pre-tertiary education. (robustness to the logit model)

VARIABLES	School type (public=0, private=1)
Expenditure on pre-primary & primary &JSS (log)	-0.2094*** (0.0629)
Expenditure on Secondary education (Log)	0.1112* (0.0670)
School and Registration fees (Log)	0.1259** (0.0571)
Transportation to & from school (log)	0.3353*** (0.0533)
Distance of school from household	-0.0202*** (0.0074)
Basic education of Household Head	0.2953** (0.1332)
Secondary education of Household Head	0.0587 (0.2406)
Tertiary education of Household Head	0.1145 (0.1925)
Age of Household Head	0.0032 (0.0077)
Household Head is Married	1.2989*** (0.3266)
Rural Area of Household	0.0228 (0.1409)
Household Size	-0.4637*** (0.1245)
Household Head is male	0.3501** (0.1459)
Household Head have Bank Account	0.8592*** (0.2079)
Household Head does not have an insurance policy	-0.1387 (0.1537)
Household Head Age Squared (log)	-0.1956*** (0.0616)
Household Size squared (log)	1.5586*** (0.3953)
Incidence of fee payment: Supporter	-0.1219 (0.2530)
Constant	-5.5867*** (1.0753)
Observation	1,400
Wald chi2(18)	197.03043
Prob > chi2	0.0000



Log pseudolikelihood:

-496.64572

GLSS 7 Robust Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Ordinary Least Square Regression Results

The Ordinary Least Squares (OLS) regression results in Table 6 reveal the determinants of various education-related expenditures in Ghana, focusing on basic education, secondary education, school and registration fees, and transportation fees.

Private schools positively impact basic education (Model 1), with households spending 10.20% more on basic education when choosing private schools. Additionally, tertiary education of the household head also significantly increases expenditure by 16.0%, indicating that higher educational attainment of the household head is associated with higher spending on basic education. Furthermore, households in rural areas spend 28.8% less, reflecting disparities in education expenditure between rural and urban areas. Household size also significantly affects spending, with larger households spending more on basic education by about 5.30%. Moreover, households with male heads spend 7.62% more on basic education than those with female heads.

For secondary education expenditure (Model 2), private school attendance significantly decreases spending by 19.8%. This could imply that the private school fees for secondary education might be structured differently than public schools. Basic education of the household head increases expenditure by 13.7%, while the presence of an insurance policy increases spending by 13.1%. The negative significant effect of age of the household head (-1.68%) suggests that older household heads tend to spend less on secondary education. Notably, being in a rural area reduces spending by 24.4%, again highlighting the urban-rural divide.

Married household heads spend significantly less, by 69.5%, possibly due to financial constraints or differing priorities in married households. Age squared of the household head shows a positive effect, indicating a nonlinear relationship where specific age brackets might see increased spending on secondary education. Additionally, households paying their fees spend significantly less (-45.0%), indicating that self-financed households are more cost-conscious.

Regarding school and registration fees (Model 3), attending a private school lead to a 24.9% increase in these fees. Distance from the household to school has a significant negative impact (-2.24%), suggesting that further distances might deter higher spending on these fees. The household head's basic and secondary education levels significantly increase spending on these fees (39.2% and 41.3%, respectively), as does having an insurance policy (29.7%). Rural households spend significantly more (41.3%) due to limited access to public school facilities, leading to higher costs for private or distant schools. Larger households also spend more (13.8%), indicating economies of scale in education spending. However, households with male heads spend 42.1% less. Having a bank account significantly reduces expenditure on school fees (-30.5%), apparently due to better

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financial planning or access to credit facilities. Households that self-finance their fees spend significantly more (164.2%), possibly due to a commitment to higher-quality education despite higher costs.

Finally, for transportation fees (Model 4), attending a private school significantly increased transportation costs by 46.4%. Distance from the household to the school positively affects transportation spending (1.03%). The household head's secondary and tertiary education significantly increase transportation expenditure (52.6% and 53.5%, respectively), indicating that higher educational attainment correlates with a willingness to invest more in education-related transportation. Rural households also incur significantly higher transportation costs (42.2%), likely due to the scarcity of nearby educational facilities. Larger household size again shows a significant positive impact on spending (16.2%). Additionally, male household heads spend 19.4% more on transportation. A bank account reduces transportation spending by 28.4%, reflecting better financial management or access to resources that minimise these costs. Interestingly, households that pay their fees have significantly higher transportation expenses (67.3%), suggesting a greater commitment to education despite higher associated costs.



Table 6: Ordinary least square regression results

VARIABLES	(1) Expenditure on Basic Education(log)	(2) Expenditure on secondary education (log)	(3) School & registration fee (log)	(4) Transportation fee (log)
Type of school: Private	0.1020* (0.0592)	-0.198** (0.0785)	0.2490*** (0.0892)	0.4640*** (0.0813)
Distance from household to school	-0.00105 (0.00139)	-0.00142 (0.00185)	-0.0224*** (0.00210)	0.0103*** (0.00191)
Basic education of Head	-0.0382 (0.0464)	0.137** (0.0615)	0.392*** (0.0699)	0.0985 (0.0637)
Secondary education of Head	0.0358 (0.0753)	-0.0255 (0.0998)	0.413*** (0.113)	0.526*** (0.103)
Tertiary education of Head	0.160** (0.0680)	-0.0405 (0.0902)	0.0270 (0.103)	0.535*** (0.0934)
Age of Head	-0.00332 (0.00282)	-0.0168*** (0.00374)	-0.0127*** (0.00425)	0.00491 (0.00387)
Head is married	0.304** (0.124)	-0.695*** (0.165)	-0.247 (0.187)	0.397** (0.171)
Rural area of Head	-0.288*** (0.0425)	-0.244*** (0.0563)	0.413*** (0.0640)	0.422*** (0.0583)
Household size	0.0530*** (0.0192)	0.0140 (0.0254)	0.138*** (0.0289)	0.162*** (0.0263)
Head is male	0.0762* (0.0427)	-0.00707 (0.0566)	-0.421*** (0.0644)	0.194*** (0.0587)
Head has bank account	0.0290 (0.0495)	-0.0397 (0.0656)	-0.305*** (0.0745)	-0.284*** (0.0679)
Head has insurance policy	0.0875 (0.0578)	0.131* (0.0766)	0.297*** (0.0871)	0.0301 (0.0794)
Age squared (log)	0.0239 (0.0261)	0.177*** (0.0346)	0.178*** (0.0393)	0.0446 (0.0358)
Household size squared(log)	-0.0832 (0.0694)	0.203** (0.0920)	-0.444*** (0.105)	-0.415*** (0.0953)
Supporter pays fees	0.0221	-0.0595	0.135	-0.00924



Fee is paid by self	(0.0578) -0.229*	(0.0766) -0.450***	(0.0871) 1.642***	(0.0794) 0.673***
Constant	(0.131) 7.543***	(0.173) 5.648***	(0.197) 6.330***	(0.179) 4.948***
	(0.193)	(0.255)	(0.290)	(0.265)
Observations	1,440	1,440	1,440	1,440
R-squared	0.066	0.088	0.212	0.198

GLSS 7

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1



Discussion

The results offer critical insights into the determinants influencing household choice between Ghana's public and private pre-tertiary education.

Expenditure and School Choice

The significant negative relationship between expenditure on pre-primary, primary, and junior secondary school (JSS) education and the likelihood of choosing private education suggests that households investing heavily in foundational education tend to opt for public schools as their children advance. This finding suggests a strategic allocation of resources where households seek to maximise the returns on their early educational investments by minimising costs at later stages (McCullough et al., 2015). Thus, as indicated by McCullough et al. (2015), more affordable public schools offer a way to manage educational expenses without compromising on the educational continuity of their children.

Conversely, the positive association between school and registration fees, transportation costs, and the likelihood of choosing private education underscores the role of perceived quality and accessibility in educational decisions (Chowdhury & Synthia, 2020; Shabbir, 2014; Anomaly, 2018). In line with this, Chowdhury and Synthia (2020) explain that households willing to pay higher fees and transportation costs are likely doing so because they perceive private schools as offering superior education, better facilities, or a safer environment for their children. This interpretation aligns with global trends where private education is often associated with higher perceived quality, prompting families to make financial sacrifices for the perceived long-term benefits of private schooling (Chaturvedi, 2016; Anomaly, 2018).

Influence of Household Head Characteristics

The positive relationship between the basic education of the household head and the likelihood of choosing private education reflects the value placed on education by those who have received at least a basic level of schooling (Bernard et al., 2019; Chaubey et al., 2020). For instance, Chaubey et al. (2020) emphasised that these household heads may be more aware of the potential advantages of private education, making them more willing to invest in it for their wards. However, the lack of significant associations for secondary and tertiary education levels suggests that beyond basic education, other factors, such as financial constraints or a deeper understanding of the long-term benefits of public education, may influence the decision-making process.

Marital status emerges as a strong determinant, with married household heads significantly more likely to choose private education. This finding reflects that married households combine financial resources and decision-making processes, which may facilitate a greater willingness or ability to invest in private schooling (Kosunen & Carrasco, 2016). Furthermore, the significance of the



household head's sex indicates potential gendered differences in financial priorities or decision-making power, with male heads more inclined to prioritise educational investments.

The relationship between household size and school choice is particularly fascinating. The negative impact of household size on the likelihood of choosing private education suggests that larger households facing greater financial constraints are less likely to opt for private schooling. However, the positive association found in the squared term of household size indicates that once households reach a specific size, they may adopt strategies that enable them to afford private education for some children. According to Awan and Zia (2014), this could involve selective investment in the education of certain children based on perceived potential or financial planning to manage the costs associated with large families.

The age of the household head presents a subtle relationship with school choice. While age itself does not show a significant direct effect, the significant negative association in the age-squared term suggests that younger heads may initially be less likely to choose private education, possibly due to financial constraints or a focus on other priorities. However, as they age and potentially achieve greater financial stability, the likelihood of choosing private education increases. This interpretation aligns with the life-cycle hypothesis (Cooper & Zhu, 2016; Girshina, 2019; Rözer & Bol, 2019), where individuals prioritise different investments at various stages of their lives, with education becoming a more prominent concern as financial stability improves.

Role of Financial Inclusion

Financial inclusion, indicated by the household head having a bank account, significantly influences the ability of families to opt for private education. This positive relationship indicates that households with access to financial services, such as banking and credit facilities, can manage and plan for the expenses associated with private schooling more effectively (Chaubey et al., 2020; Manzoor et al., 2017). With financial stability, Tsimicalis et al. (2020), explain that these households are better equipped to handle tuition fees, transportation costs, and other education-related expenditures, making private education a more feasible option. This underscores the critical role that financial access plays in educational decision-making, as it empowers families to make choices that align with their aspirations for quality education, ultimately contributing to greater educational equity and opportunity (Kim et al., 2017; Manzoor et al., 2017).

Urban-Rural Divide and Educational Disparities

The results highlight a stark contrast between urban and rural households in their educational expenditures and school choices, with rural households spending less overall and being less inclined to opt for private education. This disparity stems from rural communities' broader socio-economic challenges, such as lower income levels, which limit their financial capacity to invest in more expensive private schooling. Additionally, rural areas often lack access to private schools,

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meaning families have fewer options, and the educational infrastructure in these regions are generally less developed (Ahsan et al., 2020; Bandyopadhyay et al., 2021). This underdevelopment can manifest in fewer schools, poorer facilities, and less qualified teachers, further discouraging investment in education and reinforcing the preference for more affordable public schools, even if the quality is perceived to be lower.

Impact of Proximity on School Choice

The negative relationship between school distance and the likelihood of choosing private education underscores the importance of accessibility in educational decisions. Even when families favour private schooling for its perceived benefits, the feasibility of commuting can heavily influence their choice (He & Giuliano, 2018; Abraham, 2023). This is particularly true in rural areas, where inadequate transportation infrastructure makes travelling long distances to school difficult and costly. As a result, families in these regions opt for nearby public schools despite a preference for private education simply because the daily logistics of accessing distant private schools are impractical (Mandic et al., 2017; He & Giuliano, 2017).

CONCLUSION

The study explored the factors influencing households' decisions between public and private pre-tertiary schools in Ghana using a nationally representative survey dataset, the GLSS 7. It primarily examined how households' unique socioeconomic characteristics and school-specific factors shape their school-choice decisions. The findings revealed that expenditure on earlier stages of education, household characteristics, proximity, and financial inclusion all play significant roles in determining whether households choose public or private education. The study underscored the disparities between urban and rural areas in the choice of school type, highlighting rural households' challenges in accessing private education. Financial inclusion, as indicated by having a bank account, emerged as a critical factor of choice because it enables families to navigate private schooling costs.

Policy Implications

The findings highlight the need for policies that enhance financial inclusion, address urban-rural disparities, and improve public education quality to ensure equitable access to quality schooling. Investments in rural infrastructure, targeted support for large households, and initiatives to reduce school distance can expand public and private education access. Strengthening public schools at all levels, promoting affordable private education, and incentivising private school expansion in underserved areas can reduce costs and improve family options. Additionally, policies should account for household dynamics, such as gender, marital status, and life-cycle needs, to create tailored financial and educational support systems that empower families to make informed decisions and achieve sustained educational outcomes.

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ISSN: 2408-7920

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