

*Full Length Research Paper*

# The determinants of household education expenditure in Ghana

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The role of formal education in the socio-economic development of a country cannot be over-emphasized. It is in this light, that over the years, governments of Ghana and other organizations have supported the education sector in many ways. Despite the efforts, many people think that a lot more can be done, but resources are not unlimited. Against this backdrop, it will be helpful if stakeholders are in the known as to what sections of the populace need urgent support. This is the primary motivation for this study. A logit model was estimated to find out the socio-economic determinants of a household's probability of spending on education. The data used was the 2006/2007 Ghana Living Standards Survey Round Five (GLSS-V). We found that high education expenditure does not necessarily mean high probability of spending on education. Two categories of households with high probability of education expenditure were identified. The first category consists of households whose heads have formal education, households who own land, vehicles, and other durable assets, as well as households living in the forest belt. The second category includes: female-headed households; households with greater number of children of school going age; rural households; and households living farther away from the nation's capital. Households in the second category are those that must be targeted for urgent support. Governments support in the form of capitation grant, free feeding and free supply of uniforms and stationery are in the right direction, but this must be stepped up in a sustainable manner.

**Key words:** Education expenditure, households, Logit model.

## INTRODUCTION

The United Nations Development Programme (UNDP) uses education as one of the components of its Human Development Index (HDI). The two others are food security and health. Unsurprisingly, the second millennium development goal (MDG) is on achieving universal primary education. In fact, UNICEF (2010) argues that even in meeting the other seven goals, education plays a central role.

For instance, in the eradication of extreme poverty and hunger, they argue that education empowers people with the necessary knowledge and skills needed to create or

access jobs for themselves. In this way, they are able to increase production or income to reduce hunger and malnutrition. A link is also established between education and maternal health. UNICEF (2010) further argues that education delays the age of childbirth, particularly among younger women who may be susceptible to pregnancy-related sicknesses. They stress that poor and less educated women, especially those living in rural areas, are less likely to give birth in a hospital than their counterparts who are better educated and are well-to-do. Lastly, education equips people with knowledge, skills, values and behaviour needed for taking good care of the environment. UNICEF (2010) summarizes the importance of education as follows: "Because it provides knowledge and skills, encourages new behaviour and increases individual and collective empowerment, education is the

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centre of social and economic development.”

In terms of the macroeconomic importance of education, Hanushek and Wobmann (2007) summarize the arguments of the Neoclassical and Endogenous Growth Models as follows: First, education increases the human capital inherent in the labour force, which increases labour productivity and growth; Second, education may lead to increased innovations in the economy; and lastly, education facilitates the diffusion of such innovations. However, they argue that it is the quality of education, and not mere enrollments that is crucial in bringing about development. Thus, when people are well-educated they can utilize the knowledge to make reforms that lead to research and development. For instance, Borkar (2010) argues that “Education does not simply mean bookish knowledge or learning things by rote but holds a much deeper meaning. It means opening your minds up to learn new things and pursue different options. Similarly, Hanushek and Wobmann (2007) establish a “strong evidence that the cognitive skills of the population—rather than mere school attainment—are powerfully related to individual earnings, for the distribution of income and for economic growth.”

The argument about the importance of quality of education, rather than “quantity” is tenable; however, it is important to recognize the fact that quantity is a first step to ensuring quality. In some developing countries where more than half of the population have not been to the classroom, it is important to first get the children enrolled before ensuring the quality of the educational system.

Ghana was among the first African Countries to introduce free and universal primary education in 1960 (Gyimah-Brempong and Appiah, 2008). This was followed by a rapid expansion of the higher institutions under the Ghana Education Trust System, which has continued till now. In this light, human resource development (HRD) is one of the three most important elements of the Ghana Growth and Poverty Reduction Strategy (GPRS II). The goal of HRD under the GPRS (II) “is to ensure the development of a healthy, knowledgeable, well-trained and disciplined labour force with the capacity to drive and sustain the private sector-led growth” (NDPC, 2005). Policy interventions under the education sector therefore include: increasing access to and participation at all levels of education; bridging the gender gaps in access to education; improving the quality of teaching and learning; and ensuring that education services are well delivered, among others.

ISSER (2007) reports that considerable progress has been made towards the attainment of the objectives of the GPRS I and II, and that Ghana is on track to achieving the MDGs outlined above. For instance, it reveals that “enrolment at the pre-schools grew from 1,065,963 in 2005/2006 to 1,142,784 in the 2006/2007 academic year. Enrolment of boys was highest at basic school level, with an increase of over 10 percentage points in net enrolments rates. National net enrolment

ratios at all levels increased over the previous year’s rates and were higher than the GPRS II targets, indicating that there were approximately aged children enrolled in schools in 2007 than the previous year.” Gender Parity Index (GPI), survival and completion rates have also improved at the national level. Enrolment rates in the deprived districts and the three northern regions have also shown significant improvement, even above the national growth rates.

Currently, as reported by ISSER (2007), an educational reform policy is being pursued to address some of the problems facing the educational sector. Some of the main components of the policy are as follows: providing universal compulsory basic education comprising of 2 years of kindergarten, 6 years of primary, 3 years of junior high and 3 years of senior high; promoting technical, agricultural and vocational education as an important alternative to general education; and incorporating community-based apprenticeship/skills training into the mainstream educational sector for school drop-outs. Welfare measures to increase enrolment in basic schools include: shifting the burden of payment for education services away from poorer families of children at the lower levels (especially the girl child); facilitating the implementation of the capitation grant in all public primary schools; and expanding the ongoing school feeding programme. The most recent of these welfare measures is the provision of free uniforms and exercise books to pupils in deprived public schools.

ISSER (2007) recounts that the Capitation Grant Scheme was introduced in 2005 to meet extra financial cost (such as examination registration, facilities management, security charges, games and sports) that parents usually pay as ‘school fees’ in public schools. The programme started with 40 districts and was scaled up to cover all public schools in 2006. Each pupil receives GH ₵3.00 through his or her school, about 30 percent of which is retained by the District Directorate of Education for administrative expenses. Out of this, the actual amount that is received by a school per child is GH ₵2.10.

The school Feeding Programme is also “a multi-purpose, NEPAD-assisted Government Programme, which uses enrolment in schools as an entry point to deliver interventions to reduce malnutrition, food insecurity and poverty in target communities. The primary objective of the programme is to improve school enrolment, attendance, performance and retention for children 6 to 15 using food rations” (MMYER, 2007).

There is no doubt that these measures have gone a long way to contribute to the increases in enrolments. However, there are still challenges. The Ghana Statistical Service (2007) reports that about 31% of all adults have not been to school, 17.1% attended but have no qualification, 39% have Middle School Leaving Certificate/ Basic Education Certificate Examination/ Vocational (/MSLC/BECE/VOC) and only 13.6% have

post-secondary or higher. While the number of people who are literate nationally is 51%, male and female literacy is 60 and 40% respectively. The rates for urban and rural areas are 70 and 40% respectively. It is against this background that finding out the socioeconomic, institutional and location-specific factors that influence households' decision to educate its members is important so that the government and its development partners are better informed as to how best to improve upon the quality of the educational system.

The Ghana Statistical Service (2007) again reports that in 2007, households on average spent GH ₵88.65 annually on a household member's education; the major items of educational expenditure being food, boarding and lodging, stationery and registration fees. Obviously, this figure varied among households depending on their respective locations and socio-economic backgrounds, among others. For instance, the Ghana Statistical Services (2007) further reveals that the figures for the rural areas and the three northern regions were low. In this study, we are not necessarily concerned about households who incur high expenditure on education in absolute terms but those who have the tendency to spend on education, with whatever resources they might have. It is in this light that in this study we seek to find out the probability of a household incurring educational expenditure in Ghana; probability in the sense that the emphasis is on the likelihood of a household spending on education rather than a mere explanation of why some households have spent more than others.

The data used is the Ghana Living Standards Survey (GLSS-V) for 2006/2007. In this data we find that during this period, while some households did not make any expenditure on education (at any level) others incurred substantial costs.

## METHOD OF ANALYSIS

### Theoretical framework-human capital theory

OECD (2001, P18) defines human capital as "knowledge, skills, competencies and attributes embodied in individuals and facilitate the creation of personal, social and economic well-being." Thus, any activity that increases the quality of labour may be thought of as human capital investment, such as formal education and on-the-job training.

We understand from the literature that human capital theory takes its roots from Petty (1662) and Smith (1776). It was then extensively developed by Becker (1964) and Schultz (1971). The theory suggests that education or training raises the productivity of workers by imparting useful knowledge and skills, hence, raising workers' future income by increasing their lifetime earnings (Berker, 1964). Olaniyam and Okemakinde (2008) outline some of the ways of modelling the role of education in accelerating economic growth and development. The first view is that education has positive externalities, in the sense that when one educates oneself, the nation at large also benefits from such education. "Educate part of a country and the whole of it benefits," (Olaniyam and Okemakinde, 2008). This view takes its roots from the classical theory, which

argued strongly for government's active role in education on the grounds of the positive benefits that society at large would gain from educating the populace, especially the labour force (Van-Den-Berg, 2001).

Another way of modelling the role of education is to view human capital as a critical resource for innovation, research and development. Thus, government intentionally invests in education in order to make possible, the creation of new ideas, which would go a long way to bring technological progress for economic growth and development. In this way, proponents of this view argue that there is a high correlation between innovation and the levels of education. This is in line with the Schumpeter's (1973) approach.

Similarly, there are three ways by which education attainment can be conceptualized (Wilson, 2001). The first is that an individual acquires human capital in response to the expected returns to education. For example, an individual is modelled as choosing between current work or foregoing this work to acquire human capital that will yield higher returns in future. The second approach focuses on the effect of school characteristics on educational attainment. Thus, using a production function framework, education attainment is the output (dependent variable) while school and family characteristics are the inputs (explanatory variables). In the third approach, reduced form equations are estimated to show the relationships between family and neighbourhood characteristics and educational attainment. The three approaches are all very important in trying to understand the extent to which socio-economic variables can explain educational attainment. However, it is equally important for us to understand how these socio-economic indicators influence a household to educate (and for that matter spend in educating) its members.

The dependent variable for the model is households' education expenditure for the year 2007. There are two main approaches by which a model for such a study can be designed. These are the direct and indirect approaches. The direct approach is to regress education expenditure on the socio-economic variables that are believed to influence the dependent variable. However, such an approach would suffer two main limitations: Firstly, it would imply a constant relationship between the dependent variable and the explanatory variables. Secondly, even though education expenditure is continuous, such an approach would have cut off households with zero expenditure, and this would lead to sample selection bias. Households with zero expenditure also did make a choice in the year under review-a choice not to make any expenditure on formal education. While the former limitation may be overcome using the logarithm values of the variables the second limitation can be resolved using the indirect approach. The indirect approach is to use a discrete choice model such as the logit model to estimate a household's probability of making expenditure on education. Knowledge of the probability of a household making expenditure on education is more useful for policy formulation than a mere explanation of its (education expenditure) determinants.

### The Logit model

The dependent variable for the study is discrete, in the sense that it takes the values of zero and one. During the year of study (2006/2007) if a household incurred any expenditure on education we assign one (1) but if the household did not then a zero (0) value is assigned. With such a dependent variable, the use of ordinary least squares (OLS) would be inappropriate because of heteroscedasticity problems and the fact that we cannot get probabilities that lie between Zero and one. In this case, we require a discrete choice model such as the logit model (Maddala, 2003; Greene, 2003). In the Logit model it is assumed that there is an underlying response variable  $y_i^*$  defined by the regression relationship.

$$y_i^* = \beta' x_i + u_i \tag{1}$$

Where,  $y_i^*$  is the dependent variable (for example, the probability that a household would make expenditure on education);  $x_i$  is a  $(1 \times k)$  vector of independent variables (such as household socio-economic indicators);  $\beta$  is a  $(k \times 1)$  vector of parameters to be estimated; and  $u_i$  is the two sided error term with zero mean and constant variance. We do not observe  $y_i^*$  in practice. What we observe is a dummy variable  $y$  defined by;

$$\begin{aligned} y &= 1 \text{ if } y_i^* > 0 \text{ (i.e if household made expenditure on education)} \\ y &= 0 \text{ otherwise (i.e if household made no expenditure on education)} \end{aligned} \tag{2}$$

From the relations above we get

$$\begin{aligned} \Pr(y_i = 1/x_i \beta_i) &= 1 - e^{-x_i \beta} / (1 + e^{-x_i \beta}) \\ &= e^{-x_i \beta} / (1 + e^{x_i \beta}) \end{aligned} \tag{3}$$

In this case the regression model is given as;

$$y_i = 1 - F(x_i \beta) + u_i \tag{4}$$

where  $F$  is the cumulative distribution function of  $u$ . The predictions of the effect on the log-odds is given by

$$\partial = \frac{\left( \log \frac{P_r}{1 - P_r} \right)}{\partial x_i} = \beta \tag{5}$$

Where:

$$\Pr = \frac{e^{\sum \beta_i}}{1 + e^{\sum \beta_i}} \tag{6}$$

The marginal effects are given by;

$$\frac{\partial \Pr}{\partial x} = \beta_i [\Pr(1 - \Pr)] \tag{7}$$

**Empirical model**

The empirical model that specifies the determinants of the probability of a household making education expenditure is given as;

$$\begin{aligned} \log \left( \frac{\Pr}{1 - \Pr} \right) &= \beta_0 + \beta_1 \text{Sexhd}, \beta_2 \text{Agehd}, \beta_3 \text{Agehdsq}, \\ &\beta_4 \text{Educhd}, \beta_5 \text{Busown}, \beta_6 \text{landown}, \beta_7 \text{Durasset}, \\ &\beta_8 \text{Childn}, \beta_9 \text{Ymales}, \beta_{10} \text{YFemales}, \beta_{11} \text{Loc}, \beta_{12}, \\ &\text{Coast}, \beta_{13} \text{Sav}, \beta_{14} \text{Reg} + u_i. \end{aligned} \tag{8}$$

Where:

$\Pr$  is the probability of making household expenditure and  $\log = \left( \frac{\Pr}{1 - \Pr} \right)_i$  is the odds ratio in favour of making household expenditure. Thus, the dependent variable is 1 if a household made education expenditure in the Year 2007 and 0 if it did not make any such expenditure. The rest of the variables are defined in Table 1.

To test the reliability of the model, there will be the need to conduct a diagnostic test. Unlike the standard regression model, the F-test cannot be used to test the overall fit in a discrete choice model. The most popular diagnostic test in such cases is the  $\chi^2$  statistic (which is like the F-test) defined based on a likelihood ratio formulation as:

$$\chi^2_{(n)} = -2 \log \frac{L_R}{L_U} = -2(\log L_R - \log L_U) \tag{9}$$

where  $L_R$  and  $L_U$  are the restricted and the unrestricted likelihood functions, respectively. The restricted log-likelihood function is obtained when equation 8 is estimated with the restrictions that the slope parameters are all equal to zero and unrestricted because a priori there are no restrictions put on the parameters. This implies that in the case of the former, only the intercept term is estimated while the latter involves the intercept as well as the slope parameters. Like the log likelihood ratio test in general, the basic idea behind the above test is that if the a priori restriction is valid, the log-likelihood function of the restricted and unrestricted equations should not be different in which case the test statistic  $\chi^2$  (or  $\lambda$  in the case of generalized likelihood test) will be zero. But if that is not the case the two likelihood functions will diverge. Thus, we can test the degree of divergence between the restricted and unrestricted likelihood functions at 1 or 5% significant levels.

**Data and description of variables**

The data for the study come from the Ghana Living Standards Survey (GLSS) (Round 5). The data were collected by the Ghana Statistical Service in conjunction with the World Bank in 2005 and 2006. The sample size is 3941. The GLSS 5 is a nation-wide survey which collected detailed information of topics, such as demographic characteristics of the population, education, health, employment, income and expenditure, among others. One of the

main aims of the survey is to determine the welfare, and for that matter poverty levels of households, using their consumption figures. Thus, welfare was computed as; household per capita consumption divided by the Greater Accra (January 2006) Price Index augmented by Ghana's equivalence scale. Households whose welfare falls above the upper poverty line (GH¢ 370.89) are considered non-poor (rich). Those whose welfare falls below the upper poverty line but above the lower poverty line (GH¢ 288.4) are poor, while the extremely poor households are those whose welfare falls below the lower poverty line.

Some of the main findings with respect to welfare and education expenditure are as follows:

- i) Greater Accra Region has the highest annual average capita expenditure of GH¢ 1,050, followed by Ashanti (GH¢ 682) and Central (GH¢ 676). However Upper East, Upper West and Northern region, and Volta regions recorded the lowest average annual per capita expenditure, each of which is less than the national average of GH¢ 644.
- ii) The average annual per capita expenditure of urban localities is almost GH¢ 887 while that of the rural localities was GH¢ 458. The lowest per capita expenditure of GH¢ 303 was recorded by rural savannah.
- iii) Households on average spent about GH¢ 89 on education. The amount spent in Accra and other urban centres were GH¢ 280 and GH¢ 112 respectively. In rural areas the amount is far less than the national average, with rural Savannah recording as low as GH¢ 21. In terms of poverty trends in general, the following conclusions were drawn:
  - iv) Poverty has been declining faster in southern Ghana than in northern Ghana;
  - v) Poverty in Ghana has remained a disproportionately rural phenomenon;
  - vi) The contribution of rural savannah to total poverty in Ghana has consistently been increasing. On the other hand, the contribution of rural forest to total poverty has been declining. This might be due to the recent boom in the cocoa; and
  - vii) Female headed households were on average less poor than the male headed households

### Probability of incurring education expenditure

It needs to be stressed that the data used in this study is secondary and as such most of the variables had already been measured and defined directly or indirectly. Even though the variables are defined in Table 1, it shows that some of them need further explanation. First as indicated earlier, the dependent variable is the probability of a household incurring expenditure on formal education. In the data set some households (2280, representing 57%) had reported making expenses on education while others (1662, representing 43% did not make any expenditure on education) in the year 2007. In order to use the Logit Model we designated one for households who made any expenditure on education and zero for those who did not during the year 2007. Admittedly, this is not an adequate definition, as compared to using the actual expenditures. However, the use of a discrete choice model enables us to measure the probability of incurring expenditure, which for purposes of policy formulation, is preferred to an ordinary least squared model that would only give us the determinants. Besides, the latter would have meant excluding the households with zero expenditures. Also it needs to be stressed that making expenditure on education does not in any way inform us about the quality of the education being invested in. Thus, this study is not about the quality of education. However, it is hoped that knowing about the probability of making education expenditure by households is a first step in knowing

about the quality of education that they pursue.

### Ecological zones

In Ghana, three main ecological zones can be distinguished, namely, forest zone, coastal zone and savannah zone. The forest zone is normally richer than the others and that is because the ecology supports agriculture best, and besides most of the nation's mineral (and recently oil) deposits can be found there. In fact, the Ghana Statistical Service (2007) speculates that the decline in the zone's poverty levels is partly as a result of the recent boom in the cocoa sector. Against this backdrop, in defining the ecological variables ("coastal" and "savannah") two dummy variables were constructed with the forest belt as the reference point as follows: 1 for forest and 0 otherwise.

The a priori expectations are that the probability for incurring education expenditure would be greater for households in the forest belt as opposed to those in the coastal and savannah belts.

### Regional variable

Southern Ghana is generally richer than the north. Similarly, there are more educational facilities in the south than in the north (Ofori, 2003). The probability of making expenses on education is therefore generally believed to be greater in the south than in the north. It is against this background that the regional variable is defined to measure the extent to which a household's remoteness from the capital region can affect its probability of spending on education.

### Bus ownership

This is a dummy variable that takes the value one if a household owns a bus and zero if it does not. The rationale behind considering this variable is that like other durable assets, a bus is wealth; which goes a long way to increase a household's chances of educating its members. Thus, a household that owns a bus is more likely to afford formal education than a household which does not. However, this variable is also narrow in scope as it excludes other equally important vehicles such as taxis. It should be noted that in the data set this variable was separated from the other durable assets.

## RESULTS

From Table 2 the chi-squared value is 8883.4 with a probability value of 0 which implies that it is significant at 1%. What this means is that the explanatory variables are good in explaining the variation in the dependent variable. All the explanatory variables are also significant, most of them maintaining their expected signs.

The household head variables are sex, age and years of education (of the household head). The negative sign of sex of the household head variable implies that female headed households have greater probability of spending on education than their male-headed counterparts. However, from Figure 1 we notice that the average household expenditure is higher for male-headed households than female-headed households. Thus, it can

**Table 1.** Summary definition of variables.

Variable	Description
Sex of household head	Dummy variable; 1 if head is male and 0 if female
Age of household head	No of years
Age of household squared	The square of the age of household head
Education of household	Average number of years a household has spent in formal education
Durable assets	Total value in millions of old Ghanaian cedes of household physical durable assets. The assets are sewing machine, stove, refrigerator, fan, radio, video, TV, camera, electric iron, bicycle, car and mobile phone.
Bus ownership	1 if a household owns a bus and 0 if otherwise. This is distinguished from the other assets.
Land holdings	In acres
Locality	Dummy; 1 if household lives in an urban centre and 0 if in a rural area.
Coastal zone	1 if household lives in the forest belt and 0 if otherwise (i.e. household lives in the coastal or Savannah Zone).
Savannah zone	1 if household lives in the forest belt and 0 if otherwise (i.e. household lives in the Savannah or coastal zone).
Regional distance	Distance in kilometers from Accra (the national capital) to the capital of the region in which a household lives.
Children	Children under 5 years old
Youth males	Young males under 15 years old
Youth females	Young females under 15 years old

be concluded that even though male-headed households on average, spend more on education, their female counterparts have a higher tendency to spend on education. We find similar cases with some of the location variables: the negative sign of "locality" implies that the probability to spend on education is higher for living in rural areas than in the urban centres. However, from Figure 2 we see that on average, households in the urban centres spend more on education than those in the rural areas. Similarly, even though the positive sign of the marginal effect of "region" implies that the probability of spending on education is higher for households farther from the Greater Accra region, Figure 3 shows that Greater Accra region records the highest education expenditure followed by the Brong Ahafo, Ashanti and Western. While Eastern, Central and Volta take the 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> positions respectively, the three northern regions come last with the Upper East recording the least expenditure. Furthermore, in the case of the ecology variables the a priori expectations have been met in the sense that the probability of spending is higher for households dwelling in the forest zone than in either the coastal or savannah zones (it must be recalled that the forest belt was used as the reference point, having been assigned 1, and 0 otherwise). However, in Figure 4 we notice that the average education expenditure is highest for the coastal zone, followed by the forest zone. The least amount is recorded by the savannah zone.

The higher probability of spending on education among deprived households is explained by Talick (2002). He argues that "if households perceive that the quality of human and physical infrastructure in the school is inadequate they feel compelled to invest in education." Following from this argument, it can be argued further that in the deprived areas of Ghana (such as the rural areas and northern Ghana in general) the inadequate supply of resources, among others, compel households to spend more on education. It is in this light that government's assistance in the form of capitation grant, school feeding programme, and recently, free school uniforms are in the right direction. A step-up of the assistance would go a long way to cut down rural costs of education. Second cycle school students in the three northern regions of Ghana have enjoyed boarding fee Subsidy since independence. The findings from this study imply that this should continue. One of the main limitations of this policy however, is the fact that it is only the northerners (excluding their southern counterparts who face the same constraints) that enjoy the assistance. This has attracted (oral) criticisms from some residents in the regions (especially southern parents who are paying fees for their wards in the north). Perhaps, the fear of the government is that if this is made open, some parents would abuse it by deliberately withdrawing their wards from southern schools to the north.

Concerning the age of the household head, as indicated,

**Table 2.** Maximum likelihood estimates for parameters of the education expenditure model.

Variable	Parameter	Marginal effect	Standard error	t-ratio	P-value
Constant	$\gamma_0$	-5.19	0.38	-13.5***	0.00
Sex of HH head	$\gamma_1$	-0.12	0.02	-5.5***	0.00
Age of HH head	$\gamma_2$	-0.36	0.00	-11.7***	0.00
Age of HH head sqd	$\gamma_3$	0.88	0.07	12.7***	0.00
Educ. Of HH Head	$\gamma_4$	0.05	0.01	5.2***	0.00
Bus ownership	$\gamma_5$	0.09	0.02	4.6***	0.00
Land ownership	$\gamma_6$	0.01	0.01	1.1	0.26
Durable assets	$\gamma_7$	0.01	0.00	4.9***	0.00
No of children	$\gamma_8$	0.23	0.04	6.2***	0.00
No. of male youth	$\gamma_9$	0.25	0.03	9.2***	0.00
No. of female youth	$\gamma_{10}$	0.29	0.03	11.4***	0.00
Locality	$\gamma_{11}$	-0.05	0.02	-2.3**	0.02
Coastal	$\gamma_{12}$	0.07	0.03	2.8***	0.01
Savannah	$\gamma_{13}$	0.09	0.02	3.8***	0.00
Region	$\gamma_{14}$	0.01	0.01	2.0*	0.04
	$\chi^2$	883.42			0.00

\*\*\*, significant at 1% \*\* significant at 5% Note: Dependent variable: Education Expenditure: 1 if household made any expenditure on education in 2007; 0 if otherwise. No. of observation= 3941. Degrees of freedom=14. Log likelihood function and restricted log likelihood are -2241.2 and -2682.9 respectively. Marginal effects are computed at the means of the independent variables.

earlier, we have age and age square where theoretically the former stands for the young household heads and the latter the relatively old. In this case, the a priori expectations were that age and age square would have positive and negative marginal effects respectively to suggest that the probability of household making education expenditure is greater when the head is younger, but as the head grows old the probability reduces. From the results in the table below, we observe that both age and age square were significant in influencing the dependent variable, however, while age square maintained its expected sign, age did not, but instead had a negative sign, suggesting that households with younger heads also have smaller probability of making education expenditure. This comes as a surprise, considering the fact that young heads can be viewed to be more progressive and better understand the benefits of education than their ageing counterparts. Closely, related to this is the fact that the longer the years of education of a household head the greater the probability of the household making education expenditure.

This is consistent with the a priori expectation that when a household is himself /herself well educated he/she would be willing to take his/her members to similar heights. Sackey (2007) also found that for both female and male school children, the educational attainments of their mothers and fathers, especially at higher levels, increased the probability of children attending school. He stressed that "the effect of parents' education on that of their children is one of the key factors in any consideration of the intergenerational transmission of human capital and economic wellbeing within families" (Sackey, 2007). Other studies that report the positive effect of parents' education on school enrolment or attendance are Glick and Sahn (2000) in Guinea, Tansel (2002) in Turkey, Tansel (1997) in Cote d'Ivoire and Ghana, Oliver (1995) and Glewwe and Jacoby (1994) in Ghana.

To be able to educate its members, a household should be endowed with wealth. In this study, the durable assets include; television, sound system, sewing machine and bicycles, among others. Both the life-cycle and permanent

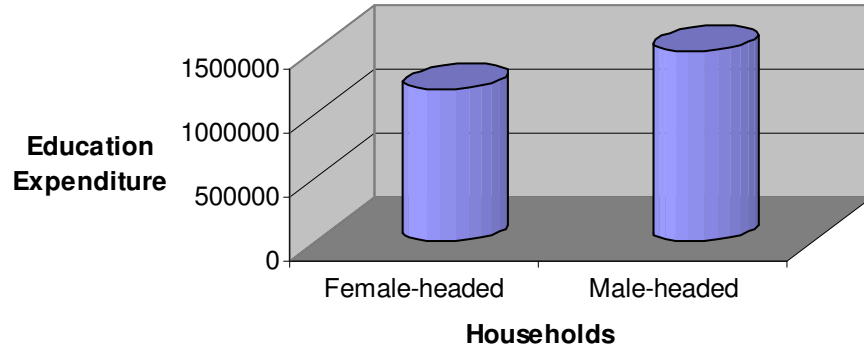


Figure 1. Average education expenditure by sex of household head.

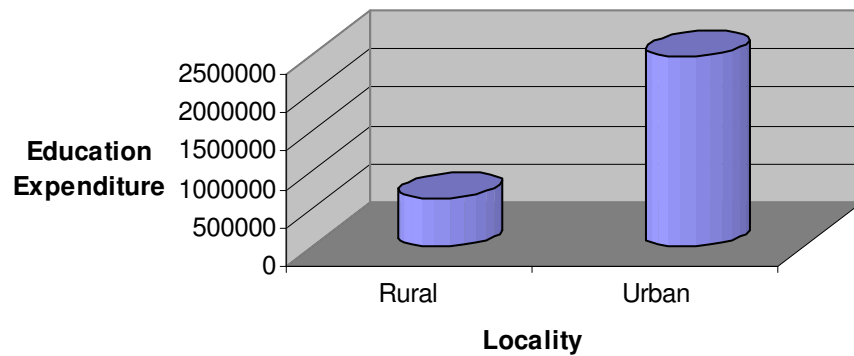


Figure 2. Average education expenditure by locality.

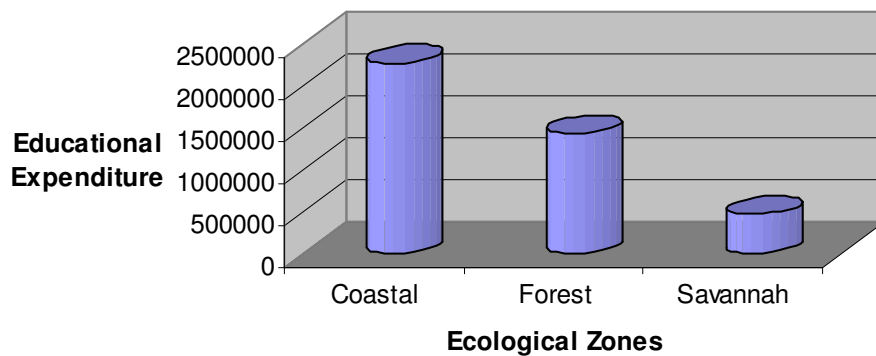


Figure 3. Average education expenditure by ecological zones

income hypotheses argue that household expenditure is a function of, not only current income but also wealth. It is not surprising therefore that in this study ownership of land, bus as well as other durable assets are positive and significant determinants of household education expenditure. This is consistent with Sackey's (2007) finding who used household per capita expenditure as proxy for household resources. This variable was significant in increasing school attendance for both boys

and girls in Ghana. He re-echoes the assertion by Haveman and Wolfe (1995) that the amount of family income or household resources allocated to children and the timing of their distribution goes a long way to determine the school attainment of children.

Furthermore, the positive and significant marginal effects of the number of children and youth implies that the greater the number of children of school going age in a household the greater the probability of the household



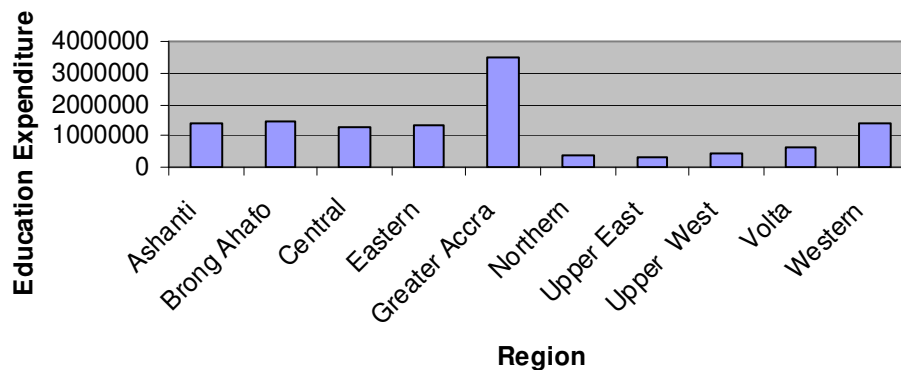


Figure 4. Average education expenditure by region

expenditure of that household. This is very much expected. Alhassan (2010) also found that in addition to the level of parents' education and parental income, the number of children in a household has positive effects on a girl-child education in Gushegu/Karaga District of the northern region of Ghana. However, Khanam and Ross (2005) found that the number of children aged 5-17 years negatively affected the school attainment in Bangladesh.

## CONCLUSIONS AND RECOMMENDATIONS

The main objective of this study has been to find out the factors influencing household spending on education. A logit model was estimated with the dependent variable being the probability of incurring education expenditure. The essence was not to merely explain the determinants of education expenditure but to know which sections of the Ghanaian populace have a greater likelihood to spend on education, so that such people could be targeted for support. We found two categories of households with greater probability of spending on education. The first category consists of households whose heads are relatively young and those whose heads have formal education as well as ownership of land, bus and other durable assets. The second category includes female headed households, households with greater number of children of school going age; rural households and households living farther away from the nation's capital. The difference has to do with affordability. While the former can be said to have affordability the same cannot be said about the latter. Hence, even though both categories need support the second category embodies those that must be targeted for urgent support by both Government Organizations (Gos) and Non-Governmental Organizations (NGOs). The interventions so far in the form of Capitation Grant, free meals and uniforms are a step in the right direction but efforts should be made to improve upon them and make them sustainable. We hope in future, studies, to factor in the quality of education.

**Abbreviations:** BECE, Basic education certificate examination; ISSER, Institute of Social, Statistical and Economic Research; GLSS, Ghana living standards survey; GOs, government organizations; GPRS, growth and poverty reduction strategy; GPI, gender parity index; HDI, human development index; MDG, millennium development goal; MMYE, Ministry of Manpower, Youth and Employment; MSLC, middle school leaving certificate; NEPAD, New Partnership for African Development; NDPC, National Development Planning Committee; NGOs, non-governmental organizations; OLS, ordinary least squares; OECD, Organisation for Economic Co-operation and Development; UNDP, United Nations Development Programme; UNICEF, United Nations Children's Education Fund; VOC, vocational; HRD, human resource development.

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