The Effect of Poverty, Household Structure and Child Work on School Enrolment

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Abstract

This study examines the effect of poverty, household structure and child work on child schooling in Ghana across gender and age dimensions using data from the GLSS 4 and 5. We find that there exist variations in the effect of the various explanatory variables on child schooling across gender and age dimensions. Parental education, especially that of the father is important in influencing child schooling. The effect of father's education on child schooling is higher for boys than for girls and for children in the 15~19 age group than those at lower age groups. However, mother's education had the greatest influence on girls' schooling than boys and on children at lower age groups than those in the 15~19 age group. The effect of poverty on child schooling was higher for boys than for girls and for younger children than for older children. Child work significantly reduces enrolment probabilities with the effect being higher for girls than for boys and higher for older children than younger children. The study concludes that, household human and physical capital endowments are important considerations in child schooling decisions. Thus, policies to ensure meaningful access to all must be inherently pro-poor.

Keywords: Poverty, Education, Gender, Age, Ghana

1. Introduction

The history of the evolution of poverty and its effects or consequences and its eradication measures in Africa and the world at large is as old as the world itself. Several measures, termed as household livelihood strategies in the development literature were taken consciously to mitigate food poverty years even before the passing of the Millennium Development Goals (MDGs) in the year 2000. The eradication of extreme poverty and hunger; achievement of universal primary education; and the promotion of gender equality and empowerment of women were at the heart of the MDGs. Increasing household human capital endowment through investments in children's education has been reckoned as a major escape strategy from cyclical poverty in developing countries (Grootaert, 1997; Okijie, 2002; Todaro and Smith, 2009; and Awan and Iqbal, 2010). This has been promoted by the move of most developing countries' governments including Ghana to expand access to education, in particular, the girl child due to the realization that educating the girl-child serves as a major impetus for reducing global poverty and promoting gender equality.

In Ghana, the education policies of the late 1980's and the introduction of the Free Compulsory Universal Basic Education (FCUBE) policy in 1996 as well as the Growth and Poverty Reduction Strategy (GPRS II, 2006-2009) has contributed immensely in raising school enrolment ratios. Over the period 1992 to 2012, gross primary school enrolment of pupils stood at 79.4%, 80.5%, 95.5% and 107.27% in 1992, 1999, 2006 and 2012 respectively (WDI, 2013). However, despite the progress made in terms of gross enrolment rates in Ghana, the WDI (2013) showed that, slightly over 6% of primary school children at the appropriate age group were not in school in 2012. This indicates that some pockets of primary school-aged[1] children are still denied access to education. Additionally, although age appropriate enrolment rates for girls are higher than the rates for boys at the primary level, the reverse is the case for enrolments at the secondary level in 2011 (WDI, 2013). Thus, notwithstanding the consistent reduction in gender differences in child schooling in Ghana over the period 1992 to 2011 as the girls to boys enrolment ratios at primary and secondary education levels stood at 77.96%, 89.1%, 94.5% and 96.4% in 1990, 1999, 2006 and 2011 respectively (WDI, 2013), more needs to be understood as poverty still competes to deny many children, in particular, girls from benefiting from this educational expansion (GSS, 2007).

Moreover, given the implementation of direct cost reduction mechanisms with a view of promoting educational access in Ghana, the slow progress in achieving the MDG goals of universal access to education by all children and the promotion of gender equality in educational access by 2015 could be attributed to the limited attention that policy has paid to mitigating the effect of other indirect cost constituents that limits children's schooling in Ghana. Akyeampong et al. (2007) noted that although the cost barrier is important for policy to address, but it is one of the many equally important factors that determines access to basic education in Ghana. An important

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[1] Primary school-aged children represent children in the 6~11 age group based on the Ghanaian education system
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component of these indirect cost factors is the opportunity costs of the child's time which tend to increase with the age of the child (Galenson, 1995). The effect of this is usually high for children from poor households since these children are often engaged in family businesses as their earning potential rises. In view of the above, some of the questions that emerge are: Are there significant differences in the effects of the various explanatory variables, in particular, household welfare/poverty on the schooling of children at different age groups? Does the effect of household welfare or poverty status on the schooling of children differ on a gender perspective? And to what extent does a child's locality influences his/her schooling across gender and age perspectives? These questions form the basis of this study.

The present study differs from previous studies in Ghana in many respects. First, no study on the role of poverty on child schooling in Ghana have explored the relationship on a gender and age dimensional perspective using the most recent data set available for the analysis of children's education in Ghana. Thus, although the role of poverty in determining child schooling has received some attention (Sackey, 2007 and Rolleston, 2009) it remains a fact that its variation by the gender and age of the child, is not considered exhaustively in Ghana. Although Sackey (2007) dealt with the gender dimension of the determinants of school attendance in Ghana, the study did not make use of the most recent data set in Ghana. Consequently, the present study seeks to add to the literature by investigating thoroughly the extent of variation in the effect of poverty on child schooling in Ghana across gender and age dimensional perspectives using the most recent household survey data set available in Ghana.

The rest of the paper is organised as follows: The next section explores the related empirical literature. The third section looks at the theoretical framework and methodology while the fourth and fifth sections present the results and conclusion respectively.

2. Literature Review

Interest in the modelling of the determinants of child schooling in developing countries has been on the rise in recent times. In the empirical literature, household income has been identified as an important factor that influences child schooling in many parts of the world (Chernichovsky and Meesook, 1985; Zimmerman, 2001; Jayachandran, 2002; Rolleston, 2009). Psacharopoulos and Arriagada (1987) and Mason (1988) found that household income had a positive and significant effect on the probability of a child being enrolled while Kabubo-Mariara and Mwabu (2007) found that household poverty status insignificantly influence child school enrolment in their study. Burney and Irfan (1995) found that household income and household tenurial status as landowner had a positive and significant effect on child schooling. On gender and age dimensions, the study found that the effect of household income was more strengthening for males in the 17-20 age group than for females. Moreover, the positive association between household income and child schooling indicates that for poor households, children are more likely not to have access to education and that this effect may be more pronounced for girls than it is for boys. The study also concludes that the opportunity cost of schooling increases with age and the returns to schooling are lower for females because they have lower perceived labour force participation rates. Similarly, Lloyd and Blanc (1996) found that in five of the seven African countries they studied, school enrolment of boys aged 6–14 is more responsive to an increased standard of living than is enrolment of girls. On the contrary, Dreze and Kingdon (1999) and Handa (2002) found that although household wealth enhances school participation for boys and girls, the effect is highly significant for girls than boys.

Shapiro and Tambashe (2000) found that for both boys and girls in all the three age groups, there appears to be a strong tendency for an increased household economic well-being to be associated with high enrolment rates. Also, the difference in the impact of economic well-being on the schooling of boys and girls is relatively modest among the age group 10-14, but considerably larger (by a factor of two or three) among those aged 6-9 and 15-19. Additionally, Glick and Sahn (2000) found that increases in household permanent income, proxied by household expenditure per adult, had a positive effect on current enrolment of girls but with no significant impact on the schooling of boys. Related to this, Tansel (2003) found that the effect of income on the schooling of girls was larger than that of boys. Contrary to the preceding discussion, Keng (2004) found that there is inconclusive evidence on the effect of household economic resources on child schooling in rural Cambodia. This result was however, attributed to the fact that in rural Cambodia, household land holdings and cattle owned are the major household assets and a source of households economic power. Closely linked to this, Schaffner (2004) found that household resource effects were found to be smaller in urban areas than in rural areas. In Ghana, Sackey (2007) found that household resources are a significant determinant of school attendance for both boys and girls and that the effect is higher for girls than it is for boys.

The effect of parental education on child schooling cannot be underestimated. Several studies have found a positive and significant association between parental education and child schooling (Psacharopoulos and Arriagada, 1987; Handa, 2002; Dostie and Jayaraman, 2003; DeGraff and Bilsborrow, 2003; Schaffner, 2004; Mani et al., 2009). However, significant variation exists in terms of the effect of parental education on child school enrolment probabilities across gender and age groups. Conlisk's (1969) study revealed that parental

education is an important determinant of school enrolment especially for children in the 14-15, 16-17 and 18-19 age groups. Also, Connelly and Zheng (2003) found that parental education had a significantly increasing impact on the probability of schooling with no significant difference between boys and girls. Haveman and Wolfe (1995) note that the most fundamental economic factor in the determination of child schooling decision is the human capital of parents which is normally measured by the number of years of schooling attained. The positive association between parental education and child schooling reflects the transmission of schooling across generations. The authors observe that a mother's education tends to be more closely related to the child's schooling attainment than does the father's which is in sharp contrast to the findings of Burney and Irfan (1995) wherein mother's education was found to be inconsequential for a child school enrolment in rural Pakistan.

In addition, Dreze and Kingdon (1999) found that the probability of school participation increases with parental education (both maternal and paternal), though mother's education did not have a significant effect on male school participation. Glick and Sahn (2000) found that mother's years of schooling had a large and highly significant impact on girls' enrolment probabilities but had no impact on boys' enrolment while increases in father's schooling raises enrolment probabilities of both boys and girls with a larger effect on girls. This is consistent with the findings of Al-Samarrai and Peasgood (1998). Further, Jayachandran (2002) found that, parental education is significantly and positively related to school attendance for males and females and that literate parents care more about the education of children of their sex. Thus, the author notes that there are strong inter-generational same-sex effects as opposed to cross-sex effects in educational transfers. In Ghana, Sackey (2007) found a significant positive association between the probability of child's current school enrolment status and parental educational attainment, especially at higher levels relative to no schooling for both males and females.

Further, household size and composition as measured by the number of younger children in the household, influences child school enrolment probabilities. Psacharopoulos and Arriagada (1987), Burney and Irfan (1995) and Shapiro and Tambashe (2000) found that the number of younger children in the household had a negative and significant effect on the probability that a child will be enrolled. Lloyd and Blanc (1996) found that the presence of very young children (ages 0–5) tends to be associated with lower school enrolment of youth aged 6–14 presumably reflecting increased demand for child care, an activity often performed by school-age youth. At the same time, increased numbers of school-age children (ages 6–14) are consistently associated with higher enrolment rates of those aged 6–14. This finding is consistent with that of Chernichovsky's (1985). On the other hand, with more school-age children in the household, responsibilities for childcare and other domestic tasks could be shared and at least some children could attend school. In terms of gender, Dreze and Kingdon (1999) and Jayachandran (2002) found that the presence of younger children in the household significantly reduces the enrolment probabilities of girls than boys. Also, Connelly and Zheng (2003) revealed that both boys and girls are disadvantaged by the presence of younger siblings, but on sibling sex composition, girls are equally disadvantage by having a younger brother or sister whereas boys are less disadvantaged by having a younger sister than a younger brother. Sackey (2007) and Rolleston (2009) found that the presence of younger siblings, relative to older ones, had a negative effect on the probability of child school attendance for both boys and girls with the effect being higher for girls than for boys.

Parental employment status is found to bear a significant positive influence on child school enrolment probabilities across gender and age groups (Psacharopoulos and Arriagada, 1987). However, Burney and Irfan (1995) found that household labour force participation had a negative effect on child schooling. Other studies that looked at the effect of the child's gender and age on the chances of a child being enrolled found that girls were less likely to be enrolled than boys at higher age groups than at lower age groups (Conlisk, 1969; Rolleston, 2009). This result was interpreted as indicating societal reluctance to invest in the schooling of a prospective housewife. Dostie and Jayaraman (2003) found that boys were more likely than girls to attend school. Using age category dummies, Sackey (2007) found that the age of a child was a significant predictor variable of school attendance for boys and girls. On the effect of the gender of the household head on the probability of enrolment, Lloyd and Blanc (1996) found that children from female headed households are consistently more likely to be enrolled in school than children from male headed households. Further, their results indicate that gender differences in school investments in children tend to be smaller in female-headed households. However, Galenson (1995) found that female-headship is a significant negative predictor of boys schooling.

Moreover, Psacharopoulos and Arriagada (1987) and Connelly and Zheng (2003) found that rural residence is the largest negative determinant of enrolment for boys and girls. Rural girls had lower enrolment rates than rural boys and rural boys are also substantially disadvantaged compared to urban boys and girls. Also, Tenikue (2007) and Sackey (2007) found that children residing in urban areas are more likely to be enrolled than those living in rural areas. However, Rolleston (2009) found no significant effect in relation to the rural/urban locations dummy. Other studies have stated the importance of a child's working status as a key determinant of his/her participation in schooling. These studies depend largely on the assumption that for poor families children are largely used in supporting household's income generation activities rather than give them the opportunity to access schooling.

This phenomenon is particularly great among older children in the household. Basu and Van (1998) identified clearly the positive relationship between poverty and child labour and hence the negative effect of poverty on children's education. The authors claim that education, as well as leisure, is a "luxury good" for poor families with an extremely low income. In their altruistic model, household wealth is the most important factor in the decision to send children to school or to work. That is, child labour arises only if adult wages are insufficient to sustain the household. The authors argued that a ban on child labour may even be welfare reducing for a poor household if poverty is the main cause of child labour. However, Baland and Robinson (2000) asserts that even though a ban on child labour does not directly compensate parents, it may result in an actual Pareto improvement since endogenous changes in wages induced by a reduction in child labour may make parents and firms better off. In line with the theoretical arguments of Basu and Van (1998), Jayachandran (2002) and Grigoli and Sbrana (2011) showed that poverty is among the key factors that determine parental decisions regarding child schooling. Empirically, while some studies have found significant negative relationship between schooling and working (Rosenzweig and Evenson, 1977; Lavy, 1985; Canagarajah and Coulombe, 1997; Boozer and Suri, 2001; Amin et al., 2006; and Rolleston, 2009), the study by Ravallion and Wodon (2000) using 1995/96 Household Expenditure Survey of Bangladesh found that child labour and schooling were not mutually exclusive. More so, by disaggregating work into light work (household work/chores) and agricultural/non-agricultural work, Khanam and Ross (2005) found that there is a negative association between all types of work and the schooling of children aged 12-17 and hence no matter whether the work done by children is light work or not there is a trade-off between child work and schooling.

3.0 Theoretical Framework and Empirical Estimation Model
Becker (1964) human capital model is the main theoretical framework under which this study is conducted. The model postulates that investment in education and training is based upon consideration of the net present value of the cost and benefit of such an activity. We follow closely the work of Mani et al. (2009) in outlining our model for the determinants of child schooling as shown below:
We assume that households desire to maximize their utility, U (4.1) subject to an income constraint (4.2a) and a schooling production function (4.2b).

$$U = u(C_t, S_t, L_t; D_t) \qquad (4.1)$$
$$p_t^c C_t + p_t^m M_t = w_t(T_t - L_t) + \pi_t \qquad (4.2a)$$
$$S_t = f(M_t, I_t; \theta_c, \theta_{ct}, \mu_h, \mu_{ht}) \qquad (4.2b)$$

Where: C_t represents both food and non-food consumption goods; L_t represents leisure enjoyed by the household; S_t represents child schooling; M_t represents schooling inputs; p_t^c depicts a vector of the price of food and non-food consumption goods; p_t^m represents a vector of price of schooling inputs; w_t is the wage rate; T_t is parents total time endowment; π_t captures profit income from farm and non-farm activities and all other sources of non-labour income; and D_t represents time-varying household demographic characteristics.

It is assumed that the household does not derive any direct utility from the consumption of M_t except through its impact in determining S_t. S_t has been modeled here as a pure consumption good from which the household derives utility. The utility function is affected by time-varying household demographic characteristics D_t such as age of the head of the household capturing household experience and life-cycle position. The schooling production function specified in (4.2b) follows the health production function specified in Sahn and Fedorov (2005), Strauss and Thomas (1995, 2008), Mani (2007) and Mani et al. (2009). The schooling production function S_t is written as a function of schooling inputs, community resources, child characteristics and household characteristics.

Schooling outcomes, S_t here measures child school enrolment status. Schooling inputs M_t include books, school uniform, and other home inputs. Environmental characteristics I_t capture overall resource availability in the community and include factors such as school availability, access to electricity and other community infrastructure that affects schooling outcomes. In addition, θ_c, θ_{ct} include child specific characteristics such as child's sex and age capturing age and gender specific differences in schooling. θ_c, θ_{ct} also include time-varying and time-invariant measures of child's own innate ability to perform well in school capturing overall cognitive development and learning potential. μ_h, μ_{ht} capture household demographic characteristics and other time-invariant and time-varying rearing and caring practices, all of which affect child schooling.

Using the first-order conditions, the optimal amount of schooling input is given as;
$$M_t^* = f(p_t^c, p_t^m, w_t, I_t, \pi_t, D_t, \mu_{ht}, \mu_h, \theta_{ct}, \theta_c) \qquad (4.3)$$
By substituting equation (4.3) in to equation (4.2b), we obtain the static conditional schooling demand function as;
$$S_t^* = f(p_t^c, p_t^m, w_t, I_t, \pi_t, D_t, \mu_{ht}, \mu_h, \theta_{ct}, \theta_c) \qquad (4.4)$$
Equation (4.4) implies that household demand for schooling for their children crucially depends on the price of food and non-food consumption goods, the price of school inputs, the wage rate, environmental characteristics, non labour income, household and child specific characteristics. Thus, household demographic characteristics as

well as child's specific characteristics and community level variables are key explanatory variables in the child schooling demand equation. The dependent variable in equation (4.4) is a binary choice variable[2] which takes a value of 1 if a child attends school and zero otherwise. For the purpose of our empirical estimation, the study defines children as individuals not older than 19 years of age. Implicitly, we assume that individuals within this age range are still in the basic school-going age population and so it is quite informative to conduct analysis on the role of their peculiar situations in determining their school participation status. For the purpose of our empirical estimation, we would estimate functionally the following equation:

$$\emptyset = \delta + \gamma_1 Father's\ Education + \gamma_2 Mother's\ Education + \gamma_3 Father's\ Occupation$$
$$+ \gamma_4 Mother's\ Occupation + \gamma_5 Household\ size\ squared + \gamma_6 Children\ under\ 7$$
$$+ \gamma_7 Child\ Work + \gamma_8 Square\ of\ child's\ age + \gamma_9 Household\ poverty\ status$$
$$+ \gamma_{10} Gender + \gamma_{11} Gender_{Head} + \gamma_{12} Region + \gamma_{13} Locality$$
$$+ \gamma_{14} Distance\ to\ school + \gamma_{15} School\ cost$$
$$+ e \hspace{4cm} (4.5)$$

Equation (4.5) captures the effect of the various individual, household and community level characteristics on child's school enrolment status. Since the dependent variable is a dichotomous variable assuming the value of 1 if the child was in school during the reference period and zero otherwise, equation (4.5) is estimated using the Maximum Likelihood Logit Estimation Method.

3.1 Choice of Estimation Technique and Justification

In microeconometric data analysis, the Linear Probability Models (LPM) was the first method employed in the modelling of binary choice decisions. The application of the LPM in the analysis of binary choice dependent variables is however challenged by a number of problems that largely undermine statistical inferences. Some of the key challenges of the LPM include;

i.   The LPM does not use a Cumulative Density Function (CDF) which is the actual behaviour of non-linearity. It however, lets $y_i = F(x_i, \beta) = \beta'x_i$

$$y_i = E[y_i/x_i] + [y_i - E(y_i/x_i)]$$
$$y_i = \beta'x_i + \varepsilon_i$$

Where $\varepsilon_i = y_i - E(y_i/x_i, \beta)$. This means that the error term cannot be normal if the dependent variable y_i assumes a value of 1 or 0. Therefore the error term will be heteroscedastic. As a result, although the estimates will be unbiased the usual standard errors will be biased. However, heteroscedasticity can be corrected using feasible GLS.

ii.   The fitted probabilities may not lie in the range of 0 and 1 since OLS can give up to a case where $y_i > 1$ or $y_i < 0$. This can however be solved by truncation.

iii. The LPM depicts linearity in the effects of independent variables. That is, yields a constant slope. The implication of this is that, the marginal effects are the same throughout which is usually not the case since the effect of a variable on a dependent variable is likely to be small at lower levels, high at middle levels and small at higher levels. Hence, the LPM does not help in the analysis of non-linear relationships.

iv.   In short, the LPM is at best a reduced form approach to model a discrete situation, which does not yield justifiable outcomes.

As a result of the important challenges that bedevil the application of LPM in the analysis of binary choice variables, the Logit or Probit models that use the CDF are most preferred because they are non-linear and actually capture the behaviour more realistically. Thus, for the purpose of this study, a Logit model will be used.

3.2 Data Source

This study made use of secondary data sets provided by the Ghana Statistical Service (GSS). The fourth and fifth rounds of the Ghana Living Standard Survey data sets (i.e. GLSS 4 and GLSS 5) are used for our analysis. The GLSS 5 is currently the most recent household data set available. Both the GLSS 4 and GLSS 5 are multidimensional household surveys which collected information on a wide variety of household and individual level variables, including detailed demographic characteristics of the population, education, health, employment and time use, migration, housing conditions and household agriculture. Also, the GLSS 5 included information on non-farm household enterprises.

The GLSS 5 was conducted in 2005/06 while the GLSS 4 was conducted in 1998/99. Other GLSS data sets include the GLSS 1, GLSS 2 and GLSS 3 which were conducted by the GSS in 1987/88, 1988/89 and 1991/92 respectively. Further, the GLSS data sets make it possible to decompose the analysis on the basis of regions, ecological zones, rural-urban location and gender. The study would use both the GLSS 4 and GLSS 5 for the descriptive analysis. The econometric analysis will make use of only the GLSS 5.

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[2] A binary variable is a discrete choice variable that involves a choice between only two alternatives (For instance, zero or 1).

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4.0 Empirical Results

We present the results for the pooled sample and the gender disaggregated samples for boys and girls as well as the results from the age-cohort estimations. The discussion of the empirical results from the Logit model is preceded by a discussion of school attendance rates with respect to age groups, gender and locality. The set of regressors for equation (4.5) includes a vector of individual and household demographic characteristics and a vector of contextual variables. The individual and household level variables include; the child's father and mother highest levels of educational attainment, the child's father and mother sector of employment, child work, household poverty status, household size and its squared, the square of the child's age, gender of the child and of the household head. Contextual variables capture the locality of the individual child on the basis of rural/urban and region.

4.1 School Attendance rates by Age-groups, Gender and Locality

Based on the GLSS 5 data, it was found that there are some important concerns regarding differences in enrolment rates across age groups, gender and locality in Ghana. As would be expected, the descriptive statistics revealed an increase in the proportions of primary and secondary school aged persons (restricted to persons aged 6~19) who are enrolled over the period 1998/99 and 2005/06. The enrolment rate of children aged 6~19, non-gender disaggregated, in 1998/99 stood at 64% whereas that for 2005/06 was 80% representing an impressive 16 percentage point increment in total enrolment. Besides, on the basis of age groups, although there was again an observed general improvement in the proportion of children at specific age groups who were enrolled over the period, the enrolment rates of children age 15~19 underwent a rather marginal increase compared to that observed for age groups 6~11 and 12~14 (See Table 4.1). In relation to the gender distribution of enrolment ratios at distinct age groups, we realized that the pattern of the distribution remains fairly the same over the period with males dominating their female counterparts except for the age group 12~14 in 1998/99 where we found that the shares of females in total enrolment was larger than that of males by 1.72 percentage points as shown in Table A.1 (see Appendix). Thus, over the period, although less observable difference seemed to be existing among males and females children in the age groups 6~11 and 12~14, significant difference in the shares of males and females to total enrolment seemed to be persisting at the age group 15~19.

Table 4.1: School Enrolment Trend for the 1998/99 and 2005/06 Periods by Age group

Age group / Period	1998/99(%)	2005/06(%)
6~11	66.24	86.73
12~14	64.85	86.95
15~19	59.41	66.73
6~19	64.00	79.97

Source: Author's computation based on GLSS 4 and GLSS 5

On the rural-urban divide, rural areas contributed about 50.13% to national enrolment whereas urban areas contributed 49.87% to national enrolment rate of children aged 6~19 in 1998/99. In 2005/06, the contribution of urban centers to national enrolment fell by 12.27 percentage points as shown in Table A.2 (see Appendix). In terms of within-locality enrolment, about 60.2% of school age children were enrolled in rural areas whereas about 68.4% was registered for urban centers in 1998/99. This indicates that enrolment of children in the urban centers of Ghana dominates the rates recorded in rural areas. Urban areas still registers the highest within-locality enrolment rates in 2005/06 as about 86.7% of school age children were in school in urban centers whilst that for rural areas stood at about 72.4%. Hence, there is a general improvement in enrolment rates over the period for both urban and rural areas as shown in Table A.2 (see Appendix). In relation to gender, about 60.8% and 59.6% of boys and girls respectively were enrolled in rural areas whereas about 68.3% and 68.5% of boys and girls respectively were enrolled in urban areas in 1998/99. This means that several pockets of boys and girls in rural as well as urban areas were not in school in 1998/99 as shown in Table A.3 (see Appendix). But, the proportion of boys and girls not in school in both urban and rural areas declined in 2005/06. About 27.1% of boys and 28.2% of girls in rural areas were not in school in 2005/06 whereas only 11% of boys and 15.6% of girls represented the population of school-aged boys and girls without access to education in urban areas. The rates are indicative of the fact that the proportion of boys and girls alike without access to schooling are sufficiently higher in rural areas than in urban areas and that for both urban and rural areas, girls are especially more likely to be denied access to education than their male counterparts.

4.2 Logistic Regression Results

The pooled model and the gender disaggregated models included as regressors all the explanatory variables in

equation (4.5) with the exception of distance to school and school cost[3]. Results from the marginal effects suggests that in both the pooled model and the gender disaggregated models, the probability of schooling is significantly influenced by parental education especially that of the father, mother's in production related works, household size squared, children under 7, child work, child age squared, gender of the child, and some regional dummies as shown in Table 4.2. From the marginal effects in Table 4.2, it is realized that father's with basic, secondary and tertiary education are about 9.6%, 12.1% and 12.3% respectively more likely to enroll their children in school than those with no education in the pooled model. This implies that the effect of fathers educational attainment on the probability of child schooling is increasing in the level of education attained. This result is consistent with the findings of Sackey (2007). In the gender disaggregated models, we find that whereas mother's educational achievement had a bias relationship with the probability of child schooling experience in favour of girls, the effect of father's educational attainment was unbiasedly related to the probability of schooling for boys and girls. For instance, father's educational attainment at all levels significantly influences both boys and girls schooling in Ghana while mother's educational attainment at all levels significantly influence the enrolment probabilities of only girls as seen in Table 4.2. This result is in line with the intergenerational same-sex effects as opposed to cross-sex effects in educational transfers' postulation of Jayachandran (2002) for India.

Father's occupation did not attain statistical significance in all the estimations. However, mother's working in production related activities are significantly less likely to enroll their children than those in agriculture related works in the pooled and boys sample only. Household size squared was positively and significantly associated with the enrolment probabilities of boys but not significantly related with the enrolment probabilities of girls. This indicates that boys are more likely to access education in larger households than girls. In both the pooled and the gender disaggregated models, having a child below 7 years of age reduces the enrolment probability of children in the 6~19 age group. This is consistent with the findings of Psacharopoulos and Arriagada (1987), Zimmerman (2001) and Rolleston (2009). Also, working children were significantly less likely to enroll than non-working children in all the three estimations. This finding is consistent with the findings of Rosenzweig and Evenson (1977) and Canagarajah and Coulombe (1997). Further, child age squared was significantly different from zero at 1% level of significance. The co-efficient was negative and the marginal effect indicates that a unit increase in the age of the child reduces enrolment probabilities in both the pooled and gender disaggregated models. This is consistent with the findings of Dreze and Kingdon (1999) who established that the probability of being in school is lower for older boys than for younger boys.

Household poverty status did not significantly determine child school enrolment probabilities in all the three models. The result is consistent with the findings of Kabubo-Mariara and Mwabu (2007). This clearly demonstrates the benefits of the several educational policies[4] implemented in Ghana over the years. We find also that children from female headed households were about 1.1%, 0.9% and 0.7% less likely to be enrolled relative to those from male headed households in the pooled, boys and girls estimations respectively. This is in line with the findings of Gallenson (1995) but contrary to that of Lloyd and Blanc (1996) who found that children from female headed households were more likely to be enrolled than those from male headed households. In the pooled estimation, the gender of the child had a significant influence on the child school enrolment probabilities. Females are about 6.9% less likely to be enrolled than their male counterparts. Children were more likely to be enrolled if they were in Western, Central, Volta, Eastern and Brong Ahafo regions relative to those in Upper East region whereas children in the Greater Accra and Northern regions were less likely to be enrolled relative to those from the Upper East region. Also, whereas girls in the Greater Accra region were less likely to be enrolled relative to those in the Upper East region, the reverse was the case for boys. Children from rural areas were less likely to be enrolled than those from urban areas in all the estimations. This is consistent with the findings of Sackey (2007) for Ghana but inconsistent with that of Rolleston (2009).

In the discussion that follows, we present the results from the estimations of child school enrolment for children in the 6~11, 12~14 and 15~19 age groups. From Table 4.3, it is seen that variables that significantly determine the probability of enrolment of children in the 6~11 age group include; mother's educational attainment, child work, locality (i.e. rural versus urban) and some regional dummies. Father's education, the occupation of the child's father and mother, household size squared, poverty status, the sex of the child and sex of the household head were found to be insignificantly associated with the probability of enrolment for children in the 6~11 age group (see Table 4.3).

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[3] Distance to the nearest school and school cost were observed for a smaller sample which led to their non-inclusion in our empirical exercise in order to maintain a reasonable sample size of children within the age group 6~19.

[4] For example, Free Compulsory Universal Basic Education, Capital grant and school feeding program

Table 4.2 Marginal Effects for Logit Regression: Dependent Variable – School attendance of children aged 6 ~ 19 (Pooled and Gender Disaggregated Models)

Regressand: Enrolment		Pooled Model		Gender Disaggregated Models			
				Boys		Girls	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Father's	Basic	.0955316***	.02969	.1081283***	.03813	.1023961***	.03973
Education	Secondary	.1209101***	.02643	.1011411***	.02884	.1286283***	.04018
	Tertiary	.1233009***	.03152	.1103086***	.0244	.119226**	.05288
Mother's	Basic	.0719049**	.02929	.062656	.04165	.0914862**	.03756
Education	Secondary	.0635014	.04986	-.0306397	.11015	.145501***	.04112
	Tertiary	.1272202**	.05113	-	-	.1494582***	.05039
Father's	Service	-.0440226	.0369	-.0894382	.05562	-.0223797	.04526
Occupation	Production	-.022625	.07783	.0482109	.07482	-.0832219	.09915
	Other	.0290621	.04781	.02618	.05844	.0219623	.06124
Mother's	Service	.03489	.02713	.0179004	.03406	.04035	.03998
Occupation	Production	-.319826**	.15392	-.604933***	.14862	-.1878844	.17183
	Other	-.0020403	.05642	.0006953	.07986	.0011931	.07693
Household size^2		.0004116*	.00022	.0005463**	.00025	.0002759	.00037
Children under 7		-.192863***	.07168	-.273802**	.12116	-.166939**	.08033
Child Work		-.473816***	.04994	-.484658***	.06921	-.460405***	.06333
Child age^2		-.001181***	.00016	-.000932***	.0002	-.001357***	.00022
Moderately_Poor		.0091219	.0459	.0144529	.05501	-.0174556	.06659
Non_Poor		.0133154	.03855	.0709483	.04871	-.0421189	.04913
Female dummy		-.069195***	.02034	-	-	-	-
Female_Head		-.0109367	.02934	-.0086412	.0401	-.0070592	.03688
Western Region		.1073189***	.04102	.0665728	.04962	.1434789***	.04781
Central Region		.1023153***	.03387	.1026098***	.03218	.0975827*	.0566
Greater Accra Region		-.0127291	.0663	.0685604	.04369	-.0543635	.10469
Volta Region		.0841688*	.04318	.0569839	.06016	.105119**	.05072
Eastern Region		.1300231***	.03153	.1289463***	.03065	.1039699*	.05654
Ashanti Region		.0382209	.04822	.0395452	.04729	.0316542	.07654
Brong Ahafo Region		.1268806***	.02975	.0903293**	.03541	.1504761***	.04122
Northern Region		-.0273357	.06402	-.0358808	.07563	-.001493	.08897
Upper West Region		.1284767	.02426	.09723***	.02635	.1477343***	.034
Rural		-.0357425	.03454	-.0422729	.03554	-.0313486	.04558
Prob > F		0.0000					

Notes: ***, **, and * denote 1%, 5% and 10% levels of significance respectively

Source: Author's computation based on GLSS 5

Table 4.3: Marginal Effects for Logit Regression: By Age groups

Regressand: Enrolment		6 ~ 11		12 ~ 14		15 ~ 19	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Father's	Basic	.043486	.0329	.0151338	.02049	.1644489***	.05605
Education	Secondary	-	-	.0098146	.03077	.2053405***	.07238
	Tertiary	-.0026566	.07314	-	-	.2760539***	.06401
Mother's	Basic	.1382082***	.03338	.0351718**	.01756	.0045781	.05984
Education	Secondary	.0753739***	.01863	-.0232921	.05079	.204413*	.11671
	Tertiary	-	-	-	-	.1642935	.20243
Father's	Service	-.0288668	.03941	.0243678	.01718	-.152166**	.07296
Occupation	Production	.0352392	.04488	.0262946**	.01142	-.2845024	.22082
	Other	.0363971	.03893	.0380608**	.01534	-.0807522	.10018
Mother's	Service	-.0026591	.02993	.0042684	.01577	.1414011***	.05516
Occupation	Production	-.2046435	.18798	-.79949***	.16748	-.312536**	.15636
	Other	.0132274	.04693	-.1317023	.0961	.1958265**	.08696
Household size^2		.0002186	.00022	.0001228	.00012	.0006135	.00039
Children under 7		-.0451827	.03426	-	-	-	-
Child Work		-.547832***	.09699	-.50265***	.10129	-.51530***	.04783
Moderately_Poor		-.0031518	.04214	-.0456765	.05003	.0723787	.10778
Non_Poor		-.0066324	.03104	.0281437	.02826	-.0119944	.07971
Female dummy		-.0203912	.02704	-.0106826	.01155	-.180600***	.04476
Female_Head		-.0052156	.03615	.0065333	.01611	-.0053924	.05763
Western Region		.0248098	.04749	.0173574	.02167	.2864896***	.07995
Central Region		-	-	.0392944***	.01292	.1800299**	.09069
Greater Accra Region		-.1170825	.09636	.009315	.02856	.1948381**	.09009
Volta Region		-.0123763	.07031	.0294845*	.01586	.2365373***	.07708
Eastern Region		.0940929***	.02811	.0359138**	.01744	.2594431***	.08246
Ashanti Region		-.0123006	.0592	.0107961	.02626	.1670105*	.09948
Brong Ahafo Region		.0789669***	.0271	.0360982**	.01775	.266289***	.07656
Northern Region		-.0062996	.05465	-.0187615	.05142	.0458529	.13166
Upper West Region		.0762254***	.01925	.0298763**	.01269	.2996814***	.0532
Rural		-.061540**	.02886	.0015448	.01368	.0815631	.06517
Prob > F		0.0000					

Notes: ***, **, and * denote 1%, 5% and 10% levels of significance respectively
Source: Author's computation based on GLSS 5

Mother's with basic and secondary education were about 13.8% and 7.5% respectively more likely to send their children to school relative to those with no education. This supports the findings that mother's education is more closely related to child's schooling than that of the father (Haveman and Wolfe, 1995). Working children in this age group were about 54.8% less likely to be enrolled relative to non-working children and rural children were about 6.2% less likely to be in school relative to urban children. For children in the 12~14 age group, the empirical results indicates that mother's with basic education were 3.5% more likely to send their children to school than those with no education. Father's education and household poverty status were insignificantly related with child school enrolment. Child work significantly displaces children from school. Working children faces 50.3% tendency of non-enrolment.

Contrary to the results for the 6~11 and 12~14 age groups, father's educational attainment is significantly and increasingly related to child school enrolment for children in the 15~19 age group. Father's with basic, secondary and tertiary education were about 16.5%, 20.5% and 27.6% more likely to enroll their children than those with no education as shown in Table 4.3. This is in line with the findings of Conlisk (1969) who established that parental education was an important determinant of child schooling especially for children in the 14~19 age group. Household poverty status, household size square and locality did not attain statistical significance. Working children in the 15~19 age group were about 51.5% less likely to be in school than their non-working counterparts and girls were about 18.1% less likely to be in school than boys. The negative relationship between child work and schooling among children in all the three age groups confirms the theoretical foundations of Basu and Van (1998). Rural children were more likely to be enrolled than urban children.

5.0 Concluding Remarks

The primary motive of this study has been to examine the effect of poverty, household structure and child work on child schooling in Ghana across gender and age dimensions.

On the basis of the findings, the study offers the following policy recommendations: Firstly, the findings revealed that household poverty status does not significantly determined child school enrolment in Ghana across gender and age groups. This is construed as indicating the non-importance of household welfare levels in influencing child schooling decisions. However, from the descriptive overview, it was realized that children from extremely poor households had higher representation among working children in Ghana and implying that most of these children could be financing their education out of money earned from working. The study maintains that, although direct cost reduction schemes have performed sufficiently well in bringing more children to school who would otherwise have been left out due to poverty, it is important that policy seeks to now address the indirect cost (the opportunity cost of schooling. i.e. child work) to education which is usually higher for poor households. Future policy actions should therefore be geared towards reducing the indirect cost of child schooling through reductions in household poverty.

Secondly, parental education was associated with increases in the likelihood of a child being in school for both males and females and across age groups. The study however, found differences in the individual effects of father's and mother's education on child schooling across age and gender dimensions. A call for policies and programmes that creates awareness on the benefits of child schooling particularly in rural areas that will help improve the positive effect of parental education on child schooling particularly for girls is imperative since better informed parents are more likely to place a higher premium on their children's education than less informed parents. Also, the study affirmed the same-sex and cross-sex effects of parental education on child schooling in Ghana. Policies must therefore entreat parents to give equal chance to all children, both males and females to access education. Sufficient awareness campaigns on gender equality should be mounted in order to open up hopes for girls' education particularly among the poor. In addition, the study recommends that a mix of policies should be instituted at rural and urban areas and also at the regional level to ensure that both boys and girls alike obtain an adequate access to education since the dynamics of the educational access at the contextual level differ strikingly among boys and girls and across age groups. Thus, policies to ensure meaningful access to all must be inherently pro-poor. In conclusion, we suggest that given that the GLSS 5 does not depict a much more recent phenomenon as it lags behind by as much as seven years, a further research can be conducted along similar lines if a recent national data set becomes available. Also, a look at the gender dimension of the determinants of child schooling for each age group can be very interesting.

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Appendix
Table A.1: School Enrolment by Age group and Gender for 1998/99 and 2005/06

Sex	1998/99 (%)				2005/06 (%)			
Period	**6~11**	**12~14**	**15~19**	**6~19**	**6~11**	**12~14**	**15~19**	**6~19**
Male	51.21 [66.94]	49.14 [65.81]	50.81 [58.80]	50.63 [64.35]	52.04 [83.33]	51.58 [83.78]	55.54 [67.49]	52.92 [77.96]
Female	48.79 [65.53]	50.86 [63.94]	49.19 [60.06]	49.37 [63.65]	47.96 [83.84]	48.42 [83.77]	44.46 [61.45]	47.08 [76.33]
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Author's computation based on GLSS 4 and GLSS 5
Values in parenthesis represent the percentage of males and females in each age group who are enrolled

Table A.2: School Enrolment Proportions by Locality and Survey Round

Locality Period	1998/99 (%)	2005/06 (%)
Rural	50.13[60.18]	62.40[72.41]
Urban	49.87[68.37]	37.60[86.68]

Source: Author's computation based on GLSS 4 and GLSS 5
Values in parenthesis represent the percentage of school going age persons who are enrolled in each locality.

Table A.3: School Enrolment Proportions by Locality and Survey Round (Gender disaggregated)

Locality Period	1998/99 (%)	2005/06 (%)
Rural	60.80[59.57]	72.92[71.80]
Urban	68.28[68.47]	89.11[84.38]

Source: Author's computation based on GLSS 4 and GLSS 5
Values in parenthesis depict the percentage of females of school going age who are enrolled in each locality.