Child labour and school attendance: evidence from Bangladesh

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Abstract: Purpose – The objective of this paper is to better understand the determinants of child labour and schooling in Bangladesh.

Design/methodology/approach – This paper uses data from a survey based in rural Bangladesh and considers ther children aged 5–17 years living in rural households in which the mother and father are both present. The sample size is 1628 children. A multinomial logit model is used to estimate the determinants of schooling and working, combining schooling and work, or doing nothing children.

Findings – The results show that the education of parents significantly increases the probability that a school-age child will specialise in study. The presence of very young children (aged 0-4) in the household increases the likelihood that a school-age child will combine study with work. The significant and positive gender coefficient suggests that girls are more likely than boys to combine schooling with work. The children who are sons and daughters of the household-head, as opposed to being relatives living in the household are more likely to combine study and work but less likely to specialise in work.

Originality/value – The existing anti-child labour policies mainly focus on the lowering of the demand for child labour in Bangladesh. The focus of this paper is, however, on the supply side of child labour, particularly on the use of child labour in the agricultural sector and the household sector where children are mainly employed by their parents. Unlike most of the existing studies on child labour, this paper considers housework and non-market works in the definition of child labour.

Keywords: Child labour, School Attendance, Multinomial Logit Model, Asia, Bangladesh.

Article Type: Research paper

I Introduction

International bodies such as the International Labour Organisation (ILO), World Bank and UNICEF, and countries, such as the United States of America (USA), have been concerned about the use of child labour in the formal sector, particularly in the garment sector of Bangladesh. Accordingly, consumer organisations, child welfare activists and policy-makers in the rich countries have been taking various initiatives to combat child labour. These measures include lowering employment opportunities for children through harmonising international child labour standards, and organised consumer boycotts of products that involve of child labour in their production. From the mid-1990s, child labour, however, has no longer existed in the garment sector of Bangladesh as a result of the Child Labour Deterrence Act (Harkin Bill), which banned imports of products made with child labour into the USA.[1] Now the question is: have these measures helped reduce child labour in Bangladesh?[2] Recent statistics released by the government of Bangladesh reveal that the incidence of child labour in Bangladesh is still far from over.

According to the recent Labour Survey of Bangladesh (1999–2000), the child labour force in Bangladesh is 6.77 million out of the 17.43 million children in the age group of 10–14 years, that is, 38.9 per cent of the total child population (10–14 years) is found to be economically active. This constitutes about 11 per cent of the total labour force of Bangladesh (BBS 2000, p. 160).

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[1] The Harkin Bill was such a great threat to Bangladesh's exports industries that the Bangladesh Garment Manufacturers and Exporters Association (BGMEA) signed a Memorandum of Understanding (MOU) with the International Labour Organisation (ILO) and UNICEF to eliminate jobs held by the children under the age of 14.

[2] Since the Child Labour Deterrence Act (the Harkin Bill) was implemented, 50,000 children have been displaced from garment factories; these children were later found in more hazardous informal jobs, such as begging, and in prostitution (Rahman, Khanam and Absar 1999).

The primary objective of this study is to better understand the determinants of child labour and schooling in Bangladesh. The existing anti-child labour policies mainly focus on the lowering of the demand for child labour in Bangladesh. The focus of this study is, however, on the supply side of child labour, particularly on the use of child labour in the agricultural sector and the household sector where children are mainly employed by their parents. Another contribution of this study is its consideration of housework and non-market works in the definition of child labour. Considering household and non-wage work in the definition of child labour, this study carefully examines the effect of work on girls, who are substantially more likely to engage in household work, and on those boys, who are deprived from attending school because of unpaid household work or farm work.

Notwithstanding the universal concern about the prevalence of child labour, there has been disagreement on the policy responses, particularly on how to reduce child labour. Therefore, better understanding the determinants of child labour might also be important because of its potential impact on education policy and poverty reduction strategies.

The rest of the paper proceeds as follows: Section II outlines the theoretical framework and literature review. Section III describes the characteristics of the survey and data set and presents some selected descriptive statistics, while section IV looks at the correlation of child labour with schooling in rural Bangladesh. Section V presents the empirical model and estimation issues. The empirical results are reported in section VI. Finally, concluding remarks are given in section VII.

II Literature Review and Theoretical Framework

Literature Review

Notwithstanding a very high child labour participation rate[3] in Bangladesh, this issue has attracted academic attention only recently after the implementation of the Child Labour Deterrence Act (Harkin Bill 1993) in 1995. After the mid-nineties a small number of papers have focussed on the issue of child labour in Bangladesh. Among these, Rahman, et *al.* (1999), Ravallion and Wodon (2000), Delap (2001), Amin, Quayes and Rives (2004, 2006a and 2006b), Salmon (2005), Khanam (2004 and 2006) and Khanam and Rahman (2007) are notable. However, not all of these papers have focussed on the determinants of child labour in Bangladesh. For example, Rahman *et al.* (1999) evaluated the impact of Harkin's Bill on Bangladesh. Ravallion and Wodon (2000) examined the effectiveness of a targeted enrolment subsidy (Food-For-Education Programme) to increase school attendance and to reduce child labour in rural Bangladesh. Khanam (2004) explored the linkages between child work and both school attendance and school attainment of children aged 5–17 years using data from a survey based in rural Bangladesh. The central message from this study is that child labour adversely affects the child's schooling, which is reflected in lower school attendance and lower grade attainment. Amin et al (2006b) also looked at the impact of market work and household work on a child's continuous school attendance and found that child labour reduces the probability of continuous schooling of Bangladeshi children. Amin et al (2006a) investigated whether a child and a parent are substitutes or complements in the family labour supply decision. They found that for market work, fathers and children are substitutes or complements whereas mothers and children are complements in the family labour supply decision. Khanam (2006) focussed on the trends, patterns and policy options of child labour in Bangladesh particularly during the 1990s.

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[3] For example, a high child labour participation rate from the South Asian average and the world average

A small number of papers have focussed on the determinants of child labour. For example, using the 1995-96 Household Expenditure Survey (HES) of Bangladesh, Amin *et al.* (2004) examined the role of poverty as a determining factor of child labour in Bangladesh. Their result found that household poverty is an important factor in explaining child labour in Bangladesh. Subsequently, using the 2000 Bangladesh Labour Force Survey, Salmon (2005) found support of Amin et al.'s finding that poverty compels children to work in Bangladesh and children are the last economic resources of the household. Using data collected from Dhaka Slums, Delap (2001) however argued that socio-cultural factors are more important than economic rationality in explaining child work in urban Bangladesh. Khanam and Rahman (2007) examined the role of birth position of a child in explaining child work and schooling in Bangladesh and found that being a first-born child increases the probability of work. The present study contributes to this small but growing literature that explains the determinants of child labour in Bangladesh. As previously discussed, good understanding of the key determinants of child labour is essential for formulating appropriate policies that will reduce child labour.

Theoretical Framework

The theoretical framework adopted in this study is a household production model introduced by Becker (1965), and later developed by DeTray (1973) and Rosenzweig and Evenson (1977). Rosenzweig and Evenson (1977) adopted a household production function to study the multiple activities of children in a developing country. Continuing in this tradition and motivated by the Becker-type household models, this study uses a general utility maximising framework to model the choices of a child's schooling and activities as a reduced-form function of individual, household, parental and community characteristics.

Based on Becker (1965), and Becker and Lewis (1973), the household is assumed to maximise utility in terms of the quantity and quality of children and also the consumption of other

household produced goods and services, and leisure. The household demand for i th child's activity (Wi) can be specified as

$$W_i = w(X_i, X_h, X_c, v_i) \qquad (1)$$

where X_i, is a vector of child's characteristics such as the child's age, gender, X_h is a vector household characteristics such as the parents' education and occupation, family size, X_c is a vector of community characteristics, and v_i s a vector of any individual, household or community specific unobservable characteristics that may affect child's activity. The equation (1) can be considered as reduced form equation, which contains only exogenous explanatory variables.

III Data Description and Sample Selection

The data set used in this study comes from a survey titled 'Micronutrient and Gender Study (MNGS) in Bangladesh' administered by the International Food Policy Research Institute (IFPRI) during the period of 1996-1997. The survey was a four-round panel that covered three survey sites: Saturia, Mymensingh and Jessore, and included 47 villages. The focus of the MNGS was on the household, and data on all household members were collected. It collected extensive information from 5,541 individuals in a sample of 957 households from three districts, and also conducted a detailed community survey.

This study restricts the sample only to the children of the first round of the survey, because the second, third and fourth rounds included only those adult household members who were away from home at the time of the first round of the survey. These household members were very few in number; hence it is expected that they do not affect the analysis. The sample of data used in this study is broadly representative of rural households.

The present analysis is based on data for children aged 5–17 years living in rural households in which the mother and father are both present.[4] The sample size is thus 1628 children.[5] Table 1 presents the sample characteristics of the study.

IV Child Labour and Schooling in Bangladesh

(i) Schooling Situation in Bangladesh

In Bangladesh, formal education is mainly provided by the government.[6] It is divided into 5 years of primary education, 5 years of secondary education, 2 years of higher secondary education and 2-5 years of higher education. The Government of Bangladesh has established a universal primary education to prevent children from early labour. According to the Bangladesh Primary School Act (1992), a child of 6 years old must go to school. To make the school attendance easier for children from poor parents, tuition fees and textbooks are supplied free of charge for all children up to grade 5. An alternative subsidy program, Food-For-Education, has also been implemented to help the destitute children and their parents. Despite all of these measures, a large proportion of children are not yet enrolled in school.

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[4] This study expects that exclusion of single parent families will not bias the results for two reasons. First, the proportion of children who live in single parent households in the data set is less than one per cent – reflecting the very small incidence of these types of households in rural Bangladesh. Second, there is an unusually high rate of missing information on key variables in the single parents households; this means that many of these households have to be discarded due to missing values.

[5] About 99 per cent of children of the sample come from male-headed household.

[6] However, alongside the formal education system there exists a non-formal system offered by NGOs and government, which targets disadvantaged children and young adults. A privately owned early childhood development and care program exists for the children of affluent families aged between 3-5 years.

Table 2 shows the official primary school enrolment rate in Bangladesh in recent years. Of these enrolled in school, the gender gap in primary school enrolment is declining. However, data of this study reveal that non-enrolment rate is still high in Bangladesh. Figure 1 shows that, by the age of 5, around 70 per cent of children are not yet enrolled in school. The non-enrolment figure declines gradually up to 9 -11 years; beyond 11 years, the rate rises.

Figure 1 shows non-enrolment rates by gender and age. This figure contradicts with the conventional belief that boys receive more education than girls. Boys' non-enrolment rate is higher than girls' at all age except age 14. This is probably because, in recent times, the government of Bangladesh introduced an incentive program with the help of World Bank to increase girls' school enrolment. From the age of 5, non-enrolment rates steadily decline to age 11 years for both boys and girls before it increases again. Girls' non-enrolment rises to 17.7 per cent at age 14 years, whereas, boys' non-enrolment is 14 per cent at the same age. At the age of 13, boys' non-enrolment rate is much higher than that of girls suggesting that boys enter the labour market from this age. Girls' non-enrolment rate again rises sharply from the age of 15. At the age 17, girls' non-enrolment rate is greater than boys.

Reason for Drop out from School

For the children not currently attending school, the main reason for leaving school has been reported in the data. Table 3 reports the causes of leaving school for 5-17 years old children. Children that dropped out of school (about 8.8 per cent of the total sample) are asked the reason for dropping out from school; 27 per cent leave school because their parents couldn't afford the expense;[7] 27 per cent do not want to go to school; 13 per cent are deprived of schooling because their labour is essential for household work; and another 4.2 per cent of children leave school in

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[7] Although primary education is free in Bangladesh, there is a significant opportunity cost of education, which many parents cannot afford.

order to work in the family-owned farm and for other income-generating activities. Another reason for female children dropping out is that their parents are reluctant to send them to school: this accounts for 8.3 per cent of the total dropout rate. Many parents in Bangladesh believe that it is not appropriate to send girls to school. Religious beliefs discourage parents from sending their daughters outside their home after a certain age.

(ii) Measurement of Children's activity

A total of thirty types of occupations were reported in the survey as the primary and secondary occupation of children. A primary occupation is reported for all children. A secondary occupation is also reported for 27 per cent of children along with a primary occupation. However, no secondary occupation has been reported for 73 per cent of children. For simplicity, this study classifies children's occupation into five main categories:

- Study - consists of children who report their occupation as being a student

- Housework - considers children who perform household work

- Agricultural work – various types of farming activities and earth works are included.[8]

- Non-agricultural work - all income-generating activities, except agricultural work and housework, are included, as well as service, business, self-employment and permanent labour. The highest number of paid child worker comes from this category, although they are very few in number.

- Neither - includes those children for whom neither work nor schooling is reported.

Child labour is defined on the basis of these two occupations (primary and secondary occupation). This study defines child work broadly by including non-wage work and housework. Work and study are not mutually exclusive categories; as we see in the data, some children are

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[8] There may be a negligible amount of paid child workers in this category.

reported as attending school, while at the same time they are performing some form of paid or unpaid work. In light of this, we have created four mutually exclusive categories to define each child's activity. These categories are: (1) "study only", (2) "work only" (3) "work and study"; and (4) "neither work nor study". Children are classified under "study only", if their primary and secondary occupations consist of study, or they do not have a secondary occupation. Similarly, "work only" category includes all those children whose primary and secondary occupation are paid or unpaid work, or they do not have any secondary occupation but their primary occupation is definitely some sort of work. [9] If a child works[10] and attends school as well, he or she is subsumed under the 'work and study' category. In this category, either the primary occupation or the secondary occupation of the child is work. 'Neither work nor study' category includes all other children. They are neither going to school nor engaged in work, although they are of school-going age. Table 4 presents child activity by gender and age.

Table 4 shows that only 48 per cent of children attend school as their only activity. This represents 50.8 per cent of all boys and 44.1 per cent of all girls. Another 23 per cent of children combine schooling with work.[11] As seen from Table 4, another 17 per cent of children are engaged in work as their only activity. Neither work nor study category includes 12 per cent of children.[12]

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[9] Work includes household work, agricultural work and non-agricultural work.

[10] Again, work includes household work, agricultural work and non-agricultural work.

[11] One could expect a much large proportion of rural children (in this category) to help out at home or the family farm. However, this expectation is not valid, as another study by Cigno and Rosati (2002) that used a rural sample, based on the Human Development of India Survey, conducted by the National Council for Applied Economic Research, New Delhi, found that only less 5 per cent of children combine work and study in rural India. Their study also included data on household work.

[12] Table 4 shows that children in neither category decline with age in Bangladesh. After 11 years, there are no children in this category. This is really a puzzle; however, there may be three reasons for this. One,

V. A Multinomial Logit Model

The multinomial logit model is used to estimate simultaneously the determinants of "work only", "study only", combining both, or doing neither. Let Y_i denote the polytomous variable with multiple unordered categories. Suppose there are j mutually exclusive categories and $P_{i1} P_{i2} \ldots \ldots \ldots \ldots Pi_j$ are the probabilities associated with j categories. In this case, we have four categories ($j = 4$):

$\quad$ $j = 0$ If the child attends school only,

$\quad$ $j = 1$ If the child works and attends school,

$\quad$ $j = 2$ If the child neither works nor studies,

$\quad$ $j = 3$ If the child works only.

$\quad$ Here, we consider study as the reference category. These choices are associated with the following probabilities:

$$P_r(y_i = 0 | x_i) = P_{i0} = \frac{1}{1 + \exp(x_i'\beta_1) + \exp(x_i'\beta_2) + \exp(x_i'\beta_3)} = \text{probability of study (not working),}$$

$$P_r(y_i = 1 | x_i) = P_{i1} = \frac{\exp(x_i'\beta_1)}{1 + \exp(x_i'\beta_1) + \exp(x_i'\beta_2) + \exp(x_i'\beta_3)} = \text{probability of combining study and work,}$$

$$P_r(y_i = 2 | x_i) = P_{i2} = \frac{\exp(x_i'\beta_2)}{1 + \exp(x_i'\beta_1) + \exp(x_i'\beta_2) + \exp(x_i'\beta_3)} = \text{probability of neither work nor study,}$$

$$P_r(y_i = 3 | x_i) = P_{i3} = \frac{\exp(x_i'\beta_3)}{1 + \exp(x_i'\beta_1) + \exp(x_i'\beta_2) + \exp(x_i'\beta_3)} = \text{probability of work (not going to school),}$$

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these children may be considered as too young to perform any job by their parents. Second, parents of these children may be to poor to afford direct cost and opportunity cost of schooling; or parents lack of productive resources, such as family business and operated land to employ these children. Third, it could be that these children are actually working, but their parents do not wish it to be known.

where β_1, β_2 and β_3 are the covariate effects of the response categories study and work, neither work nor study and work only respectively, with the reference category study ($j = 0$) where $\beta_0 = 0$.

In general, for an outcome variable, Y_i with j categories, the probability can be modelled as:

$$P_r(y_i = j \mid x_i) = P_{ij} = \frac{\exp(x_i'\beta_3)}{1 + \sum_{j=1}^{j-1} \exp(x_i'\beta_j)} \quad \text{for } j \succ 0$$

and   (2)

$$P_r(y_i = 0 \mid x_i) = P_{i0} = \frac{1}{1 + \sum_{j=1}^{j-1} \exp(x_i'\beta_j)}.$$

Now, we estimate the above model for the sample size n. Each of n individuals falls into one of the j categories, with the probabilities given by (2). Let x_i be the vector of explanatory variables, such as child, family and community characteristics. Thus for a model of k covariates, a total of (k+1)*(j-1) parameters are to be estimated. Then we use x_i to see the propensity of i towards j.

VI Estimation and Empirical Findings

In empirical analysis, time use by children in different activities is used as dependent variable. The explanatory variables used for the empirical investigation of the time use of school-age children mostly reflect the covariates in eq (1) of section II. The estimated coefficient, t-statistics and odds ratios of multinomial logit are reported in the Table 5-7. Table 5 presents the results of all children, while Table 6 and Table 7 show the results for boys and girls separately.

(i) Child characteristics

Child characteristics, such as age, gender, and whether the child is the son or daughter of the head of the household, appear to be important determinants of child labour and schooling decision. First let us consider the effect of age. The age coefficient is found to be significant for all categories ("work and study", "neither" and "work") and for the boys' sample. The probability of "working" and 'combining work and study' increases with age as opposed to the probability of study only. One explanation of this result is that as children grow up, their opportunity cost for study (only) increases, therefore, they either combine study and work or fully specialise in work. Grootaert's (1999) study in Cote-d'Ivoire and Cigno and Rosati's (2002) study in India find similar effects of age on the probability of combining work with study. Cigno and Rosati, however, find mixed effect of age on the probability of full-time work. Their findings show that probability of full time working decreases for the children up to 8 years old, then increase with the age up to age 12 years, then decreases again. The significant negative age coefficient of "neither work nor study" indicates that younger children are more likely to be in neither category. This finding tells a different story in the case of Bangladesh, whereas studies from other developing countries find that older children are more likely to be in neither category.[13]   There are some possible explanations for this result. One reason may be that these children are from very poor households who do not have much land or other productive resources to employ them. The other reason could be that the children are from illiterate parents, by whom the value of education is not understood well, so parents think that a child of the age of 11 years is too young to go to school. A study by Levison *et al.* (2001) find no significant effect of age on the probability of combining "work and study" and on the probability on "neither work nor study" on Mexican children.

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[13] See, for example, Blunch and Verner (2000).

Table 5-7 confirm that if a child is the son or daughter of the head of household, he or she is more likely to combine study and work but less likely to specialise in work. This can be interpreted differently. For example, if a child is not the son or daughter of the head, his or her odds to specialise in work are (1/exp (-2.221) =) 9.22 times as great as that of a child of the head of household. This coefficient shows a significant and positive effect on the probability of combining work and study, implying that the son or daughter of the household head is also likely to combine study and work as opposed to the children of other relatives of the household head.

Now let us turn to the gender coefficient. Although the gender coefficient has no effect on the probability of working and on the probability that a child will neither study nor work (Table 6); it has a significant effect on the probability of combining study and work. Female children are more likely to combine study with work, since the odds of combining study with work for girls are nearly 3 times (exp (1.037) = 2.82) as high as those of boys. This result is not surprising, as the present analysis includes housework in the definition of work. It is thus consistent with the finding of Levison, *et al*.'s (2001) who also find that if housework is included in the measurement of work, then, girls are 14.1 percentage points more likely than boys to combine work and study. However, other studies (for example, Grootaert, 1999; Maitra and Ray, 2002) that use conventional definition of work find that girls are less likely than boys to combine work and study.

(ii) Parent Characteristics

Among parental characteristics, the education of the father and mother and the occupation of the father, have a significant impact on child labour and schooling decision. Consistent with the theoretical assumption, empirical findings also reveal that a higher level of education among parents increases the likelihood that a school-age child will specialise in study relative to the likelihood that the child will "work only" or do neither. For example, the odds of working or doing neither as opposed to schooling for children from illiterate father (used as reference

category) are respectively (1/exp (-.902)) 2.47 and (1/exp (-1.205) 3.33 times as great as those from the better-educated father (who can sign and write) (Table 5). On the other hand, relative to the children of a better educated mother (who can sign and write), the children of illiterate mother are 1.55 times more likely to combine study with work, 4.49 times more likely to be in neither category, and 2.23 times more likely to work fulltime as opposed to study fulltime.

The parental education further confirms that schooling will be full-time rather than part-time (Table 5, Table 6). The girls' sample, however, does not agree with this result as these coefficients (parents can read and write) are found to be insignificant in the case when the girls combine study and work (Table 7, Column 3). The parental education significantly reduces the probability that a school-age child will be in neither category. However, all these findings confirm that parents with higher level of human capital have better potential income than that of lower educated parents; and thus higher income of parents increases the chance of the children to be in school rather than working.

Now let us turn to the occupation of parents. Some of the coefficients of occupation variables give significant results. For example, if father's occupation is trade, then it is more likely for the child to specialise in schooling. This gives the expected results that are predicted in the theoretical discussion. This is because if a father is engaged in trade then positive income effect dominates to keep the children in the school. On the other hand, if the father of a child is a day labourer or wage labourer, then it reduces the probability that the child will "study only" and increases the probability that the child will combine "study and work" or "work only". For example, relative to the reference category (father's occupation is farming), children of day/wage labourer are nearly one and half times more likely to combine study with work, and nearly three time more likely to work fulltime (Table 5).

The coefficient of mother's occupation is found to be insignificant in the combined sample and boys' sample. In the case of girls' sample, however, having a mother who does housework increases the likelihood that a girl specialises in schooling (Table 7). If mother does

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housework, then, it relieves girls from housework and enables them to utilise their extra time for study. Finally, parents' occupations appear to have no impact on the probability of "neither work nor study".

(iii) Household Characteristics

The number of total member in the household raises the probability that a school-age child will "study only" relative to the probability that the child will "work only" or "work and study", but it has no effect on the probability of "neither work nor study". It is consistent with the argument that in a larger household with many potential workers, the probability that any single child will be working is somewhat lower. An increase in the number of pre-school children (aged 0-4) reduces the likelihood of full-time schooling and indicates that schooling will be part-time with work. The effect of the presence of pre-school children on the probability of combining study with work is large for girls (Table 7); but it has no impact on boys (Table 6). As the boys' sample does not confirm this result, it, therefore, indicates that pre-school children generate housework that is particularly done by the girls. In that case schooling of girls becomes part time instead of fulltime. Theory also assumes that the additional number of pre-school children tends to withdraw school-age children from schooling to work by the increased demand for child care time or by the increased cost of raising pre-school children. However, the empirical result contradicts with the theoretical prediction that the number of school-age children (aged 5–17) influences the probability of working and schooling of children, as this variable is found to be statistically insignificant.

The total land area owned by the household does not exhibit a significant effect on child labour and schooling decision; and where it is statistically significant, for example, on the probability of "neither work nor study", the effect is weak (Table 5). Table 6, however, shows a slightly higher effect for male children. An increase in the total land increases the probability of schooling and decreases the risk of being in the 'neither study nor work" category for male

children. This is consistent with the theoretical prediction. Table 7 shows that an increase in total land raises the probability of combining study and work rather than 'study only' for girls. However, in Table 7 this variable does not show proper sign. On the other hand, an increase in the operated land is associated with a higher probability of combining study and work relative to "study only". An explanation of this result is that an additional amount of operated land tends to demand more labour that requires school-age children to be involved with farm work, because land and labour are complementary. Table 7 (girls' sample), however, does not support this result. This is because girls are less likely than girls to do farming activities along with study. The homestead area gives ambiguous results in the combined sample and boys' sample. The girls' sample (Table 7), however, provides an expected result. An additional increase in the homestead area is associated with the probability that the school age children will specialise in study. However, the odds ratio is unity for all land coefficients, which rules out the existence of strong link between land ownership (or income) and child labour.

The distance to primary school and the availability of a secondary school in the village are used as proxies to cover the opportunity cost of schooling. Most estimated coefficients of these variables are found to be insignificant, but where significant, they provide unexpected signs. A possible explanation of this result is that distance to primary school and the availability of a secondary school in the village might not be reliable proxies for schooling cost, as the data show that schools are typically not far away from the child's residence. However, it is also not possible to construct other variable that covers opportunity cost of schooling from the current data set. The regional dummies indicate that children residing in Mymensingh and Jessore are more likely to work full time relative to children from Saturia.

VII Conclusions

This paper examines the determinants of child labour and school attendance in Bangladesh. The empirical findings provide evidence that the education of parents significantly increases the probability that a school-age child will specialise in study. The empirical results also show that if the father is employed in a vulnerable occupation, for example, day-labour or wage-labour, it raises the probability that a child will work full time or combine work and study. An increase in the number of total household members is associated with a higher probability of schooling.

Most of the studies on child labour in developing countries find that boys are more likely to combine study and work. However, the significant and positive gender coefficient of this paper suggests that girls are more likely than boys to combine schooling with work in Bangladesh. Most of the girls in study areas are engaged in household work that allows them to combine school and work. This is because household work is more flexible than formal wage earning jobs. Another interesting finding of this study is that the analysis of the data shows that girls' enrolment rate is higher than boys at all ages. This is probably because there is an on going education subsidy program for girls' education in Bangladesh that attracts parents to send their daughters to school.

The findings of this study provide important directions for policy makers. Since it is evident that working is common among older children, policy makers should target those older children who cannot continue with school (for whatever reason), as well as those older girls who are deprived from schooling as a result of early marriage. More attention should be paid to the children of less educated and poor parents (estimated by occupation), as they cannot afford schooling. We also find that the children who are not the sons or daughters of the head of household are more likely to work than the sons or daughter of the household head. This may reflect the fact that if the household head is resource constrained then it is more likely for him or her to choose his or her own child for schooling first. Empirical evidence shows that some study

areas lag behind others regarding the school attendance of children. Therefore, policy makers and NGO workers should target those areas where school enrolment is low compared to other areas.

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Table 1: Variable names and definitions, means and standard deviations (standard deviation in parentheses under means) of variables.

| Variables Name	Definition	Total (N=1628)	Boys (N=993)	Girls (N=635)
Child Characteristics				
Female	Gender of child (1 if Female, 0 otherwise	.39(.48)	0(0)	1(0)
Son/daughter	1 if son/daughter of the Head, 0 otherwise	.85(.35)	.86(.34)	.83(.36)
Age	Age of Child	11.12(3.57)	11.27(3.59)	10.88(3.54)
Age Squared	Age of Child, squared	136.51(79.46)	140.04(80.33)	131(77.82)
Household Characteristics				
Children (5-17)	Number of Children in Household 5-17	2.84(1.26)	2.77(1.28)	2.95(1.23)
Children (0-4)	Number of Children in Household 0-4	.53 (.72)	.49(.71)	.59(.73)
Total Member	Number of Total Member in Household	6.57(2.74)	6.43(2.69)	6.79(2.81)
Total Land	Total Land measured in decimal (1 decimal = 408 square feet)	175.59(247.29)	173.73(234.00)	178.43(266.93)
Operated Land	Operated Land measured in decimal	113.86(156.33)	114.85(154.86)	112.32(158.71)
Homestead	Homestead measured in decimal	21.26(24.14)	21.41(23.69)	21.04(24.85)
Parents Characteristics				
Father Age	Age of Father	46.86(10.57)	47.01(10.75)	46.61(10.28)
Father Education				
Illiterate	1 if father is illiterate, 0 otherwise	.26(.44)	.26(.44)	.25(.43)
Can sign only	1 if father can sign only, 0 otherwise	27(.44)	.27(.44)	.26(.44)
Can read only	1 if father can read only, 0 otherwise	.02(.16)	.02(.16)	.02(.16)
Can read and write	1 if father can read and write, 0 otherwise	.43(.49)	.43(.49)	.45(.49)
Father Occupation				
Farming	1 if father's occupation is agriculture, 0 otherwise	.48(.49)	.48(.49)	.47(.49)
Service	1 if father's occupation is service, 0 otherwise	.11(.32)	.11(.32)	.12(.33)
Trade	1 if father's occupation is business, 0 otherwise	.16(.37)	.16(.37)	.16(.37)
Day/Wage Labourer	1 if father is day labour and wage labour, 0 otherwise	.19(.39)	.19(.39)	.21(.40)
Other Occupation	1 if father is engaged in other occupation than the occupation stated above, 0 otherwise	.03(.18)	.03(.18)	.02(.15)
Mother Age	Age of Mother	38.01(9.21)	38.12(9.27)	37.84(9.12)

Mother Education				
Illiterate	1 if mother is illiterate, 0 otherwise	.36(.48)	.39(.48)	.31(.46)
Can sign only	1 if mother can sign only, 0 otherwise	.36(.48)	.34(.48)	.39(.48)
Can read only	1 if mother can read only, 0 otherwise	.04(.20)	.03(.17)	.05(.23)
Can read and write	1 if mother can read and write, 0 otherwise	.23(.42)	.23(.42)	.23(.42)
Mother's Occupation	1 if mother does housework, 0 otherwise	.94(.22)	.94(.23)	.95(.21)
Cost of Education				
Distance to Primary School	Distance to the nearest primary school	.25(.43)	.28(.46)	.20(.38)
Secondary School	1 if there is any secondary school in the village, 0 otherwise	.87(.33)	.86(.34)	.88(.31)
Region Dummy				
Saturia	1 if household resides in Saturia, 0 otherwise	.31(.46)	.39(.48)	.20(.40)
Mymensingh	1 if household resides in Mymensingh, 0 otherwise	.36(.48)	.33(.47)	.41(.49)
Jessore	1 if household resides in Jessore, 0 otherwise	.31(.46)	.27(.44)	.37(.48)

Table 2: Enrolment in Primary School (1995-2001)

Year	Total (in million)	Boys (per cent)	Girls (per cent)
1995	17.2	52.6	47.8
1996	17.5	52.8	47.6
1997	18.0	51.9	48.1
1998	18.3	52.1	47.8
1999	17.6	51.8	48.6
2000	17.6	51.3	48.7
2001	17.6	50.9	49.1

Source: Primary and Mass Education Division of Bangladesh.

Figure 1: Children not Enrolled in School by Age and Gender.
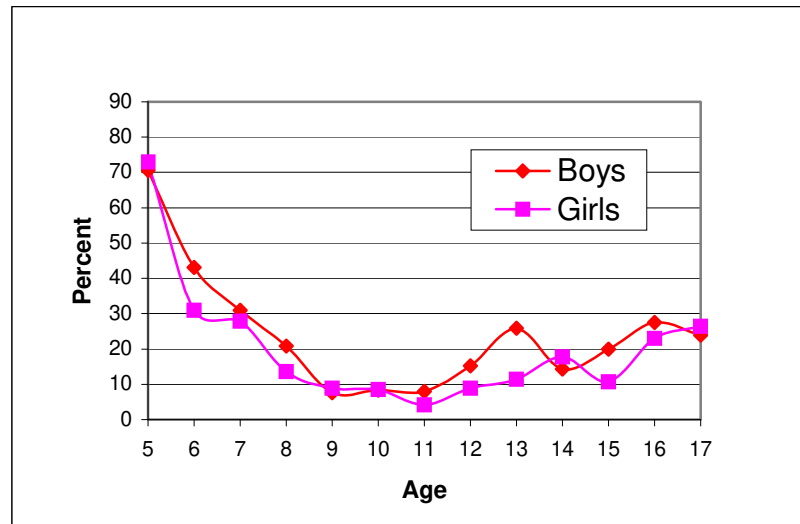
Source: Author's calculation from MNGS in Bangladesh, 1996-97.

Table 3: Reason for Leaving School.

Cause	Per cent
Couldn't Afford	27.1
Sickness	4.2
Needed for Housework	13.2
Needed for Family-owned Farm	0.7
Needed for Income Generating Activities	3.5
School too Faraway	6.9
Not Appropriate to send girls to School	8.3
Did not Want to Go	27.1
Other Reason	9.0
Total	100

Source: Author's calculation from MNGS in Bangladesh, 1996-97.

Table 4: Activity Status of Children across Gender and Age (in per cent).

	Study Only	Work and Study	Neither	Work Only	Total
Gender					
Boys	50.8	18.0	11.9	19.3	100.0
Girls	44.1	30.7	11.8	13.4	100.0
Age					
5	26.9	0.9	72.2	0.0	100.0
6	59.4	1.0	39.6	0.0	100.0
7	60.0	8.2	30.0	1.8	100.0
8	77.7	5.1	16.2	0.0	100.0
9	79.3	10.3	7.0	3.4	100.0
10	69.7	22.1	4.1	4.1	100.0
11	58.8	35.3	2.5	3.4	100.0
12	50.6	33.1	0.0	16.3	100.0
13	35.0	37.6	0.0	28.4	100.0
14	37.6	39.0	0.0	23.4	100.0
15	24.6	37.0	0.0	38.4	100.0
16	23.1	30.0	0.0	46.9	100.0
17	17.2	26.8	0.0	56.0	100.0
Total	48.0	23.0	12.0	17.0	100.0

Source: Author's calculation from MNGS in Bangladesh, 1996-97.

Table 5: Multinomial logit estimates for all children (The reference category is Study only).

Variable Names	Study and Work			Neither			Work		
	Coefficient	t-statistics	Odds-ratio	Coefficient	t-statistics	Odds-ratio	Coefficient	t-statistics	Odds-ratio
Constant	-9.252	-6.084		9.106	4.750		-12.500	-4.378	
Child Characteristics									
Female	1.037	6.659	2.820	-0.017	-0.078	0.983	-0.174	-0.815	0.840
Son/daughter	0.595	1.970	1.810	-0.158	-0.358	0.853	-2.221	-8.075	0.108
Age	1.156	5.069	3.177	-1.430	-3.603	0.239	1.451	3.500	4.267
Age squared	-0.031	-3.379	0.969	0.034	1.407	1.034	-0.029	-1.884	0.971
Household Characteristics									
Children (5–17)	0.039	0.475	1.039	0.223	1.759	1.249	-0.010	-0.114	0.99
Children (0–4)	0.340	2.760	1.404	-0.061	-0.326	0.940	0.102	0.619	1.107
Total member	-0.130	-2.641	0.87	0.028	0.397	1.028	-0.112	-1.937	0.894
Total land	0.000	1.038	1.000	-0.001	-1.656	0.999	-0.000	-0.084	1.000
Operated land	0.002	1.950	1.002	-0.002	-1.292	0.998	-0.000	-0.026	1.000
Homestead	-0.006	-1.622	0.994	0.019	2.389	1.019	-0.005	-1.208	0.990
Parents Characteristics									
Father's age	-0.017	-1.017	0.983	-0.022	-0.822	0.978	0.029	1.577	1.029
Father's Education (ref.: Illiterate)									
Can sign only	0.006	0.028	1.006	-0.790	-2.755	0.453	-0.607	-2.296	0.544
Can read only	0.540	1.112	1.716	-1.064	-1.279	0.345	0.242	0.387	1.273
Can read and write	-0.358	-1.629	0.699	-1.205	-3.845	0.299	-0.902	-3.369	0.405
Father's Occupation (ref.: Farming)									
Service	-0.364	-1.437	0.694	0.110	0.248	1.116	-0.438	-1.291	0.645
Trade	-0.565	-2.449	0.568	0.229	0.726	1.257	0.006	0.023	1.006
Day/wage labourer	0.395	1.774	1.484	0.388	1.194	1.474	0.995	3.452	2.704
Other occupation	-0.276	-0.621	0.758	-0.069	-0.122	0.933	0.264	0.533	1.302
Mother's Age	0.015	0.736	1.015	0.003	0.084	1.003	-0.020	-0.916	0.980
Mother's Education (ref.: Illiterate)									
Can sign only	-0.227	-1.251	0.796	-0.399	-1.566	0.670	-0.609	-2.632	0.543
Can read only	-0.299	-0.738	0.741	-0.798	-1.250	0.450	-0.611	-1.094	0.542
Can read and write	-0.439	-1.922	0.644	-1.500	-3.966	0.223	-0.802	-2.726	0.448
Mother's occupation	-0.332	-1.019	0.717	-0.087	-0.164	0.916	0.063	0.156	1.065
Cost of Education									
Distance to primary school	-0.188	-1.040	0.828	0.279	1.057	1.321	-0.071	-0.322	0.932
Secondary school	0.003	0.013	1.003	-0.033	-0.093	0.967	0.410	1.278	1.506
Region Dummies (ref.: Saturia)									
Mymensingh	-0.016	-0.079	0.984	0.166	0.564	1.180	0.497	1.909	1.644
Jessore	-0.061	-0.321	0.940	-1.117	-3.793	0.327	0.523	2.155	1.687
Chi squared				1471.672 (d.f.81)					
Pseudo R-squared				0.363					
Number of observations				1628					

Table 6: Multinomial Logit Estimates for Boys (The reference category is Study only).

Variable Names	Study and Work			Neither			Work		
	Coefficient	t-statistics	Odds-ratio	Coefficient	t-statistics	Odds-ratio	Coefficient	t-statistics	Odds-ratio
Constant	-7.727	-3.568		8.227	3.461		-12.496	-3.665	
Child Characteristics									
Son/daughter	0.673	1.459	1.960	0.119	0.202	1.126	-2.128	-6.162	0.119
Age	0.931	2.904	2.537	-1.397	-2.794	0.247	1.401	2.840	4.059
Age squared	-0.022	-1.749	0.978	0.032	1.071	1.032	-0.028	-1.514	0.972
Household Characteristics									
Children (5–17)	0.130	1.133	1.138	0.101	0.640	1.106	0.011	0.093	1.011
Children (0–4)	0.014	0.081	1.014	-0.061	-0.250	0.94	-0.028	-0.140	0.972
Total member	-0.068	-0.969	0.934	0.020	0.215	1.020	-0.088	-1.197	0.915
Total land	-0.000	-0.355	1.000	-0.003	-2.132	0.997	-0.000	-0.800	1.000
Operated land	0.002	1.974	1.002	-0.000	-0.431	1.000	0.000	0.279	1.000
Homestead	-0.002	-0.283	0.998	0.028	2.995	1.028	-0.003	-0.482	0.997
Parent's Characteristics									
Father's age	-0.031	-1.330	0.969	-0.014	-0.401	0.986	0.034	1.520	1.034
Father's Education (ref.: Illiterate)									
Can sign only	-0.176	-0.630	0.838	-0.877	-2.370	0.416	-0.655	-2.077	0.519
Can read only	0.500	0.809	1.648	-0.850	-0.846	0.427	0.284	0.369	1.328
Can read and write	-0.554	-1.874	0.574	-1.028	-2.591	0.357	-0.917	-2.776	0.399
Father's Occupation (ref.: Farming)									
Service	-0.470	-1.277	0.625	0.585	1.015	1.794	-0.659	-1.618	0.517
Trade	-0.912	-2.732	0.401	0.398	0.970	1.488	-0.164	-0.497	0.848
Day/wage labourer	0.574	1.916	1.775	0.458	1.092	1.58	0.894	2.544	2.444
Other occupation	0.005	0.011	1.005	-0.347	-0.482	0.706	0.590	1.083	1.803
Mother's Age	0.019	0.648	1.019	0.001	0.029	1.001	-0.021	-0.793	0.979
Mother's Education (ref.: Illiterate)									
Can sign only	-0.373	-1.541	0.688	-0.580	-1.753	0.559	-0.579	-2.087	0.560
Can read only	0.056	0.094	1.057	-0.810	-0.830	0.444	-0.107	-0.141	0.898
Can read and write	-0.710	-2.209	0.491	-1.692	-3.539	0.184	-0.624	-1.799	0.535
Mother's occupation	0.000	0.001	1.000	0.109	0.173	1.115	0.691	1.406	1.995
Cost of Education									
Distance to primary school	-0.296	-1.288	0.743	0.266	0.845	1.304	-0.292	-1.122	0.746
Secondary school	-0.002	-0.008	0.998	0.127	0.280	1.135	0.137	0.382	1.146
Region Dummy (ref.: Saturia)									
Mymensingh	-0.641	-2.360	0.527	0.269	0.704	1.309	-0.043	-0.144	0.957
Jessore	-0.466	-1.825	0.628	-0.668	-1.808	0.513	0.359	1.274	1.431
Chi squared				863.203(d.f. 78)					
Pseudo R-squared				0.355					
Number of observations				993					

Table 7: Multinomial Logit Estimates for Girls (The reference category is Study only).

Variable Names	Study and Work			Neither			Work		
	Coefficient	t-statistics	Odds-ratio	Coefficient	t-statistics	Odds-ratio	Coefficient	t-statistics	Odds-ratio
Constant	-10.525	-4.444		11.258	2.974		-12.730	-2.319	
Child Characteristics									
Son/Daughter	0.567	1.264	1.762	-0.400	-0.534	0.670	-2.453	-4.749	0.086
Age	1.306	3.659	3.691	-1.554	-1.948	0.211	1.216	1.525	3.373
Age squared	-0.035	-2.324	0.965	0.036	0.694	1.036	-0.015	-0.482	0.985
Household Characteristics									
Children (5–17)	-0.031	-0.237	0.969	0.397	1.657	1.487	-0.010	-0.055	0.990
Children (0–4)	0.850	4.153	0.427	-0.060	-0.181	0.941	0.345	1.029	1.411
Total member	-0.212	-2.691	1.000	0.090	0.618	1.094	-0.174	-1.608	0.840
Total land	0.001	1.974	1.000	0.000	0.054	1.000	0.001	0.972	1.000
Operated land	0.000	0.743	0.987	-0.004	-1.281	0.996	0.000	0.235	1.000
Homestead	-0.013	-2.218	1.007	0.005	0.348	1.005	-0.016	-1.800	0.984
Parent's Characteristics									
Father's age	0.007	0.250	1.300	-0.024	-0.514	0.976	0.012	0.289	1.012
Father's Education (ref.: Illiterate)									
Can sign only	0.263	0.735	1.300	-0.760	-1.539	0.467	-0.579	-1.068	0.560
Can read only	0.228	0.283	1.256	-0.701	-0.419	0.496	0.305	0.270	1.356
Can read and write	-0.051	-0.143	0.950	-1.606	-2.909	0.201	-0.918	-1.805	0.399
Father's Occupation (ref: Farming)									
Service	-0.360	-0.906	0.697	-0.584	-0.692	0.557	0.460	0.690	1.584
Trade	-0.370	-0.985	0.690	0.181	0.342	1.198	0.432	0.744	1.540
Day/wage labourer	0.363	1.014	1.437	0.371	0.674	1.449	1.745	2.946	5.725
Other occupation	-1.913	-1.787	0.148	0.555	0.577	1.741	-29.13	0.000	
Mother's Age	0.014	0.433	1.014	-0.013	-0.220	0.987	0.002	0.033	1.002
Mother's Education (ref: Illiterate)									
Can sign only	-0.165	-0.533	0.847	-0.172	-0.388	0.841	-0.781	-1.685	0.458
Can read only	-0.995	-1.672	0.369	-1.060	-1.067	0.346	-1.355	-1.485	0.257
Can read and write	-0.147	-0.396	0.863	-1.496	-2.184	0.224	-1.163	-1.880	0.312
Mother's occupation	-1.341	-2.185	0.261	-0.876	-0.846	0.412	-1.568	-1.781	0.208
Cost of Education									
Distance to primary school	-0.008	-0.026	0.992	-0.038	-0.071	0.962	0.647	1.419	1.909
Secondary school	0.298	0.791	1.347	-0.108	-0.173	0.897	1.944	2.085	6.986
Region Dummy (ref: Saturia)									
Mymensingh	1.237	3.386	3.445	-0.110	-0.213	0.896	1.942	3.302	6.972
Jessore	0.931	2.648	2.537	-1.902	-3.578	0.149	0.955	1.657	2.599
Chi squared				671.455 (d.f. 78)					
Pseudo R-squared				0.425					
Number of observations				635					