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DOES CHILD LABOUR DISPLACE SCHOOLING? EVIDENCE ON BEHAVIOURAL RESPONSES TO AN ENROLLMENT SUBSIDY*

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It is often argued that child labour comes at the expense of schooling and so perpetuates poverty for children from poor families. To test this claim we study the effects on children's labour force participation and school enrollments of the pure school-price change induced by a targeted enrollment subsidy in rural Bangladesh. Our theoretical model predicts that the subsidy increases schooling, but its effect on child labour is ambiguous. Our empirical model indicates that the subsidy increased schooling by far more than it reduced child labour. Substitution effects helped protect current incomes from the higher school attendance induced by the subsidy.

Schooling typically raises future earnings. Yet one finds relatively low enrollments amongst currently poor families. A common explanation is that schooling competes with labour-intensive jobs for children (wage labour, employment in family enterprises, or collection activities). By this view, the low current incomes of their families keeps poor children out of school and thus perpetuates their poverty into the next generation.[1]

If this is right, then policy reforms that promote labour-intensive production—the comparative advantage of most low-income countries—are a mixed blessing for the poor. Trade liberalisation may well attract poor children out of school prematurely. Pro-growth trade policies may then come at a cost to human development, and possibly future growth, in poor countries. A recent study of child labour in a city in western India concluded that: 'The prevalence and absolute expansion of child labour in a period and region of relatively high growth of aggregate output indicates that the nature of economic growth is flawed' (Swaminathan, 1998, p. 1526).

One proposal has been to ban child labour in developing countries, as it had been by the late nineteenth century in most present-day developed countries. It is recognised that a ban could come at a cost to the short-term welfare of the poor,[2] though a proper assessment would have to take account

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[1] This assumes that parents cannot borrow to finance schooling or enter binding contracts with their children. On the implications of contract enforcement problems for understanding why child labour exists see Baland and Robinson (1998).

[2] Heywood (1988) describes the resistance to bans on child labour in late nineteenth century France.

of general equilibrium effects, particularly on the labour market.[3] However, the enforceability of a ban on child labour is a moot point. While child labour bans were eventually introduced in most of Europe during the nineteenth century, enforcement was very difficult, and it has been argued that other factors (rising incomes, and technological change) were more important in reducing child labour (Nardinelli, 1980; Heywood, 1988). In most developing countries, it is far from obvious how a ban could be enforced.

Observations such as these have led to a search for other ways to reduce child labour while keeping the advantages to the poor of labour-intensive growth in developing countries. One seemingly appealing option is to make schooling more attractive to parents, and this has been favoured by a number of observers.[4] An obvious policy instrument for this purpose is a targeted enrollment subsidy. Motivated by a desire to reduce both current and future poverty, cash or in-kind transfers targeted to poor families—but conditional on their kids staying at school—have recently become popular in developing countries. It is assumed that such programmes increase schooling, and that this comes out of child labour. Of course, the foregone income of participants could then be high (though presumably less than the value of the subsidy)—raising concerns about the efficiency of such programmes as a means of reducing current poverty.

Both the arguments that 'child labour reflects bad growth', and that 'making schools cheaper can turn it into good growth' assume that child labour displaces schooling. This paper tests that assumption. To do so we study the effects on both schooling and child labour of an enrollment subsidy in Bangladesh. The enrollment subsidy is expected to increase schooling. If there is one-to-one displacement of schooling by child labour then the increment to schooling for families that receive the subsidy will be matched by a decrease in child labour by the same amount. Thus we can measure the extent of substitution by examining the joint effects of the subsidy on both schooling and child labour. We do not evaluate the programme, but only use it as means of identifying how much child labour displaces schooling.

The next Section compares our approach to alternatives suggested by the literature. Section 2 outlines our theoretical model, demonstrating that an enrollment subsidy increases schooling, but need not reduce child labour. We turn to our data and econometric model in Section 3. Our main empirical results can be found in Section 4, and Section 5 concludes.

[3] Famously, Simonde de Sismonde argued that child labour lowered parents' wages and so 'their activity has not produced an improvement in the incomes of the poor' (Heywood, 1988, p. 222). Also see Basu and Van (1998) who argue that there can be multiple equilibria in the labour market such that one equilibrium entails child labour with low wages while the other has higher wages but no child labour.

[4] Including Grootaert and Kanbur (1995), World Bank (1995, ch. 11; 1999), Psacharopoulos (1997), and Grootaert and Patrinos (1998).

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1. Testing for Substitution between Child Labour and Schooling

Children are a current economic resource for poor parents. It is common to find children doing productive work of some sort in poor rural economies. Cain (1977) found that children in a Bangladeshi village were economically active from the age of six, and that boys were net producers by 15. Jacoby and Skoufias (1997) found that child labour helps smooth the incomes of rural Indian families, consistent with poorly developed credit and risk markets.

However, there are ways that poor families can protect the schooling of working children, because there are other things that children do besides school and work. To allow double shifts (given limited school building and other facilities), primary school days of four hours or so per child are common in developing countries. Longer school days than this also create logistic problems of feeding the children. Public primary ('vernacular medium') schools in Bangladesh are open about 120 days a year and the school day entails 3–4 hours of class time (about 17 hours per week, with slightly less at junior grades, and slightly more at private schools). A survey for Bangladesh found that boys (5–14) in rural areas classified as being in the workforce (including work on the family farm or non-farm enterprise) did an average of 26 hours work per week; the corresponding average for girls was 20 hours (BBS, 1996, Table 6.10). So one cannot assume that the time these children spend working must come at the expense of formal time at school, although there may be displacement of informal (after-school) tutorials or homework.

Nor is it clear that child labour is an important factor in temporary absences from school. Table 1 summarises answers to a question on the main reason for the longest absence from school of school-age children, from the 1995–6 Household Expenditure Survey (HES) done by the Bangladesh Bureau of Statistics (BBS). For 15% of children enrolled in school, some form of child labour was given as the main reason for absence;[5] the proportion was higher in rural areas than urban areas but similar between the poor and non-poor (defined by official poverty lines). Other factors appear to be more important to school attendance, although it may be that parents do not want to admit that child labour is the reason.

Table 1

Main reason for the longest absence from school in last three months

	Rural	Urban	Non-poor	Poor
Sickness	25.5	23.3	24.8	26.1
Child labour	15.0	7.7	13.5	14.3
Bad weather	20.5	14.5	18.9	21.0
Unscheduled vacation	11.1	19.2	12.7	11.6
Other	28.0	35.4	30.2	27.1

Source: Authors' computation from the Household Expenditure Survey for Bangladesh, 1995–96. The percentages are computed over the population in school.

[5] The survey identified 'help at work', 'farm work', and 'help in the family business' as the main categories.

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How might one measure the effect of child labour on schooling? A common method is to compare the educational attainments of children who work with those who do not. From such comparisons, Psacharopoulos (1997) concludes that child labour leads to two years less schooling on average (using data for Bolivia and Venezuela). This suggests that child labour entails a large cost to childrens' future welfare. However, the possibility of selection bias through the choices made by parents clouds such comparisons. The parents of children who currently work may well send their kids to school less than do other parents even when work is not an option.

If one could do an experiment that created an exogenous increase in schooling, then one could simply see how much child labour fell as a consequence. An exogenous decrease in the price of schooling would qualify for such an experiment. An important element in the price of schooling is the wage rate for child labour. However, this is also the price of leisure (assuming that parents are free to allocate their children's time; we return to that assumption later). Thus disentangling the own price effect from the cross-price effect is problematic using wage data.[6]

One might look for other indicators of school price. The presence of a school in the village of residence is one possibility (Rozenzweig, 1982). Another is the distance or travel time to the nearest school (Grootaert, 1998) or average out-of-pocket expenditures on schooling in the area of residence (Cartwright, 1998). On *a priori* grounds it is unclear just how well such variables measure the price of schooling, and the usual concerns arise about attenuation bias due to the use of weak proxies. The endogeneity of both access and average school expenditures also raises concerns, since these measures may well pick up spurious geographic effects. The existing evidence for effects of school price on child labour is mixed, although it is recognised in the literature that this may be due to poor indicators of school price (Grootaert and Patrinos, 1998).

We follow a different route. We examine how parents' choices between sending their kids to school versus work in rural Bangladesh are affected by the Food-for-Education (FFE) programme. The programme aims to keep the children of poor rural families in school. In 1995–6, 2.2 million children participated (13% of total enrolment). Participating households receive monthly food rations as long as they send their children to primary school. Targeting is done in two stages. First economically backward areas are chosen by the centre. Second, community groups — exploiting idiosyncratic local information — select participants within those areas.

From the 1995–6 HES, the mean amount of rice received under the FFE programme was 114 kg per year per participating household. Based on the same survey, we estimate that the average price of rice paid by the poor in 1996 was 12.5 Tk per kilo in rural areas. That translates into an average monetary value for the FFE stipend of 119 Tk per month. A separate BBS survey in 1996

[6] To add to the difficulty, wages for child labour are rarely collected (or at least in the same surveys for which other relevant data are required), or are badly measured.

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found that the average monthly income of boys in paid work was 464 Tk while it was 291 Tk for girls (BBS, 1996, Table 5.11, p. 53). Given that there are on average about two children of primary-school age in participating households, the value of the FFE stipend is about 13% of the average monthly earnings of boys and 20% of that for girls. These could well be underestimates, since there is anecdotal evidence that FFE rations are sold to buy cheaper grain, suggesting that FFE rice has a higher price that we have assumed.

To receive the stipend, children must attend at least 85% of all classes each month. The headmaster of the school monitors school attendance and the food distribution is made within the school each week. The schools submit estimates of their grain needs to the local district headquarters, which then takes charge of transport, distribution, and handling.

The FFE stipend is a pure discount on the price of schooling to parents. Our data include both participants and non-participants. We can thus use the existence of this programme as a quasi-experiment to test whether child labour displaces schooling. The test also throws direct light on the effectiveness of an enrolment incentive in reducing child labour. However, to obtain a consistent estimate of the impact we must allow for the endogeneity of participation arising from purposive targeting of the programme. First there is placement endogeneity due to purposive targeting of the *geographic areas* that are to receive the programme. Secondly, there is placement endogeneity due to targeting of the *individual recipients* within the selected areas.

We cannot assume that the local information used for individual placement is observable by the centre; indeed, a common argument for the decentralisation of social programmes is to exploit idiosyncratic local information on who is in most need. So it is implausible that one could ever find suitable control variables to deal with endogeneity of individual placement of a programme such as FFE. Thus one needs an instrumental variable which determines programme placement at the individual level without also determining programme outcomes conditional on placement. At first glance, one might well be sceptical of ever finding such a variable. The local community group can be assumed to target the programme according to a set of observed household characteristics, every one of which would presumably also influence the household's behaviour and welfare, and thus should appear in a model for any likely outcome indicator.

However, the process of programme placement entails that the central government first allocates across a lower level of government (defined geographically) and then governments at that level allocate to the lower level. This creates geographic separability, whereby the allocation across individuals within a given area is conditional on the allocation to that area, and is otherwise independent of the attributes of other areas.

This feature of the FFE programme helps evaluate impact in two ways: Firstly, the fact that the centre retains control of the geographic placement suggests that suitable control variables should be observable to deal with this source of endogeneity. Then, in principle, one should be able to treat this aspect of the problem as 'selection on observables' (Barnow *et al.*, 1980;

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Heckman and Robb, 1985). There will no doubt be some omitted variables in any empirical model of geographic targeting, but with information on the programme and geographic data, this problem should be limited. Secondly, this process of programme placement helps by creating a valid instrumental variable for individual programme placement. With suitable controls for household and geographic heterogeneity, we argue that programme impacts at the individual level can be estimated in a believable way by using geographic placement as an instrument for individual placement. Section 3 will describe the estimation method in greater detail.

2. The Effect of a School Stipend on Child Labour

In this section we provide a rudimentary model of parents' decisions about how to allocate their children's time. The model is no more complex than is needed to demonstrate formally the argument in the previous section that there can be no presumption that cheaper schooling will reduce child labour. We assume that parents care about current consumption and their children's schooling, which may give pleasure in its own right, but will presumably also make parents directly better off in the future, via transfers from their adult children. Parents also attach value to their children's leisure and/or domestic labour within the home.

The effects of a programme such as FFE will depend in part on what constraints parents face in allocating their children's time. Schooling is not compulsory in most low-income countries, and so there is no constraint requiring a minimum amount of schooling. There is a maximum in public and NGO schools. When this is binding, the FFE stipend becomes an ordinary targeted transfer payment. The programme may still be likely to reduce child labour, but only via the income effect, assuming that children's leisure is a normal good for parents. However, since the programme exists as a response to low school attendance amongst the poor, we will not assume that the constraint on maximum school attendance is binding.

If there is underemployment of child labour then this will also constrain parents' choices. If the wage rate for child labour is inflexible downwards then a small increase in the stipend will have no effect on child labour—the extra time at school will come out of leisure.

However, it is hard to see what would generate downward inflexibility in child wages in this setting. There are no child labour unions to our knowledge. Adverse effects of low adult wages on nutritional status and (hence) productivity can yield downward wage inflexibility (under the well-known Efficiency Wage Hypothesis). However, while income pooling may not be complete within the household, it is plain that children do share in the family's total resources, in which case the link from children's own wages to their nutritional status will be weak.[7]

[7] A survey by the Bangladesh Bureau of Statistics in 1996 found that 83% of children in rural areas paid their earnings to their parents (BBS, 1996, Table 5.12, p. 54).

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Thus it would seem reasonable to assume that parents in this setting are free to determine how their children's time is allocated. In making that choice, let parents' utility be:

$$U = U(C, S, H; \mathbf{Z}) \tag{1}$$

where the household's current consumption is C, S is the child's school attendance, and H is the child's leisure. We assume that U is strictly quasi-concave in C, S and H. We allow for heterogeneity by including a vector of exogenous household and local geographic variables $\mathbf{Z}$. The child's total time available (T) can be devoted to schooling, leisure (H), or wage labour (L):

$$S + H + L = T \tag{2}$$

In addition to income from child labour or the enrolment subsidy, the household obtains an income Y from other sources, which we assume to also be a function of $\mathbf{Z}$. (The latter will include the parents' education and landholding.) So the budget constraint is:

$$C = wL + bS + Y(\mathbf{Z}) \tag{3}$$

where w is the wage rate for child labour, and b is the monetary value of the food received under the FFE programme.[8] The stipend is zero if the household is not selected for programme participation.

Parents maximise (1) subject to (2) and (3) with respect to C, S, H and L, given w, b, $\mathbf{Z}$ and T. This is equivalent to maximising (1) with respect to C, H, and S, subject to:

$$C + (w - b)S + wH = wT + Y(\mathbf{Z}). \tag{4}$$

This makes clear that $w - b$ is the price of schooling. With no other constraints on time allocation, the parents' choice equates the MRS between consumption and schooling with school price $w - b$, and it equates the MRS between consumption and leisure with the price of leisure, w. The derived demand function of parents for their children's schooling and leisure are then:

$$S = S(w - b, w, wT + Y(\mathbf{Z}), \mathbf{Z}) \tag{5}$$

$$H = H(w, w - b, wT + Y(\mathbf{Z}), \mathbf{Z}). \tag{6}$$

The supply of child labour is then determined as a residual using (2). The corresponding utility-compensated demand functions minimise the full expenditure, $C + (w - b)S + wH$, needed to attain a given level of utility, and so are given by:

$$S = S^*(w - b, w, U, \mathbf{Z}) \tag{7}$$

$$H = H^*(w, w - b, U, \mathbf{Z}). \tag{8}$$

[8] In the case of the FFE programme, a participating family only receives the stipend if the children attend 85% of classes, which creates a discontinuity in the budget constraint. While our analysis can be modified to deal with this, doing so does not appear to offer further insights. We stick to the simpler continuous version for the purposes of this model.

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The effect of an increase in the stipend reveals how time allocation varies with the price of schooling. Using the Slutsky decomposition, the effect on the supply of child labour is:

$$\frac{\partial L}{\partial b} = \frac{\partial S^*}{\partial (w-b)} + \frac{\partial H^*}{\partial (w-b)} - S\frac{\partial (H+S)}{\partial [wT + Y(\mathbf{Z})]}. \tag{9}$$

If this is negative then child labour is a substitute for schooling. Quasi-concavity of U implies that the first term on the RHS of (9) – the utility compensated own-price effect on demand for schooling – is negative. The third term in (9) is negative, assuming that schooling and leisure are a normal good in total (i.e., that $H + S$ is increasing in full income at given w and b). The second term is the utility-compensated cross-effect of the price of schooling on demand for children's leisure, or (equivalently, by symmetry of the Slutsky matrix) the effect of the price of leisure on schooling. The sign of this effect is ambiguous. It will be positive if schooling and leisure are (utility-compensated) substitutes. A sufficient condition for the programme incentive to reduce child labour is that schooling and leisure are complements.

So it is unclear on theoretical grounds whether a reduction in the price of schooling generated by a higher stipend will reduce child labour; the extra time spent at school may well come out of children's leisure. And, by the same token, if the substitution effects between schooling and leisure are strong enough, child labour will not come at much cost to longer-term prospects of children escaping poverty. Our empirical work tests these effects.

3. Data and Estimation Methods

We use the rural sample of the 1995–6 HES for Bangladesh, and its matched community survey. (We only use the rural sample, since the FFE programme is not found in urban areas.) The HES included questions on FFE participation. The survey did not include time use. We measure the incidence of child labour according to survey responses to the question: 'What was your normal activity last week?' A child is deemed to be in the labour force if the answer was 'employed', 'employed but not working', 'household work', or 'seeking work'. By this definition, 11.8% of boys and 12.1% of girls aged 5–16 in the sample were classified as being in the workforce. It is likely that this understates the extent of child labour, either because of deliberate under-reporting, or because relatively small amounts of part time work are not deemed to constitute the child's 'normal activity'.

Our theoretical model assumed an interior solution. This is reasonable since it is likely that most, if not all, children in rural Bangladesh work at least a few hours each month. However, our data only allow us to test for effects on whether a child's 'normal activity' is being in the workforce. This will presumably entail that the child works more than some number of hours, though we do not (of course) know what that number is. (It is very unlikely that parents will report working as their children's 'normal activity' if the number of hours worked is 'low', but how low we cannot say.) Clearly, these data do not allow us

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to capture any effects of the programme on small amounts of child labour, though presumably it should not be hard to accommodate modest amounts of part-time work while still keeping children at school.

We assume that a child is reported to be in the workforce if the amount of work done exceeds some latent critical value, η. Actual labour supply by the ith child is

$$L_i = \eta_i + \alpha FFE_i + \boldsymbol{\beta}'\mathbf{X}_i + \varepsilon_i \tag{10}$$

where *FFE* is the amount of food received under the programme, ε is a normally distributed innovation error and the vector $\mathbf{X}$ includes household size and family structure variables, the education levels of the father and the mother, the land ownership, the age of the child and the religion, and a number of village level variables on school access and quality (discussed further below). The probability of the child being reported as normally in the labour force is then:

$$\text{Prob}(L_i > \eta_i) = F(\alpha FFE_i + \boldsymbol{\beta}'\mathbf{X}_i) \tag{11}$$

where F is the distribution function of ε. Thus we estimate a probit on the dummy variable taking the value one if the child's normal activity is to be in the workforce. We use the data for all children in rural areas aged 5–16, and we estimate separate probits for boys and girls.

In modeling school attendance we follow reasonably standard practices in the literature. A question in the HES asked: 'What is your current educational status'.[9] We estimate a probit for the answers to this question, for all children aged 5–16 years who have not completed primary school. (We use a wide age interval because the average time to complete primary school in rural Bangladesh is nine years; World Bank, 1996.)

We find that 74% of boys in the sample were recorded as 'currently attending school', and 75% of girls. Of the 1,295 children not at school (685 boys), 704 (378 boys) were not classified as being at work in the 'normal activity' question either. So the data do not suggest that the majority of those children not at school are normally working instead.

The extent of household participation in the FFE programme is measured by the actual quantity of foodgrains received under the programme, which could be zero (for non-participants) or some positive number. The community module also provides independent information on whether the village participates in FFE.

The survey did not identify any non-participants who were offered the stipend but declined it. So we have little choice but to assume that any family offered the stipend will take it up. This does not seem implausible in a poor rural economy. Neither of the two independent assessments that have been done of the programme in operation mention any problems of households declining FFE when it was offered (Ahmed and Billah, 1994; BIDS, 1997),

[9] Alternatively we could have used the 'normal activity' question, for which 'student' is one possible response. However, we decided that the educational status question would be more reliable.

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though this may well be hard to observe given the decentralised programme implementation. If the foregone income from child labour is sufficiently large then a targeted FFE family will presumably decline the programme, or drop out. This means that we have miss-measured the FFE stipend for such families; we have wrongly assumed it is zero. If we find that the extra schooling displaces child labour and hence that there is sizable forgone income then this would lead one to question our assumption.

Hence the observed stipend recorded in our data is taken to be determined by the way authorities allocate programme resources across households. This is, nonetheless, treated as endogenous to children's time allocation. There are two levels of purposive targeting: selection of the village, and selection of the household. Given that geographic placement is done centrally, based on explicit criteria, it is reasonable to treat this aspect of the purposive targeting as a problem of selection-on-observables. Since we have a rich set of village-level data set, it is believable that village level placement can be accounted for adequately by a set of control variables at village level, included in the vector $\mathbf{X}$. These include distances to school; the type of school (governmental, private, NGO); a series of school quality variables reported in the community survey; land distribution; irrigation intensity; road quality; electrification; distance and time to thana and district headquarters and to Dhaka; distance to various facilities (health care, banks, government agencies); incidence of natural disasters; attitudes to women's employment, education and family planning; average schooling levels of the head and spouse; majority religion of the village; and population size of the village. These were (jointly) very good predictors of programme placement. A probit regression of whether the village had the programme on the geographic control variables gave a pseudo-R^2 of 0.55 (Chi-square of 91.7 which is significant at the 0.5% level, with 166 observations).

However, individual placement of the programme *within* villages clearly cannot be treated the same way, given that the programme is designed to exploit idiosyncratic local information that cannot be readily observed. Not all households in selected villages receive the programme; indeed, the proportion of the population of FFE villages who receive the programme is 37%. There are also a small number of households in non-FFE villages who receive the stipend. However, it is clear that the likelihood of any household receiving the stipend is enhanced when its village is selected. So we write an equation for the FFE stipend of the form:

$$FFE_i = \gamma FFEV_i + \eta' \mathbf{X}_i + \nu_i \tag{12}$$

where *FFEV* is a dummy variable taking the value one if that household lives in an FFE village and zero otherwise. Given that household-level selection depends on unobservables, there must be a strong presumption that the error terms ε and ν are correlated.

To deal with this aspect of endogenous programme targeting, the probits for schooling and child labour included the residuals from estimating (12) as a tobit. To be a valid instrumental variable, village participation must not affect

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child labour or schooling controlling for the variables in the second-stage regressions. Under this identifying assumption and with normally distributed errors, we can consistently estimate the coefficient on the FFE stipend in the probits for child labour and schooling as long as we control for the residuals from the first-stage regression. (Datt and Ravallion (1994), Appendix 1, prove consistency for a more general simultaneous tobit model, generalising Smith and Blundell (1986), to allow for a censored endogenous variable. The consistency proof for our case is a minor variation.[10]) The coefficient on the residuals also provides an exogeneity test.

4. Results

Mean school enrollment rates, labour force participation rates and other variables are given in Table 2. For both boys and girls, FFE participants have a mean enrolment rate that is 0.15 higher than non-participants while the child labour participation rate is 0.05 lower for FFE participants. So these figures suggest partial displacement of child labour by schooling; about one third of the extra school attendance comes from work. However, endogeneity of placement clouds these estimates (Section 1). Since the programme is targeted to poor families whose children are less likely to be in school, the expectation is that the naïve comparisons based on Table 2 will underestimate the impact on schooling.

Table 3 gives the first stage household participation regression and the second stage probits for child labour and schooling. The participation regression is estimated at the household level because targeting was done at that level.[11] The results indicate that the coefficient of the village level participation dummy is highly significant, as expected.[12] There are signs that the FFE stipend is targeted to poorer households. This is suggested by the fact that the coefficients for the large land owners are negative and statistically significant.

It can be seen from the second stage probits that the FFE stipend has a significant negative effect on children's labour force participation, and it has a strong opposite effect on the probability of being at school. Exogeneity of the stipend is rejected (at the 5% level) for boys' work and (at almost the 10% level) for girls' schooling. At the sample means, the probit coefficients imply that an extra 100 kilos of rice increases the probability of a boy going to school by 0.17, and 0.16 for a girl. At the average stipend of 114 kilos, the schooling gains are 0.19 and 0.18 respectively. As expected, these are higher than the comparisons of sample means based on Table 2, though the differences are

[10] If the FFE stipend was continuous (rather than censored) then our estimation method would be the same as that proposed by Rivers and Vuong (1988).

[11] Also, the participation at the child level may not be well recorded in the data, if for example an older child brings back the grain for his younger sibling.

[12] A small number of households participate in the programme even though their village does not participate; this could be because these households send their children to schools in participating villages.

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Table 2

Summary data for FFE participants versus non-participants

	Boys				Girls			
	FFE participants		Non-participants		FFE participants		Non-participants	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
Work	0.072	0.259	0.122	0.328	0.074	0.262	0.125	0.331
Schooling	0.882	0.323	0.727	0.446	0.891	0.313	0.736	0.441
Household characteristics								
Log household size	1.802	0.282	1.819	0.353	1.761	0.288	1.841	0.346
Share boys 5 to 9	0.144	0.117	0.146	0.122	0.054	0.083	0.067	0.093
Share girls 5 to 9	0.065	0.096	0.064	0.092	0.180	0.134	0.151	0.121
Share boys 10 to 16	0.179	0.137	0.174	0.140	0.088	0.115	0.091	0.112
Share girls 10 to 16	0.070	0.095	0.078	0.102	0.133	0.124	0.152	0.127
Share adults male 17 to 40	0.132	0.109	0.130	0.108	0.126	0.100	0.127	0.107
Share adults female 17 to 40	0.164	0.079	0.163	0.092	0.162	0.080	0.161	0.089
Share adults male above 40	0.084	0.092	0.082	0.086	0.088	0.093	0.080	0.083
Share adults female above 40	0.053	0.077	0.059	0.089	0.055	0.086	0.055	0.083
Female household head	0.092	0.289	0.082	0.274	0.053	0.225	0.086	0.280
No spouse, married	0.050	0.219	0.060	0.238	0.035	0.185	0.065	0.247
No spouse, single	0.021	0.143	0.018	0.135	0.023	0.150	0.020	0.141
No spouse, div./widowed	0.041	0.199	0.036	0.187	0.023	0.150	0.033	0.178
Age of the child	9.693	2.389	9.613	2.521	9.090	2.381	9.481	2.482
Age of the child squared	99.640	47.756	98.770	49.947	88.273	46.184	96.047	48.807
Non-Muslim	0.121	0.327	0.096	0.294	0.117	0.322	0.103	0.305
Education of father and mother								
Father below class 5	0.168	0.375	0.132	0.339	0.194	0.397	0.128	0.335
Father class 5 (primary completed)	0.057	0.232	0.083	0.275	0.068	0.253	0.076	0.264
Father class 6 to 9 (secondary school)	0.115	0.319	0.134	0.340	0.086	0.281	0.129	0.336
Father higher level	0.042	0.202	0.079	0.270	0.005	0.071	0.090	0.286
Mother below class 5	0.140	0.348	0.109	0.312	0.140	0.347	0.084	0.277
Mother class 5 (primary completed)	0.054	0.227	0.090	0.286	0.025	0.157	0.101	0.302
Mother class 6 to 9 and higher	0.042	0.198	0.079	0.262	0.023	0.145	0.081	0.266
Land ownership								
0.05 to 0.49 acres	0.486	0.501	0.350	0.477	0.398	0.491	0.347	0.476
0.50 to 1.49 acres	0.200	0.401	0.215	0.411	0.232	0.423	0.217	0.412
1.50 to 2.49 acres	0.061	0.239	0.114	0.318	0.067	0.251	0.113	0.316
2.50 acres or more	0.137	0.345	0.194	0.396	0.087	0.283	0.186	0.389

Source: Computations by the authors using 1995–6 Household Expenditure Survey for Bangladesh. Only the boys and girls for which there are no missing data (and hence the regressions of Table 2 can be estimated) are included in these summary statistics.

Table 3

Impact of the Food-for-Education Programme on Child Labour and Schooling

	First stage		Second stage (with bootstrapped standard errors)							
	Household Participation		Work by girls		Schooling by girls		Work by boys		Schooling by boys	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
FFE village participation	5.266	0.646	n.a.		n.a.		n.a.		n.a.	
FFE household stipend	n.a.		−0.628	0.265	0.637	0.171	−0.628	0.204	0.611	0.146
FFE residuals to correct for endogeneity	n.a.		0.013	0.036	−0.036	0.025	−0.069	0.034	−0.019	0.024
Household characteristics										
Log household size	−0.266	0.230	−0.084	0.213	−0.090	0.120	−0.125	0.161	0.030	0.130
Share boys 5 to 9	−0.369	0.810	−0.102	0.799	−0.419	0.521	−0.047	0.671	0.073	0.443
Share girls 5 to 9	0.657	0.765	0.128	0.765	−0.717	0.493	−0.911	0.688	0.669	0.453
Share boys 10 to 16	−0.015	0.759	−1.177	0.699	0.021	0.462	−0.211	0.642	−0.222	0.376
Share girls 10 to 16	−0.794	0.760	−1.251	0.748	−0.399	0.426	−0.903	0.594	0.006	0.384
Share adults male 17 to 40	−1.060	0.809	−1.623	0.703	−0.189	0.560	−1.978	0.653	0.863	0.554
Share adults female 17 to 40	−1.780	0.948	−1.416	0.874	0.871	0.601	−0.763	0.851	0.468	0.566
Share adults male above 40	0.786	0.932	0.085	0.880	−0.622	0.662	−0.391	0.717	−0.127	0.594
Share adults female above 40	−1.897	0.933	−0.079	0.891	−0.350	0.711	−0.991	0.897	0.634	0.551
Female household head	0.974	0.536	0.032	0.432	−0.626	0.307	−0.277	0.408	0.186	0.275
No spouse, married	−1.436	0.518	0.259	0.381	0.174	0.301	0.141	0.400	−0.231	0.257
No spouse, single	0.263	0.437	0.213	0.403	0.110	0.253	0.579	0.474	−0.080	0.226
No spouse, div./widowed	−1.556	0.565	0.228	0.476	−0.143	0.274	0.311	0.320	−0.723	0.250
Age of the child	1.324	0.251	0.409	0.280	1.169	0.131	0.507	0.305	0.881	0.122
Age of the child squared	−0.064	0.012	0.003	0.013	−0.064	0.007	−0.004	0.013	−0.049	0.006
Non-Muslim	−0.134	0.221	−0.141	0.235	−0.211	0.125	0.133	0.206	−0.177	0.157
Education of father and mother										
Father below class 5	0.166	0.184	−0.442	0.195	0.416	0.108	−0.339	0.161	0.382	0.095
Father class 5 (primary completed)	−0.176	0.246	−0.847	0.256	0.635	0.182	−0.669	0.252	0.438	0.138
Father class 6 to 9 (secondary school)	0.050	0.234	−1.210	0.378	0.753	0.145	−0.538	0.181	0.459	0.146
Father higher level	−0.382	0.365	−1.740	0.382	1.523	0.272	−1.100	0.363	1.124	0.257
Mother below class 5	0.271	0.195	−0.292	0.286	0.446	0.172	−0.283	0.192	0.467	0.117
Mother class 5 (primary completed)	0.380	0.292	−0.868	0.339	0.418	0.200	−0.631	0.335	0.411	0.170

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Table 3 (*Continued*)

Impact of the Food-for-Education Programme on Child Labour and Schooling

	First stage		Second stage (with bootstrapped standard errors)							
	Household Participation		Work by girls		Schooling by girls		Work by boys		Schooling by boys	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Mother class 6 to 9 and higher	−0.315	0.320	0.133	0.357	0.375	0.235	0.346	0.265	0.116	0.195
Land ownership										
0.05 to 0.49 acres	0.059	0.179	−0.141	0.170	0.210	0.117	0.109	0.180	0.059	0.099
0.50 to 1.49 acres	−0.248	0.207	−0.405	0.187	0.559	0.135	−0.218	0.206	0.392	0.112
1.50 to 2.49 acres	−0.758	0.278	−0.377	0.248	0.632	0.168	−0.046	0.216	0.609	0.138
2.50 acres or more	−0.649	0.261	−0.294	0.204	0.615	0.163	−0.047	0.245	0.508	0.125

Source: Regressions by the authors using 1995–6 Household Expenditure Survey for Bangladesh. The first stage regression is a tobit at the household level, with a sample size of 2,598 and a Pseudo R^2 of 0.52. Bootstrapped standard errors in the second stage used 100 replications. The regressions also included geographic controls (variables describing schools and communities likely to influence programme placement at village level). Sample sizes are 2,441 for boys and for 2,323 girls. Pseudo R^2 of 0.38 for work for boys, 0.44 for work for girls, 0.20 for schooling for boys, and 0.26 for schooling for girls. The excluded categories for dummy variables are male household head, spouse present, illiterate father, illiterate mother, landless household, and Muslim household. The residuals used to correct for endogeneity were obtained from the first-stage tobit for the FFE stipend which includes the (statistically significant) village-level participation as an instrumental variable.

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not large. The FFE stipend appears to be about right for achieving full school attendance for kids at the current average attendance rate (about 0.74) and receiving the average stipend.

The displacement of child labour is smaller than the gain in schooling. The probit coefficients in Table 3 imply that an extra 100 kg. of rice reduces the incidence of child labour by 0.04 and 0.02 for boys and girls respectively (31% and 18% of mean child-labour incidence). These impacts are smaller than the naïve estimates based on Table 2. When combined with our results on the impacts on schooling, this revealed pattern of bias in the naïve estimates suggests that there is an underlying tendency for the programme to reach children not at school, but not at work either.

For boys selected for the programme, lower incidence of child labour accounts for about one quarter of the increase in school enrolment; for girls, it accounts for one eighth.

Recall that the average wage for boys is 464 Tk/month, and 291 Tk for girls. Then the stipend's effect on child labour (Table 3) implies an average foregone income from FFE participation of 16.7 Tk/month for boys and 6.4 Tk for girls. A typical FFE family has two children of primary-school age. For a family with one school-age boy and one school-age girl, the foregone income from FFE participation is then 19% of the estimated monetary value of the FFE stipend of 119 Tk/month (Section 2).

So there is a large net transfer benefit to poor households from the programme. There is of course also a benefit over time, through higher schooling. Wodon (1999) finds that completing primary school in rural Bangladesh increases expected *per capita* consumption by 9% (controlling for a range of individual and household characteristics). And there are likely to be other benefits from the higher school attendance induced by the programme, including through better health-care and greater ability to participate in society. A complete evaluation would have to also consider the costs, of course. For example, unless there is excess capacity (which seems unlikely) or a sufficient contemporaneous investment on the supply-side, the higher enrollments due to the programme will create congestion in schools, lowering the quality of education.

The effects of household demographic variables are generally weak. Children from larger households are neither more nor less likely to be in the workforce, or at school. A higher share of working-age adult males in the family reduces child labour by boys. This suggests greater pressure for boys to earn income when in families where there are fewer adult male earners. There is a negative effect of female headship on girls' schooling.

There are very strong effects of parental education on children's child labour and schooling. Higher parental education is associated with lower incidence of child labour and higher school attendance rates. There are qualitatively similar effects of maternal education, although they are not as large in magnitude or as significant statistically.

Finally, owning more land decreases girls' child labour, but not boys'. Parents with larger holdings may well have larger demand for boy's labour

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time in helping to supervise hired labour—an activity that is unlikely to be seen as appropriate for girls in rural Bangladesh.

We also tried stratifying the regressions for work and schooling according to education and landholding, to see if there are differences in programme impacts. The only notable difference in programme impact is between children with different paternal education. While there is a strong effect of the programme on schooling of children with an illiterate farther, this vanishes when the farther is educated. It appears that the programme is acting as a pure transfer payment for educated parents, who send their children to school with or without the programme's incentive.

5. Conclusions

We have tried to determine if children sent to work in rural Bangladesh are caught in a poverty trap, such that the extra current income to poor families from child labour comes at the expense of the children's longer term prospects of escaping poverty through education. Concerns about the effects of child labour on schooling have often been raised in development-policy debates, including in recent discussions of the welfare effects of labour-intensive growth fuelled by trade liberalisation.

The poverty trap argument depends critically on the substitution possibilities between children's leisure and schooling. On *a priori* grounds it would not seem difficult for parents to assure that a child in Bangladesh working for (say) 20 hours per week can still attend all primary school classes. Nor does it seem that the majority of children who have not finished primary school, but are not at school, are normally working. Casual observations and the descriptive statistics available from surveys do not seem to offer much support for the poverty trap idea.

To explore the question more deeply, we have used a targeted school stipend to identify how much child labour displaces schooling. We find strong positive effects on school attendance of the incentive provided by Bangladesh's Food-for-Education programme. A stipend with a value considerably less than the mean child wage was enough to assure nearly full school attendance amongst participants. This impact on schooling is likely to be socially beneficial from a number of points of view.

Our results suggest that the enrollment subsidy also reduced the incidence of child labour. However, this effect only accounts for a small proportion of the increase in school enrolment; the reduction in the incidence of child labour by boys (girls) represents about one quarter (eighth) of the increase in their school enrollment rate. Parents are clearly substituting other uses of their children's time, so as to secure the current income gain from access to the programme with modest impact on earnings from their children's work.

Our tests are limited in a number of respects. Work may well displace time for doing homework or attending after-school tutorials; we have not been able to identify such effects with the data available. There may also be other welfare

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losses to children from work (such as when this entails exposure to an unsafe working environment). And there may well be other gains (such as when the skills learned from working enhance the returns from schooling). However, our results do lead us to question the seemingly common view that child labour comes largely at the expense of schooling and so is a major factor creating future poverty in this setting.

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