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Abstract

This paper uses household, school, and test score data from Bangladesh to compare and contrast the effectiveness of NGO-run and state-run schools in the provision of primary education. I study how the entry of NGOs in primary education has affected educational outcomes of girls and examine the mechanisms which account for the relative performance of NGO versus state schools in improving female educational outcomes. The results show that the entry of NGO schools has significantly increased girls' enrollment as compared to boys. Constructing cohorts from cross-sectional data using year of birth and year of NGO school establishment, I show that cohorts which were exposed to NGO schools have higher probability of enrollment and the effect operates mainly through girls. The two most prominent characteristics of NGO schools that encourage girls' enrollment are the high percentage of female teachers and having Parent-Teacher Associations (PTAs). NGO schools show strong effects in improving children's test scores.

Keywords: NGOs, non-formal schools, girls' education, Bangladesh.
JEL classification: I21, O15.

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1 Introduction

There has been a significant increase in the number and roles of non-governmental organizations (NGOs) around the world in the last few decades.[1] In developing countries NGOs have become heavily involved in the provision of public goods and services including health care, education, and rural credit.[2] As NGOs are rapidly becoming important providers of public goods in developing countries, a key issue is to understand how they perform relative to the state.

The objective of this paper is to examine how NGO expansion affects educational attainment. Education is one area which has typically been preserved for the state but has seen an increasing role for NGOs, where NGO involvement is often intended to overcome state failure in the delivery of education. Whether and how NGO involvement affects educational outcomes is an important issue which has attracted the interests of several researchers. For example, Miguel and Kremer (2003) find that an NGO program of school-based mass treatment with deworming drugs in Kenya is effective in reducing school absenteeism. Banerjee et al. (2003) find an NGO remedial education program in India, where young women from the community are hired to teach children who lag behind in class, to be effective in improving children's test scores. A school meals program implemented by an NGO is found to increase school participation in Kenya (Vermeersch, 2002).

One of the key problems with studying NGOs and evaluating their effects relative to the state is the fact that they are highly heterogeneous group. This motivated the paper's focus on Bangladesh, where there is one large NGO in primary education. With a large NGO operating under a single model, I can make clear comparisons between NGO-run and state-run schools and identify the characteristics of each type of school that affect educational outcomes.

Using a large, nationally representative data from the Education Watch Project in Bangladesh, the paper studies the effects of NGO schools on the educational outcomes of girls. Bangladesh is an important case study because the country is home to a large number of active NGOs[3], and NGOs play an important role in the provision of primary education. Moreover, there has been a rapid increase in the enrollment rate of girls in recent years such that Bangladesh is now the only country in South Asia to have achieved gender equity in primary enrollment.[4] Eliminating gender disparity

[1] In the U.S. there are approximately 2 million NGOs, most of which were formed in the past 30 years, while in Russia, where almost none existed before the fall of communism, at present the number is at least 65,000 (The Economist, 2000). Between 1990 and 2000 the number of international NGOs has grown by almost 20% to 37,281 (Human Development Report, 2002).

[2] Besley and Ghatak (2001) analyze how ownership matters in public good provision, with applications to NGOs.

[3] NGOs in Bangladesh are documented as being one of the most active in the world. There are about 20,000 NGOs operating in Bangladesh's 86,000 villages providing education, health, small loans, and agricultural extension services (The Economist, 1998).

[4] In 1980, net primary enrollment rates for boys and girls were 62% and 47%; in 2000 the corre-

in primary education is a key part of the United Nations Millennium Development Goals.[5] The education of girls is recognized as crucial to development, leading to higher economic productivity, lower infant and maternal mortality, and improved health. Understanding what factors led to gender parity in primary education and identifying the role that NGOs played in this process is a key challenge. Bangladesh's experience can provide useful policy lessons for other countries aiming to achieve gender equity in primary enrollment.

NGOs in Bangladesh initiated non-formal primary education in the middle of 1980s as it was perceived that primary education provided by the government could not reach the poorest children in remote areas. Non-formal education has many characteristics that differ from formal education. For example, parents and the teacher decide together on the timing of the lessons and vacation schedules. The schools usually have one classroom and one teacher. In most cases teachers are female, which is believed to encourage the enrollment of girls. At present, around 1.4 million children or 8% of the children enrolled in primary schools are in NGOs' non-formal schools (henceforth NGO schools). Figure 1 shows the expansion of NGO schools in Bangladesh. The largest NGO in the field of education is the Bangladesh Rural Advancement Committee (BRAC), which provides non-formal education to 1.2 out of 1.4 million children receiving non-formal education. Even schools which are run by NGOs other than BRAC tend to follow the BRAC model. I therefore have the advantage of comparing a largely homogenous group of NGO schools with state-run schools.

Nationally representative data from the Education Watch Project shows that, in 1998, gender gap in primary enrollment in favor of boys existed only in the case of urban households which reported their economic status as 'surplus'. As Figures 2A, 2B, and 2C show, girls from rural areas, and girls from poorer households appear to do better than boys in terms of net primary enrollment. In particular, girls from rural BRAC target households, which are the poorest households in Bangladesh, and girls from households which reported their economic status as 'always in deficit' have notably higher enrollment rate compared to boys. In many other developing countries, the opposite is true. For example, in India and Nepal, gender gap in favor of boys is greatest in rural areas and for poorer households, as Figures 3A and 3B show. Why do girls from rural areas and poorer households in Bangladesh have such high enrollment rates relative to boys? One possible explanation could be the works of NGOs such as BRAC, as NGO schools in Bangladesh target poorer households.

To investigate these issues I use household, school, and test score data from the Education Watch Project to analyze the effects of NGO schools on the educational

sponding rates were 79.8% and 79.9%, respectively.

[5] Goal 3, namely "Promote gender equality and empower women", has the specific target to "Eliminate gender disparity in primary and secondary education, preferably by 2005, and to all levels of education no later than 2015." Details of the Millennium Development Goals can be found at www.un.org/millenniumgoals/ and www.developmentgoals.org.

outcomes of girls in Bangladesh. Combining household and school data, I first study how the entry of NGO schools affects girls' enrollment as compared to boys. I then analyze the characteristics of NGO and state schools which affect girls' enrollment. Finally, I investigate the learning outcomes of students attending NGO and state schools using test score data.

Constructing cohorts from cross-sectional data using year of birth and year of NGO school establishment, I show that cohorts which were exposed to NGO schools have higher probability of enrollment, and the effect operates mainly through girls. Moreover, for primary school aged children, living in a village with at least one NGO school, or a village with higher NGO school involvement, is associated with higher probability of enrollment for girls as compared to boys, controlling for other factors. When rural and urban areas are studied separately, the effects of NGO schools in increasing girls' enrollment are found mainly in the rural areas. Moreover, the effects of NGO schools in increasing girls' enrollment are stronger for BRAC target households[6] compared to non-target households, suggesting that NGO schools increase girls' enrollment more for poorer households as BRAC target households are the poorest group of the population. The two most prominent characteristics of NGO schools that encourage girls' enrollment are the high percentage of female teachers and having Parent-Teacher Associations (PTAs). Being enrolled in an NGO school has positive and strongly significant effects on children's test scores, as measured by Assessment of Basic Competencies (ABC) test.

The paper is organized as follows. The next section presents a theoretical framework showing how NGO school entry might affect girls' educational outcomes. Section three discusses the institutional background and the data. Section four describes the methodology and presents the results. Section five concludes.

2 Theoretical Framework

The simple model in this section attempts to capture how NGO schools might affect the enrollment of girls as compared to boys. The main assumption is that there exists a disutility associated with sending a child to school, which differs by gender and by school type.[7]

Given household characteristics and characteristics of schools available, household i chooses expenditure on the education of child i to maximize the following household

[6] BRAC target households are defined as households with less than 0.5 acre of land and at least 1 person engaged in manual labor for at least 100 days a year (Nath, 1999).

[7] Possible reasons for gender differences in human capital investments include different expected returns by gender, different costs of investment, and tastes, which may reflect social and cultural norms (Strauss and Thomas, 1995). For example, Alderman and King (1998) assume different rates of returns and different expected transfers to explain differences in school enrollment. Garg and Morduch (1998a and 1998b) assume higher rates of return for males.

utility function:

$$B(x_s) - p_{skj} + U(Y - c_{kj} - x_s) \tag{1}$$

where $B(\cdot)$ and $U(\cdot)$ are household i's perceived benefits of education and utility from current consumption, respectively.[8] $B(\cdot)$ and $U(\cdot)$ are assumed to be increasing and concave. x_s is expenditure on the education of a child of sex s, s = male (m) and female (f). p_{skj} is the disutility associated with sending a child of sex s to school type k in village of residence j. Here k = government school (g) and NGO school (n). Y is household i's income, and c_{kj} is the opportunity cost of time of a child when enrolled in school type k in village j.

The main assumption of the model is that, for each village j, $p_{fgj} > p_{mgj} = p_{mnj} = p_{fnj}$. The disutility of sending a child to a government school is higher for girls compared to boys. In the context of Bangladesh, this could be thought of as the worry of having the child far away from home, which is usually greater in the case of girls, or the disutility of having a girl taught by male teachers. The average distance between a government school and children's homes is 3.2 kilometers, and over 60% of teachers in government schools are male (Jalaluddin and Chowdhury, 1996). The disutility of sending a child to an NGO school is assumed to be the same for boys and girls, and is equal to the disutility of sending a boy to a government school. NGO schools have some characteristics that should be associated with lower disutility for girls compared to government schools. For example, NGO schools are usually built in the village nearby to children's homes, and over 90% of NGO school teachers are female.

The benefit function, $B(\cdot)$, is assumed to be the same for boys and girls, and the same for government schools and NGO schools. The opportunity cost of time is assumed to be the same for boys and girls[9], and higher in the case of government schools compared to NGO schools. This is because NGO schools are located nearby to children's homes and have class times decided by parents and the teacher to allow children to work outside of school time.

Let $x_s^*(Y)$ be the solution to the maximization problem (1), and let $V(Y)$ be the maximum value function, given p_{skj} and c_{kj}. If household i decides not to enrol the child, the household utility is $U(Y)$. The condition for household i to enrol the child is therefore:

$$V(Y) - U(Y) > 0 \tag{2}$$

It is straightforward to show that initial enrollment is non-decreasing with respect to Y, and non-increasing with respect to p_{skj} and c_{kj}.[10] This is intuitive, since high

[8] Subscript i is omitted for simplicity.

[9] Girls may help with child care and household chores while boys may work in the farm, thus in general it is inconclusive whether the opportunity cost of time is higher for girls or boys (Strauss and Thomas, 1995).

[10] Applying the envelope theorem, the derivative of the left-hand side of (2) is $\frac{\partial V}{\partial Y} - \frac{\partial U}{\partial Y} = \frac{\partial U(Y - c_{kj} - x_s)}{\partial Y} - \frac{\partial U(Y)}{\partial Y} > 0$ since $U(\cdot)$ is concave. Moreover, $\frac{\partial V}{\partial p_{skj}} = -1 < 0$ and $\frac{\partial V}{\partial c_{kj}} = -\frac{\partial U}{\partial Y} < 0$.

income makes it more 'affordable' to enrol a child, while high disutility associated with sending a child to school and high opportunity cost make it more 'expensive' to enrol a child.

Let Y^*_{skj} be the threshold level of income above which a household will enrol a child of sex s in school type k in village j, i.e., $V(Y^*_{skj}) - U(Y^*_{skj}) = 0$. Since $p_{fnj} = p_{mnj} = p_{mgj} < p_{fgj}$ and $c_{nj} < c_{gj}$, it follows that:

$$Y^*_{fnj} = Y^*_{mnj} < Y^*_{mgj} < Y^*_{fgj} \tag{3}$$

Result 1: NGO schools contribute to an increase in the enrollment rates of boys and girls, with stronger effects for girls.

Let us further assume that NGOs target poor households with income less than Y^{tg}. Suppose Y^{tg} is such that (i) $Y^*_{mn} = Y^*_{fn} < Y^*_{mg} < Y^{tg} < Y^*_{fg}$, or (ii) $Y^*_{mn} = Y^*_{fn} < Y^{tg} < Y^*_{mg} < Y^*_{fg}$.

Result 2: The effects of NGO schools in increasing girls' enrollment relative to boys will be stronger for NGOs' target households. Moreover, gender gap in enrollment disappears for target households, but exists for non-target households.

3 The Program

With over 20,000 NGOs working in areas such as health, education, micro-credit and agricultural services, Bangladesh is documented as having one of the most active NGOs in the world. NGOs in Bangladesh started to emerge after the War of Independence in 1971, when the country was in a state of upheaval and many refugees were returning home. At that time, most NGOs were aid and relief agencies. As the needs of society changed, many NGOs evolved into development agencies. The number of NGOs has also increased significantly. NGOs in Bangladesh range from small local NGOs to large and internationally well-known NGOs such as the Bangladesh Rural Advancement Committee (BRAC) and the Grameen Bank. In the area of education, NGOs in Bangladesh play a vital role in the provision of non-formal primary education.

Primary education in Bangladesh was initially the responsibility of the state. After independence, under an Act of Parliament all primary schools in Bangladesh were nationalized in 1973 (Jalaluddin and Chowdhury, 1996). From the second half of 1980s, however, the state has allowed NGOs to experiment with a variety of delivery mechanisms to cater for basic education needs of the disadvantaged households. The objective of NGOs' non-formal schools is to provide education to the poorest children who did not attend or have dropped out of formal schools.

Primary education in Bangladesh is 5 years in length, starting at age 6. There are

11 types of primary schools.[11] Currently, around 1.4 million children, or 8 percent of children enrolled in primary schools, are in NGO-run schools. Around two-thirds are enrolled in government schools, and another 20 percent in registered privately managed schools. For other types of schools, the percentage of children attending each type is 2% or smaller. As Figure 1 shows, NGO schools are relatively new. The majority of NGO schools in the rural areas were set up after 1992. For the urban areas, most NGO schools were established after 1995. In the case of government schools, most were established before 1990, with only 2 out of 354 schools under the survey established after 1990.

The Bangladesh Rural Advancement Committee (BRAC) is the single largest NGO in non-formal primary education with over 30,000 non-formal primary schools. BRAC started the Non-Formal Primary Education (NFPE) in 1985 in response to demands from parents whose children did not have a chance to go to school. After 2 years BRAC developed a model of non-formal schools which has become highly successful.[12]

This unique characteristic of having one large NGO in education makes it possible to compare how NGO and state schools function, which is usually not possible since NGOs in education are heterogeneous in most other countries.[13] Using nationally representative data from the 1998 Education Watch Project, this paper examines how the expansion of NGO schools affects the educational outcomes of girls, and which characteristics of NGO and state schools matter for those outcomes.

Table 1 gives means and standard deviations of the main variables.[14] Panel A shows individual level means of boys and girls aged 6 to 10 years old for all Bangladesh, and separately for rural and urban areas. The enrollment rate of girls has surpassed that of boys for all Bangladesh and the rural areas. Girls' enrollment rate has increased significantly in recent years.[15] The table also shows differences between rural and urban areas in certain family characteristics, such as parental education

[11] These are: government schools, registered privately managed schools, unregistered privately managed schools, primary schools attached to high schools, PTI's experimental schools, independent religious schools, religious schools attached to high madrassas, kindergarten, satellite schools, community schools, and NGO schools (World Bank, 2000).

[12] When BRAC started non-formal schools, the objective was to provide basic education to children, and continuation into the fourth grade in the formal system was not expected. However, out of over 1.67 million students who have graduated from BRAC schools, 90% have gone on to government schools. Nath et al. (1999) find that graduates of BRAC schools have a high level of basic competency compared to other types of schools.

[13] See, for example, Miguel and Kremer (2003).

[14] Details on the Education Watch data are contained in the Data Appendix.

[15] The increase in girls' enrollment rate is believed to have been brought about by a number of 'positive discriminatory' actions taken by the state and NGOs in favor of girls and poor children in the rural areas. Among these are: (i) non-formal primary education; (ii) Female Stipend program, where the state provides stipends to girls in secondary school and does not charge any tuition; and (iii) Food for Education program, where the state provides a food ration to children from rural poorer families for attending school (Chowdhury et al., 2001).

and household economic status. Despite having parents who have less education, girls in rural areas are more likely to be enrolled overall than urban girls and more likely to be enrolled than rural boys.

The expansion of NGO schools into a village is captured by *'the involvement of NGO schools in a village'*, defined as the percentage of children aged 6 to 10 years old enrolled in NGO schools among children aged 6 to 10 years old enrolled in school in each village. *'The involvement of government schools'* is similarly defined. Panel B gives village level means of *'the involvement of NGO schools'* and *'the involvement of government schools'*.

In general NGOs target villages with low enrollment rates. NGO schools are usually built in villages where there is demand for the school, i.e. villages with many dropout and non-enrolled children. For BRAC, in villages where BRAC has its development activities, a survey is conducted to find out the number of children who are non-enrolled or have dropped out of school, and one school is open for 33 children.

Panel C gives the school level means of the characteristics of NGO schools and government schools. The differences between the two types of schools can be seen in many areas. For class size, NGO schools have much smaller class size, on average around 30 students in one class[16], while government schools' average class size is 55. Teacher absenteeism appears higher in the case of government schools; the percentage of teachers present on the day of school visit is 97% for NGO schools and 86% for government schools. The percentage of female teachers is much higher for NGO schools, 92% compared to 35% in the case of government schools. Teachers' education is on average lower in the case of NGO schools. Government school teachers have on average almost 12 years of education, compared to 10 years for NGO school teachers.[17] NGO school teachers also have much fewer years of experience, on average 2.65 years compared to almost 20 years for government school teachers.

4 Empirical Analysis

To answer the question of how the entry of NGO schools affects girls' educational outcomes, I start by analysing how NGO schools affect girls' enrollment. For children aged 11 to 20 years old, I find out how exposure to NGO schools affects the probability of having been enrolled, and whether the effect differs between boys and girls. I also study whether, for primary school aged children, being in a village with at least one NGO school, or a village with higher NGO school involvement, affects girls' enrollment as compared to boys. Next I find out the characteristics of NGO and state schools which affect female participation in education. Finally, I investigate the quality of NGO schools by analysing the learning outcomes of boys and girls attending NGO

[16]For BRAC schools, class size is set at 33 children for each school, which is usually a one-room construction with one teacher.

[17]BRAC has a policy of hiring female teachers who have completed 9 or more years of school.

and state schools.

Table 2 gives an overview of how the entry of NGO schools affects girls' enrollment. I show the percentage of children with no schooling in villages with at least one NGO school and villages with no NGO school. I focus on two age groups, 17 to 20 and 11 to 14, as most 17 to 20 year olds were not exposed to NGO schools while children in the 11 - 14 year range were.[18] Comparing columns (1) and (4), it appears that NGO schools entered villages with a higher percentage of children with no schooling. This is in line with the targeting policy of NGOs, where more schools are built in villages with demand for the schools, i.e. villages with many dropout or non-enrolled children. Columns (2) and (5) show that, for 11 to 14 years old children, girls in villages with at least one NGO school do better than girls in villages with no NGO school. For boys, however, the opposite is true. Columns (3) and (6) show that the reduction in the percentage of children with no schooling has been fastest for girls in villages with at least one NGO school. In fact, from being the worst-off group before NGO schools entered, they became the group with the highest percentage of children having been enrolled. This issue is further explored in the following analysis.

As Table 2 shows, NGOs appear to enter villages with low initial enrollment. Table 3 confirms NGOs' targeting policy. NGO school involvement is greater in villages where adults have lower average schooling, as defined by (i) average class passed for adults 21 years and above, and (ii) percentage of adults 21 years and above with no schooling.[19] As NGO school placement is a function of the initial level of education in the village, there is a possible endogeneity problem where the results found are due to the targeting policy of NGOs and not the activities of NGO schools. To deal with this possible endogeity problem, I control for village fixed effects when analyzing children aged 11 to 20 years old. This is possible because for each village I can divide the children into those who were exposed to NGO schools and those who were not, using year of birth and year of NGO school establishment. In interpreting the results, the identification assumption is that there is no omitted time-varying and region specific effects correlated with the placement of NGO schools. When analyzing children aged 6 to 10 years old, I control for several village characteristics.[20] Results showing similar patterns emerge from analyzing 11 to 20 years old and 6 to 10 years old, suggesting that under the assumption that there is no time-varying component the results found are not driven by NGO school placement.

[18] As Figure 1 shows, most NGO schools started on or after 1992. Children aged 17 to 20 in 1998 were 11 or older in 1992, thus most of them were not exposed to NGO schools as NGO schools usually enrol children aged 8 to 10 years old.

[19] In Table 3, the dependent variable is the involvement of NGO schools in a village, and explanatory variables are village characteristics as listed. The education of adults 21 years and above is not affected by whether there is an NGO school in the village, as those 21 years and above in 1998 would be 11 years or older in 1988, and in 1988 there were hardly any NGO schools at all (as shown in Figure 1).

[20] As all children aged 6 to 10 years old are exposed to NGO schools, it is not possible to control for village fixed effects.

4.1 Entry of NGO Schools and Girls' Enrollment

A. Basic Results

First I explore the key question of this paper - does the entry of NGO schools contribute to the increase in girls' enrollment as compared to boys?

To find out whether being exposed to NGO schools has different effects on the enrollment status of girls as compared to boys, I estimate the following equation:

$$\begin{aligned}\Pr(S_{ij} = 1) = \alpha_0 + \alpha_1 EXP_{ij} + \alpha_2 Girl * EXP_{ij} + \alpha_3 C_{ij} + \alpha_4 Girl * C_{ij} \\ + \alpha_5 Girl + \alpha_6 V_j + \text{error term} \qquad (4)\end{aligned}$$

where S_{ij} is equal to 1 if individual i in village j has been enrolled in school, and 0 otherwise. Here I focus on the age range of 11 to 20, as this age range includes children who were exposed to NGO schools as well as those who were not. EXP_{ij} is equal to 1 if individual i in village j has been exposed to an NGO school in the village, and 0 otherwise. An individual is considered exposed to an NGO school if he/she was 10 years old or younger when the first NGO school in the village was established, as most NGO schools enrol 8 to 10 years old children.[21] $Girl$ is the dummy variable for being a girl. I control for a number of individual and family characteristics, represented by vector C_{ij}, and village fixed effects, V_j. Equation (4) is estimated by maximum likelihood logit. In this specification, and all others that follow, standard errors are clustered at the village level.[22]

I control for the following child and family characteristics to account for unobserved heterogeneity that might drive enrollment: age of the child, number of adults in the household, number of siblings, percentage of boys among all siblings, whether the household is a female headed household, father's education, mother's education, household's self-perceived economic status, whether mother has access to NGO credit, whether mother is engaged in income-generating activities, whether there is at least one member of the household who sells labor more than 100 days/year, and religion.

Columns (1) to (4) of Table 4 show that being exposed to NGO schools increases the probability of having been enrolled for girls as compared to boys. Interaction terms with Girl are not included in column (1), and are included in column (2). Column (1) shows that, compared to those who were not exposed to NGO schools, being exposed to NGO schools increases the probability of having been enrolled for all children. In column (2), the interaction term 'Girl*Exposed to NGO school' is positive and strongly significant, while the level term 'Exposed to NGO school' becomes insignificant. This suggests that compared to children who were not exposed to NGO schools in the village, being exposed to NGO schools increases the probability

[21] I constructed this variable using the age of an individual and the year when the first NGO school was established in the village of residence.

[22] See Deaton (1997).

of having been enrolled for girls as compared to boys. The marginal effect suggests that being exposed to NGO schools increases girls' probability of having been enrolled by 3% compared to boys.

Columns (3) and (4) look at children who were exposed to NGO schools and those who were not. I split the sample in this way to allow for child and family characteristics to have different effects on children who were exposed to NGO schools and whose who were not.[23] For the group of children who were exposed to NGO schools, girls are more likely to be enrolled compared to boys, controlling for other factors. The coefficient of 'Girl' is positive and strongly significant in column (3). On the other hand, for children who were not exposed to NGO schools, the coefficient of 'Girl' is marginal and insignificant.

Taken together, the results suggest that being exposed to NGO schools in the village significantly increases the probability of having been enrolled for girls as compared to boys.

Next I investigate whether the exposure to NGO schools leads to an increase in class passed, defined as the last class which a child has completed, and whether the effects are stronger for girls as compared to boys. Columns (5) and (6) of Table 4 show the results from estimating equation (4) using the last class passed as the dependent variable. The results are similar to those in the case of enrollment: being exposed to NGO schools increases class passed for all children, and the effect operates mainly through girls. The marginal effect suggests that being exposed to NGO schools increases class passed for girls by 0.23 year as compared to boys.

Columns (7) and (8) report the results from splitting the sample into those who were exposed to NGO schools and those who were not. For the group of children who were exposed to NGO schools, girls appear to have significantly higher class passed compared to boys. The coefficient of 'Girl' is positive and significant at the 1% level. For children who were not exposed to NGO schools, the coefficient of 'Girl' is much smaller in magnitude and less strongly significant[24] compared to the case of children who were exposed to NGO schools.

Taken together, the results suggest that the entry of NGO schools increases girls' enrollment and class passed compared to boys.

Table 5 shows the results from using a different identification strategy, where I analyze how the intensity of NGO schools in the village affects enrollment and class passed of children born in different years.[25] The year of birth and the village of birth jointly determine an individual's exposure to NGO schools. As Figure 1 shows, over 95% of NGO schools were established in or after 1992. Since NGO schools usually

[23] It is possible that for children who were exposed to NGO schools, parents may become more sensitive towards girls' needs for education due to NGO activities in the village of residence.

[24] For children who were not exposed to NGO schools, the coefficient of 'Girl' is significant at 10% level.

[25] The intensity of NGO schools in a village is measured by the number of NGO schools in the village per 100 children aged 11 to 20 years old.

enrol children aged 8 to 10 years old, those who were 11 or older in 1992 were not exposed to NGO schools. At the time of the survey in 1998, children who were 17 years or older form the cohort who were too old to benefit from NGO schools. I compare the effects of the intensity of NGO schools in the village of residence on children who were young enough to be exposed to the schools versus those who were too old to benefit from them. If exposure to NGO schools increases class passed rates for children, we would expect to find no effect for those 17 years or older, and increasing effects for younger children.[26]

I estimate the following equation:

$$Y_{ijk} = \alpha_0 + \alpha_1 NP_j * T_{ik} + \alpha_2 T_{ik} + \alpha_3 C_{ijk} + \alpha_4 V_j + \text{error term} \quad (5)$$

where Y_{ijk} is (i) whether individual i in village j who is of age k has ever been enrolled[27], and (ii) the last class passed for individual i in village j who is of age k, where $11 \leq k \leq 20$. NP_j is the number of NGO schools in village j per 100 children aged 11 to 20 years old. T_{ik} is the treatment dummy indicating the age of individual i. C_{ijk} denotes child and family characteristics of individual i in village j who is of age k.

Columns (1) and (2) of Table 5 show that exposure to NGO schools has positive effects on the probability of having been enrolled for girls. The coefficients of 'Number NGO schools*age k' are positive and significant for girls aged 12 to 15, and positive though insignificant at the 10% level for boys of the same age range. For both boys and girls, there appears to be little or no effect on those aged 17 and above. Here age 20 is the omitted category. The results show that NGO schools increase the probability of having been enrolled for children who were exposed to the schools, with stronger effects in the case of girls. Results regarding class passed, as shown in columns (3) and (4) of Table 5, are similar to those regarding enrollment. The coefficients of 'Number NGO schools*age k' are positive and significant for girls aged 15 and below, and positive though mostly insignificant at the 10% level for boys of the same age range.

Overall, the results in Table 5 point to the same direction as those in Table 4: NGO schools appear to increase girls' enrollment and class passed as compared to boys.

Next I look at whether being in a village with an NGO school increases the probability of being enrolled for children aged 6 to 10 years old. While studying the enrollment history of children 11 to 20 years old has the advantage of comparing between those who were exposed to NGO schools versus those who were not, focusing on 6 to 10 years old, the primary school age in Bangladesh, allows for the analysis of the current primary enrollment situation in Bangladesh.

[26] This is the same identification strategy as in Duflo (2001).

[27] The variable is equal to 1 if the individual has ever been enrolled and 0 otherwise.

I estimate the following equation:

$$\begin{aligned}\Pr(S_{ij} = 1) = {} & \alpha_0 + \alpha_1 N_{ij} + \alpha_2 Girl * N_{ij} + \alpha_3 G_{ij} + \alpha_4 Girl * G_{ij} + \alpha_5 C_{ij} \\ & + \alpha_6 Girl * C_{ij} + \alpha_7 Girl + \alpha_8 A_j + \alpha_9 Vc_j + \text{error term} \end{aligned} \quad (6)$$

where N_{ij} represents two different measures of supply of NGO schools in village j. One is whether there is at least 1 NGO school in village j , and the other is the involvement of NGO schools in village j. *'The involvement of NGO schools in a village'* is defined as the percentage of children aged 6 to 10 years old enrolled in NGO schools among children aged 6 to 10 years old enrolled in school in each village, excluding the child from the sample. This variable shows the relative importance of NGO schools in a village. G_{ij} is similarly defined for government schools.[28] A_j represents the stratum in which village j is located, and Vc_j is a vector of village-level characteristics. Village characteristics included are percentage of adults with no schooling, whether there is an NGO micro-credit in the village, average economic status, percentage of landless households, percentage of households with members who sell labor more than 100 days/year, percentage of female headed households, and percentage of Muslims in the village. All other variables are as defined above.

Columns (1) to (4) of Table 6 show the main findings. In column (2), the interaction term 'Girl*At least 1 NGO school' is positive and significant at the 1% level, indicating that being in villages with at least 1 NGO school is associated with higher probability of being enrolled for girls as compared to boys. The marginal effect suggests that the magnitude of this effect is 3%, which is similar to the case of 11 to 20 years old. The interaction term 'Girl*Fraction NGO' in column (4) is also positive and significant at the 10% level. Both results point to the same direction that NGO schools increase girls' enrollment as compared to boys. On the other hand, having at least 1 government school in the village or having more government school involvement does not show different effects on the probability of being enrolled for girls as compared to boys. This suggests that it is exposure to NGO schools and not government schools that drives up girls' enrollment relative to boys.

Column (3) shows that NGO school involvement is associated with lower probability of being enrolled for all children. As Tables 2 and 3 suggest, NGOs appear to target villages with low enrollment rates.

To conclude, the results in Tables 4, 5, and 6 point to the role of NGO schools in increasing girls' enrollment. Being exposed to NGO schools significantly increases enrollment and class passed for girls as compared to boys. Moreover, living in a village with at least one NGO school, or a village with higher NGO school involvement, is associated with higher enrollment for girls as compared to boys.[29]

[28] As there are 11 types of primary schools in Bangladesh, the involvement of NGO schools and the involvement of government schools in a village do not add up to one.

[29] Appendix 2, Table 12 shows the effects of child and family characteristics on the probability of

B. Extensions

Results in the previous subsection lead to the conclusion that NGO schools have contributed to the increase in female enrollment in Bangladesh. However, given the characteristics of NGO schools which aim to suit the needs of the poorest children, it is possible that NGO schools may increase female enrollment for some groups (e.g. rural versus urban, BRAC target versus non-target households) and not others. Also, to draw out policy implications it is useful to find out how NGO schools affect female enrollment for different groups of the population.

Here I analyze whether the effects of NGO schools in increasing girls' enrollment vary between rural and urban areas, and between BRAC target and non-target households. The rural and urban areas in Bangladesh differ in many aspects which possibly impact how NGO schools affect female enrollment. For example, in the urban areas schools are more likely to be closer and there are more infrastructures such as roads.

In the case of BRAC target and non-target households, when BRAC started its NGO schools the main objective was to provide education to children from BRAC target households, defined as households with less than 0.5 acre of land and at least 1 person engaged in manual labor for at least 100 days a year (Nath, 1999). However, as there were many children from non-target households who did not have an education, BRAC schools also enrol children from non-target households. BRAC target households are the poorest group of the population, and whether NGO schools affect target and non-target groups differently should provide insights into how NGO schools affect female enrollment.

Panel A in Table 7 shows the results from estimating equation (4) separately for rural and urban areas, while Panels B and C show the results from estimating equation (6) for rural and urban areas. Columns (1) and (2) show that, for children aged 11 to 20 years old, the effect of being exposed to NGO schools on relative female enrollment can be found in both rural and urban areas, with the effect being stronger for the rural areas. Panels B and C show that the effects of NGO schools in increasing girls' enrollment as compared to boys are found mainly in the rural areas. For Panel B, the coefficient of 'Girl*At least 1 NGO school' is positive and significant only for the rural areas. For Panel C, the coefficient of 'Girl*Fraction NGO' is positive and significant for the rural areas, and insignificant for the urban areas.

One possible reason NGO schools seem to increase relative female enrollment mainly in the rural areas is that in rural villages government schools and other types of schools are likely to be far away, therefore having an NGO school in the village would encourage parents to send the girls to school. As the theory suggested, the disutility associated with sending a girl to school could be reduced by having NGO

being enrolled for boys and girls. Most of the child and family characteristics have the expected sign, although there are some exceptions. In line with Figure 2C, being from a household which reports their economic status as 'surplus' has a negative and significant relationship with the probability of being enrolled for girls in the urban areas.

schools nearby to children's homes. Moreover, in many cases the poorest children in urban areas who attend NGO schools are children of construction workers who often have to move from site to site, making it difficult for the children to continue in school.[30]

Table 8 shows the results from estimating equation (6) separately for BRAC target and non-target households. The results show that NGO schools have stronger effects in increasing relative female enrollment for BRAC target households as compared to non-target households.[31] The coefficients of 'Girl*At least 1 NGO school' and 'Girl*Fraction NGO' are positive and significant in the case of target households. The effects on non-target households are positive though not statistically significant at the 10% level. The results suggest that the effects of NGO schools in increasing relative female enrollment is stronger for BRAC target households, although there is evidence of some effects in the case of non-target households as well. This is in line with the fact that NGO schools also enrol children from non-target households.

In summary, it appears that NGO schools increase relative female enrollment mainly in the rural areas. Moreover, the effects of NGO schools in increasing relative female enrollment are stronger for BRAC target households compared to non-target households.[32] These results make us more confident that the increase in female versus male primary school enrollment is being driven by exposure of poor rural households (and in particular BRAC target households) to NGO schools.

C. Robustness Checks

Restricting to BRAC schools

The largest NGO in non-formal primary education is the Bangladesh Rural Advancement Committee (BRAC). The school data from the Education Watch Project shows that 73% of NGO schools are BRAC schools. Many smaller NGOs also follow the BRAC model in setting up and managing their schools.[33] For a robustness check of whether the previous findings are driven by BRAC schools, here I restrict the analysis to BRAC schools only.

Table 9 shows that the main results regarding BRAC schools are very similar to those in the case of all NGO schools. Columns (1) to (6) show that, for children 6 to 10 years old, BRAC school involvement is significantly associated with higher probability

[30] I thank BRAC personnel who suggested this possibility.

[31] As the criteria of land-owning is relevant only for the rural areas, the analysis focuses on BRAC target and non-target households in the rural areas.

[32] As the condition of having 'at least 1 person engaged in manual labor for at least 100 days a year' may change each year, I also looked at the criterial of land-owning only. The results show that the effects of NGO schools in increasing relative female enrollment are positive and significant for households owning less than 0.5 acre of land and insignificant for households owning more than 0.5 acre of land.

[33] BRAC's Education Support Programme provides support in the areas of technical, conceptual and human skills to 303 NGOs for 2,505 schools.

of being enrolled for girls as compared to boys, moreover, the effect is found mainly in the rural areas and the effects are stronger for BRAC target households compared to non-target households.[34] These results are very similar to those found in the case of all NGO schools, and suggest that BRAC schools play an important role in increasing girls' enrollment in Bangladesh and that the BRAC model of non-formal primary education contains certain characteristics which encourage girls' enrollment.

4.2 What School Characteristics Determine Female Participation in Education?

The previous section has shown that NGO schools contribute to an increase in female enrollment. The objective of this section is to uncover the mechanisms through which NGO schools affect female participation in education.

To find out the characteristics of NGO and government schools in the village of residence which affect enrollment, I estimate the equation:

$$\Pr(S_{ij} = 1) = \alpha_0 + \alpha_1 Nc_j + \alpha_2 Gc_j + \alpha_3 C_{ij} + \alpha_4 A_j + \alpha_5 Vc_j + \text{error term} \tag{7}$$

where Nc_j is a vector of aggregate village-level characteristics of NGO schools in village j, and Gc_j is a vector of aggregate village-level characteristics of government schools in village j. All other variables are as defined above. Here the analysis is restricted to villages with at least one NGO school, therefore the sample size is smaller compared to the previous section.

Interaction terms with *Girl* are included in the next equation to find out the different effects that village-level school characteristics have on the probability of being enrolled for girls as compared to boys.

$$\begin{aligned}\Pr(S_{ij} = 1) = {} & \alpha_0 + \alpha_1 Nc_j + \alpha_2 Girl * Nc_j + \alpha_3 Gc_j + \alpha_4 Girl * Gc_j + \alpha_5 C_{ij} \\ & + \alpha_6 Girl * C_{ij} + \alpha_7 Girl + \alpha_8 A_j + \alpha_9 Vc_j + \text{error term}\end{aligned} \tag{8}$$

The results are reported in Table 10. Column (1) shows that the most prominent NGO school characteristic which appears to encourage enrollment for all children is the high percentage of female teachers. The percentage of female teachers in NGO schools also appears to increase girls' enrollment as compared to boys, the coefficient of 'percentage of female teachers in NGO schools*Girl' is positive and significant at the 5% level. For NGO schools, having Parent-Teacher Associations (PTAs) also seems to encourage enrollment for all children.

For government schools, larger class size appears to discourage enrollment, and the effects appear similar for boys and girls. Having government school teachers with

[34] Similar results are found using 'whether there is at least 1 BRAC school' instead of 'BRAC school involvement'.

more experience seems to encourage girls' enrollment, although there is no significant effect in the case of boys. Having School Management Committees (SMCs), on the other hand, appears to encourage boys' enrollment with no effect in the case of girls.

Overall, the results suggest that high percentage of female teachers and having PTAs are important NGO school characteristics which encourage enrollment for both boys and girls. In particular, high percentage of female teachers appears to be the most prominent NGO school characteristic which encourages girls' enrollment.[35]

4.3 How do NGO Schools Affect Learning Outcomes?

The impact of NGO schools on welfare depends not only on enrollment, but also on how the students are learning as a result of attending NGO schools. In this section I further investigate the quality of NGO schools using test score data. NGO schools use a different model of teaching compared to state schools, and there is no obvious reason why NGO school students should perform better or worse compared to those attending state schools.

Under the Assessment of Basic Competencies (ABC) survey, in each village 7 boys and 7 girls aged 11-12 years old were randomly selected to take the ABC test.[36] Using this sample, I estimate the following equation:

$$\begin{aligned} Y_{ij} &= \alpha_0 + \alpha_1 T_{ij} + \alpha_2 Girl * T_{ij} + \alpha_3 C_{ij} + \alpha_4 Girl * C_{ij} + \alpha_5 V_j \\ &\quad + \text{error term} \end{aligned} \tag{9}$$

where Y_{ij} represents (i) whether a child passed the ABC test or not, and (ii) test scores of life-skills, reading, writing, and numeracy sections. T_{ij} is the dummy variable for the type of school that the child was attending at the time of suvey. I control for children who have dropped out of school, and the omitted category is the group who have never been enrolled. Other variables are as defined above.

A child is considered to have 'basic education', i.e. to pass the ABC test, if he/she satisfied the following criteria: (i) answering correctly at least 7 out of 10 life skills questions; (ii) answering correctly at least 3 of the 4 questions from the reading comprehension passage; (iii) correctly communicating a given message through a letter; and (iv) answering correctly at least 3 of the 4 mental arithmetic questions (Chowdhury et al., 1999).

[35] As shown in Table 1, attendance rate is much higher in NGO schools compared to government schools (85% versus 55%). OLS regressions with attendance rate as dependent variable and school characteristics and school type dummies as explanatory variables show that the determinants of attendance are similar for boys and girls (results not shown). The single most important determinant of attendance is the percentage of teachers present on the day of school visit. Teacher absenteeism therefore appears to discourage attendance of both boys and girls. Teacher absenteeism is also quite common and is a major concern in other developing countries such as India (The PROBE team, 1999).

[36] The Data Appendix contains detail on the ABC test.

Table 11 shows that, for both boys and girls, attending an NGO school has positive and significant effects on the probability of passing the ABC test, and all test scores. Attending an NGO school also significantly increases the probability of passing the ABC test for girls as compared to boys. For each section's test scores, however, the effects do not differ between boys and girls.

Attending a government school appears to significantly increase the probability of passing the ABC test for girls, although there seems to be no effect for boys. For all children, attending a government school significantly increases reading and writing scores. The effect on numeracy section is positive though not significant, and there appears to be no effect on life skills section.[37] For each section, the effect of attending a government school do not differ between boys and girls.

The effects of attending an NGO school on test scores are larger than the effects of attending a government school. For reading skills[38], compared to children who have never been enrolled, attending an NGO school increases the scores of reading skills by 21% for boys and 22% for girls. For government schools, the corresponding effects are 9% and 8% respectively. For writing skills[39], attending an NGO school increases the scores by 26% for boys and 31% for girls, while the corresponding effects are 10% for both boys and girls in the case of government schools. Attending a government school does not show significant effects in improving scores for the life skills and numeracy skills sections.

The strongest determinant of test scores for all sections is the last class passed. Listening to the radio, watching television, and reading newspaper are positively associated with the scores of life skills section. Listening to the radio and reading newspaper also significantly increase the probability of passing the ABC test. Most factors related to household economic status do not significantly affect children's test scores. Most of the determinants of test scores appear similar for boys and girls.[40]

Results from Table 11 suggest that, controlling for other factors, attending an NGO school shows stronger effects in improving children's test scores compared to attending a government school. For children who took the ABC test, those in NGO schools would have been in school for a shorter period of time compared to their peers in government schools, since NGO schools enrol children 8-10 years old while government schools enrol children 6 years or above. Moreover, NGO school students are mainly those from the poorest families who were non-enrolled or have dropped out of school. As NGO schools use a different model of teaching, including a

[37] The different effects of NGO schools and government schools on life skills section could be due to the curriculum. NGO schools emphasize more on matters such as health and personal hygiene, which are tested in the life skills section.

[38] There are 4 questions for reading skills section.

[39] The full score for writing skills section is 9.

[40] The most notable exception is that being from economically well-off families has a positive and significant relationship with the reading and writing scores for girls compared to boys. In fact, being from well-off families appears to have a negative effect on reading and writing scores for boys, a rather surprising result.

child-centered approach, simple textbooks which are relevant to rural life, continuous evaluation instead of exams, and flexible class times, the strong effect of NGO schools on test scores is very likely the result of the NGO model of teaching.

Overall, the results indicate that NGO schools significantly improve children's competencies in all areas tested by the ABC test. Moreover, attending an NGO school significantly increases the probability of passing the ABC test for girls as compared to boys. The effects, however, do not appear to differ between boys and girls for each section's test scores.

5 Conclusions

Bangladesh has achieved gender parity in primary enrollment in spite of being one of the poorest countries in the world. More surprisingly, it is among the poorest households in the rural areas where net enrollment rate of girls is most notably higher than that of boys. This is contrary to the situation in other low income countries. For Bangladesh, the entry of NGOs in primary education appears to be an important part of the success story. NGOs in Bangladesh are heavily involved in the provision of primary education, in particular to the poorest children.

Understanding what factors led to gender parity in primary enrollment is a key issue which has important policy implications. In this paper I identify the effects of NGO schools on girls' enrollment and examine the characteristics which account for the relative performance of NGO versus state schools in improving girls' educational outcomes.

The results show that the entry of NGO schools has significantly increased girls' enrollment as compared to boys. For children aged 11 to 20 years old, being exposed to NGO schools significantly increases the probability of having been enrolled for girls as compared to boys. Moreover, for children aged 6 to 10 years old, living in a village with at least one NGO school or a village with higher NGO school involvement is associated with higher enrollment for girls as compared to boys. When divided into rural and urban areas, the effects of NGO schools in increasing girls' enrollment are found mainly in the rural areas, where circumstances are likely to allow NGO schools to function well. Moreover, the effects of NGO schools in increasing girls' enrollment are stronger for BRAC target households, the original target group of NGO schools, compared to non-target households. The two most prominent characteristics of NGO schools that encourage girls' enrollment are the high percentage of female teachers and having Parent-Teacher Associations (PTAs). NGO schools also show strong effects in improving children's test scores.

The innovative ways of NGO schools and the resulting increase in girls' enrollment show what can be achieved when policies are designed to suit the needs of the poor. In this paper I have identified some characteristics of NGO schools which affect educational outcomes. However, certain characteristics that are believed to have contributed to the success of NGO schools are those related to pedagogy practices

and motivation. Such characteristics are difficult to capture in quantitative data. How dancing and singing are part of the curriculum and how NGO school teachers actually visited houses to convince parents to send their children to school are only some examples. There are other aspects of NGO schools that are beyond the scope of this paper.

References

[1] Alderman, H. and E. King, 1998, Gender differences in parental investment in education, Structural Change and Economic Dynamics 9, 453-468.

[2] Banerjee, A., S. Cole, E. Duflo, and L. Linden, 2003, Remedying education: Evidence from two randomized experiments in India, Mimeo, MIT.

[3] Besley, T. and M. Ghatak, 2001, Government versus private ownership of public goods, Quarterly Journal of Economics 116(4), 1343-1372.

[4] BRAC, web-based material at: http://www.brac.net

[5] Chowdhury, AMR, et al. (eds), 1999, Hope not complacency: State of primary education in Bangladesh 1999, The University Press Limited, Dhaka.

[6] Chowdhury, AMR, S. Nath, and R. Choudhury, 2001, Equity gains in Bangladesh primary education, BRAC Research Monograph Series No. 20.

[7] Deaton, A., 1997, The Analysis of Household Surveys: A Microeconometric Approach to Development Policy, Johns Hopkins University.

[8] Duflo, E., 2001, Schooling and labor market consequences of school construction in Indonesia: Evidence from an unusual policy experiment, American Economic Review 91 (4), 795-813.

[9] The Economist, July 25th, 1998, The other government in Bangladesh, page 74.

[10] The Economist, January 29th, 2000, Sins of the secular missionaries, pages 25-28.

[11] Filmer, D., 2003, Educational Attainment and Enrollment Profiles: A Resource Book based on an Analysis of Demographic and Health Survey Data, mimeo, Development Research Group, The World Bank.

[12] Garg, A. and J. Morduch, 1998a, Sibling rivalry, Development Discussion Paper No. 630, Harvard Institute for International Development, Harvard University.

[13] Garg, A. and J. Morduch, 1998b, Sibling rivalry and the gender gap: Evidence from child health outcomes in Ghana, Journal of Population Economics 11(4), 471-493.

[14] Human Development Report, 2002, UNDP.

[15] Jalaluddin, A. K., and A. M. Chowdhury, 1996, Getting Started: Universalising Quality Primary Education in Bangladesh, The University Press Limited, Dhaka.

[16] Miguel, E. and M. Kremer, 2003, Worms: Identifying impacts on education and health in the presence of treatment externalities, forthcoming in Econometrica.

[17] Nath, S.R., 1999, Level, pattern, and socio-economic determinants of enrolment in formal schools of the graduates of BRAC's non-formal schools, Perspectives in Education 15(3): 179-189.

[18] Nath, S. R., K. Sylva and J. Grimes, 1999, Raising basic education levels in rural Bangladesh: the impact of a non-formal education programme, International Review of Education 45(1).

[19] The PROBE Team, 1999, Public Report on Basic Education in India, Oxford University Press.

[20] Strauss, J. and D. Thomas, 1995, Human resources: Empirical modeling of household and family decisions, in Behrman and Srinivasan (eds.), Handbook of Development Economics, vol. 3A.

[21] Vermeersch, C., 2002, School meals, educational achievement and school competition: Evidence from a randomized experiment, Mimeo, Harvard University.

[22] World Bank, 2000, Bangladesh: Education Sector Review, Volumes 1 & 2, The University Press Limited, Dhaka.

6 Data Appendix

The data used in this study came from the Education Watch Project. The Education Watch project was initiated in 1998 by the Campaign for Popular Education (CAMPE), a coalition of more than 400 NGOs involved in non-formal primary education, together with concerned individuals and organizations. The project aims to create more transparency in the education system in Bangladesh by collecting and providing accurate information relating to education, particularly primary education. CAMPE provided the secretariat for the project, while the Research and Evaluation Division of BRAC carried out the actual management and execution of the study. Three rounds of data have been collected; the first round in 1998, and the second and third rounds in 2000. Each round of data contains information on certain aspects of

education in Bangladesh. This paper uses the first round of data, which focuses on the internal efficiency[41] of primary education system in Bangladesh.

The survey was conducted during October and November 1998, and data from 42,584 households and 885 schools in 240 clusters covering all 64 districts in Bangladesh was collected. Out of 240 villages under the survey, 81 villages have at least 1 NGO school.

Three survey instruments were used to collect the data:

(1.) Household Survey Questionnaire (42,584 households from 312 villages in all 64 districts with 31,092 children). This questionnaire has 4 sections: profile of each household member, schooling of the members aged 4-20 years, parental information, and household level information.

(2.) Assessment of Basic Competencies (ABC) Questionnaire (3,360 children: 7 boys and 7 girls from each of the 240 clusters). This part of the survey is intended to provide information on the level of basic competencies of the children as an indicator of achievement. There are four sections: life skills/knowledge, reading, writing, and numeracy.

A child is considered to have 'basic education' if he/she satisfied the following criteria: (i) answering correctly at least seven of the ten life skills questions; (ii) answering correctly at least three of the four questions from the reading comprehension passage; (iii) correctly communicating a given message through a letter; and (iv) answering correctly at least three of the four mental arithmetic questions.

(3.) School Observation Checklist (885 schools). There are seven sections in the checklist: general information about the school, classroom information, teachers' profile, community participation, retention and dropout, school visit by the supervisors, and losses due to the flood of 1998.

The sampling procedure was designed in such a way that the data is nationally representative. Because of variations in educational attainment in different geographical regions in Bangladesh, eight different surveys were carried out in each strata. The strata considered were six rural divisions, the metropolitan cities and the non-metropolitan urban areas.[42] For each stratum the same sample size and similar sampling strategy were followed. Employing a multi-stage sampling procedure, at the first stage, for each stratum 30 thanas (pourashava for non-metropolitan urban areas) were selected through systematic random sampling technique with probability proportional to size (PPS). At the second stage, one union (or ward for the urban strata) for each selected thana/pourashava was selected randomly. At the third stage, one village (mahala for the urban strata) was selected, again randomly, for

[41] In education literature two types of efficiencies are identified: external and internal. External efficiency refers to broader social goals such as better health and productive person-power for the labour market, while internal efficiency refers to objectives which are internal to the education system such as enrollment and achievement (Chowdhury et al., 1999).

[42] The six rural divisions are rural Dhaka, rural Chittagong, rural Rajshahi, rural Khulna, rural Barisal, and rural Sylhet, while the metropolitan cities and the non-metropolitan urban areas are located throughout the country.

each selected union/ward. In other words, 30 villages/mahalla were selected for each stratum, totalling 240 for the whole of Bangladesh. It came out that all 64 districts of the country were represented in the sample.

For each village/mahalla, the number of households interviewed varied between 125 and 200, depending on the size of the village/mahalla. The interviewers started in the north-west corner of the village/mahalla, and surveyed the first household of the corner, and then moved anti-clockwise for the next household, and continued doing so. If the village/mahalla was small, and the number of households did not reach 125, then the interviewers moved to the closest village/mahallah and completed the interview. If there were more than 200 households in the village/mahallah, then the survey stopped at reaching the 200th household. For each village/mahallah, 14 children (7 boys and 7 girls) aged 11-12 years, chosen randomly from the surveyed households, were interviewed for the ABC survey. For the school survey, all schools located in the selected village/mahallah and its adjacent village/mahallah were surveyed through the School Observation Checklist.

TABLE 1
SUMMARY OF MAIN VARIABLES

Panel A: Individual Level Means*	All Bangladesh		Rural		Urban	
	Boys	Girls	Boys	Girls	Boys	Girls
Enrollment rate	.766	.791	.760	.793	.793	.784
	(.42)	(.41)	(.43)	(.41)	(.41)	(.41)
Number of adults in household	2.59	2.59	2.57	2.57	2.67	2.66
	(1.37)	(1.36)	(1.31)	(1.34)	(1.56)	(1.45)
Number of siblings	3.83	3.90	3.92	4.00	3.51	3.50
	(1.72)	(1.69)	(1.72)	(1.70)	(1.68)	(1.58)
Proportion of boys among siblings	.67	.36	.66	.37	.68	.32
	(.23)	(.23)	(.23)	(.22)	(.24)	(.24)
Proportion of female headed households	.030	.030	.032	.032	.024	.026
	(.17)	(.17)	(.18)	(.18)	(.15)	(.16)
Father's education (class passed)	3.13	3.18	2.64	2.70	5.04	4.95
	(4.22)	(4.25)	(3.77)	(3.82)	(5.19)	(5.17)
Mother's education (class passed)	1.99	2.00	1.58	1.62	3.57	3.41
	(3.19)	(3.17)	(2.68)	(2.72)	(4.31)	(4.17)
Proportion of households 'always in deficit'	.33	.32	.35	.34	.24	.23
	(.47)	(.47)	(.48)	(.48)	(.43)	(.42)
Proportion of households 'sometimes in deficit'	.33	.34	.35	.36	.29	.29
	(.47)	(.48)	(.48)	(.48)	(.45)	(.45)
Proportion of households economically 'balance'	.24	.24	.22	.22	.33	.32
	(.43)	(.43)	(.41)	(.41)	(.47)	(.47)
Proportion of households economically 'surplus'	.09	.10	.08	.08	.15	.16
	(.29)	(.30)	(.27)	(.27)	(.36)	(.37)
Proportion of households: mother access to NGO credit	.18	.18	.19	.19	.12	.13
	(.38)	(.38)	(.39)	(.39)	(.33)	(.33)
Proportion of household: mother involved in income generating activities	.25	.25	.27	.26	.19	.21
	(.43)	(.43)	(.44)	(.44)	(.39)	(.41)
Proportion of households: member sells labor at least 100 days/year	.48	.48	.51	.52	.37	.35
	(.50)	(.50)	(.50)	(.50)	(.48)	(.48)
Number of observations	15846	15187	12568	11965	3278	3222

Panel B: Village Level Means	All Bangladesh	Rural	Urban
Involvement of NGO schools	.07	.066	.084
	(.13)	(.13)	(.15)
Involvement of government schools	.61	.65	.49
	(.29)	(.30)	(.24)
Number of observations	240	180	60

Panel C: School Level Means	NGO schools	Gov. schools
Class size	29.8	55.3
	(5.1)	(30.7)
Proportion of teachers present on day of visit	.97	.86
	(.15)	(.18)
Proportion of female teachers	.92	.35
	(.26)	(.33)
Teachers' education (years)	10.1	11.8
	(1.3)	(1.0)
Teachers' experience (years)	2.65	19.5
	(2.4)	(5.7)
Proportion of schools with PTAs	.34	.70
	(.47)	(.46)
Proportion of schools with SMCs	.77	.99
	(.42)	(.09)
Attendance rate	.85	.55
	(.16)	(.15)
Number of observations	215	353

* Individual Level Means are those of individuals aged 6-10 years old.
Standard deviations are in parentheses. See the Data Appendix for detail on the 1998 Education Watch Data.

TABLE 2
PERCENTAGE OF CHILDREN WITH NO SCHOOLING
BY COHORT AND VILLAGE OF RESIDENCE

	NGO school availability in village of residence					
	At least 1 NGO school			No NGO school		
	Aged 17-20	Aged 11-14	% Change	Aged 17-20	Aged 11-14	% Change
	(1)	(2)	(3)	(4)	(5)	(6)
Girls:	.273	.126	-53.8	.244	.149	-38.9
	(.44)	(.33)		(.43)	(.36)	
Boys:	.234	.180	-23.1	.207	.165	-20.3
	(.43)	(.39)		(.41)	(.37)	

Standard deviations are in parentheses.

TABLE 3
DETERMINANTS OF NGO SCHOOL LOCATION

Dependent variable: The involvement of NGO schools in a village						
	All Bangladesh		Rural		Urban	
	(1)	(2)	(3)	(4)	(5)	(6)
Village characteristics:						
Average class passed (adults 21 +)	-.025		-.025		-.022	
	(3.3)***		(2.3)**		(1.8)*	
% adults (21+) with no schooling		.259		.213		.399
		(3.5)***		(2.5)**		(2.5)**
NGO micro-credit in village	.039	.053	.063	.066	-.025	-.012
	(1.6)	(2.1)**	(1.9)*	(2.0)**	(.56)	(.28)
Average economic status	.023	.007	.038	.031	.011	.022
	(.59)	(.21)	(.82)	(.67)	(.16)	(.34)
% landless households	-.003	-.006	-.034	-.045	.108	.105
	(.05)	(.09)	(.48)	(.63)	(.81)	(.81)
% hh w/ members who sell labor	.050	.045	.031	.033	.108	.051
100 days/year +	(.74)	(.67)	(.38)	(.41)	(.87)	(.41)
% female- headed households	-.024	.007	-.003	.009	-.432	-.379
	(.13)	(.04)	(.02)	(.04)	(1.0)	(.91)
% Muslims	-.005	-.013	-.035	-.041	.125	.109
	(.13)	(.35)	(.80)	(.92)	(1.5)	(1.3)
Stratum effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	240	240	180	180	60	60
Adjusted R-squared	.14	.14	.10	.10	.25	.29

Absolute t-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

TABLE 4
ENTRY OF NGO SCHOOLS AND GIRLS' ENROLLMENT AND CLASS PASSED:
BOYS AND GIRLS AGED 11 TO 20

	Dependent variable: Ever enrolled = 1				Dependent variable: Last class passed			
	All children		Exposed	Non-exposed	All children		Exposed	Non-exposed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Exposed to NGO school	.182	.004			.207	.089		
	(2.0)**	(.03)			(1.7)*	(.69)		
Girl*Exposed to NGO school		.385				.231		
		(2.9)***				(2.8)***		
Girl	.065	-1.53	.308	.036	.102	-1.88	.290	.079
	(1.3)	(6.4)***	(2.7)***	(.70)	(2.6)**	(7.1)***	(3.1)***	(1.9)*
Control for child and family characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	43738	43738	4369	39264	43677	43677	4468	39209
Pseudo R2 / Adjusted R2	.254	.258	.253	.257	.449	.449	.408	.449

For columns (1) – (4), absolute z-statistics are in parentheses. For columns (5) – (8), absolute t-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are corrected for clustering at the village level. Child and family characteristics include: age of the child, number of adults in the household, number of siblings, percentage of boys among all siblings, whether the household is a female headed household, father's education, mother's education, household's self-perceived economic status, whether mother has access to NGO credit, whether mother is engaged in income-generating activities, whether there is at least one member of the household who sells labor more than 100 days/year, and religion. A child is considered 'exposed to an NGO school' if he/she was 10 years old or younger when the first NGO school in the village was established.

TABLE 5
ENTRY OF NGO SCHOOLS, ENROLLMENT, AND CLASS PASSED:
BOYS AND GIRLS AGED 11 TO 20

	Dep Var: Ever enrolled = 1		Dep var: Last class passed	
	Boys	Girls	Boys	Girls
	(1)	(2)	(3)	(4)
Number NGO schools*age11	.003	.093	.231	.261
	(.03)	(1.0)	(1.6)	(1.9)*
12	.130	.162	.229	.269
	(1.4)	(2.1)**	(1.8)*	(2.1)**
13	.007	.177	.206	.245
	(.08)	(2.3)**	(1.5)	(1.7)*
14	.049	.161	.138	.294
	(.38)	(2.2)**	(.93)	(2.1)**
15	.102	.196	.194	.266
	(1.1)	(2.5)**	(1.4)	(2.1)**
16	.012	.099	.088	.171
	(.14)	(1.5)	(.68)	(1.4)
17	-.020	.116	.030	.138
	(.25)	(1.5)	(.24)	(1.1)
18	.030	.099	.010	.109
	(.36)	(1.3)	(.07)	(.93)
19	-.042	.023	-.080	-.034
	(.41)	(.20)	(.46)	(.19)
Control for child and family characteristics	Yes	Yes	Yes	Yes
Village effects	Yes	Yes	Yes	Yes
Number of observations	22081	21657	22052	21629
Pseudo R2 / Adjusted R2	.238	.304	.448	.459

For columns (1) and (2), absolute z-statistics are in parentheses. For columns (3) and (4), absolute t-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are corrected for clustering at the village level. Child and family characteristics include: age of the child, number of adults in the household, number of siblings, percentage of boys among all siblings, whether the household is a female headed household, father's education, mother's education, household's self-perceived economic status, whether mother has access to NGO credit, whether mother is engaged in income-generating activities, whether there is at least one member of the household who sells labor more than 100 days/year, and religion. A child is considered 'exposed to an NGO school' if he/she was 10 years old or younger when the first NGO school in the village was established.

TABLE 6
SCHOOL ENROLLMENT: BOYS AND GIRLS AGED 6 TO 10

Dependent variable: Currently enrolled in school = 1				
	(1)	(2)	(3)	(4)
At least 1 NGO school	.013	-.114		
	(.15)	(1.2)		
Girl*At least 1 NGO school		.220		
		(2.6)***		
At least 1 government school	.107	.089		
	(.71)	(.54)		
Girl*At least 1 government school		.045		
		(.36)		
NGO school involvement			-.656	-.917
			(1.7)*	(2.2)**
Girl*NGO school involvement				.543
				(1.8)*
Government school involvement			.075	-.006
			(.47)	(.04)
Girl*Gov. school involvement				.168
				(1.3)
Girl	.114	-.748	.114	-.680
	(2.6)***	(2.6)***	(2.7)***	(2.3)**
Control for child and family characteristics	Yes	Yes	Yes	Yes
Control for village characteristics	Yes	Yes	Yes	Yes
Stratum effects	Yes	Yes	Yes	Yes
Number of observations	31033	31033	31033	31033
Pseudo R2	.143	.146	.143	.146

Absolute z-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are corrected for clustering at the village level. Child and family characteristics include: age of the child, number of adults in the household, number of siblings, percentage of boys among all siblings, whether the household is a female headed household, father's education, mother's education, household's self-perceived economic status, whether mother has access to NGO credit, whether mother is engaged in income-generating activities, whether there is at least one member of the household who sells labor more than 100 days/year, and religion. Village characteristics include percentage of adults with no schooling, whether there is an NGO micro-credit in the village, average economic status, percentage of landless households, percentage of households with members who sell labor more than 100 days/year, percentage of female headed households, and percentage of Muslims in the village.

TABLE 7
SCHOOL ENROLLMENT: RURAL VERSUS URBAN AREAS

	Rural versus urban			
	Dep var: Ever enrolled = 1		Dep var: Currently enrolled = 1	
	Rural	Urban	Rural	Urban
	(1)	(2)	(3)	(4)
PANEL A: 11-20 years old				
Exposed to NGO school	.010	-.104		
	(.08)	(.58)		
Girl*Exposed to NGO school	.315	.594		
	(2.2)**	(1.9)*		
Girl	-1.37	-2.23		
	(4.4)***	(4.1)***		
PANEL B: 6-10 years old				
Measure of supply of NGO schools (1)				
At least 1 NGO school			-.149	-.103
			(1.4)	(.51)
Girl*At least 1 NGO school			.195	.211
			(2.0)**	(1.5)
At least 1 gov. school			.015	.157
			(.07)	(.77)
Girl*At least 1 gov. school			-.022	.020
			(.13)	(.14)
Girl			-.639	-.407
			(2.0)**	(.87)
PANEL C: 6-10 years old				
Measure of supply of NGO schools (2)				
Fraction: NGO schools			-1.02	-1.88
			(1.9)*	(2.5)**
Girl*Fraction NGO			.796	-.086
			(2.2)**	(.22)
Fraction: Gov. schools			-.198	-.025
			(1.1)	(.06)
Girl*Fraction Gov.			.116	.015
			(.85)	(.06)
Girl			-.591	-.305
			(1.8)*	(.60)
Control for child and family characteristics	Yes	Yes	Yes	Yes
Control for village characteristics	No	No	Yes	Yes
Stratum effects	No	No	Yes	Yes
Village effects	Yes	Yes	No	No

Absolute z-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are corrected for clustering at the village level. Child and family characteristics include: age of the child, number of adults in the household, number of siblings, percentage of boys among all siblings, whether the household is a female headed household, father's education, mother's education, household's self-perceived economic status, whether mother has access to NGO credit, whether mother is engaged in income-generating activities, whether there is at least one member of the household who sells labor more than 100 days/year, and religion. Village characteristics include percentage of adults with no schooling, whether there is an NGO micro-credit in the village, average economic status, percentage of landless households, percentage of households with members who sell labor more than 100 days/year, percentage of female headed households, and percentage of Muslims in the village.

TABLE 8
SCHOOL ENROLLMENT: BRAC TARGET VERSUS NON-TARGET HOUSEHOLDS
BOYS AND GIRLS AGED 6 TO 10

Dependent variable: Currently enrolled in school = 1				
	BRAC target versus non-target households			
	Target	Non-target	Target	Non-target
	(1)	(2)	(3)	(4)
At least 1 NGO school	-.138	-.181		
	(1.0)	(1.7)*		
Girl*At least 1 NGO school	.214	.169		
	(1.7)*	(1.5)		
At least 1 government school	.187	-.299		
	(.88)	(1.2)		
Girl*At least 1 government school	-.259	.352		
	(1.4)	(1.4)		
NGO school involvement			-.737	-1.39
			(1.1)	(3.4)**
Girl*NGO school involvement			.872	.648
			(2.0)**	(1.6)
Government school involvement			-.029	-.364
			(.14)	(1.8)
Girl*Gov. school involvement			.198	-.026
			(1.1)	(.14)
Girl	-.403	-.608	-.684	-.216
	(1.0)	(1.6)	(1.6)	(.66)
Control for child and family characteristics	Yes	Yes	Yes	Yes
Control for village characteristics	Yes	Yes	Yes	Yes
Stratum effects	Yes	Yes	Yes	Yes
Number of observations	10331	14202	10331	14202
Pseudo R2	.107	.142	.107	.142

Absolute z-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are corrected for clustering at the village level. Child and family characteristics include: age of the child, number of adults in the household, number of siblings, percentage of boys among all siblings, whether the household is a female headed household, father's education, mother's education, household's self-perceived economic status, whether mother has access to NGO credit, whether mother is engaged in income-generating activities, whether there is at least one member of the household who sells labor more than 100 days/year, and religion. Village characteristics include percentage of adults with no schooling, whether there is an NGO micro-credit in the village, average economic status, percentage of landless households, percentage of households with members who sell labor more than 100 days/year, percentage of female headed households, and percentage of Muslims in the village.

TABLE 9
BRAC SCHOOLS AND ENROLLMENT:
BOYS AND GIRLS AGED 6 TO 10

Dependent variable: Currently enrolled = 1						
	All Bangladesh		Rural	Urban	Target	Non-target
	(1)	(2)	(3)	(4)	(5)	(6)
Fraction: BRAC schools	-1.42	-1.91	-1.80	3.34	-2.00	-1.63
	(3.4)***	(5.1)***	(4.4)***	(4.2)***	(4.1)***	(3.7)***
Girl*Fraction BRAC		1.05	1.27	-.144	1.61	.836
		(2.3)**	(3.1)***	(.26)	(3.1)***	(1.8)*
Fraction: Gov. schools	.044	.037	-.234	.319	-.094	-.352
	(.28)	(.23)	(1.3)	(.85)	(.47)	(1.8)*
Girl*Fraction Gov.		.169	.126	-.031	.211	-.021
		(1.4)	(.91)	(.12)	(1.2)	(.12)
Girl	.116	-.680	-.606	-.169	-.716	-.226
	(2.7)***	(2.3)**	(1.9)*	(.32)	(1.7)*	(.69)
Control for child and family characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Control for village characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Stratum effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	31033	31033	24533	6500	10331	14202
Pseudo R2	.146	.148	.151	.190	.109	.142

Absolute z-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are corrected for clustering at the village level. Child and family characteristics include: age of the child, number of adults in the household, number of siblings, percentage of boys among all siblings, whether the household is a female headed household, father's education, mother's education, household's self-perceived economic status, whether mother has access to NGO credit, whether mother is engaged in income-generating activities, whether there is at least one member of the household who sells labor more than 100 days/year, and religion. Village characteristics include percentage of adults with no schooling, whether there is an NGO micro-credit in the village, average economic status, percentage of landless households, percentage of households with members who sell labor more than 100 days/year, percentage of female headed households, and percentage of Muslims in the village.

TABLE 10
SCHOOL CHARACTERISTICS AND ENROLLMENT:
BOYS AND GIRLS AGED 6 TO 10

Dependent variable: Currently enrolled in school = 1			
	Pooled	Interacted	
		Level	*Girl
	(1)	(2)	(3)
Class size (NGO)	.012	.004	.016
	(.67)	(.19)	(.78)
Class size (Gov.)	-.008	-.007	-.001
	(2.5)**	(2.2)**	(.18)
% teachers present (NGO)	-.577	-.304	-.811
	(.22)	(.11)	(0.38)
% teachers present (Gov.)	-.254	-.096	-.497
	(.48)	(.17)	(1.1)
% female teachers (NGO)	1.41	.927	1.04
	(4.3)***	(2.7)***	(2.3)**
% female teachers (Gov.)	.165	.007	.276
	(.30)	(.01)	(.67)
Teachers' education (NGO)	-.026	.002	-.056
	(.31)	(.02)	(.89)
Teachers' education (Gov.)	.056	.003	.133
	(.39)	(.02)	(1.2)
Teachers' experience (NGO)	-.013	-.027	.019
	(.44)	(.67)	(.47)
Teachers' experience (Gov.)	.034	.006	.065
	(1.3)	(.23)	(2.7)***
% of schools with PTAs (NGO)	.367	.364	-.005
	(1.8)*	(1.7)*	(.03)
% of schools with PTAs (Gov.)	-.047	-.025	-.078
	(.28)	(.15)	(.50)
% of schools with SMCs (NGO)	.316	.474	-.331
	(1.4)	(2.0)**	(1.7)*
% of schools with SMCs (Gov.)	1.84	2.72	-1.97
	(1.5)	(1.9)*	(1.5)
Control for child and family characteristics	Yes	Yes	
Control for village characteristics	Yes	Yes	
Stratum effects	Yes	Yes	
Number of observations	8611	8611	
Pseudo R2	.158	.168	

Absolute z-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are clustered at the village level. Child and family characteristics include: age of the child, number of adults in the household, number of siblings, percentage of boys among all siblings, whether the household is a female headed household, father's education, mother's education, household's self-perceived economic status, whether mother has access to NGO credit, whether mother is engaged in income-generating activities, whether there is at least one member of the household who sells labor more than 100 days/year, and religion. Village characteristics include percentage of adults with no schooling, whether there is an NGO micro-credit in the village, average economic status, percentage of landless households, percentage of households with members who sell labor more than 100 days/year, percentage of female headed households, and percentage of Muslims in the village.

TABLE 11
TEST SCORES: BOYS AND GIRLS AGED 11 TO 12

	ABC		Life skills		Reading		Writing		Numeracy	
	Level	*Girl	Level	*Girl	Level	*Girl	Level	*Girl	Level	*Girl
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Currently attending	.902	2.02	.708	.498	.838	.053	2.35	.468	.384	.105
NGO school	(1.6)	(2.5)**	(2.6)***	(1.4)	(4.6)***	(.20)	(5.6)***	(.79)	(2.3)**	(.45)
Currently attending	-.046	1.51	-.132	.269	.361	-.030	0.89	.015	.212	-.068
government school	(.10)	(1.9)*	(.56)	(.88)	(2.6)**	(.16)	(3.1)***	(.04)	(1.4)	(.30)
Indicator: Girl	-1.48		-.850		.604		.383		-.943	
	(1.1)		(1.5)		(1.9)*		(.73)		(4.0)***	
Class passed	.761	-.062	.399	-.049	.525	-.005	1.08	.025	.226	.102
	(8.6)***	(.53)	(9.3)***	(.87)	(17.4)***	(.12)	(17.5)***	(.31)	(9.0)***	(2.7)***
Listen to the radio	.526	-.494	.226	.029	.136	-.026	.200	-.201	-.014	.074
	(3.1)***	(2.0)**	(2.5)**	(.23)	(2.1)**	(.28)	(1.6)	(1.0)	(.26)	(.94)
Watch television	-.058	.140	.208	-.061	.041	-.110	-.013	-.061	.039	-.144
	(.32)	(.62)	(2.0)**	(.46)	(.55)	(1.1)	(.10)	(.33)	(.71)	(1.7)*
Read newspaper	.973	.078	.366	.048	-.090	.427	-.030	.686	-.023	.218
	(2.9)***	(.18)	(2.6)**	(.20)	(.90)	(2.9)***	(.15)	(2.0)**	(.38)	(1.9)*
Father's education	.035	.005	.016	.001	.019	.002	.051	.004	-.002	-.000
	(1.4)	(.14)	(1.1)	(.03)	(1.8)*	(.15)	(2.7)***	(.14)	(.22)	(.02)
Mother's education	.054	-.028	.011	.024	-.018	.013	-.003	.019	.010	-.003
	(1.5)	(.58)	(.56)	(.96)	(1.4)	(.75)	(.11)	(.55)	(1.1)	(.18)
Always in deficit	-.206	.341	.096	.017	-.073	.013	-.159	.047	.034	.059
	(.83)	(1.0)	(.71)	(.10)	(.81)	(.11)	(.89)	(.19)	(.43)	(.53)
Sometimes in deficit	-.252	.331	-.078	.006	-.066	.086	-.256	.180	-.010	.106
	(1.3)	(1.1)	(.63)	(.04)	(.83)	(.71)	(1.7)	(.78)	(.15)	(1.2)
Surplus	-.540	.708	-.153	.022	-.237	.343	-.614	.683	-.072	.181
	(1.9)*	(1.9)*	(.99)	(.11)	(2.0)**	(2.1)**	(2.7)***	(2.2)**	(.92)	(1.5)
Mother: access to NGO credit	-.037	.294	.156	-.026	-.070	.146	-.164	.089	.035	.028
	(.16)	(.95)	(1.4)	(.16)	(.70)	(1.2)	(.86)	(.38)	(.53)	(.29)
Mother: involve in income	.010	-.125	-.067	.115	-.051	-.031	-.122	-.138	.030	-.030
generating activities	(.05)	(.48)	(.62)	(.78)	(.64)	(.29)	(.78)	(.69)	(.50)	(.33)
At least 1 member of hh	.215	-.179	.026	-.170	.037	-.153	.052	-.197	.029	.060
sells labor 100 days/year +	(1.1)	(.65)	(.26)	(1.2)	(.52)	(1.6)	(.35)	(1.0)	(.53)	(.70)
Control for other family charac. and other school types	Yes		Yes		Yes		Yes		Yes	
Village effects	Yes		Yes		Yes		Yes		Yes	
Number of observations	3061		3324		3324		3324		3324	
Pseudo R2 / Adjusted R2	.339		.363		.518		.577		.295	

For columns (1) and (2), absolute z-statistics are in parentheses. For columns (3) to (10), absolute t-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are clustered at the village level. Child and family characteristics include: age of the child, number of adults in the household, number of siblings, percentage of boys among all siblings, whether the household is a female headed household, father's education, mother's education, household's self-perceived economic status, whether mother has access to NGO credit, whether mother is engaged in income-generating activities, whether there is at least one member of the household who sells labor more than 100 days/year, and religion.

Appendix 2:

TABLE 12
DETERMINANTS OF SCHOOL ENROLLMENT: BOYS AND GIRLS AGED 6 TO 10

Dependent variable: Currently enrolled in school = 1						
	All Bangladesh		Rural		Urban	
	Boys	Girls	Boys	Girls	Boys	Girls
	(1)	(2)	(3)	(4)	(5)	(6)
NGO school involvement	-.862	-.444	-.870	-.403	-1.73	-2.10
	(2.2)**	(-1.0)	(1.7)*	(.77)	(2.3)**	(2.0)**
Government school involvement	.039	.130	-.140	-.142	.045	-.063
	(.24)	(.71)	(.75)	(.73)	(.10)	(.10)
Number adults	.080	.080	.094	.111	.019	-.018
	(3.9)***	(4.1)***	(4.2)***	(5.0)***	(.40)	(.49)
Number siblings	-.036	-.058	-.057	-.074	.059	-.004
	(2.3)**	(3.5)***	(3.5)***	(4.1)***	(1.7)*	(.10)
Percentage of boys	-.447	.174	-.463	.168	-.382	.197
	(5.0)***	(1.5)	(4.5)***	(1.3)	(2.1)**	(.82)
Female head of household	-.213	-.052	-.257	-.082	.070	.129
	(1.9)*	(.38)	(2.1)**	(.53)	(.21)	(.39)
Father's education	.078	.107	.093	.116	.042	.090
	(8.6)***	(10.4)***	(8.9)***	(10.7)***	(2.2)**	(4.1)***
Mother's education	.139	.140	.128	.126	.193	.188
	(10.5)***	(9.2)***	(8.3)***	(6.7)***	(7.1)***	(6.6)***
Always in deficit	-.530	-.536	-.512	-.571	-.642	-.311
	(7.6)***	(7.1)***	(6.7)***	(6.8)***	(4.2)***	(2.0)**
Sometimes in deficit	-.106	-.100	-.143	-.184	.005	.199
	(1.7)**	(1.3)	(2.1)**	(2.2)**	(.04)	(1.3)
Surplus	.168	-.432	.120	-.111	.315	-.731
	(1.6)	(3.1)***	(.94)	(.75)	(1.7)*	(3.3)***
Mother: access to NGO credit	.257	.285	.172	.189	.667	.637
	(3.3)***	(3.6)***	(2.1)**	(2.3)**	(4.1)***	(3.4)***
Mother: income generating	-.009	-.132	.054	-.108	-.391	-.333
activities	(.16)	(1.9)**	(.84)	(1.3)	(3.6)***	(2.7)***
At lease 1 household member	-.490	-.357	-.537	-.364	-.308	-.394
sells labour 100 days/year +	(9.7)***	(6.2)***	(9.6)***	(5.7)***	(2.9)***	(3.3)***
Stratum effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	15846	15187	12568	11965	3278	3222
Pseudo R2	.143	.153	.140	.162	.191	.185

Absolute z-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are corrected for clustering at the village level. Child and family characteristics include: age of the child, number of adults in the household, number of siblings, percentage of boys among all siblings, whether the household is a female headed household, father's education, mother's education, household's self-perceived economic status, whether mother has access to NGO credit, whether mother is engaged in income-generating activities, whether there is at least one member of the household who sells labor more than 100 days/year, and religion. Village characteristics include percentage of adults with no schooling, whether there is an NGO micro-credit in the village, average economic status, percentage of landless households, percentage of households with members who sell labor more than 100 days/year, percentage of female headed households, and percentage of Muslims in the village. Percentage of adults with no schooling has a negative and significant relationship with the probability of being enrolled for both boys and girls. Percentage of households with members who sell labor more than 100 days/year has a positive and significant relationship with the probability of being enrolled for boys. All other village characteristics are insignificant.

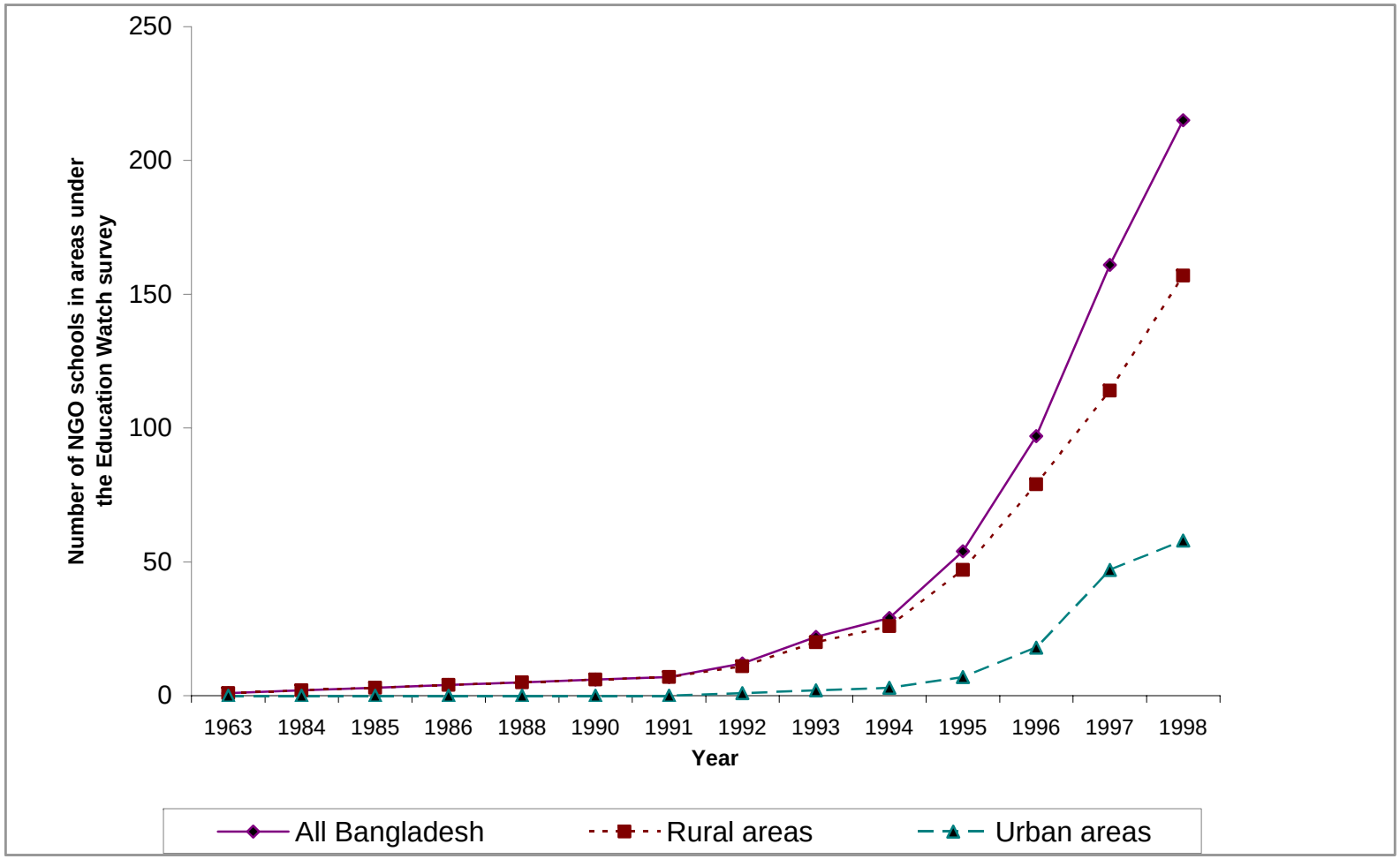

FIGURE 1: EXPANSION OF NGO SCHOOLS IN BANGLADESH

Notes: All variables refer to the cumulative number of NGO schools. The variables are constructed using information from the 1998 Education Watch data. The Data Appendix provides a full description of the data.

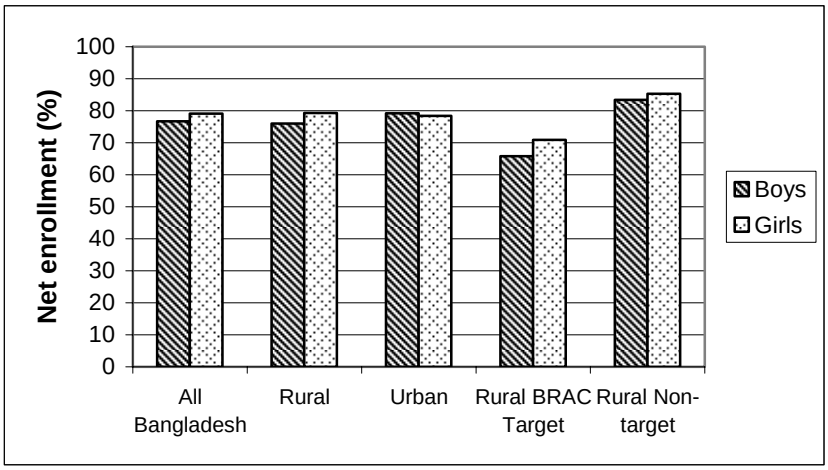

FIGURE 2A: NET ENROLLMENT IN BANGLADESH

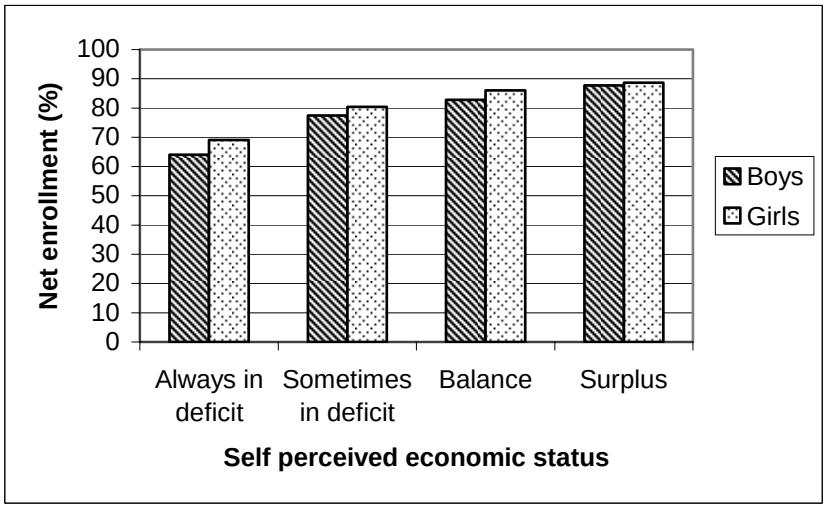

FIGURE 2B: NET ENROLLMENT AND SELF PERCEIVED ECONOMIC STATUS IN RURAL BANGLADESH

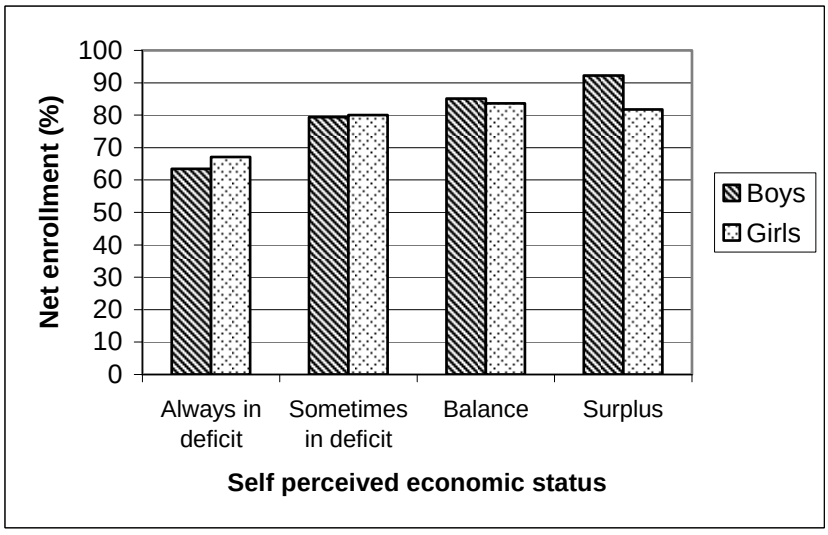

FIGURE 2C: NET ENROLLMENT AND SELF PERCEIVED ECONOMIC STATUS IN URBAN BANGLADESH

Notes: The variables are constructed using information from the 1998 Education Watch data. The Data Appendix provides a full description of the data. BRAC target households are defined as households with less than 0.5 acre of land and at least 1 person engaged in manual labor for at least 100 days a year (Nath, 1999).

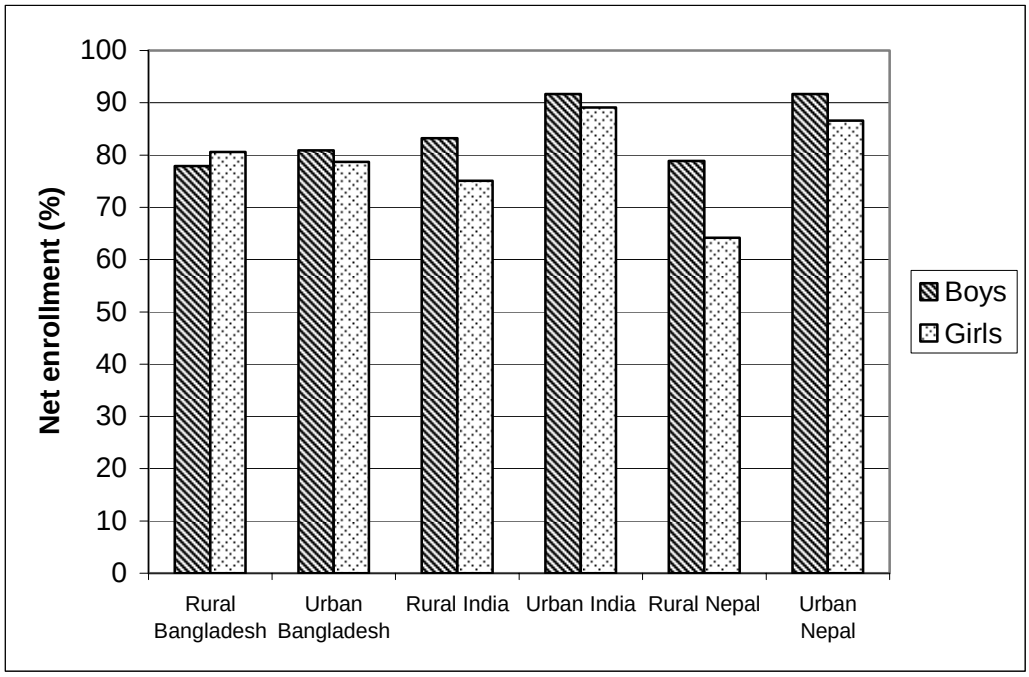

FIGURE 3A: NET ENROLLMENT IN BANGLADESH, INDIA, AND NEPAL: BY AREA

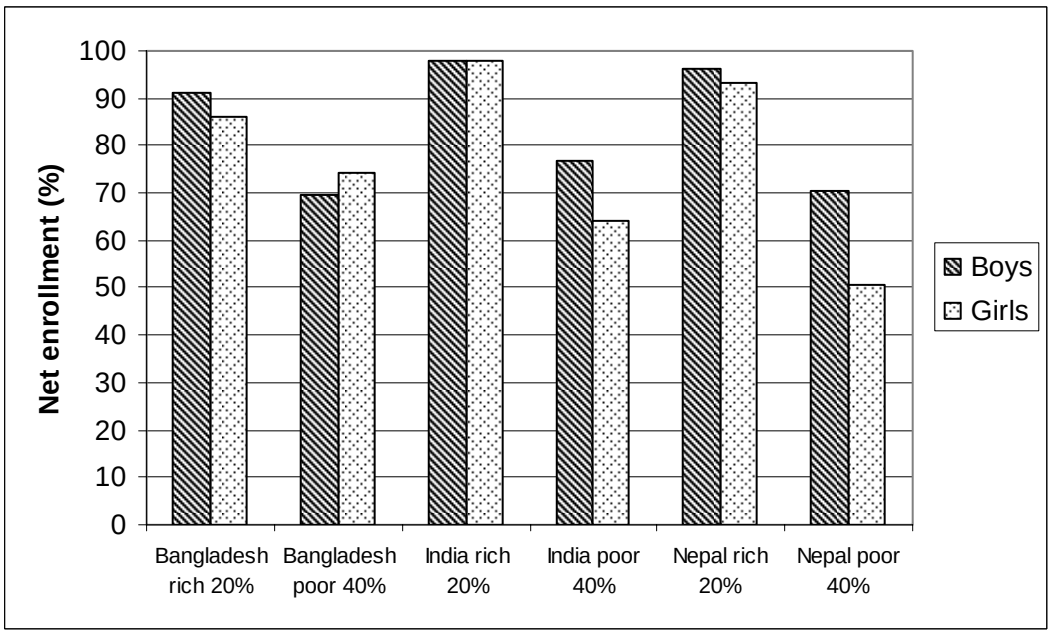

FIGURE 3B: NET ENROLLMENT IN BANGLADESH, INDIA, AND NEPAL: BY ECONOMIC STATUS

Notes: The variables are constructed using information from the Demographic and Health Survey (Bangladesh 1999, India 1998/99, and Nepal 2001), as reported in the data sheet in support of Filmer (2003).