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The Net Impact of the Female Secondary School Stipend Program in Bangladesh*

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Abstract

This paper examines the impact of the secondary school stipend program for female students on student enrolment in Bangladesh. After a brief description of the stipend program, we examine both nationwide and project-level data on student enrolment. While the former data show little identifiable impact of the stipend program, the project-level data show significant positive impact of the program. We find that, on average, the stipend program increased female student enrolment by 2% above the prevailing trend rate of increase while the program had significantly negative impact on male enrolment. Thus the program had a major effect in closing the gender gap, thereby accelerating the trend that had already existed in Bangladesh before the stipend program was introduced in 1994.

1. Introduction

It has been well recognized that educating girls needs special attention not only for the purpose of closing the gender gap in education but also for their important role in economic activities and in enhancing the welfare of household members, particularly of children. Increasing female school enrolment at the secondary schooling level is crucial for augmenting the stock of female school teachers, agricultural extension agents and family planning workers, and NGO field workers, as well as of girls pursuing higher education. Furthermore, it has been found in various studies that the effects of female education on lowering fertility mainly operate at the secondary schooling level.

Gender disparity is particularly pronounced in South Asia (including Bangladesh). South Asia is one of the few areas in the world where gender discrimination is so severe that aggregate population statistics reveal skewed gender ratios suggesting differential life expectancies between women and men resulting from socio, economic and cultural factors. (e. g., Sen 1990) In rural Bangladesh, although there have been rapid changes

in recent years (as we will see in later sections), girls, unlike boys, have often been seen as a liability rather than an asset, with lower levels of education, low participation in productive economic activities, early marriages and high fertility. For example, the literacy rate in Bangladesh was about 35%, and among women it was only 22%, as of early 1990s. (World Bank 1992) At the secondary education level, 33% of the total enrolled were female and only 5% of them completed up to grade 10. (GOB 1996) In addition to such official statistics, the World Bank conducted a household-level survey with basic skill attainment testing in 1991/92. Its results indicate that only 10% of the population have mastered a basic set of minimum literacy and mathematical skills, and that a sizable minority of those with at least some secondary school education did not have such minimum skills. The survey also showed significant gender gaps in such skill attainment. (Khandker 1999)

In response to such a situation, important government interventions have been implemented in the secondary education sector in Bangladesh in recent years. These interventions include: Female Secondary School Assistance Project (FSSAP) funded by IDA, Female

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Secondary Stipend Project (FSSP) funded by GOB, Secondary Education Development Project (SEDP) and Community School Project funded by ADB, and Female Secondary Education Project (FSEP) funded by NORAD. Major components of these projects are the nationwide stipend programs targeted to the girls of grade between 6 and 10 in 460 rural thanas¹, starting in 1994². As we will describe in the next section, these programs intend to stimulate a significant increase in secondary school enrolment of girls and to reduce early marriage by providing tuition subsidies and stipend allowances to all qualified girls³.

As a result of such program initiatives and perhaps of other factors, there has been a marked increase in the secondary school enrolment among female students in recent years. (See Section 2 below) Furthermore, in 1998, the average performance of girls exceeded that of boys in the national post-secondary school level examination, Secondary School Certificate, a significant achievement indeed.

Now about five years after the implementation of the nationwide secondary school stipend program, there appears to be an ideal opportunity to evaluate the impact and effectiveness of this important policy intervention. This paper attempts to measure the net impact of the secondary school stipend program on girls' and boys' enrolment utilizing the school-level enrolment data obtained from the Management and Information System (MIS) set up for the Female Secondary School Assistance Project (FSSAP) funded by the World Bank. We find that the stipend program had a significant impact on girls' enrolment at secondary schooling level, after controlling for the trend rate of increase over time which results from both the impact of the educational policies prior to the stipend program and the secular increase in the demand for girls' education.

2. The Female Secondary Stipend Program:

Project description

The main objective of the Female Secondary Stipend Program was to stimulate a significant increase in secondary school enrolment of girls, thereby enlarging the stock of educated women capable of participating fully in economic and social development of Bangla-

desh (GOB 1996, World Bank 1993). The more specific objectives of the program consist of short-term and long-term objectives. The short-term objectives are:

- (a) to increase the number of enrolment among female students in classes 6-10;
- (b) to assist them pass their SSC examination so that they become qualified for employment as primary school teachers, agricultural extension agents, health and family planning workers and NGO field workers, etc.; and
- (c) to hold them in studies and refrain from early marriage.

The long-term objectives are:

- (a) to enlarge the number of educated women capable of participating in economic and social development of the Bangladesh;
- (b) to increase the social status of the female in the community and reduce gender gap;
- (c) to create a positive impact on population growth; and
- (d) to provide occupational skills training to school leaving girls interested in entering the labour market as self-employed workers, semi-skilled and skilled workers.

The program was launched nationwide in January 1994 and is implemented by four project implementation units (PIUs) according to the separate funding agencies of the program, namely:

- Female Secondary Stipend Project (FSSP) financed by the Government of Bangladesh (GOB) (282 thanas)
- Female Secondary School Assistance Project (FSSAP) financed by the World Bank and GOB (118 thanas)
- Secondary Education Development Project (SEDP) financed by the Asian Development Bank and GOB (53 thanas)
- Female Secondary Education Project financed by Norwegian Government (NORAD) (7 thanas)

Despite the existence of the separate PIUs, they all share the same primary objectives mentioned above, the uniform stipend scheme (including the stipend amount and eligibility criteria) and the uniform Management Information System (MIS), as described by the Operation Manual (GOB 1996).

In order to achieve those program objectives, the

Stipend and Tuition Rates (amount in Taka)

class	Type of institution	First installment: Jan-Jun				second installation: Jul-Dec				annual total	monthly stipend	monthly tuition
		stipend	tuition	books	total	stipend	tuition	books	total			
6	Gov't	150	60		210	150	60		210	420	25	10
	Non-gov't	150	90		240	150	90		240	480	25	15
7	Gov't	180	72		252	180	72		252	504	30	12
	Non-gov't	180	90		270	180	90		270	540	30	15
8	Gov't	210	72		282	210	72		282	564	35	12
	Non-gov't	210	90		300	210	90		300	600	35	15
9	Gov't	360	90	250	700	360	90		450	1150	60	15
	Non-gov't	360	120	250	730	360	120		480	1210	60	20
10	Gov't	360	90		450	540	135	250	925	1375	60	15
	Non-gov't	360	120		480	540	180	250	970	1450	60	20

Program provides financial assistance to eligible female students in classes 6 through 10. The eligibility criteria are as follows:

- (1) attendance of at least 75% of school days;
- (2) securing at least 45% marks in the annual examination, and
- (3) remaining unmarried.

Once a school participates in the program, all the female students satisfying the above criteria receive the stipend as specified below and the students have to comply with those conditions for continuation of the stipend. For each stipend student, the schools also receive tuition subsidy from the project so the recipient would have to pay no tuition. The amount of stipend and other allowances to be paid for the eligible female students are specified as in the above table (GOB 1996).

In addition, these stipend programs also have been complemented with other components such as curriculum reforms and instructional materials development, teacher training, recruitment of female teachers, improvement of school infrastructure, awareness programs at the community level, and institutional capacity building. These additional project components, however, differ depending on the funding agencies (i. e., Asian Development Bank, World Bank, NORAD and GOB).

3. Nationwide Secondary School Enrolment in Bangladesh, 1989-1996

Before turning to the analysis of our school-level data set focussing on the net impact of the stipend project on girls' enrolment, we briefly examine the nation-wide statistics on the changes in the secondary school enrolment in the past ten years in Bangladesh. Table 1 summarizes secondary school enrolment, by gender, since 1961. As Figure 1 shows, there has been a steady upward trend in the enrolment for both male and female students throughout the data period. Female enrolment generally grew faster than male enrolment, thus the share of female students increased steadily over time (except in 1993) from 17% in 1970 to 44% in 1996. Furthermore, the annual growth rate appears to have increased over time; while the average annual growth rate of female (male) enrolment was 10% (4%) between 1985 and 1991, it increased slightly to 13% (7%) between 1991 and 1996.

There was a major increase (jump) in male secondary enrolment in 1993 and then a stall in 1994. Also, the trend increase in male enrolment appears to be slightly higher in the period after 1991 than previously. On the other hand, female enrolment had a major jump in 1995.

In sum, the nation-wide statistics reveal that the secondary school enrolment has been increasing for both boys and girls and that the rate of increase in enrolment has tended to be higher among girls than

Table 1 Number of secondary school students (thousands)

Year	boys		girls		Total		female share
	enrolment	growth	enrolment	growth	enrolment	growth	
1961	367	—	166	—	533	—	31.14%
1970	1205	14.12%*	255	4.89%*	1460	11.85%*	17.47%
1980	1778	3.97%	627	9.41%	2405	5.12%	26.07%
1985	1866	0.97%	772	4.25%	2638	1.87%	29.26%
1986	1941	4.02%	804	4.15%	2745	4.06%	29.29%
1987	2053	5.77%	909	13.06%	2962	7.91%	30.69%
1988	2130	3.75%	1014	11.55%	3144	6.14%	32.25%
1989	2293	7.65%	1124	10.85%	3417	8.68%	32.89%
1990	2345	2.27%	1180	4.98%	3525	3.16%	33.48%
1991	2297	-2.05%	1365	15.68%	3662	3.89%	37.27%
1992	2480	7.97%	1529	12.01%	4009	9.48%	38.14%
1993	3017	21.65%	1656	8.31%	4673	16.56%	35.44%
1994	3008	-0.30%	1876	13.29%	4884	4.52%	38.41%
1995	3204	6.52%	2327	24.04%	5531	13.25%	42.07%
1996	3277	2.28%	2511	7.91%	5788	4.65%	43.38%
1997	3277	2.28%	2511	7.91%	5788	4.65%	43.38%

(source: Statistical Yearbook 1997 : 544)

* : annual average

Secondary school enrollment

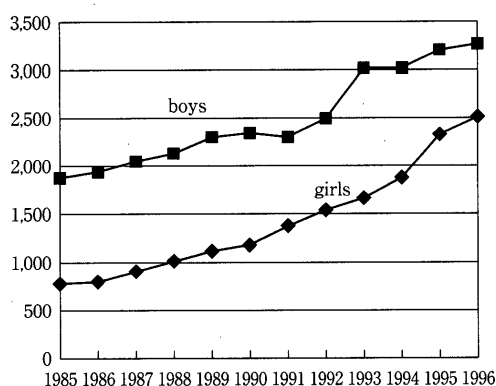


Figure 1

share of female secondary students

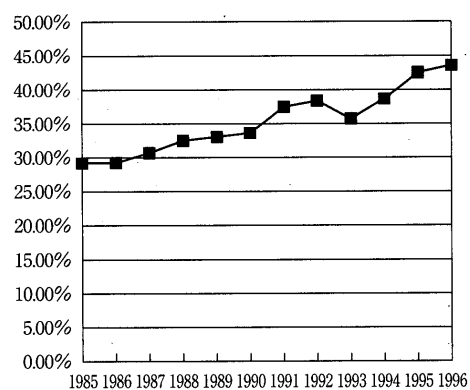


Figure 2

Figure 3 The Student Class Cohorts* Included in the FSSAP-MIS Data and Stipend Recipients

Year	Class 6	Class 7	Class 8	Class 9	Class 10
1994	1994 cohort	1993 cohort	1992 cohort	1991 cohort	1990 cohort
1995	1995 cohort	1994 cohort	1993 cohort	1992 cohort	1991 cohort
1996	1996 cohort	1995 cohort	1994 cohort	1993 cohort	1992 cohort
1997	1997 cohort	1996 cohort	1995 cohort	1994 cohort	1993 cohort
1998	1998 cohort	1997 cohort	1996 cohort	1995 cohort	1994 cohort

*A 'class cohort' is defined as a group of students entering secondary school in a particular year, with each class cohort being identified by the year of entering class 6 (entering class cohort of 1990, 1991, 1992, etc.) The shaded areas in the table indicate the class cohort eligible for the stipend in a given year.

among boys, thereby closing the gender gap. At this level of aggregation, however, it appears not possible to identify any clear impact of the stipend program which started in 1994. Thus, we now turn to the project MIS data in order to quantify the program impact on female enrolment at secondary schools.

4. Data Description and a Preliminary Analysis

The Data

The data set we will utilize is the Management and Information System (MIS) data collected in conjunction with the administration of the World Bank funded portion of the nationwide stipend program, the Female Secondary School Assistance Project (FSSAP). All the secondary schools participating in any of the female secondary stipend programs (i. e., FSSP funded by the Government, FSSAP funded by the World Bank, SEDP funded by ADB and FSEP by NORAD) are required to regularly provide the project offices with school and recipient information using a uniform MIS format; such required information includes student enrolment by gender and by class, information on school facilities (e. g., class room size, availability of tube wells, latrines, etc.), attendance and examination record of the stipend recipients and other school information needed for administering the stipend program. We will utilize the enrolment information as well as other school characteristics included in the MIS data obtained from the World Bank funded FSSAP project office which were relatively well organized. While all the other stipend program offices presumably maintain essentially the same set of information under the same MIS format, MIS data from other project offices were either not immediately available (e. g., school-level information being not yet computerized) or not well organized to be easily accessible.

Data Caveats

Unfortunately, our data set is not ideal for isolating all the sources affecting the enrolment changes and identifying the net impact of the stipend program on student enrolment. Among the possible sources of changes in the enrolment other than the net impact of the stipend, identifying the trend increase in enrolment that would have existed without the stipend pro-

gram, due to the combined effects of the pre-stipend education policies and the secular trend increase in the demand for girls' schooling, appears most important but difficult. We observed in section 2 a clear upward trend in girls' enrolment over the past decade prior to the start of the stipend program⁴.

The student cohorts observed in our data set are summarized in Figure 4. The FSSAP-MIS data contain enrolment data for each class for the year between 1994 (for schools that joined the program after 1994, the first year they joined the program) and 1998 so that MIS data constitute a panel data set on enrolment immediately following the introduction of the stipend program. A major limitation of our data, however, is that they contain no information on the period before the program was introduced, although there is a feature of the program that allows us to infer the enrolment before the introduction of the stipend program; the stipend program restricted the entry points for the stipend recipients to only class 6 and class 9. As a result, when the nation-wide stipend program started in 1994, stipend was awarded to the female students in classes 6 and 9 alone. In 1995, stipend was awarded to the female students in all the classes except class 8. Starting in 1996, all the female students meeting the eligibility criteria⁵ received stipend regardless the class cohort (the class cohorts of female students receiving stipend in different years—indicated by the shaded area—are summarized in Figure 4). Thus the existence of those students not receiving the stipend even after the school joined the program would allow us to estimate the before and after difference in student enrolment due to the stipend. Nevertheless, while the FSSAP-MIS data provide a panel of observations on the student cohorts receiving the stipend, there are relatively few observations on the pre-stipend student cohorts. Therefore, separating the increase in the student enrolment after the stipend from the pre-stipend trend rate of increase is likely to be rather difficult.

Finally, the observed increase in the student enrolment for each school in our data set could potentially be in part due to the students transferring from non-project schools into the project schools. The magnitude of such transferring students from non-program schools to program-schools, however, is not identifiable

in our data. Based on the FSSAP-MIS database, 82% of the program schools as of 1998 had joined the program in the initial project year of 1994. Given such a fairly rapid spread of the program and given the (probably) limited choice of schools to attend in rural areas, the magnitude of students transferring due to the stipend program may not be overwhelming. To the extent such effects are present, however, they would constitute a part of our estimated impact of the stipend.

A Preliminary Analysis of the FSSAP-MIS Data

While the national aggregate data did not allow us to observe any clear impact of the stipend program, the aggregate statistics from the FSSAP-MIS data do reveal the impact of the stipend on the enrolment among female students. Tables 2 through 4 (and corresponding Figures 5 through 7) summarize class-wise total enrolment among male students, class-wise total enrolment among female students and class-wise share of female students, respectively. Since we are interested in the increase over time the schools included in these tables are limited to the 1826 schools which appeared in the MIS database throughout the entire period between 1994 and 1998⁵. Figure 6 (based on

Table 3) shows the changes in the female student enrolment between 1994 and 1998 by class. We can observe that there was a major jump in enrolment in 1995 for class 7, in 1996 for class 8, in 1997 for class 9 and in 1998 for class 10 while no comparable jump in enrolment is observed for class 6. On the other hand, Figure 5 indicate no sign of such systematic increase in male enrolment. These findings are consistent with a possibility that the start of the stipend program in 1994 resulted in a major increase in the enrolment of female students among the entering cohort of 1994 in class 6. The changes in the share of female students, as depicted in Figure 7, show very similar patterns as observed in the female enrolment (Figure 6). It thus appears quite clear that the stipend program had a major impact on the enrolment of female students but not so much on the male students. In the following section, attempts will be made to quantify the magnitude of such impact using regression analysis.

5. Identifying the Effects of the Stipend Program: a statistical model

As we saw in the previous section, since some cohorts of students were excluded as stipend recipients

Table 2 Secondary School Enrolment among FSSAP Schools: male only

year	Class 6	class 7	class 8	class 9	class 10
1994	78823	63299	54508	45966	41897
1995	83230	70190	60347	50604	38687
1996	83987	74877	62701	51481	48336
1997	85317	71362	64548	55799	44857
1998	79783	66343	55817	50819	41178

(total number of schools = 1826)

Table 3 Secondary School Enrolment among FSSAP Schools: female only

year	Class 6	class 7	class 8	class 9	class 10
1994	83452	59419	51177	37368	30253
1995	79979	78443	56424	41445	33647
1996	82858	75105	71718	43425	41608
1997	89620	77464	69484	68343	39843
1998	93970	79923	67788	64820	56131

(total number of schools = 1826)

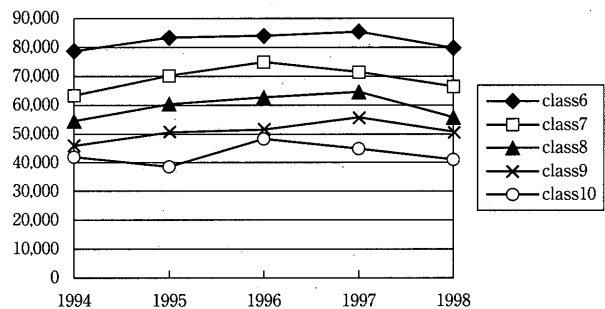


Figure 5 Secondary School Enrolment: male

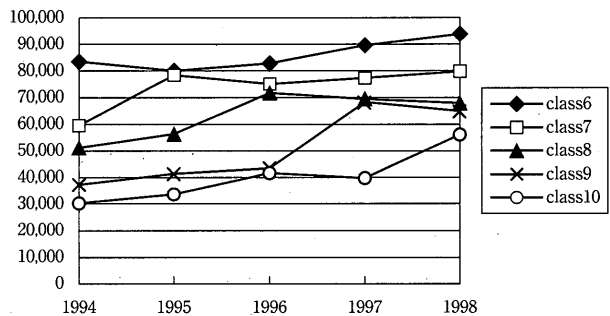


Figure 6 Secondary School Enrolment: female

Table 4 Share of Female Students among FSSAP Schools

year	Class 6	class 7	class 8	class 9	class 10
1994	0.5143	0.4842	0.4842	0.4484	0.4193
1995	0.49	0.5278	0.4832	0.4502	0.4652
1996	0.4966	0.5008	0.5335	0.4576	0.4626
1997	0.5123	0.5205	0.5184	0.5505	0.4704
1998	0.5408	0.5464	0.5484	0.5605	0.5768

(total number of schools = 1826)

in certain years during our data period (i. e., the entering class of 1992 in their class 8 year, the entering class of 1993 during their class 7 and 8 years and the entering class of 1990 during their class 10 year), it is possible to estimate the impact of the stipend program on enrolment if we are willing to make additional assumptions.

In the following analysis we assume that there are fixed rates of survival between class 6 and the subsequent class levels (i. e., class 7 through class 10), which are constant over time but vary among different class levels. We also assume that (1) the stipend program introduces a one time increase in the enrolment (affecting enrolment by the same amount across all class-levels) but (2) the trend rate of increase stays at the same level as before the introduction of the stipend program (thus the stipend only affects the intercept but not the trend coefficient). Our statistical model under these assumptions would take the following form:

$$Y_{ckmt} = \beta_0 + \beta_1 D_{ct}^{\text{stipend}} + \beta_2 T_t + \sum_{i=7}^{10} \beta_3 D_c^{\text{class } i} + \beta_4 S_{kmt} + \mu_{km} + \mu_m + \varepsilon_{ckmt} \quad (1)$$

where:

- Log of the number of female students enrolled, Y_{ckmt} (in class level c , at school k , in thana m , in year t).
- Time trend, T_t (i. e., 1994 = 1, 1995 = 2, etc.).
- Dummies for the year cohort of students eligible for the stipend program, D_{ct}^{stipend} . D_{ct}^{stipend} takes the value one if the students were eligible for the stipend in particular year, and zero otherwise.
- Dummies for class-level i , $D_c^{\text{class } i}$ (class 7–10).
- Project inputs and other school characteristics, S_{kmt} : number of tube wells; number of latrines, classroom square-footage; number of PTA/SMC

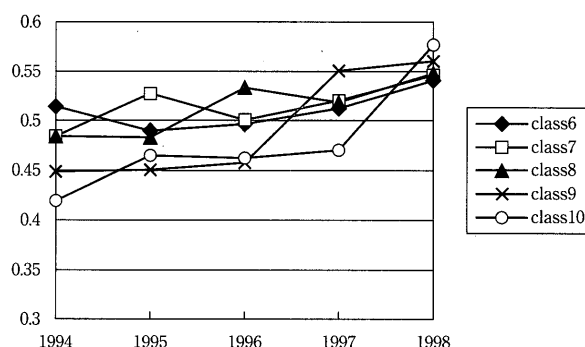


Figure 7 Share of Female Students

meetings;⁷

- μ_{km} : unobserved school specific effects.
- μ_m : unobserved Thana specific effects.
- β_1 measures the average rate of the increase in student enrolment due to stipend, across all class-levels assuming that the trend rate of increase remains the same before and after the stipend. β_3^i measures the average rate of student drop-out between class 6 and class i .
- β_4 measures the net effects of school level project inputs (other than stipend) on student enrolment.

6. Empirical Results

Our empirical results are presented in Table 5. We estimated these models assuming that the unobserved school specific and thana specific effects are fixed over time (i. e., fixed-effects model)⁸.

Our results show that the stipend program had a significantly positive impact on female enrolment but the quantitative magnitude appears rather small. On average, the stipend program increases overall female student enrolment by 2%, above the trend rate of increase observed before the introduction of the stipend program. The impact on the male student, on the other hand, is significantly negative with an estimated rate of -3%. Thus the stipend program had a significant positive enrolment impact on female students but negative impact on male students, thereby leading to significant reduction of the gender gap.

While the program is targeted only to female students and thus male students are not eligible for stipend, the program can have indirect effects on the enrolment of male students as well as direct effects on female enrolment. On one hand, provision of stipend

Table 5 Estimated (Fixed-Effects) Regression Coefficients
*Dependent Variable: Log of the number of students enrolled for each school by class, by gender**

Independent Variables	Male enrolment	Female enrolment
Stipend Dummy	-0.0338982 (-7.61)	0.0192165 (3.36)
Trend	0.0099581 (8.30)	0.0986113 (64.23)
Class dummy : class 7	-0.1512675 (-38.73)	-0.1824606 (-36.83)
Class dummy : class 8	-0.2986151 (-70.00)	-0.3835433 (-70.61)
Class dummy : class 9	-0.4635164 (-120.26)	-0.6077991 (-123.14)
Class dummy : class 10	-0.6454061 (-159.90)	-0.8465988 (-162.77)
Number of tube wells	-0.0059637 (-2.18)	0.0133665 (3.83)
Number of latrines	0.0047213 (2.63)	0.00447 (1.98)
Number of PTA meetings per year	-0.0002066 (-0.24)	-0.0017225 (-1.61)
Number of SMC meetings per year	0.0001858 (0.33)	-0.0000626 (-0.09)
Constant	3.790296 (526.271)	2.799474 (304.77)
R-squared	0.3064	0.3311
Total number of observations	79209	89478

*t-statistics in parentheses.

could have some 'income effects' for those households having school age girls and boys where, by relieving household resource constraints somewhat the program could encourage school enrolment of boys as well as girls. At the same time, however, there is also a possibility of 'cross-persons substitution effects'; with free tuition and the additional cash stipend given to only girls, the program makes it relatively cheaper than before to send girls to secondary school compared to sending boys to secondary school. This could potentially induce some households to enroll their girls who would otherwise be performing household chores or other family labor activities and withdraw their boys instead from school in order to substitute for the family labor requirement previously filled by teenage girls.

Typically girls in rural Bangladesh are engaged in such household chores as child care, water and firewood collection. How easy (or how acceptable) for boys to substitute these household chores taking the place of girls, and whether the income or the substitution effects dominate are empirical questions. If such

cross-persons effects (substitution effects) in intra-household resource reallocation is strong enough, they could cause secondary school enrolment among male students to decrease due to the stipend program, and our empirical result showing strong substitution effects is consistent with such a possibility.

The estimated coefficients on the class (grade) level dummy variables indicate the rate of drop-out from one class (grade) level to another, controlling for the cohort (i. e., the year the students entered class 6). The estimated drop-out rate is about 18% among female students and about 15% among male students for the transition from class 6 to class 7; about 20% among female and 13% among male students for the transition from class 7 to class 8; 22% among female students and 16% among male students for the transition from class 8 to class 9, and 24% among female students and 18% among male students for the transition from class 9 to class 10. Thus estimated drop-out rates appear to be much higher among female students than among male students.

The estimated coefficients on the trend variable measure the secular trend increase in the demand for schooling. In line with our earlier findings from the national aggregate data, the trend rate of increase in enrolment has been higher among female students than among male students, and such differential trend rates of increase between male and female students have resulted in narrowing gender gap in secondary school enrolment even without the stipend program. The estimated trend rates of increase in the demand for female education is 10% among female students and 1% among male students.

Among the school-level variables, the number of tube wells at school has significantly positive effects on only female enrolment, while the number of latrines has significantly positive effects on both female and male student enrolment. Quantitative magnitude of such effects, however, is small; an additional tube well tends to increase female enrolment by 1.3%, and an additional latrine tends to increase female and male enrolment by a roughly same rate of 0.5%. The positive impact of the existence of tube wells and latrines on school enrolment is not surprising, since these additional facilities make school more attractive for both female and male students. However, the positive impact of tube wells on female but not male students might be a result of intrahousehold division of labor. One potential possibility is that the *school-level* access to tube wells may be positively correlated with the *village-level* access to tube wells (safe drinking water facilities). If that is the case and thus the positive coefficient reflects such village-level, rather than school-level, access to drinking water, then our results could imply that among those communities where drinking water is not easily available, introducing safe drinking water facilities into the community (not necessarily to the school) might have some positive payoff in attracting female students to secondary schools. Such might be the case, for example, if obtaining drinking water for family members is a major job by teenage girls within the community, and the positive impact of drinking water access suggests that relieving those girls of this duty would have a major positive impact on their secondary schooling. Alternatively, if fetching drinking water is primarily done by adult female, relieving them of this duty and thus allowing them to do

more of domestic work (such as child care and other domestic chores) would in turn relieve their teenage daughters of those domestic chores so that they could be enrolled in secondary schools.

Finally, neither the number of school management committee (SMC) meetings nor the number of PTA meetings appears to have significant impact on female or male student enrolment, despite the expectation that more active PTA activities would likely reflect more active parent involvement in children's education and thus would be associated with higher enrolment.

7. Conclusion

We find that the nationwide stipend program had a significantly positive impact on the secondary school enrolment among female students. Our estimates show that, on average, the stipend program increased the female student enrolment of an incoming cohort by 2% above the prevailing trend rate of increase in female student enrolment. In contrast, the impact of the stipend on male students is found to be negative. Thus, we can conclude that the stipend program had a positive impact on the increased enrolment of female students and on the closing of the gender gap at the secondary schooling level, thereby accelerating the trend that had already existed before the stipend program was introduced. This achievement, however, appears to have come partly at the expense of male student enrolment at the secondary schooling level. Our study thus reveals that a careful analysis of the project impact on both targeted (girls) as well as non-targeted (boys) population is important for the evaluation of projects. The Female Secondary School Stipend project in Bangladesh would need to be re-evaluated in this light.

Apart from the stipend impact, we find that some school level variables are also significantly associated with secondary school enrolment; school-level access to tube wells has asymmetric effects between female and male, with a positive impact on female enrolment but not on male enrolment. Also found to have significant positive impact on both female and male enrolment is the school-level access to latrines.

Notes

- 1 'Thana' is a local administrative unit consisting typically of about 30 villages.
- 2 In fact, the origin of the stipend program dates back to 1982 when a local NGO started a pilot project in a single thana.
- 3 See section 2 for eligibility criteria.
- 4 Furthermore, the World Bank's Mid-term Review Report for FSSAP noted (with a detailed discussion of supporting evidence) that there was a remarkable jump in girls' enrolment in 1992 mainly due to the government policy of free tuition for classes 6 to 8.
- 5 See section 2 above.
- 6 While 3391 schools joined the program in 1994 and thus their data reported in 1994, not all the schools reported their school-level information for all the subsequent years; school level data appearing in the MIS database without any missing entry between 1994 and 1998 are only for 1826 schools. The fact that some of the schools 'dropped out' of the school-level database in the MIS does not mean that those schools dropped out of the program. No school has dropped out of the program and individual-level recipient data (rather than school-level data) are presumably reported and maintained in the MIS database. The main reason for the attrition of school-level data in MIS appears to be the fact that while the individual recipient-data are critical in administering the project school-level data are not directly used in administering the project and thus are not as closely monitored as the recipient data.
- 7 In addition, the project MIS data include the num-

ber of teachers, by gender and by trained/un-trained categories, which might be used as additional project input variables in regressions. These variables, however, are likely to be endogenous and thus (in the absence of suitable instruments) are not included in the results reported below. While not reported here, regressions including the number of teachers were also conducted but the quantitative estimates of the impact of stipend on enrolment remain unchanged.

8 Random effects models are also estimated. However, the Hausman tests strongly rejected the null hypothesis that the unobserved school-level effects are un-correlated with the regressors, thus suggesting that the underlying assumption of the random effects models is not supported by data. Thus we only report the fixed-effects results here

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バングラデシュ国女子中等教育奨学金プログラムの計量的インパクト評価

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摘 要

本論文では、バングラデシュで1994年より実施された女子中等学校奨学金プログラムが中学生の就学数に与えた影響を計量評価することを目的とする。はじめにプログラムの概要を概観した後、政府発表の全国レベルデータ、および奨学金プログラムオフィスによって収集・管

理された各学校レベルのデータを用いて奨学金導入のインパクトの推定を試みる。全国レベルのデータからは奨学金導入の影響を識別することは困難であるが、学校レベルのデータからは奨学金導入の影響がはっきりと確認できる。回帰分析の結果、奨学金の影響により女子の就学数は約2%増加した一方、男子の就学数は逆に約3%減少したことが見出される。