What Criteria Should Policymakers Use for Assisting Households with Educational Expenditure? The Case of Urban Bangladesh

M. Najeeb Shafiq*
University of Pittsburgh

November 2010

* Assistant Professor of Economics and Education, Department of Administrative and Policy Studies, School of Education, University of Pittsburgh, 230 S. Bouquet Street, 5907 Posvar Hall, Pittsburgh, PA 15260, USA. Phone: (412) 648-1832. Fax: (412) 648-1784. Email: mnshafiq@pitt.edu. Acknowledgements: I am deeply indebted to an anonymous referee, Barry Bull and Robert Toutkoushian for detailed comments on an earlier version. My thanks also to Pravin Trivedi, Henry Levin, Mun Tsang, Francisco Rivera-Batiz, and the Bangladesh Bureau of Statistics for the data. This study was generously funded by a Proffitt Grant from Indiana University.

What Criteria Should Policymakers Use for Assisting Households with Educational Expenditure? The Case of Urban Bangladesh

Abstract: Low household expenditure on education compromises the learning and future labor market prospects of children. This study provides an empirical framework for determining the criteria that South Asian policymakers can use for assisting households with educational expenditure. A case study of urban Bangladesh using tobit and hurdle regression models indicate that households in the bottom two per-capita quartiles should receive priority as recipients of policy assistance. Other criteria include households with parents who have not completed primary schooling, and households with boys, older children, and multiple children of school-going age.

I. INTRODUCTION

Unlike in industrialized countries, tax systems in South Asia are not well developed, and property and income taxes are not systematically collected or available to finance education. Consequently, households directly finance their children's education by paying schools for tuition, fees, supplies, uniforms, and transportation (Tsang, 1994). Because low household educational expenditure may compromise children's educational outcomes, policymakers have begun assisting low-spending households using a range of interventions such as cash stipends, tuition waivers, and fee reduction initiatives (Das, 2005). The enthusiasm in policy circles about such interventions is partly attributable to success of programs such as Mexico Opportunidades cash transfer program (which paid cash to households for enrolling children in school) in raising

educational attainment has provided optimism on the impact of policy assistance towards household educational expenditure (Schultz, 2004).

There are challenges with assisting households with educational expenditure, however. In particular, there are efficiency concerns because of targeting households who do not require assistance, or not targeting household who do require assistance; such efficiency losses from ineffective targeting are especially problematic in developing countries facing severe resource constraints. Following recent advances in the empirical methods for analyzing household educational expenditure (Aslam and Kingdon, 2008; Kingdon, 2005), this article examines the determinants of household educational expenditure in urban Bangladesh, and proposes the criteria for efficiently providing policy assistance with educational expenditure. The analyses serves as a model for other South Asian countries that are seeking to improve educational outcomes by assisting households with educational expenditure.

The rest of the article is structured as follows. Section II provides a brief background of the Bangladesh economy and education system. Section III presents the conceptual model of household educational expenditure, and a description of the empirical methodology. Section IV describes the data. Section V presents the summary statistics and estimation results. Section VI concludes with a discussion of policy implications.

II. COUNTRY BACKGROUND

In the year 2000 (the year the data was collected), the population of Bangladesh was approximately 140 million with purchasing power parity adjusted annual GDP per capita of US$1851 and unadjusted annual GDP per capita of $370 . Annual growth rates in per-capita income accelerated from about 1.6 percent per annum in the first half of the 1980s to 3.6 percent

by the latter half of the 1990s, and 5.0 percent from the late 1990s to the early 2000s (World Bank and Asian Development Bank, 2003a). A booming export-oriented ready-made garments industry and a slowdown in population growth were credited with the improvements in economic growth rates. Poverty, however, remained a major concern in Bangladesh as 54 million were categorized as poor. Over 9.3 million of the residents of urban Bangladesh (or 36.6 percent of all urban residents) were categorized as poor (p.4, World Bank and Asian Development Bank, 2003a).

The education structure of Bangladesh, as illustrated in Figure1, involves five years of primary school, five years of secondary school, two years of upper secondary school, and three or four years of higher education. There are national level examinations at the end of secondary and higher-secondary levels. Those who complete ten years of schooling and the secondary level examinations receive a Secondary School Certificate, and those who successfully complete twelve years of schooling and the higher-secondary examinations receive the Higher-secondary School Certificate. Of the national school-going population in 2000, 85 percent of school-going children attended government-run primary, secondary, and higher-secondary schools. The remaining 15 percent of school-going children attended private schools (7 percent), Islamic schools (4 percent), and Non-Government Organization (NGO)-run schools (4 percent).

[Figure 1 about here]

Education in Bangladesh at the primary, secondary, and higher-secondary level is highly centralized in policy and planning. Public spending on education as percentage of GDP steadily increased from 0.9 percent in 1973 to 2.21 percent in 2000. By educational level, public expenditure per student in 2000 was $13 for primary school, $27 for secondary school, and $155 for higher education (World Bank and Asian Development Bank, 2003b).

Table 1 presents the percentage of out-of-school population in the 11 to 19 age-group that has completed primary schooling. From 1991-92 to 2000, the national proportion with primary education jumped from 44 percent to 56 percent. This rise reflected the broad emphasis on educational expansion by the Government of Bangladesh and NGO community. Critics argue, however, that the expansion came at the cost of quality such as the deterioration school facilities and quality of teachers (CAMPE, 1999).

[Table 1 about here]

Table 1 also reflects the disparity in gains made by rural and urban areas. From 1991-92 to 2000, the rate increased from 41 percent to 54 percent in rural areas. In contrast, the rate in urban Bangladesh increased from 62 percent to just 63 percent. While the more modest change in urban areas may be attributed to higher rural-urban migration, there are policy factors at play. In particular, the substantial rise in rural attainment reflected a series of interventions that assisted rural households with educational expenditure. At the primary level, the Food for Education Program provided wheat grants to the poorest 80 percent of the rural population in exchange for school attendance. At the secondary level, the Female Secondary-School Assistance Program provided rural females of school-going age a cash stipend. Both interventions have been found to increase educational attainment in rural areas (Arends-Kuenning and Amin, 2004; Ravallion and Wodon, 2000). The remainder of this article addresses a specific policy intervention—that is, assisting household educational expenditure—for increasing *urban* educational attainment.

III. CONCEPTUAL MODEL AND METHODOLOGY

The seminal contributions of Gary Becker on human capital investment in children suggest that household educational expenditure is determined by utility maximization framework

(Becker, 1991). The large body of empirical research on household demand for education typically consider several child household, and community characteristics.[1]

Relevant child characteristics that determine household educational expenditure include age and gender. A child's age matters because educational expenditure increases gradually because of greater costs associated with educational attainment such as tuition, fees, transportation and private tutoring. The gender of a child matters because of differences in anticipated labor market returns to education by gender, which in turn affects household willingness to spend on education by gender. Since labor market discrimination against females persists in Bangladesh, the monetary returns for households from educating males are greater than the returns from educating females. Furthermore, households retain a smaller proportion of girls' future earnings (relative to boys' future earnings) because girls typically contribute to their husband's household. Despite the lower monetary benefits of investment in girls education, the educational attainment of girls exceeds the attainment of boys in urban Bangladesh (Shafiq, 2009). The analysis in this study addresses a potential explanation for this pro-female decision: households spend less for girls than boys and are therefore able to offset the lower monetary benefits.[2]

Among household characteristics, a consistent finding is that income or socioeconomic status is a major determinant of household investment in children's education. Assuming parents are altrusitic, higher income should facilitate greater educational expenditure. Parental education is acknowledged as another key determinant of household investment in children's education.

[1] For a recent survey on the determinants of household demand for schooling in developing countries, see Glewwe and Kremer, 2006.

[2] Asadullah (2007), for example, reports that the rate of return for an additional year of education is higher for females (13.2 percent) than males (6.2 percent). These estimates only imply that there are returns from being a more educated female rather than a less educated female; the estimates do not imply that educated females earn more than educated males.

Holding all else constant, paternal and maternal education are positively associated with larger spending on education. Possible reasons for this relationship is that more educated parents have a greater appreciation for children's education. A demographic factor that affects the households decisions is the presence of other school-age children in the household. In general, a larger number of boys and girls makes it harder for households to support the education of all children; therefore, the presence of other children in the household is likely to have a negative effect on educational expenditure. The last household characteristic considered is whether the household is Muslim. In general, there are differences in household behaviour towards education across religious orientation in most societies.

In terms of empirical methodology, this study adopts the tobit model and hurdle model (for a discussion of methodologies for analyzing household expenditure on non-educational items, see pp. 521-551, Cameron and Trivedi, 2009; and pp. 282, Deaton, 1997). According to a tobit model of educational expenditure, zero educational expenditure is interpreted as a left-censored variable that equals zero. In other words, the dependent variable $educexpend_i$ is only observed when $educexpend_i > 0$. The validity of the tobit model of household educational expenditure depends on whether its two key assumptions hold: normality and homoskedasticity. If these assumptions do not hold, then the tobit model makes nonsensical predictions such as negative educational expenditure.

A better alternative is the hurdle model (sometimes referred to as the two-part model). Unlike the tobit model, the hurdle model does not require the assumptions of homoskedasticity and normality for consistency. The hurdle model of household educational expenditure has two parts (Kingdon, 2005). The first part is a binary outcome equation that models the probability of positive expenditure or $\Pr(educexpend_i > 0)$ using a probit model; $educexpend_i = 0$ implies that

educational expenditure on child *i* is zero and that the child is not enrolled in school. In contrast, $educexpend_i > 1$ implies that educational expenditure on child *i* is greater than zero and that the child is enrolled in school. The second part of the hurdle model involves linear regression to model $E(\ln educexpend_i | educexpend_i > 0)$, which is regressing educational expenditure conditional on positive educational expenditure. Because there are no obvious exclusion restrictions, the two parts are assumed to be independent and estimated separately. It is further assumed in this study that the same set of explanatory variables affect both parts.[3] Since the distribution of educational expenditure is non-normal, and the dependent variable for the tobit model and second part of the hurdle model is the natural log of educational expenditure on child *i*.[4]

IV. DATA

The data for this study comes from the Bangladesh Household Income and Expenditure Survey 2000, henceforth referred to as HIES 2000. The HIES 2000, conducted in the year 2000,

[3] The formulation changes slightly if the two parts involve different regressors; see Cameron and Trivedi (2008) for a discussion. The hurdle model assumes that after holding all regressors constant, households with positive educational expenditure are randomly selected from the population. It can be argued, however, that households who spend positive amounts on education have unique characteristics from households who do not enroll. Consequently, there is sample selection bias from the use of a hurdle model, similar to the sample selection bias recognized by Heckman (1977) in female labor force participation decisions. The selection model assumes that the first part of the decision on whether to spend on education (that is, probability of positive expenditure) is independent from the second part of actual amount of educational expenditure. In the case of household educational expenditure, there is no intuitive possibility for a variable, particularly a variable that would have a significant impact on the probability of selection. Since the selection model of household educational expenditure is impractical for most cases, it is not considered in this study.

[4] Since there is no value for ln expenditure when expenditure=0, it is necessary to value the lower limit expenditure at a small non-zero value. An acceptable lower level expenditure value such as $0.01 yields a ln expenditure value of negative 4.61.

was a joint project of the Bangladesh Bureau of Statistics and the World Bank. The nationally representative HIES 2000 is based on the traditional World Bank Living Standards Measurement Surveys, with detailed person and household level information for urban areas.

The HIES includes child-level data on annual expenditure on the following educational items: tuition, fees, books and supplies, uniforms, private tutoring, transportation, donations, and miscellaneous items; in recent years, a growing share of national household surveys include such information. The dependent variable of interest is annual household expenditure for child *i*, and is calculated as the sum of annual expenditure on tuition, fees, books, supplies, uniforms, private tutoring, transportation, donations, and miscellaneous items for child *i*. These expenditure values have been converted from 2000 Bangladeshi Takas to U.S. dollars (such that US$ 1= Takas 52.40). For any given child *i*, the value for educational expenditure varies from zero to some positive amount. As mentioned earlier, the distribution of educational expenditure is non-normal, and therefore converted to natural logs. The sample consists of children in the 6 to 17 age-group because six is the age when children are socially encouraged to begin primary schooling, and seventeen is the age when children are expected to finish upper-secondary school. Educational expenditure on higher education is not considered because those over the age of 17 leave home to attend colleges and universities, and the HIES does not collect educational expenditure on members no longer residing in the household.

The child-level explanatory variables include *male* (dummy variable which is 1 if child is male, 0 if female), *age* (in years), and *agesquared*. The household-level explanatory variables include *incquartile1* (dummy variable which is 1 if child belongs to the poorest per-capita income quartile, 0 otherwise), *incquartile2* (dummy variable which is 1 if child belongs to the lower middle-income per-capita income quartile, 0 otherwise), *incquartile3* (dummy variable

which is 1 if child belongs to the upper middle-income per-capita income quartile, 0 otherwise), *incquartile4* (dummy variable which is the reference category, 1 if child belongs to the poorest per-capita income quartile, 0 otherwise), *fatheredu* (dummy variable which is 1 if the father completed primary education or more, 0 otherwise), *motheredu* (dummy variable which is 1 if the mother completed primary education or more, 0 otherwise), *otherboys* (the number of other school-age boys in the household other than child *i*), *othergirls* (the number of other school-age girls in the household other than child *i*), and *muslim* (dummy variable which is 1 if the household is Muslim, 0 if some reglion other religion such as Hindu, Christian, Buddhist or animist). Finally, a series of regional controls are included signifying the household's divisional location (divisions in Bangladesh are comparable to states in the U.S.).

Several determinants of household educational expenditure cannot be included because of data limitations. Expected labor market rates of returns and discount rates were not elicited and therefore cannot be considered in the analysis. Finally, foregone child labor earnings cannot be considered in the analysis because data on prevailing child wage rates in urban areas was not collected.

V. RESULTS

Table 2 presents the descriptive statistics—means and standard deviations—of the dependent and explanatory variables for a sample of children in the 6 to 17 age-group. The descriptive statistics in Column 1 are computed using the sample of all children (regardless of household educational expenditure). Column 2 descriptive statistics are computed using the sample of children on whom households spend nothing (suggesting that the children are not enrolled in school). Lastly, the Column 3 statistics are obtained using the sample of children on

whom households spend a positive amount (indicating that the children are enrolled in school). The Column 1 figures serve as the baseline for comparing the Column 2 and Column 3 figures. According to the sample of all children (that is, children on whom parents spend zero or positive amounts), the school enrollment rate in urban Bangladesh is 69.2 percent.

Table 2 indicates that there are substantial differences between children on whom households spend nothing on education (Column 2) and children on whom households spend a positive amount (Column 3). Males (*male*) comprise a larger share of unenrolled children (55.1 percent) than girls among children on whom households spend zero; this reflects pro-female school enrollment gaps in urban Bangladesh. Among households spending a positive amount, about half (49.1 percent) of the children are males. The average age (*age*) among children on whom households spend zero is higher (12.2 years) than chilren on whom households spend a positive amount (11 years), which is consistent with the phenomena that school enrollment rates fall with age because of greater direct costs and opportunity costs.

According to the descriptive statistics of household characteristics in Table 2, a large share (39.4 percent) of children on whom zero is spent belong to a household in the poorest quartile (*incquartile1*). Regarding parental education, children on whom a positive amount is spent have significantly more educated parents (*fatheredu* and *motheredu*) than children on on whom nothing is spent. As for demographic factors and comptition for households funds, the number of boys (*otherboys*) that reside with child *i* is slightly higher for children on whom parents spend zero (0.9 boys per household) than for children on whom parents spend a positive amount (0.8 boys per household). In contrast, there is no difference in the number of other girls (*othergirls*) between children on whom households spend zero and on whom households spend a positive amount. Finally, children from Muslim households (*muslim*) are slighly over-

represented in zero expenditure group (95.6 percent) compared to the positive expenditure group (92.0 percent).

Table 3 presents the tobit and hurdle model estimation results using the sample of children in the 6 to 17 age-group in urban Bangladesh. Where relevant, brief discussions of the differences in the tobit and hurdle model results are provided to illustrate the nuances in policy implications.

[Insert Table 3 about here]

The negative and statistically significant *male* (dummy) coefficient in the tobit model indicates that households are less likely to spend on boys' education, holding all else constant. The hurdle model reveals that households are less likely to spend a positive amount on boys (or enroll boys) but once the decision has been made to spend on boys (or enroll boys), household do not discriminate between boys and girls with respect to educational expenditure. The finding suggest that households may need additional encouragement from campaigns to enroll boys in schools.

The positive and statistically significant *age* coefficients in the tobit model and both stages of the hurdle model indicate that household educational expenditure increases with a child's age. A comparison of coefficient sizes across the models reveals that the tobit model coefficent for age is considerably higher than the hurdle model coefficients. Nontheless, both models suggest that households with older chidlren require greater support with educational expenditure.

With regard to income quartiles, the omitted group and therefore reference group is *incquartile4* or the richest group. The negative, statistically significant and larger coefficients on lower per-capita quartiles in Table 3 indicate that poorer households are less likely to spend less

on children's education than the richest households in urban Bangladesh. The statistically significant *incquartile1* and *incquartile2* coefficients for tobit model shows that the poorest households and lower-middle income households spend less on their children's education than the richest households, holding all else constant. The hurdle model's *incquartile3* coefficient reveals that upper-middle income households spend less than the richest households. Moreover, the hurdle model results for *incquartile3* reveals that upper-middle income households are more likely to enroll their children than the richest households, but once enrolled, spend less than the richest households. The statistically insignificant coefficient for *incquartile3* from the tobit model indicates that the two opposing effects cancel each other out. Thus, the tobit model would miss the fact that upper-middle income households may need assistance with educational expenditure.

The *fatheredu* and *motheredu* coefficients in the tobit and hurdle models in Table 3 show that having educated fathers and mothers increases household educational expenditure in urban Bangladesh, holding all else constant. Consistent with the worldwide literature, having an educated mother matters more than having an educated father (Glewwe and Kremer, 2006). The hurdle model shows that having educated parents improves the likelihood of enrollment and expenditure.

The tobit and hurdle model coefficients for *otherboys* and *othergirls* in Table 3 provide contrasting results on the effects of other school-age boys and girls. The statistically insignificant coefficients from the tobit model suggests that the presence of other children does not affect household educational expenditure decisions. The negative and statistically significant coefficients in the second part of the hurdle model, however, indicates that the presence of more girls and especially more boys takes away from the spending towards a particular child.

Finally, holding all else constant, both the tobit and hurdle models in Table 3 show that children from Muslim households are disadvantaged, holding all else constant. The negative and statistically significant *muslim* coefficient from the tobit model indicates that Muslim households spend less on education. The statistically insignificant coefficient from the first part of the hurdle model suggests that there are no differences between Muslim and non-Muslim households while making the enrollment decision. In contrast, the negative and statistically significant coefficient from the second part indicates that Muslim households spend less than non-Muslim households, conditional on positive expenditure.

VI. POLICY IMPLICATIONS

This study used to tobit and hurdle models as part of an empirical framework for determining the criteria that policymakers should use for assisting households with assistance such as cash transfers, tuition waivers and fee reductions in urban Bangladesh. The sizes of the coefficients in the tobit and hurdle models suggest that the main criteria for policy assistance in urban Bangladesh should be per-capita income, especially for households in the bottom two per-capita quartiles and to a lesser extent those in upper-middle income quartile. The second most important criterion is households where parents have not completed primary schooling. The results further suggest assisting households with boys, older children, and several children of school-going age. In addition, policymakers should consider informational campaigns encouraging Muslim households to spend more on their children's education; for example, informational campaigns can emphasize the value placed on education by the Quran (Halstead, 2007). Using these criteria to target policy assistance for household expenditure is likely to be an efficient approach for increasing children's educational attainment and future labor markets

outcomes. Future studies of other South Asian regions can aid policymakers with identifying households most in need of assistance with educational expenditure.

Lastly, it is worth noting that though by focusing on assisting households, should not take away from the efforts on improving educational quality. By assisting households with educational expenditure, policymakers indirectly support school quality because money received by households is then transferred to schools. In other words, the additional household educational expenditure can help improve school quality because schools receive a share of that household expenditure in the form of tuition, fees, and other funds; schools will then use the additional funds for improving facilities and staff compensation. Therefore, the methodology of this study can provide insight into achieving the twin policy objectives of increasing educational attainment and school quality in South Asia.[5]

REFERENCES

Arends-Kuenning, M. and S. Amin (2004). 'School Incentive Programs and Children's Activities: The Case of Bangladesh', Comparative Education Review, 48:295-317.

Asadullah, M. N. (2006). 'Returns to education in Bangladesh', Education Economics 14:453-468.

Aslam, M. and G. Kingdon (2008). 'Gender and Household Education Expenditure in Pakistan', Applied Economics, 40:2573-2591.

Becker, G. (1991). The Demand for Children, in Treatise on the Family. Cambridge, MA: Harvard University Press.

[5] The caveat is that the government not take away funds from schools to fund interventions that help households with educational expenditure.

CAMPE (1999). Hope Not Complacency: State of Primary Education in Bangladesh. Dhaka: The University Press Limited.

Das, J. (2005). 'Reassessing Conditional Cash Transfer Programs, World Bank Research Observer', 20:57-80.

Deaton, A. (1997). The Analysis of Household Surveys: A Microeconometric Approach to Development Policy. Baltimore: Johns Hopkins University Press.

Glewwe, P. and M. Kremer (2006). 'Schools, Teachers, and Education Outcomes in Developing Countries', in: Eric Hanushek and Finis Welch (Eds), Handbook of the Economics of Education, 2. Amsterdam: North Holland.

Heckman, J. (1979). 'Sample Selection Bias as a Specification Error', Econometrica, 47:153-161.

Kingdon, G. (2005). 'Where has all the Bias Gone? Detecting Gender Bias in the Intrahousehold Allocation of Educational Expenditure', Economic Development and Cultural Change, 53:409-51.

Ravallion, M. and Q. Wodon (2000). 'Does Child Labor Displace Schooling? Evidence on Behavioral Responses to an Enrollment Subsidy', Economic Journal, 110:C158-175.

Schultz, T. P. (2004). 'School Subsidies for the Poor: Evaluating the Mexican Progresa Poverty Program', Journal of Development Economics, 74:199-250.

Tsang, M. (1994). Cost Analysis of Educational Inclusion of Marginalized Populations. Paris: IIEP, UNESCO.

World Bank (2000). Bangladesh Education Sector Review. Dhaka: The University Press Limited.

World Bank and Asian Development Bank. (2003a). Poverty in Bangladesh: Building on progress. Joint document, The World Bank and Asian Development Bank.

_____ (2003b). Bangladesh: Public Expenditure Review. World Bank and ADB Joint Publication.

Table 1: Percentage of out-of-school population in 11-19 age-group that has completed primary school, 2000

	1991-92			2000		
	All regions	Rural	Urban	All regions	Rural	Urban
All genders	44%	41%	62%	56%	54%	63%
Boys	46%	42%	65%	53%	51%	61%
Girls	42%	39%	59%	59%	57%	64%

Source: World Bank and Asian Development Bank (2003a)

Table 2: Descriptive statistics for sample of children in the 6-17 age-group in urban Bangladesh, 2000

	Column1	Column 2	Column 3
	All children	Zero expenditure (or unenrolled) children	Positive expenditure (or enrolled) children
enroll	0.692	0.000	1.000
	(0.462)	(0.000)	(0.000)
expenditure (Takas)	39.61	0.00	57.22
	(83.54)	(0.00)	(95.27)
Ln *expenditure*	0.418	-5.100	2.870
	(4.069)	(0.000)	(2.080)
male (dummy)	0.509	0.551	0.490
	(0.499)	(0.497)	(0.500)
age (in years)	11.35	12.17	10.99
	(3.30)	(3.59)	(3.10)
age2	139.93	160.97	130.56
	(75.95)	(83.00)	(70.62)
incquartile1 (dummy)	0.248	0.394	0.183
	(0.432)	(0.488)	(0.387)
incquartile2 (dummy)	0.250	0.275	0.239
	(0.433)	(0.446)	(0.426)
incquartile3 (dummy)	0.249	0.166	0.287
	(0.433)	(0.372)	(0.452)
Incquartile4 (dummy)	0.251	0.163	0.289
	(0.433)	(0.370)	(0.453)
fatheredu (dummy)	0.442	0.194	0.552
	(0.496)	(0.396)	(0.497)
motheredu (dummy)	0.365	0.116	0.475
	(0.481)	(0.321)	(0.499)
otherboys	0.844	0.909	0.815
	(0.875)	(0.915)	(0.855)
othergirls	0.836	0.837	0.836
	(0.937)	(0.910)	(0.949)
muslim (dummy)	0.931	0.956	0.920
	(0.252)	(0.203)	(0.270)
Number of observations	3749	1154	2595

Source: Household Income and Expenditure Survey 2000 (HIES 2000)

Notes: Standard deviations in parentheses. *incquartle1* refers to the poorest per-capita income quartile. *Incquartle2* are those in the lower-middle income quartile, *incquartle3* belong to the upper-middle income quartile, and *incquartle4*refers to the richest per-capita income quartile. *fatheredu* is one if the child's father completed primary education, and zero otherwise. *motheredu* is one if the child's mother's completed primary education, and zero otherwise.

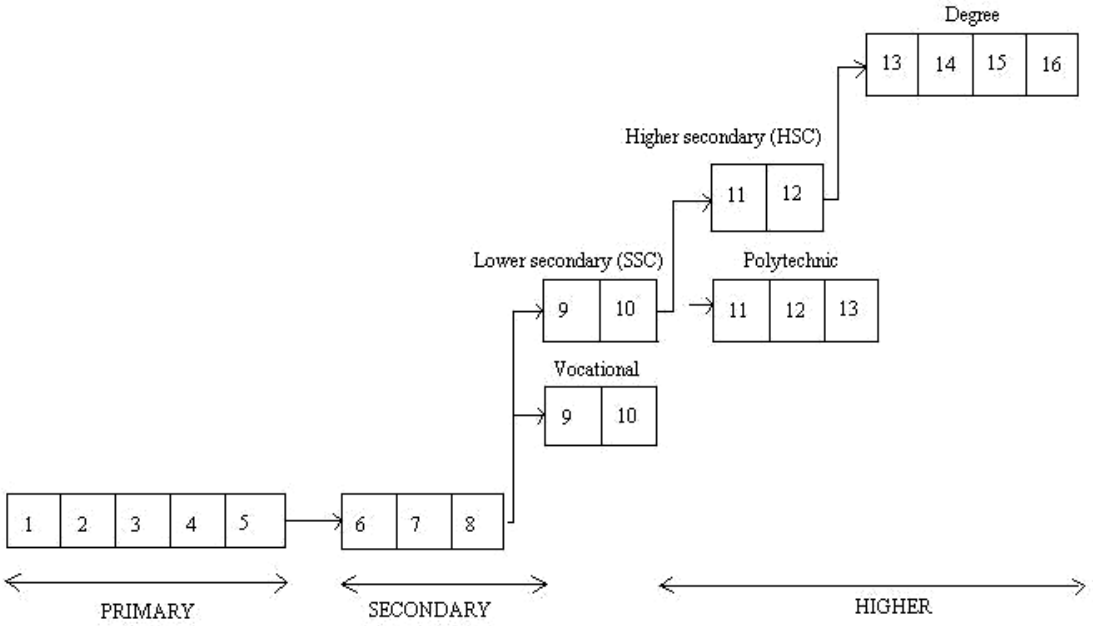
Table 3: Tobit and Hurdle model estimation results of household educational expenditure in urban Bangladesh for children in the 6-17 age-group, 2000

	Tobit model	Hurdle model	
		Part 1 (Probability of positive expenditure)	Part 2 (linear regression conditional on positive educational expenditure
male (dummy)	-0.487**	-0.163**	0.016
	(0.157)	(0.048)	(0.065)
age (in years)	2.292**	0.597**	0.513**
	(0.181)	(0.054)	(0.077)
age2	-0.108**	-0.030**	-0.014**
	(0.007)	(0.002)	(0.003)
incquartile1 (dummy)	-3.263**	-0.475**	-2.284**
	(0.262)	(0.077)	(0.115)
incquartile2 (dummy)	-1.479**	-0.098	-1.554**
	(0.238)	(0.074)	(0.100)
incquartile3 (dummy)	-0.108	0.135*	-0.715**
	(0.222)	(0.075)	(0.088)
fatheredu (dummy)	1.897**	0.549**	0.217**
	(0.196)	(0.060)	(0.080)
motheredu (dummy)	2.583**	0.815**	0.317**
	(0.207)	(0.068)	(0.083)
otherboys	-0.018	0.001	-0.093**
	(0.092)	(0.027)	(0.039)
othergirls	0.043	0.026	-0.071**
	(0.084)	(0.026)	(0.034)
muslim (dummy)	-0.824**	-0.269**	-0.059
	(0.307)	(0.104)	(0.121)
Regional dummies	Yes	Yes	Yes
Constant	-11.266**	-2.247	0.363
	1.059	0.319	0.450
Pseudo R squared/ R-squared	0.068	0.215	0.373
Number of observations	3749	3749	2595

Source: Household Income and Expenditure Survey 2000 (HIES 2000)

Notes: (1) Standard errors in parentheses. (2) * indicates statistical significance at the 5 percent level, and ** indicates statistical significance at the 1 percent level. (3) *incquartle1* refers to the poorest per-capita income quartile. *Incquartle2* are those in the lower-middle income quartile, *incquartle3* belong to the upper-middle income quartile, and *incquartle4* is the omitted category and refers to the richest per-capita income quartile. (4) *fatheredu* is one if the child's father completed primary education, and zero otherwise. (5) *motheredu* is one if the child's mother's completed primary education, and zero otherwise.

Figure 1: Structure of the system of education and training in Bangladesh



Note: The numbers in boxes denote the year of education.
Source: World Bank (2000).