An Economic Analysis of the Gender Gap in Household Demand for Education: Evidence from India

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ABSTRACT

Education plays a crucial role in building tomorrow's human capital, and thus, it is an essential tool for economic growth and development. Following the second Millennium Development Goal's (MDG) (2000) call for achieving universal school education by 2015, extensive government initiatives with special emphasis on girls were undertaken in India. Access to education has shown tremendous progress and became successful in bringing almost all potential pupils to primary (standard I-V) school. However, starting from the elementary (standard VI-VIII) level onwards, the gender gap in enrollment persists and widens with the level of education in India.

This paper quantifies the gender difference in enrollment decisions for children and provides a theoretical structure to the underlying demand-side factors that influence parents in keeping girls out of the post-primary education system compared to boys.

The analysis uses the 2nd round dataset of the India Human Development Survey (IHDS), published in 2012 and finds a significant gender gap in enrollment. A girl child is on average, 3.6% less likely to continue schooling compared to a boy, *ceteris paribus*. The enrollment probability of girls worsens with higher birth order; an eldest sister has a significantly lower probability (5.2%) of continuing school education compared to an eldest brother, keeping other things same. Further, it also finds that beyond the age of 14 when children are no longer entitled to get free compulsory education under Right to Education (RTE), girls' enrollment probability declines. For example, a girl above the age of 14 is 7.8% less likely to continue schooling, and if she is an eldest sister among siblings, her probability of discontinuing schooling is11% compared to that of boys in similar conditions. Labor market variables especially returns on education and variability in wages, play crucial and significant roles in the schooling decision of children. Parents' reciprocity expectation is also found responsible for lower enrollment of girls compared to boys.

INTRODUCTION

Following the UN Millennium Development Goal (MDG) in 2000, especially the second and third goals, various supply initiatives were undertaken with additional emphasis to close the gender gap in education and achieving universal school education by 2015. However, a gender gap in education persists in many parts of the world, especially in developing regions. India was not different from this drive, which is reflected in the government's plans, programs, and policies. In 2009, the Parliament of India enacted the Right to Education Act (RTE). The act was implemented

in 2010 and incorporated *free and compulsory* education[1] for children up to the age of 14 years, that is the age of completing elementary school level ideally.

In 2011, the gross enrollment rate (GER) at primary level (standard I-V) was 116 for boys and 115 for girls;[2] at elementary level (VI-VIII) GER is 85 for boys and 78 for girls; at secondary level (IX-X) 67 for boys and 59 for girls; and at higher secondary level (XI-XII) GER is 38 for boys and 33 for girls (Ministry of Human Resource Development, Government of India, 2011). Though the initiative has been successful in bringing all the potential pupils at the age-group 6-10 years of age to primary school, it fails to improve the universal usage of education beyond primary level and the gender gap in enrollment, in particular, persists and widens with the level of education.

Despite enrollment in schools, attendance rates, and learning outcomes, even at the primary level, remain questionable. Overall, girls in India still lag behind boys in terms of literacy, enrollment, attendance, retention, and learning at different education levels. Therefore, it remains a concern that despite the enhanced infrastructure and policies to improve supply in the Indian education system, girls still do not continue schooling beyond the primary level to the extent boys do. It implies that the goal of ensuring access to education for all does not automatically mean the use of education system equally by all.

If supply-side initiatives are adequately providing universal access to education for all children, we need to look at the demand-side factors within the household that may have a gender discriminated demand for schooling. It is crucial to identify the constraints within households that inhibit girls' enrollment beyond primary level and to analyze the link between economic and social fabrics, which add to these constraints that are responsible for the low rate of usage among girls compared to boys.

This paper attempts to identify the underlying demand-side factors that keep girls out of

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[1] Under RTE, '*free education*' means that no child (other than a child who has been admitted by his or her parents to a private school) shall be liable to pay any kind of fee/charges/expenses which may prevent him or her from pursuing and completing elementary education. '*Compulsory education*' indicates an obligation to the Government and local authorities to provide and ensure admission, attendance and completion of elementary education by all children in the 6-14 years of age group.

[2] GER can exceed 100% as it includes students, who are early and late entrants and also students who are in grade repetition.

the post-primary education system and/or attaining schools beyond the compulsory elementary levels. Therefore, the paper raises the following questions:

Whether the demand for school education differs between boys and girls? If so, how big is the gap?

As household demand for the schooling of children primarily depends on parents' preferences and decisions, the author also asks:

- Do parents prioritize son's education over daughter's education?
- Which factors are responsible for the gender gap in parents' demand for children's education?

The paper analyzes household-level factors that are responsible for the gender gap in school enrollment and explains the implications of the findings that can help to improve the usage of the school education system universally for girls and boys.

The rest of the paper is organized as follows: The next section reviews relevant literature on the topic; then follows a theoretical background for the empirical model that will be used for the analysis; the section after that details the estimation methodology and data used; followed by a presentation of the results with discussion and the last section concludes.

LITERATURE REVIEW
Research on human capital and labor market productivity has identified schooling years as important determinants of wage/earning. From a household perspective, perceived/expected returns from education motivate parents to spend on children's education. A paper by Jensen (2010) examines the importance returns on education have in schooling decisions using the survey information on perceived knowledge about the returns on education from eighth-grade boys in the Dominican Republic. He found that when randomly selected school students were made aware of the higher actual measured returns, it leads to 0.20–0.35 more years of schooling on average for the aware students over the next four years than those who were not aware.

In two papers, Attanasio (2009; 2014) investigated the role of expected returns to schooling and related risks as determinants of schooling decisions in Mexico and found that mothers' and youth's subjective expectations play a crucial role in the decision to enter college and continue high school.

The returns to education and parents' demand for child's education are linked due to parent's expectation that the child will grow up to an earning individual and then will reciprocate by providing old-age care when parents will retire from the job market. Alderman and King (1998) discuss the possible sources of gender disparity in parental investment on children and claim that such disparities can come through differences in returns realized by parents; that is the expectation of future transfers from children to parents even when market returns to children themselves do not differ.[3] Parish and Willis (1993) highlight that parents' altruistic behavior leads to investment in a child's education in Taiwan.[4] Greenhalgh (1985) discusses that patriarchal norms and parents' preference for sons in Taiwan are responsible for different treatment towards girls' education compared that of boys. The author also mentioned that parents often send their girls to work due to resource constraints within the household and also to generate a resource for brother's higher studies.[5]

Using the 1985-86 Peru Living Standards Survey, Paul and Paul (1992) showed that parents perceive lower net returns to education for girls, which leads to lack of parental desire to invest in daughter's education compared to son's education.[6] Similarly, Kingdon (2002) states that parent's gender preference and thus, differential treatments of sons and daughters lead to the gender gap in education in developing countries like India.[7]

A large number of studies also highlight that higher birth order, sibling composition and large family size are responsible for lower usage of education (Gomes 1984; Knodel, Havanon and Sittitrai 1990; Pong 1997; Shreeniwas 1993; Greenhalgh 1985; Lillard and Willis, 1994; Parish and Willis 1993; Black, Devereux and Salvanes, 2005; Knodel and Wongsith, 1991). Knodel and Wongsith (1991) show that family size has a significant negative impact on the probability of secondary school enrollment of children in Thailand as family resources per-child decrease with

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[3] Harold Alderman and Elizabeth M. King, "Gender differences in parental investment in education", *Structural Change and Economic Dynamics* 9, no. 4 (1998): 453-468, Elsevier.

[4] William L. Parish and Robert J. Willis, "Daughters, education, and family budgets Taiwan experiences", *Journal of Human Resources* (1993): 863-898, JSTOR.

[5] Susan Greenhalgh, "Sexual stratification: The other side of "growth with equity" in east Asia", Population and Development Review (1985): 265-314, JSTOR.

[6] Paul Gertler and Paul Glewwe, "The willingness to pay for education for daughters in contrast to sons: Evidence from rural Peru", *The World Bank Economic Review* 6, no. 1 (1992): 171-188, Oxford University Press.

[7] Geeta Gandhi Kingdon, "The gender gap in educational attainment in India: How much can be explained?", *Journal of Development Studies* 39, no. 2 (2002): 25-53, Taylor & Francis.

an increase in the number of children.[8] Literature has also shown that marriage and related age is responsible for girl's drop-out from formal educational institutions (Hill & King 1995; Parish & Willis 1993; Bommier & Lambert 2000). Cochrane, Mehra, and Osheba (1986) notes that parents' education has a stronger influence on children's education in Egypt and educated parents attach a higher value to education and are more likely to educate their girls similarly to boys.[9] Studies also found that household wealth/income and schooling costs (direct and opportunity costs) may have impacts on children's schooling (Glick & Sahn 2001; Pal 2004). Mauldin, Mimura, and Lino (2001) explore the factors and amount related to parents' allocation of money for children's primary and secondary education and found after-tax income, parent's education, region, age, and race are important determinants in the allocation of parents' money on children's schooling.[10]

A large volume of literature in human capital, labor, and education have identified either a factor or factors in combination that is responsible for the gender gap in education. However, so far, no existing literature provides a holistic structure to household demand for school education. This paper contributes to this gap in the existing literature by identifying the fundamental factors that generate parents' demand for the schooling of a child and combines the demographic and economic factors of the household that may influence the schooling demand. The paper provides a simple theoretical framework to household demand for education and further derives comparative statics on various demand-side factors. The paper uses Indian data and gives a general and also a gender-disaggregated measurement of the contribution of all these factors in the demand for schooling. After separating the impact of the identified determinants, it also measures the inherent gender gap in parent's decisions of schooling.

THEORETICAL BACKGROUND
Household Demand for Education

The household demand for school education of children primarily depends on parents' preferences and choices. Without the government's education subsidy, parents are solely responsible for bearing the cost of schooling and for deciding whether to enroll, how long to keep a child in school

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[8] John Knodel and Malinee Wongsith, "Family size and children's education in Thailand: Evidence from a national sample", *Demography* 28, no. 1 (1991): 119-131, Springer.
[9] Susan Hill Cochrane, Kaplana Mehra and Ibrahim Taha Osheba, T*he educational participation of Egyptian children* (Washington, DC: World Bank, 1986).
[10] Teresa Mauldin, Yoko Mimura and Mark Lino, "Parental expenditures on children's education", *Journal of Family and Economic Issues* 22, no. 3 (2001): 221-241, Springer.

or discontinue his/her schooling. However, choices regarding tertiary (college/university) education is a combined decision taken by both parents and the child.[11] As this paper focuses on parents' decisions on children's education, I consider only school level education when parents are the primary decision-makers.

Parents' decision on school education of a child has both consumption and investment motives. When the value of education is positive, parents would like to provide schooling to children as it feels good to have educated successful (in terms of the labor market and earning perspectives) children. The consumption motive behind schooling of a child depends on preference for other goods and services, that is how much parents value a child's education compared to other goods and services. Parents' schooling decisions for a child can also be considered as an investment component as it requires bearing the cost (both direct and indirect) of schooling currently and receiving a return in the future in terms of old-age care from the grown-up child. Parents' personal monetary benefits of the investment in a child's education come from the transfer of funds as financial support from a grown-up child when he/she starts earning in the future and parents retire from a job.

Further, the schooling decision is constrained by household income. Parents' utility (U) from school enrollment(E) of a child i at level S:

$$U(E_{Si}) \text{ is constrained by } I = C + \sum_{i=1}^{K} T_i$$

where I represents household disposable income; C denotes consumption of any other goods and services; K is the total number of school-going age children in the household and T_i denotes total expenditures on the schooling of child i. $\sum_{i=1}^{K} T_i$ denotes total household expenses on K number of children's school education. The household decision towards children's education depends on the current expenses (T) required to send each child to school, that is the cost of schooling, both direct (tuition fees, transport cost to school, uniforms, books, and stationery) and indirect (opportunity cost of child's schooling hours) costs. As this research considers only school education, any

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[11] After completion of school education, students often take up part-time jobs to finance (fully or partially) their own education, therefore, also play an important crucial role in decision of whether continuing education further or not and in which specialization. Beyond school education, perhaps parents and children together bear the expenses.

household expenditure on college education or higher education of children can be considered as a part of consumption (*C*).

Parents' decision towards a child's schooling depends on the utility (*U*) gains from choosing one option (i.e., to continue the child's enrollment) over another (i.e., to discontinue his/her schooling). Rational parents will keep sending their child to school if and only if the utility gain from sending him/her to school is higher than the utility gain from not sending him/her to school ($U(E_{Si} = 1) - U(E_{Si} = 0) \geq 0$).[12] Moreover, parents will not send a child to school when utility from sending to school is lower than utility from not sending ($U(E_{Si} = 1) - U(E_{Si} = 0) < 0$).

Based on parents' incentives to educate a child, the utility from providing school education depends on the expected remuneration from working in future and on the probability that the grown-up earning child will take care of retired parents. Therefore, the incentives to send a child to school depend on parents' perception of returns from education in future when the child starts earning; and their expectation that the child will reciprocate in terms of providing old-age (economic and social) care to parents. Parents are more likely to keep a child in school for longer when the return has a positive relationship with years and levels of education. However, the future returns from education cannot be observed at current times, and parents' perceptions towards future earning from a level of education are formed from the information on current actual wages in the known circle (family members, relatives and people in the neighborhood) with that level of education. The information set includes not only the distribution of wage rates for different education levels but also the associated risks in earning and access to opportunities. I assume that the expectation of returns to education is formed by the entire distribution of current actual wage returns across different education levels in the neighborhood and also consider the variability in the distribution to capture the variability of the labor market. Thus, the labor market effect can be summarized by the moments of the local wage distribution.

The expected average return from an education level *S* is defined as discounted difference between average (expected value) wages at education levels *(S)* and *(S-1)*. I categorize schooling years into different levels, such as *no schooling*, *below primary* (I-IV), *primary* (V), *elementary*

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[12] where E_{Si} takes value 1 if child *i* is enrolled at *S,* and 0 otherwise.

(VI-VIII), *secondary* (IX-X) and *higher secondary* level (XI-XII). The returns to education across these levels are then defined as:

$$ER_{Si} = \frac{W_{Si} - W_{(S-1)i}}{(1+r)^t}$$

where *ER* stands for expected returns from education; *W* is the average wage of the respective level of education; *S* denotes a schooling level, and *S-1* is its previous level; *r* is discount rate, and *t* is a time in future when *i* will earn.

In addition, the returns to education are also attached with uncertainties related to matching and other labor market imperfections and can be measured in terms of variance (standard deviation) of the local wage distribution for a particular level of education, $Var(W_{Si})$.

Parents also recognize that the higher the earning of the grown-up children, the larger will be their capacity to provide old-age care to parents. If years of education positively influence its returns, then it will also positively impact parents' reciprocity expectation. The expectation of old-age care that parents have from a child *i* is R_i, depends on social customs, feasibility, and capacity of the child to provide economic and social support to parents at their old ages.

If continuing a child's school education is a component of the parent's utility function, then this utility *U* from child's schooling can be explained as,

$$U(E_{Si}) = U(ER_{Si}, Var(W_{Si}), R_i) \qquad (1)$$

The relationship of the *fundamental factors* in the right-hand side of (1) that would generate utility for parents by taking enrollment decision is expected to be as follows:

- If the expected return from education level *S* compared to level *(S-1)* is positive, then parents will be interested in continuing the child's education into level *S* and will not stop his/her schooling after completion of level *(S-1)* that is, $\frac{\partial ER_S}{\partial S} \geq 0$ leads to $\frac{\partial U(E_S)}{\partial S} \geq 0$.

- The variability of wages may have different impacts on enrollment decisions. If the wage distribution of level *S* has higher variance, i.e., higher uncertainties to get the returns (in terms of remunerations) or in getting opportunities, then parents will be discouraged to continue a child's education in level *S*. But if the variability decreases with increase in education level -- that is if variability is lower in *S* compared to *(S-1)* -- then parents will

encourage the child to continue education for more years to have a more secure future, vice versa. It is also likely that parents are willing to take the risk as the returns are much higher for level *S* compared to (*S-1*).

- Also, if parents expect reciprocal behavior from a child, whom they want to stay with and/or to get financial help from; then they will continue the child's education for longer years, given the positive relationship of returns with levels.[13]

Household Demand for Education based on the Gender of Child

If parents are biased towards a gender among children, i.e., if having a preference for son over daughter, then investment in education may differ between boys and girls. However, even when parents are gender-neutral, their demand for girls' education may differ from boys' education if any of the fundamental factors, such as the expected future returns from education, its variability and expected reciprocity differ based on gender.

Labor market opportunities differ between girls and boys, and there is a considerable gender wage gap across occupation globally, such as male workers earn more compared to female workers with the same level of education, experience, and location. If parents have information about the labor market discrimination, they will perceive lower returns from education for girls compared to boys.

One of the primary incentives to provide schooling to a child can come from parents' expectation that the child will reciprocate by providing old-age care to parents in the future. The probability of providing old-age support to parents is lower among girls than boys, especially in patriarchal and patrilocal societies. In such societies, daughters are married away to live with in-laws family, whereas married sons stay with parents. Therefore, married daughters will get fewer opportunities to take care of their own parents compared to married sons. Therefore, in general, parents bear less expectation of daughters regarding physical and monetary support at their retired age compared to sons. This perception may provide lower incentives for parents to continue their daughter's education for as long as their son's.

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[13] It is worth to mention here, that the incentives to save can influence the decision of educating children and vice versa. An educated child when grown-up can earn and will be capable to provide old-age care to parents. If parents perceive so, then the motivation of savings for old age will be lower. To avoid this complexity in decision making I have ignored saving possibilities in this paper.

Due to funding constraints, if parents must choose between children's schooling as they cannot afford everyone's schooling, it is more likely that parents stop girls' schooling and continue boys' schooling. Parents' decisions for a child's schooling may also differ if the cost of schooling is different for boys and girls. Controlling for economic and demographic factors, the direct cost of education for girls and boys in a household is likely to be same, but the indirect cost of education may differ between boys and girls. After a certain age, especially adolescent girls, are expected to take up some of the household responsibilities, such as helping mothers at chores, taking care of younger siblings, etc. The adolescent boys are not asked to take on such household responsibilities, in general. Thus, if girls' schooling has higher opportunity costs than boys', there will be a higher probability for girls' drop-out compared to boys.

DATA AND ESTIMATION METHODOLOGY
Data

For the empirical analysis, the second round dataset of India Human Development Survey (IHDS), published in 2012, is used in this study. The first round of IHDS data was published in 2005 and is used for robustness check for the results. IHDS 2012 is a nationally representative, multi-topic survey of 42,152 households and 204,565 individuals in 1503 villages and 971 cities across India. The survey has both household and individual level information on current school enrollment status; completed education years; income and employment; consumption and standard of living; household and family structure; education; marriage and gender relations; fertility and health; birth history of the children; among others.

Estimation Strategy

Probability models are used to estimate the schooling decisions for children. Parents' decision to keep a child enrolled in school depends on their perceived difference in utilities from two choices: utility from keeping the child in school minus the utility from taking-out the child from school. This difference in utilities cannot be observed. Instead, we only observe the current enrollment status of a child. It is assumed that rational parents have made the decision comparing the two choices. Let Y^*_i represents the unobserved latent variable and can be defined as,

$$Y^*_i = U(E_{Si} = 1) - U(E_{Si} = 0) \qquad (2)$$

where, E_{Si} is a binary variable that is whether child i is enrolled ($=1$) currently in level S or is taken out of school (*enrolled* = 0). If a child never went to school, enrollment variable will get 0 as well.

Based on this difference in utilities, parents keep their child i enrolled in school if $Y^*_i \geq 0$ or decide to remove the child i from school if they perceive $Y^*_i < 0$, such as:

$E_{Si} = 1$, i.e. enrolled if $Y^*_i \geq 0$

$= 0$ i.e. not enrolled if $Y^*_i < 0$

Thus, the equation for estimation (3) can be formulated as:

$$\Pr(E_{Si} = 1 | Z_i) = \Pr(Y^*_i \geq 0 | Z_i)$$

$$= \Pr(\beta_0 + \sum_{n=1}^N \beta_n Z_{ni} + \varepsilon_i \geq 0) \quad \text{where } n \in [1, N] \quad (3)$$

Z_{ni} is the vectors of all regressors, ε_i is the error term, and

$$\sum_{n=1}^N \beta_n Z_{ni} \approx \beta_1.G_i + \beta_2.Sb_i + \beta_3.ER_{Si} + \beta_4.Var(W_{Si}) + \beta_5.R_i + \beta_6.X_i \quad (4)$$

Where: G_i represents the gender of child i; Sb_i denotes sibling composition; ER_{Si} and $Var(W_{Si})$ represent expected returns from education and standard deviation of (neighborhood) wages respectively at education level S that child i has completed and dropped out *or* the level child i is currently studying; R_i denotes parent's reciprocity expectation from child i; and X_i represents the control variables, such as age, urban or rural location, parents' education and income/consumption of the household, religion, and caste dummies. The probability of enrollment can be estimated using a probit model assuming that the unobserved determinants of enrollment after controlling for observed factors and the stochastic errors provide a normally distributed random disturbance.

As I want to measure the gender gap in education demand within household, the main explanatory variable is the gender of the child (G_i). The main coefficient of interest for measuring the gender gap in enrollment is β_1.

The analysis uses the information on the birth history of children to construct sibling composition (Sb_i), which includes the number of siblings and the number of male siblings a child has. Returns to education (ER) from a level, say level S, is the difference between average wage at level S and average wage at level ($S-1$). For this, gender-wise average wages are calculated using the gender-disaggregated actual wage distributions in the locality for different education levels.

Thus, conditional on earning money as wage, the expected returns to education are calculated based on education levels, locations, and gender. Here, locations mean the primary sampling units (PSUs) in the survey, and each PSUs were formed with randomly selected 150-200 households in villages and urban blocks. Exploiting the same distributions of actual wages, the riskiness attached with the wage opportunities is also captured. Variability of labor market $Var(W)$ is constructed from the standard deviation of gender-disaggregated local wages for an education level, conditional on earning money as wage.

To capture the reciprocity expectation of old-age care, the mothers were asked: (i) Who do you expect to live with when you get old? (ii) Would you consider living with your daughter when you get old? (iii) Who do you expect will support you financially when you get older? And (iv) Would you consider being financially supported by your daughter? Among these questions, I consider questions (i) and (iii)[14] and construct variables reciprocity expectation in general and financial reciprocity expectation, both as if a mother has an expectation of reciprocity from any of her children then reciprocity variable (R) takes value 1, otherwise 0.

Other demographic variables that may have impacts on the schooling decision of children can be the age of the child, completed schooling years, mother's and father's education, location type (urban or rural), consumption of the household[15], and religion and caste/tribe dummies. After considering the main explanatory factors and demographic control variables in the estimation, β_1 measures the difference in schooling decision based on gender.

Before including all these variables together in a regression, I examine the presence of multicollinearity by computing the correlations between the variables and also using Variance Inflation Factor (VIF)[16]. The correlation between *age of the child* and *completed schooling years*

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[14] The questions (ii) and (iv) were valid only for daughters and therefore will not be informative to examine the sample of children including both genders. However, I used these two questions in the estimations and as expected the results were not informative, but one can avail the results from the author upon request.

[15] The information of earning of the parents from different sources (remuneration from job, earning of business etc.) can be used as income of the household. A proxy for earning can be household consumption. Using BIC and AIC, I decide to keep consumption rather than income (parents' combined earnings) of the household.

[16] VIF value exceeds $^1/_{(1-Rsq)}$ in presence of multicollinearity. The presence of multicollinearity between the right-hand side variables will reduce the precision of estimated results.

is 0.85 and between *Hindu* and *Muslim* is 0.81. Also, VIF and 1/VIF values give evidence for the presence of multicollinearity[17]. Using Bayesian Information Criteria (BIC) and Akaike Information Criteria (AIC), I decided to keep the *age of the child* instead of *completed years of schooling* and keep *Muslim* instead of dummy for *Hindu* religion.

The IHDS survey includes information on all the household members. In India, living as joint family (an extended family arrangement) is common to date, such as brothers and even cousins live in the same household with their own families and children. Then there would be cases where many children come from the same household, even in the eldest and single children cases (where a parent is a brother/sister to another parent within the same household). Therefore, the observations of children within the same household would be correlated, and for variables, such as religion, location, etc. the observations would have the same values. The standard errors of all the estimations in this paper are clustered at household level.

RESULTS
Descriptive Statistics

In the total sample of 2,04,568 individuals, 51,399 (25%) are of school-going age that is between age 6 to 18 years. Among these school-going age children, 52% are boys, and 48% are girls. *Figure 1* shows the age-wise school enrollment rates among boys and girls. The enrollment of children at the age-group of 6-11 years is almost full (100%), with marginally lower rates for girls at age 10. Starting from age 12 and onward, the enrollment rates start to diverge from the full enrollment, with a higher difference for girls[18].

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[17] VIF values are higher than 2.5 and 1/VIF values are less than 0.40 between *age* and *completed schooling years* and also between *Hindu* and *Muslim*. It indicates that neither age and completed schooling years and nor Hindu and Muslim should be used together in the same regression.
[18] Ideally, at the age of 6 a child should start schooling at grade I, and complete grade I by age 7. Accordingly the ideal grade completion ages are: 8 for II, 9 for III and so on. Therefore, children at age 11 should finish primary, at 14 finish elementary (VIII), age 16 finish secondary (X) and at 18 should finish higher secondary (XII). The data reveals that few children have finished the levels early than the ideal level-completion age. 1.8% children completed primary level early; 1% completed elementary level early; 0.3% and 0.1% completed secondary and higher secondary levels early respectively. There are large percentages of children who finished the level later than ideal age of completion.
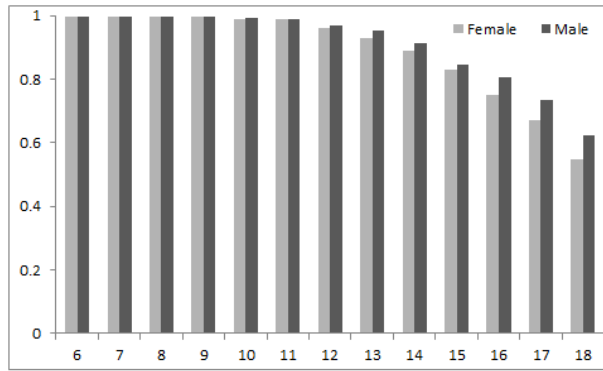
Figure 1. Gender and age-wise enrollment of children at school-going age.
Source: Author's calculation from IHDS 2012.

Among 51,399 school-going age children, around 12% are single children, who do not have any siblings. The number of eldest (firstborn children with siblings) children is 15,486 (30%).

The descriptive statistics of the children are given in *Table 1*. The mean age of school-going age children is 12 years. On average, the children have two siblings. Mother's mean year of education is four, and father's education is around five years on average. The average distance of schools is 2.7 km from home, and annual average schooling cost is 2112 INR (Indian Rupees). The negative values of cost mean that these children receive a stipend from government or any other sources.

Table 1. Descriptive Statistics of school-going age children

Variables	Obs	Mean	Std. Dev.	Min	Max
Descriptive:					
Age	51399	11.58	3.48	6	18
Siblings	51399	2.06	1.37	0	9
Male Siblings	51399	1.07	0.96	0	8
Female Siblings	51399	0.99	1.03	0	7
Mother's Education (years)	48202	4.30	4.67	0	16
Father's Education (years)	43913	5.23	5.00	0	16
Household (HH) Demographic:					
HH Members	51399	6.29	2.71	1	33
Male HH Members	51399	3.08	1.61	0	17
Female HH Members	51399	3.21	1.71	0	17
Urban HH	51399	0.315	0.46	0	1
HH Income (INR)	51399	118136.6	230840.0	0	2439999
HH Consumption (INR)	51379	121089.2	105294.3	6000	4028836
School Demographic:					
Cost of education (INR)	41685	2112.5	9053.0	-13200	470900
School Distance (Km)	43825	2.75	5.41	1	99

Measuring difference in education demand between boys and girls

To measure the difference in parents' decision in education, I use different subsamples of children,

such as children, in general, at school-going age (termed as *All Children Sample*); sample of firstborn children (is termed as *Eldest Children Sample*); and sample of children without any siblings (is termed as *Single Children Sample*). Using probit estimation method, I estimate the probability of enrollment of a girl child compared to a boy. Apart from the main explanatory variable, other variables included in the estimations are number of siblings and male siblings (not applicable for single children sample), return to education, standard deviation of wages, mother's reciprocity expectation, age of the child, urban/rural location, household consumption, both parents' education, Muslim dummy and Scheduled caste/tribe dummy.[19] In *Table 2 Panel A*, the results present the marginal effects of being a girl on the probability of enrollment compared to being a boy.[20]

Among 51,399 total school-going age children, the observation included in the estimations of all, eldest and single children is only 12049, 3841 and 875 respectively, as the observations with missing values for variables are dropped. The exclusion of missing value observations also excludes children who have never been in school, and only keeps children who have some schooling and either continue schooling or have dropped out.[21]

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[19] The estimations without any control variables and different sets of control variables are also checked, these results are not included in the paper but can be available from author upon request.

[20] Marginal effects represent percentage change in probability of enrollment due to discrete change of binary explanatory variables from 0 (being a boy) to 1 (for being a girl).

[21] The results without excluding the missing values are also estimated and these estimations include children who have no schooling with children who have some schooling. These results are not included in the paper due to space constraint but can be available from the author upon request. Further, observing the characteristics of the missing values, it is found that from 51,399 children, 39,350 (around 75%) children were dropped from estimations, and the highest number of observations (around 65%) are dropped due to missing values in returns to education and standard deviation of wages. When returns to education and standard deviation of wages are constructed, a large number of missing values are generated as when no one (can be absent for a gender) in a location earn money with a certain level of education then missing values are created for such location or gender for an education level. As robustness check, I re-estimate the probabilities of enrollment by substituting the missing values of labor market variables with district and/or state average and the results can be available from author upon request. The results for gender of the child remain robust in sign and significance, however, the size of the impact on enrollment declines in both all and eldest children samples. And, the impact of variability in wages increases when missing values of standard deviation of wages are substituted with district average and then further by state average. In addition, around 10% observations are dropped due to missing values in other covariates.

Table 2. Probit Regression: Marginal effects on enrollment of children

| Dependent variable:	Main Explanatory Variables: Girl Child		
Enrollment	All	Eldest	Single
Panel A:	*School- going Age Children*		
Marginal Effects: dy/dx	-0.0364***	-0.0521***	-0.00572
	(0.0063)	(0.0108)	(0.0249)
N	12049	3841	875
Panel B:	*Completed Primary level (Std V)*		
Marginal Effects: dy/dx	-0.0288	-0.0067	0.0308*
	(0.0192)	(0.0343)	(0.0166)
N	861	245	59
	Completed Elementary level (Std VIII)		
Marginal Effects: dy/dx	-0.0375***	-0.0477***	0.0136
	(0.0101)	(0.0163)	(0.0463)
N	5675	1878	419
	Completed Secondary level (Std X)		
Marginal Effects: dy/dx	-0.0667***	-0.0787***	-0.1144
	(0.0194)	(0.0305)	(0.0698)
N	1171	453	65
Panel C:	*Children above age 14*		
Marginal Effects: dy/dx	-0.0785***	-0.1127***	-0.0021
	(0.0169)	(0.0260)	(0.0627)
N	3962	1447	328

Note: Controls used in all estimations are number of siblings and male siblings (not applicable in single children sample), returns to educations, standard deviation of wages, mother's reciprocity expectation, child's age, urban/rural, HH consumption, parents' education, religion (Muslim) and Scheduled caste/tribes dummies. Standard errors clustered at HH level are given in parentheses. *, ** and *** represent statistical significance levels at 10%, 5% and 1% respectively.

The results in *Panel A* for all children sample indicate that a girl, in general, has 3.6% significantly (at 1% level) lower probability of enrollment compared to similar boys, keeping all other things same. Among eldest children, an eldest sister on average has 5.2% lower chances of enrollment compared to a similar firstborn boy. The marginal impact of `being a girl' on enrollment status shows that being an eldest daughter is worse than being a daughter in general in terms of their schooling probability. Using a single children sample, I find the effects of being a girl child on enrollment are negative but statistically insignificant. It indicates that when parents have only one child, there is no significant difference in schooling decision between parents who have a girl child and parents with a boy child. However, there can be a concern that the subsample of single children may have potential endogeneity issues, as the decision of the number of children is not random.

Gender difference in enrollment across levels of education

The examination of school enrollment across different schooling standards reveals that the drop-out rates are higher at the transitions from one level to another. *Figure 2* shows that the drop-out

rate is higher after completion of primary level (V) compared to immediate pre and post standards, such as standards IV and VI. A higher percentage of children also drop-out after completion of elementary school (VIII) compared to standards VII and X. Though the drop-out rate at the secondary level is also higher in comparison to drop-out upon completion of standards XI and XII, it is lower than drop-out after standard IX. The gender-wise drop-out rates are also examined, both have similar patterns as *Figure 2*, with higher drop-out among girls.
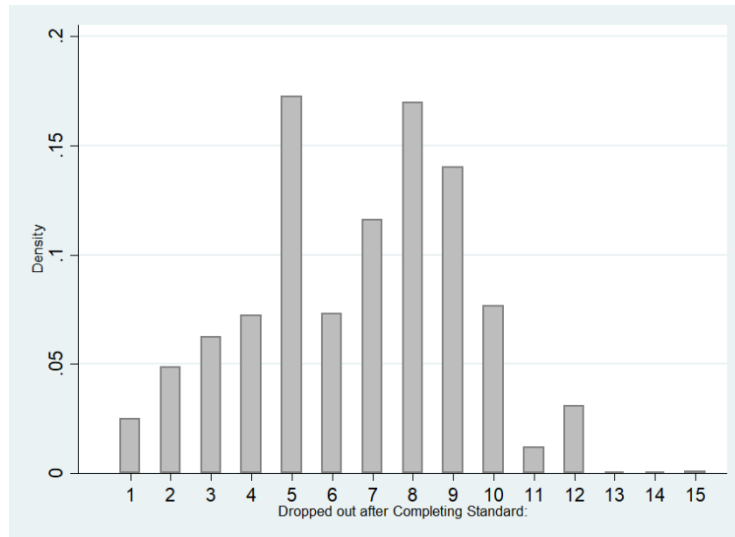
Figure 2. Drop-out rate at different school levels *Source:* Author's calculation from IHDS 2012.

With the evidence of higher drop-out rates after completion of levels, I decided to examine the influence of gender of the child on enrollment decision in the transition period from one level to another. In *Table 2 Panel B*, I use three subsamples; children who have completed primary level or standard V, children who have completed elementary level or standard VIII and children who have completed secondary level or standard X; under all, eldest and single children samples. These estimations also include the full set of control variables.

For pupils who have completed primary schooling, the gender of the child does not significantly influence their enrollment decision in all children and eldest children samples. However, for single children, the girl child has significantly (at 10% level) higher probability by 3% to remain enrolled compared to the single boys after primary level. After completion of elementary level, girls in general and firstborn girls are significantly less likely by 3.7% and 4.8% to continue schoolings compared to boys in general and eldest boys respectively. After elementary level, as schooling does not remain free and parents have to bear the costs, it seems that parents are increasingly reluctant to bear girls' schooling costs compared to similar boys. However, among

parents with single child enrollment decision beyond elementary does not differ based on the gender of the child. After the secondary level, girls and eldest girls on average have 6.7% and 7.9% lower probability of continuing schooling compared to boys in general and eldest boys respectively, *ceteris paribus*. The gender difference in enrollment decisions of single children remains insignificant even after completion of secondary schooling. From the level-wise analysis, it is evident that the probability of girls' and eldest sisters' drop-out increases as the level of education increases, given all other things remain the same.

As the implementation of RTE Act (2009-2010) ensures that every child up to the age of 14 years has right to full-time free and compulsory education, the schooling cost burden is not a factor to create gender gap in parents' decision of schooling of children up to that age. However, beyond the free schooling age of 14, the schooling demand decreases as schooling is not free anymore, and the gender gap in enrollment decision may become significant. To show this, I re-estimated the enrollment probability for children above age 14. The results in *Table 2 Panel C* show that the gender gap in enrollment probability increases, such as girls in general and firstborn girls have 7.8% and 11% lower probability (statistically significant at 1% level) of continuing schooling compared to similar boys, keeping other things same.

Implications of Fundamental Factors on Enrollment Decision Based on Gender

In this section, I examine the fundamental factors that generate parents' demand for children schooling and measure how these factors can impact enrollment decision based on the gender of the child. For these estimations, I use the interaction terms between the fundamental factors and girl child.

Examining the IHDS 2012 data, I find that the gender gap in wages persists at all levels of education. However, it cannot be said that the returns to education are always lower for females than males though in most parts it is so. Further, the data reveals that the standard deviation of wages across education levels is lower for females than males. An explanation is that females are less likely to even apply for the highly paid jobs when they have lower education levels whereas their male counterpart with a similar qualification is more likely to try their luck even in the highest paid jobs. Therefore, the variability in the male wages is higher not only because the inherent riskiness in the labor market opportunities but also because males in fact try and get highly paid jobs with comparatively lower educational qualification than females (The graphical presentations

can be available from the author upon request).

The probit estimation results in *Table 3 Panel A* show the impact of gender-disaggregated returns to education on enrollment probability of boys and girls differently. The marginal effects of female wage returns on enrollment of girls are positive and higher in size compared to the impact of male returns on boys' enrollment. For example, in all children sample, the results indicate that 1 unit[22] increase in female returns to education improves the chances of girls' enrollment significantly by 9.2%, whereas 1 unit increase in male returns can improve boys' enrollment probability only by 1.1% (insignificant). For eldest and single children samples estimations, the results remain statistically insignificant though the size of the impact of female returns on girls' enrollment is much higher compared to the impact of male returns on boys'.

Table 3. Impact of Fundamental Factors on Enrollment Decision Based on Gender

Probit Estimations: Dependent Variable: Enrollment	All Children	Eldest Children	Single Children
Panel A:			
Return to education X Girl	0.0924* (0.0488)	0.0204 (0.0778)	0.0886 (0.1815)
Return to education	0.0112 (0.0077)	0.0033 (0.0149)	0.0030 (0.0248)
Panel B:			
Standard Deviation of wages X Girl	0.0045 (0.0539)	-0.0197 (0.0853)	0.1278 (0.2823)
Standard Deviation of wages	0.0848*** (0.0161)	0.0794** (0.0358)	0.0459 (0.0428)
Panel C:			
Reciprocity Expectation X Girl	0.0015 (0.0614)	0.0128 (0.0901)	0.2003** (0.0931)
Reciprocity Expectation	-0.0108 (0.0407)	-0.0702 (0.0685)	-0.2400*** (0.0583)
Panel D:			
Financial Expectation X Girl	-0.0450 (0.0416)	-0.1448** (0.0639)	-0.0275 (0.0742)
Financial Expectation	0.0304 (0.0208)	0.0354 (0.0276)	0.0828 (0.0437)
Panel E:			
Parent with govt. job X Girl	-0.0035 (0.0163)	-0.0016 (0.0266)	-0.0077 (0.0582)
Parent with govt. job	0.0264*** (0.0087)	0.0372** (0.0155)	-0.0080 (0.0297)
N	12049	3841	875

Note: Controls used in all estimations are number of siblings and male siblings (not applicable in single children sample), mother's reciprocity expectation, child's age, and gender, urban/rural, HH consumption,

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[22] Return values are scaled down by dividing with 100,000. Taking log is not possible as some returns have negative values when average wage for an education level in a location is lower than the wage of the previous level. Based on the scaling, 1 unit increase in return means increase of INR 100,000 in returns.

parents' education, religion (Muslim) and Scheduled caste/tribes dummies. Standard errors clustered at HH level are given in parentheses. *, ** and *** represent statistical significance levels at 10%, 5% and 1% respectively.

In *Table 3 Panel B*, when examining the impact of labor market variability on school enrollment, I find that probability of boys' enrollment improves significantly by around 8% if the variability of male wages increases by 1 standard deviation, using both all and eldest children samples. However, for girls (especially for eldest girls), the variability in female wages can reduce their enrollment probabilities, but the estimated impacts remain statistically insignificant. In the case of single children sample, the impacts of variability in male and female wages are statistically insignificant on both boys' and girls' enrollment. Thus, it can be stated that parents with multiple children behave differently to the variability of female and male wages when deciding for girls' and boys' schooling, respectively.

The difference in parents' behavior towards variability in male and female wages can be explained in the following ways: Labor market imperfection, the uncertainty of getting an opportunity to work and secure remuneration may positively influence schooling decisions, i.e. parents would like to continue children's education longer in the prevalence of such imperfections. Parents probably perceive that without completing school education it would become hard for a child to get a good job in the presence of labor market uncertainties and that higher education gives more confidence to individuals to try their luck in highly paid jobs. However, this perception does not hold for parents with a girl child; these parents rather get discouraged by the labor market variability for females. If parents already perceive gender discrimination and the pro-male labor market policies and opportunities, higher variability for females reduces their incentives for girls' schooling further.

Parent's reciprocity expectation from children can influence their schooling decision. I use mothers' reciprocity expectation in general and financial reciprocity expectation for the analysis. The results in *Table 3 Panels C and D* give the marginal effects of general reciprocity expectation and financial reciprocity expectation respectively from a child on enrollment probability based on gender, as I include the interaction terms of reciprocity with a girl child. The results for all and eldest children sample would not very informative as for a child in general and/or eldest child; it can be the case that parents have reciprocity expectation but may or may not be from the child in question but from his/her brother. In single children sample if parents have reciprocity expectation

from a child, it definitely is from the child in question. For the single girl child, parents' reciprocity expectations, in general, influence her enrollment significantly by as large as with 20% higher probability. Parents with single girl child are more likely to continue her schooling when they do not have a son to depend on; they may perceive that education will make their daughter successful and independent in future and she may provide old-age care to parents even after marriage. For single boy child, parents' reciprocity expectation reduces the probability of enrollment largely, by 24%, this is not what I expected. It can be the case that parents with higher reciprocity expectation are more likely to stop boy's schooling as they want him to join the labor market as soon as possible and start providing monetary help to the family. For girl child in general and for eldest sisters the results remain positive but become insignificant.

The expectation of financial reciprocity from a child, in general, can motivate parents to continue boys' education with 8.3% higher probability for the single boy child. However, financial expectation from a child does not influence parents to continue a girl's education, not even for a single child. Parents' financial expectation from a child significantly reduces the enrollment probability for eldest daughter by 14%, as parents expect financial help only from sons.

Further, in *Table 3 Panel E*, I also use parents with government jobs as a counter indicator of reciprocity expectation. In India, government jobs are considered to be more secure than private-sector jobs, and all government employees are entitled to monthly pension payment after retirement. So people in a government job can be assumed as financially less dependent on grown-up children at retirement, and therefore are expected to have lower reciprocity expectation from children. I construct the government job variable as if at least one parent has a government job; the variable will take value 1, otherwise takes 0. The results of interaction terms of parent's government jobs with a girl child indicate that it adversely impacts their enrollment probability. The same impact on single boys can be observed as well. However, parent's government job significantly and positively influences boy's enrollment probability when estimations are done for all and eldest children samples, and may be due to a secured income stream from the job.

Table A1 in the Appendix presents the marginal effects of a full set of variables in different samples, such as all, eldest and single children. The results indicate the impact of different demographic and economic factors on enrollment decision of children. It can be said that higher number of siblings and/or male siblings, age of the child, Muslim religion compared to any other

religion, backward caste compared to other castes, and surprisingly urban location compared to rural may have a negative impact on enrollment decision of a child. It is also found that household consumption (a proxy for economic status), and parents' education have a positive impact on a child's enrollment decision. The analysis using interaction terms between the variables and girl child provides more detailed implications of these factors on enrollment probability based on the gender of the child. However, these results are not included in the paper.

Robustness Checks

The robustness of the main results is checked using different methods of estimations, such as: (i) logit regression; (ii) linear probability model; (iii) re-estimate the results using the sample weight that is used in survey sample design of IHDS-2012; (iv) treat the cross-section data as panel data to control the possibly correlated household invariant heterogeneity; (v) include different location (state or districts) specific dummies to take into account further location-invariant heterogeneity in the data. These different methodologies and strategies of estimation provide robust results both in terms of sign and significance and also do not differ much in magnitude in most of the cases. Also, using the first round data of IHDS 2005, I found that the results remain similar to the IHDS 2012 results in *Table 2*.

CONCLUSIONS

In India, the gender gap in enrollment beyond primary level persists and widens with the increase in the level of education, especially beyond the elementary level when schooling is no longer free under RTE. Despite multiple interventions by the Indian government to improve the education situation, policies so far have not gone beyond making the schools accessible to all and failed to adequately improve the usage of education system beyond the elementary level, especially for girls.

This paper measures the inherent gender gap in parents' decision of schooling of a child and finds that a girl child is on average around 4% less likely to continue schooling compared to a boy child, keeping the fundamental factors and all other economic and demographic variables that may have an impact on enrollment decision same. Within a household, the difference in providing schooling becomes an important question when parents have more than one child and thus have to decide on school education for each child. The paper finds that girls with an higher birth order (such as an eldest sister) face significantly more discrimination and is around 5% less likely to

continue school education compared to an eldest brother, *ceteris paribus*. This indicates that in access to schooling, it is worse to be an eldest daughter than a daughter in general. However, parents with a single child do not have any significant differences in the schooling decision based on gender. The results also confirm that having more siblings in general increases the probability of discontinuing schooling for girls compared to boys. Based on this, I infer that smaller family size may improve access to education for daughters and therefore, policies towards restricting family size can be helpful. However, population control policies may have adverse demographic impacts in terms of pro-male biased sex ratios and can exacerbate other gender imbalances. Population control policies must be adopted with stricter adoption of laws restricting sex-selective family planning practices. Awareness campaigns to improve parents' awareness about the importance of girl child and her education (such as *Beti Bachao Beti Padhao* -Save girl child, educate girl child drive launched in 2015 by the Indian government) can help to reduce gender differential behavior among parents within households. In such campaigns, success stories of girls through education should be highlighted.

Further, the estimations across education levels imply that the probability of girls' dropping out from schools increases significantly with education levels and becomes as large as 7-8% after completion of secondary school. Also, girls, in general, and firstborn girls beyond the free schooling age of 14 years are around 8% and 11% significantly less likely to continue schooling respectively, compared to similar boys. This also provides evidence that schooling cost can be an important factor to discourage parents on children's schooling, especially girls' schooling in comparison to boys' enrollment. When parents are already reluctant to send girls to schools, if secondary education bears costs, parents will be more convinced to discontinue girl's education at such levels. Therefore, government interventions should be extended towards free and/or subsidized education up to higher secondary level (XII), it would help to increase girls' presence at the higher schooling levels. In 2013, the revised *Rashtriya Madhyamik Shiksha Abhiyan* included *National Incentive to Girls* by transferring a sum of money to eligible girls as fixed deposit for encouraging girls in secondary education. The girls are entitled to withdraw the sum along with interest upon reaching 18 years of age and on passing a secondary examination. However, whether this fund will be used for girls' higher education beyond school or as dowry payment is a matter of concern and therefore demands more critical analysis.

Analysis of the fundamental factors that generate household demand for education finds that, on the one hand, education returns may have a positive impact on schooling incentives for girls and, on the other hand, the variability of the labor market may discourage parents for girls' education. Therefore, I infer that reduction in labor market discrimination, more efficient implementation of Equal Remuneration Act (was passed in 1976) and improvement in opportunities for educated workers irrespective of gender may encourage parents to provide education to daughters as equally as sons.

Parents' reciprocity expectation of getting old-age support from a child in the future motivates them to provide education and make him/her a successful individual in the future. In Indian patrilocal societies, it is more likely that parents expect reciprocal behavior, especially financial reciprocity, from sons rather than daughters. In recent times, the probabilities of getting old-age security from sons have lowered due to current economic and social changes; the likelihood that a son will live at the same place as parents has decreased. At the same time, women are becoming more economically independent and aware of their rights and roles. The equal inheritance rights over parent's property have strengthened a daughter's economic status further. Thus, the probability that daughters will take care of old parents increases. The government interventions towards pension schemes and transfers directed to old age security addressing health and disability issues will be useful to reduce parents' dependence on offspring in old age. These would reduce parent's biases towards allocating resources differently among son and daughter.

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REFERENCES

Alderman, Harold, and Elizabeth M. King. "Gender differences in parental investment in education." *Structural Change and Economic Dynamics* 9, no. 4 (1998): 453-468.

Attanasio, Orazio, and Katja Kaufmann. *Educational choices, subjective expectations, and credit constraints*. No. w15087. National Bureau of Economic Research, 2009.

Attanasio, Orazio P., and Katja M. Kaufmann. "Education choices and returns to schooling: Mothers' and youths' subjective expectations and their role by gender." *Journal of Development Economics* 109 (2014): 203-216.

Black, Sandra E., Paul J. Devereux, and Kjell G. Salvanes. "The more the merrier? The effect of family size and birth order on children's education." *The Quarterly Journal of Economics*120, no. 2 (2005): 669-700.

Bommier, Antoine, and Sylvie Lambert. "Education demand and age at school enrollment in Tanzania." *Journal of Human Resources* (2000): 177-203.

Cochrane, Susan Hill, Kaplana Mehra, and Ibrahim Taha Osheba. *The educational participation of Egyptian children*. Washington, DC: World Bank, 1986.

Desai, Sonalde, and Reeve Vanneman. "India Human Development Survey-II (IHDS-II), 2011-12. ICPSR36151-v2." *Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor]* 31 (2015).

Gandhi Kingdon, Geeta. "The gender gap in educational attainment in India: How much can be explained?" *Journal of Development Studies* 39, no. 2 (2002): 25-53.

Gertler, Paul, and Paul Glewwe. "The willingness to pay for education for daughters in contrast to sons: Evidence from rural Peru." *The World Bank Economic Review* 6, no. 1 (1992): 171-188.

Glick, Peter, and David E. Sahn. "Schooling of girls and boys in a West African country: the effects of parental education, income, and household structure." *Economics of education review* 19, no. 1 (2000): 63-87.

Gomes, Melba. "Family size and educational attainment in Kenya." *Population and Development Review* (1984): 647-660.

Greenhalgh, Susan. "Sexual stratification: The other side of" growth with equity" in east Asia." *Population and development review* (1985): 265-314.

Hill, M. Anne, and Elizabeth King. "Women's education and economic well-being." *Feminist Economics* 1, no. 2 (1995): 21-46.

Jensen, Robert. "The (perceived) returns to education and the demand for schooling." *The Quarterly Journal of Economics*125, no. 2 (2010): 515-548.

Knodel, John, Napaporn Havanon, and Werasit Sittitrai. "Family size and the education of children in the context of rapid fertility decline." *Population and Development Review* (1990): 31-62.

Knodel, John, and Malinee Wongsith. "Family size and children's education in Thailand: Evidence from a national sample." *Demography* 28, no. 1 (1991): 119-131.

Lillard, Lee A., and Robert J. Willis. "Intergenerational educational mobility: Effects of family and state in Malaysia." *Journal of Human Resources* (1994): 1126-1166.

Mauldin, Teresa, Yoko Mimura, and Mark Lino. "Parental expenditures on children's education." *Journal of Family and Economic Issues* 22, no. 3 (2001): 221-241.

Ministry of Human Resource Development, Education statistics at a glance. Government of India. 2012.

Pal, Sarmistha. "How much of the gender difference in child school enrolment can be explained? Evidence from Rural India." *Bulletin of Economic Research* 56, no. 2 (2004): 133-158.

Parish, William L., and Robert J. Willis. "Daughters, education, and family budgets Taiwan experiences." *Journal of Human Resources* (1993): 863-898.

Pong, Suet-Ling. "Sibship size and educational attainment in Peninsular Malaysia: Do policies matter?" *Sociological Perspectives* 40, no. 2 (1997): 227-242.

Shreeniwas, Sudha. "Family size structure and childrens education: ethnic differentials over time in Peninsular Malaysia." (1993): 331-72.

APPENDIX

Table A1. Probit Regression: Marginal effects on enrollment of children

Dependent Variable: Enrollment	Different Samples of Children		
Explanatory Variables:	All Children	Eldest Children	Single Children
Girl Child	-0.0364***	-0.0521***	-0.00572
	(0.0063)	(0.0108)	(0.0249)
No. of Siblings	-0.0038	-0.0140***	
	(0.0027)	(0.0047)	
No. of Male Siblings	-0.0081**	-0.0014	
	(0.0034)	(0.0062)	
Return from Education	0.0147*	0.0043	0.0048
	(0.0076)	(0.0147)	(0.0245)
Std. Dev. of Wage	0.0850***	0.0780**	0.0482
	(0.0155)	(0.0337)	(0.0429)
Reciprocity	0.0175	0.0010	0.0703**
	(0.0183)	(0.0260)	(0.0358)
Age	-0.0436***	-0.0454***	-0.0419***
	(0.0011)	(0.0020)	(0.0049)
Urban	-0.0284***	-0.0279**	0.0158
	(0.0072)	(0.0116)	(0.0256)
HH consumption	0.0189***	0.0135*	0.0277
	(0.0043)	(0.0076)	(0.0198)
Mother's Education	0.0110***	0.0126***	0.0100***
	(0.0009)	(0.0015)	(0.0026)
Father's Education	0.0069***	0.0077***	0.0079***
	(0.0007)	(0.0011)	(0.0018)
Muslim	-0.0632***	-0.0741***	-0.0708*
	(0.0078)	(0.0128)	(0.0376)
Scheduled caste and tribe	-0.0062	-0.0123	-0.0109
	(0.0071)	(0.0119)	(0.0231)
N	12049	3841	875

Note: Standard errors clustered at HH level are given in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. This table is re-estimated taking into account survey weights that are used in the survey sample design; the results remain robust. However, the results are not included in the paper and can be available from the author upon request.