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Abstract

The paper shows how parental expectations about child's future income affect the incidence of child labour and schooling. We present a theoretical framework where parents decide on the optimal amount of time invested in child education in presence of uncertainty about returns to education. Here, the uncertainty is captured using the probability that parents attach to higher returns after education. Our theoretical findings underscore the need for policy interventions that affect time preferences of parents, for any wage regulations to enhance the extent of child education. On the empirical side, we use a longitudinal survey (Young Lives Survey) for children in Andhra Pradesh, India; to measure the effect of parental expectations on investment in schooling. This longitudinal survey allows us to first, estimate the probability that parents assign to the expectation that their child will get a skilled job in future. And then, we examine the impact of these parental expectations on probability of

schooling decision as well as the amount of child's time allocated for studies. Our findings suggest that child's inherent ability, parental education and parents' attitude towards education influence the parental expectations about child's future job. Parental expectations in turn positively affect the investment in human capital. Interestingly, we find a negative impact of the average child wage in community, on both probability of schooling and the proportion of study hours only for boys. This result reflects the ambiguity predicted by our theoretical model, in the effect of child wage on child labour. Our empirical results also indicate that even free education may not encourage child education if parents lack faith in the society to provide skilled jobs.

Keywords: Parental expectations, Uncertainty, Child labour, India.

JEL Classification: J24, D84, D91

Role of Parental Expectations in Determining Child Labour and Schooling

1. Introduction

According to the International Labour Organization (ILO), 16.7% of the children in age group 5-17 years were employed in 2012 (ILO, 2013). Child labour is observed even today despite the various policies like free education, ban on child employment, adopted by the governments worldwide to combat it. Thus, a detailed analysis is warranted to understand the parental decision about child work and schooling. The present paper focuses on the role of parental expectations about the child's future earnings in this decision making process. In particular, we present a theoretical framework where parents decide on the optimal amount of time invested in child education in presence of uncertainty from returns to education. Then, we empirically estimate these expectations and quantify their impact on the parental decision using the Young Lives Survey data for Andhra Pradesh, India.

As in Basu and Van (1998), our theoretical model is a unitary household model that ignores the issues of agency within the household. In our model, parental decision on child labour is independent of the poverty status of household.[1] Unlike Ranjan (1999, 2001), we allow sharing of total time available to the child, between education and labour. Further, we study the impact of uncertain returns to education on this decision.

In related literature, Baland and Robinson (2000) too, allows for time to be shared between education and labour; and shows presence of inefficient levels of child labour due to capital market imperfections. Pauliot (2006) extends the Baland and Robinson (2000) model to allow for uncertain human capital generation and shows that this uncertainty along with imperfect insurance markets leads to inefficiently high child labour. In contrast, we adopt the perspective that any child labour is undesirable and so, refrain from making any efficiency judgement. Further, unlike Pauliot (2006), we do not make any distributional assumptions on the uncertain returns to education. Instead, we model the uncertainty as the parental beliefs in the child's ability to get a skilled job after education in future.

Our theoretical model predicts that greater belief in education would decrease the extent of child labour. Also, we find a negative relationship between child wage rate and child education provided the elasticity of substitution between present and future consumption is sufficiently high. This calls for policy interventions that generate awareness among the agents and affect their time preferences, so as to make them more cognizant of future life decisions.

Unlike most of the theoretical models, some empirical papers analyse impact of parental expectations and beliefs on child education. Buchmann (2000) analyses parental expectations about financial help from children at the old age and the job market conditions as determinants of enrollment in school. Hao and Bonstead-Bruns (1998) study interrelations between parent's and child's expectations, and their effect on academic achievement in terms of years of schooling completed. While these studies point out the importance of parental beliefs about the child's future behaviour and earnings, they do not explicitly model connection between parental expectations and investment in education through expected returns to education. We attempt to fill this gap in the present paper.

On the empirical side, this paper (i) estimates the parental beliefs and (ii) then quantifies its impact on schooling decision, using the Young Lives Survey data for Andhra Pradesh, India. We model the schooling and work decisions as a multivariate probit model. Unlike most of the existing empirical studies (Wahba, 2006 and Zapata et al., 2011), we distinguish two types of works, namely, paid and unpaid, and model them as separate decision variables along with the schooling decision. Our empirical work shows that child's innate ability, parental education, number of siblings and parent's attitude towards education, determine the beliefs held by the parent about the future returns to child education. Further, we find that investment in human capital goes up if parents expect the child to do a skilled job after education with greater probability. This finding empirically confirms our theoretical prediction. We also find a negative impact of the average child wage in community on schooling, *in the case of boys*. In terms of our theoretical predictions, this means that household's inter-temporal elasticity of substitution varies with gender of the child. This result suggests an interesting avenue of future research that seeks to verify this finding in greater detail and provide an explanation for it. Finally, in terms of policy, our empirical

study suggests that even free education may not encourage child education if parents lack faith in the society to provide skilled jobs.

In addition to our study of the schooling decision, we also analyse the trade-off between schooling and child labour in terms of time use of the child. There has been conflicting empirical evidence on this question in the literature. For example, Ravallion and Wondon (2000) show that in Bangladesh, enrolment subsidy increased schooling in greater proportion than the reduction in child labour and conclude that there is not much trade-off between child labour and education; while Akabayashi and Psacharopolulos (1999) find positive evidence of such trade-off in Tanzania. Our results show the presence of trade-off between schooling and unpaid work for boys. However, we do not find any trade-off between schooling and paid work.

The paper is organized as follows. Section 2 provides the theoretical model of child labour. Section 3 describes the dataset and variables. The empirical methods are given in Section 4. Section 5 describes the results. And Section 6 states the conclusion.

2. Model

We consider a two period model involving a household consisting of one parent and one child. In the first period, parent works as well as decides the amount of labour that the child must undertake. In the second period, the child turns adult and works at either an unskilled job or a skilled job. An uneducated child in the first period can only get an unskilled job and such a job is available with certainty in the second period. However, the availability of a skilled job in the second period is uncertain. Further, this skilled wage is assumed to depend on the amount of time spent on education in the first period by child.

In period 1, we denote the income of the parent by b and assume that the child has one unit of time which has to be divided among education and child labour. We denote the share of time

spent on education by $t \in [0,1]$ and the wage (per unit of time) for child labour in the first period as w_c.

In period 2, we denote the unskilled wage rate per unit of time to be w_u and suppose that the child gets a skilled job with probability $p \in (0,1)$ *only if there was some education in period 1*, that is, $t > 0$. This p reflects the parent's belief about possibility of her child getting a skilled job. The exact value of p may depend on various factors such as child's ability, job market conditions, and societal norms.[2] Further, we assume a continuum of skilled wages per unit of time available depending on the level of education obtained in the first period. That is, a child who has spent t > 0 amount of time on education in period 1, gets a skilled wage per unit of time as $w_u + t.I$ where I > 0 is some kind of skill premium. Clearly, the child with full education (t = 1) will get the full skill premium over the unskilled wage as skilled wage $w_u + I$.

We assume that all income is consumed in each period and denote the first and second period consumption of the household as c_1 and c_2, respectively. So if the parent choose to educate her child for t share of time, then $c_1 = b + (1 - t)w_c$ and c_2 will be;

$$c_2 = \begin{cases} w_u + t.I & with\ p \\ w_u & with\ (1-p) \end{cases}$$

So, c_2 is equal to w_u if t = 0.

We assume that the household derives utility from a consumption vector (c_1, c_2) according to the following function

$$U(c_1, c_2) = \frac{c_1^{-\rho}}{-\rho} + \beta \frac{c_2^{-\rho}}{-\rho}, \qquad -1 < \rho < \infty, \qquad \rho \neq 0$$

where $\beta \in (0,1)$ is the rate at which the household discounts future consumption[3] and $\frac{1}{1+\rho}$ is the intertemporal elasticity of substitution. Finally, we assume the household to be an expected utility maximizer. Here, the expected utility is maximized based on the probability of child getting skilled job in the second period.

We impose the following regularity condition on the parameters:

$$\left(\frac{w_u}{b+w_c}\right)^{\rho+1} < \frac{\beta pI}{w_c} < \left(\frac{w_u+I}{b}\right)^{\rho+1} \qquad (1)$$

The restriction (1) states that the discounted expected skill premium βpI should not be too high or too low in comparison to the child wage rate w_c. The intuition is as follows. If this value is very large in comparison to w_c, the household would always choose full education for the child leading to no child labour. Instead, if this value is too low, then the household would not educate the child leading to full child labour. In presence of empirical evidence of persistence of child labour along with education, we focus on the interior solution and specify the policy variables that may reduce the extent of child labour.

This brings us to the following result.

Proposition 1: The optimal share of time spent on education is

$$t^* = \frac{(b+w_c)\left(\frac{\beta pI}{w_c}\right)^{\frac{1}{\rho+1}} - w_u}{w_c\left(\frac{\beta pI}{w_c}\right)^{\frac{1}{\rho+1}} + I} \in (0,1)$$

Proof: We first show that the regularity condition (1) implies that household maximization problem $max_{t\in(0,1)}EU(t)$ has a unique interior solution, where

$$EU(t) = \frac{\{b+(1-t)w_c\}^{-\rho}}{-\rho} + \beta\frac{p(w_u+t.I)^{-\rho} + (1-p)w_u^{-\rho}}{-\rho}$$

This follows from the first order necessary conditions which imply that at the optimum t^*,

$$\frac{\partial EU}{\partial t} \leq 0, \quad t\frac{\partial EU}{\partial t} = 0, \quad t \in [0,1]$$

Note that if optimum $t^* = 0$, then $\frac{\partial EU}{\partial t}(t=0) = \beta pI w_u^{-\rho-1} - w_c(b+w_c)^{-\rho-1} \leq 0$. Also if optimum $t^* = 1$, then $\frac{\partial EU}{\partial t}(t=1) = \beta pI(w_u+I)^{-\rho-1} - w_b{}^{-\rho-1} \geq 0$. It can easily be seen that condition (1) rules out both of these possibilities. Therefore, $t^* \in (0,1)$ and so, $\frac{\partial EU}{\partial t}(t=t^*) = 0$, which in turn implies that

$$\frac{w_c}{\{b+(1-t)w_c\}^{\rho+1}} = \frac{\beta pI}{(w_u+t.I)^{\rho+1}} \qquad (2)$$

Since $-1 < \rho < +\infty$, the second order sufficiency condition is satisfied. From (2), we get the optimum level of time spent on education as:

$$t^* = \frac{(b + w_c)\left(\frac{\beta pI}{w_c}\right)^{\frac{1}{\rho+1}} - w_u}{w_c\left(\frac{\beta pI}{w_c}\right)^{\frac{1}{\rho+1}} + I}$$

The following are the comparative statics of the household maximization problem:

$$\frac{\partial t^*}{\partial p} = \frac{\beta I(w_u + t^*I)^{-\rho-1}}{(\rho+1)[\beta pI^2(w_u + t^*I)^{-\rho-2} + w_c^2\{b + (1-t^*)w_c\}^{-\rho-2}]} > 0$$

$$\frac{\partial t^*}{\partial b} = \frac{w_c\{b + (1-t^*)w_c\}^{-\rho-2}}{\beta pI^2(w_u + t^*I)^{-\rho-2} + w_c^2\{b + (1-t^*)w_c\}^{-\rho-2}} > 0$$

$$\frac{\partial t^*}{\partial w_c} = \frac{\{b + (1-t^*)w_c\}^{-\rho-2}[w_c\rho(1-t^*) - b]}{(\rho+1)[\beta pI^2(w_u + t^*I)^{-\rho-2} + w_c^2\{b + (1-t^*)w_c\}^{-\rho-2}]}$$

These comparative statics lead to the following claims:

- If the probability of getting a skilled job in period 2 increases, the extent of child labour decreases.
- If income of the household in period 1 increases, the extent of child labour decreases.
- If $\rho \in (-1,0)$ then increase in child wage rate leads to increase in extent of child labour.

The effect of uncertainty on child labour is unambiguous and empirically testable. If p increases, parent's subjective probability of getting skilled job increases, and so, the expected return on education increases. Hence, child labour decreases. Similarly, if household income increases, household's dependence on child wage reduces in period 1 allowing for greater education. Hence, again child labour decreases.

It may be noted that the effect of child wage on child labour is ambiguous and dependent on the value of ρ. This is because, ρ determines the elasticity of substitution[4] $\frac{1}{1+\rho}$ between c_1

and c_2. Therefore, if ρ is sufficiently small, then any, increase in child wage would lead to greater child labour as the household would choose to send the child to work, in spite of the fact that future consumption will be hampered by this decision.[5] We test these theoretical predictions using a survey data from Andhra Pradesh, India.

3. Data and Variables

The empirical analysis is based on the Young Lives Survey coordinated by the University of Oxford. The survey is a longitudinal survey of two age cohorts of children in the state of Andhra Pradesh, India. The first wave of this longitudinal survey was carried out in 2002. The study area constitutes of the poor communities in Hyderabad and six districts of Andhra Pradesh. The dataset provides a wide range of information for the two age cohorts of children tracked over time. The cohort group considered for this study is of the older children who were born in 1994-95. In 2002, the data covers 1,008 children from the older cohort. Overall attrition rate is 2.2 percent for the entire period of eight years (Galab et al., 2011).

We use the last two rounds of the Young Lives Survey carried out in 2006 and 2009-10. We consider the children who were around 15 years of age in 2009-10. Out of these, we concentrate on the children who were in the school in 2006 and then analyse the decision about continuation of schooling in 2009. Out of the total sample of 1008 children from the older cohort, 13.56 percent of the children have never been to school or dropped out before 2006. We do not consider these children for the analysis. Thus, after eliminating missing observations, we are left with 384 observations for girls and 392 observations for boys. We explain below the variables that we use in the present work. The precise definitions of these variables are given in Table 1.

Table 1: Definitions of the Variables

Variables	Description
Dependent Variables	
Expect Skill Job	= 1 if the parent expects child to be in skilled profession such as, doctor, dentist, pilot, policeman, computer operator, lawyer, scientist and lecturer; = 0 otherwise
Schooling	= 1 if child is in school in 2009 provided child was in school in 2006; = 0 otherwise
Paid Labour	= 1 if child is engaged in paid work in 2009 provided child was in school in 2006; = 0 otherwise
Unpaid Labour	= 1 if child is engaged in unpaid work in 2009 provided child was in school in 2006; = 0 otherwise
Study	Hrs. spent in studying (inside and outside school)/24
Paid Work	Hrs. spent on paid work/24
Unpaid Work	(Hrs. spent on other work including work on household farm, household work and caring for household members)/24
Leisure	Hrs. spent on leisure/24 (Taken as the base)
Explanatory Variables	
Height-for-age	Standardized z-score for height for age of the child
Score on Mathematics Test	Number of correct answers on the mathematics test
Education Helps	= 1 if parents think that the education will help them climb up the economic ladder; = 0 otherwise
Education Useful	= 1 if parents think that the education is very useful in life; = 0 otherwise
P (Skill Job)	Predicted probability of parental expectation about the child doing a skilled job
Time to School	Travel time to school in minutes in 2006
Child Wage	Average daily wages paid to a child in the community in 2009
Skill Premium	Difference between maximum daily skilled wages and minimum daily unskilled wages in the community. Minimum daily unskilled wages are the minimum daily farm wages for rural areas and minimum daily wages for other unskilled activities in urban areas. (for 2006)
Log Consumption	Natural logarithm of total household consumption (in Rs.)
No. of Younger Siblings	Number of younger siblings to the 'Young Life' child
No. of Older Siblings	Number of older siblings to the 'Young Life' child
SC	= 1 if household belongs to scheduled castes; = 0 otherwise
ST	= 1 if household belongs to schedules tribes; = 0 otherwise
Rural	= 1 if household resides in rural areas in 2009; = 0 otherwise
Household Size	Number of members in household
Father Education	Father's education in years

Mother Education	Mother's education in years

We want to examine how parents take decisions about child labour and schooling. To understand the determinants of these choices, we consider two types of dependent variables. Firstly, we consider decisions about child labour and schooling as binary variables. It may be noted that child may work as paid labourer or engage in unpaid work like work on family farms, household work and caring of other household members. The first type of work is usually referred to as child labour. We consider three binary variables, namely, schooling, paid labour and unpaid labour. It may be observed from Table 2 that 88.52 percent of the boys who were in school in 2006 continue education even in 2009-10. For the girls, this proportion is slightly less at 84.9 percent. Incidence of child labour among girls and boys is very similar at 8.59 and 7.14 percent, respectively.

Table 2: Summary Statistics of Dependent Variables

	Girls		**Boys**	
	Average	Std. Dev.	Average	Std. Dev.
Expect Skill Job (in %)	68.49	46.52	76.27	42.59
Schooling (in %)	84.90	35.86	88.52	31.92
Paid Labour (in %)	8.59	28.06	7.14	25.77
Unpaid Labour (in %)	86.46	34.26	58.67	49.30
Allocation of Total Time (in proportion)				
Study	0.37	0.17	0.41	0.15
Paid Work	0.02	0.08	0.03	0.10
Other Work	0.11	0.10	0.05	0.07
Leisure	0.50	0.12	0.52	0.09

Secondly, we analyse time allocation of children on various activities on a typical day. The dataset provides information on time spent by child on a typical day. Time allocation data enables us to understand total time spent by the child on study, paid work, unpaid work and leisure. Table 2 shows that, on average, girls spend 37 percent of 24 hours on studying, whereas boys spend 41 percent of the time on studying. Share of total hours spent on paid activities are similar to both girls and boys. However, it is evident that girls devote more time (11 percent) towards other work as compared to boys (5 percent). This may be because many times responsibility of household work and caring for others is on girls.

As proposed in the theoretical model, parental beliefs about the returns to child's education will impact the decision to send her to work or not. The dataset provides information on parental expectation about the potential profession of the child[6]. This information is available for the initial period, i.e., the year 2006. Table 2 shows that parents expect boys to do a skilled job in 76.27 percent of the cases as opposed to 68.49 percent of the cases for the girls. This difference in expectations may be due to cultural and societal factors, where girls are expected to look after the household work rather than entering job markets[7]. In the empirical analysis, we consider the parental expectations as endogenous and model them explicitly. We consider various determinants of parental expectations, such as child's academic ability, child's health, economic status of family, parental educational background, job market conditions in community and residential area. All these variables are for the first period. To capture child's ability, we consider child's performance on mathematics test. The standardized score on height for age reflects the child's health. The job market conditions are captured through difference between maximum wage paid for skilled job and minimum wage paid for unskilled job. This difference indicates maximum skill premium that may be obtained in the community[8]. We use the predicted probability from this analysis as parental beliefs about returns to education, p. In terms of our theoretical framework, p is the probability that child will receive skill wage in future.

Apart from expectations, today's opportunity cost of sending the child to school affects parental decision. We have considered two variables, namely, today's average child wage, and travel time to school in the previous period, to examine the above mentioned relation.

Moreover, various household characteristics are considered as controls in the empirical model. We include real per capita consumption to depict economic status of the household, social background, parental education, household composition, and region as regressors in the second step regressions. Effect of the social background is captured by inclusion of two dummies for the socially deprived classes, viz, *SC* (Scheduled Castes) and *ST* (Scheduled Tribes). Effect of the household composition is depicted by household size, number of younger and older siblings. We include two regressors, namely, father's education and mother's education to capture the effect of parental education on investment in education. Moreover, we include a dummy variable taking positive value if the household resides in the rural area.

4. Empirical Methods

The empirical analysis is carried out separately for girls and boys. The parental expectations are likely to be endogenous to parental choice about child labour and schooling[9]. To correct for this endogeneity, the estimation is done in two steps. First, we estimate the probability of parents expecting that the child will do a skilled job in the future. We use the logistic regression model to estimate this probability and examine its determinants. Here, the probability is given by:

$$P(y = 1) = \frac{e^{X\beta+\varepsilon}}{1+e^{X\beta+\varepsilon}} \qquad (3)$$

In the equation (3), y takes value one if parents expect the child to do a skilled job. The determinants of this probability are represented in the vector X and ε is the disturbance term. Second, we estimate the effect of parental expectations on schooling and child labour. The predicted probability from the first-step logistic regression is used as a regressor in the second-step analysis. As shown in Lee (1981), this two-step procedure provides consistent coefficient estimates[10].

We estimate the effect of parental expectation, determined by the first step, on child education in two different ways: (i) by modelling the schooling and work statuses of the child, and (ii) by modelling share of time spent on study and other kinds of work. Addressing the issue of child schooling in these two different approaches, enables us to obtain more comprehensive results.

In the first approach, we note, as in Wahba (2006), that the schooling and work statuses are not exclusive. That is, the child can work while being enrolled in school. Hence, we model these variables jointly. Also, we consider two types of work status for children, paid and unpaid. A child may be engaged in paid activity or work on the family business (or in the household). The latter kind of work is labelled as unpaid work. We estimate a multivariate probit model for three decisions, namely, whether to continue education of child, whether to send child for paid work and whether to engage child in family business or household work[11]. Thus, there are total three decision variables, namely, schooling (S), paid labour (PL) and unpaid labour (NPL)[12]. Here, parent will continue child's education if the utility that

household derives from sending the child to school is higher than the utility from not sending. Utility of household is modeled using the latent function described in equation (4). Similarly, we may also think about the latent functions for net utility from sending the child for paid work and engaging in unpaid activity. So the latent functions for the multivariate probit model are;

$$U_j = z_j'\gamma_j + \vartheta_j, j = S, PL, NPL, [\vartheta_S, \vartheta_{PL}, \vartheta_{NPL}] \sim N[0, \sum] \qquad (4)$$

We observe S, PL and NPL outcomes if $U_S > 0$, $U_{PL} > 0$, and $U_{NPL} > 0$, respectively. In equation (4) z is the vector of explanatory variables. Also, we make the following assumption regarding distribution of disturbance terms; ϑ_js. The disturbances follow multivariate normal distribution with mean zero and variance-covariance matrix $\sum$.

In the second approach, we estimate a model for the share of total time spent on various activities. This approach uses a more general way of measuring child education as it accounts for the share of actual time spent studying (rather than just attending school during daytime without any followup inside the household.). For this exercise, we consider three types of activities of the child, viz, study, paid work, and unpaid work. We estimate three equations for 'Study', 'Paid Work', and 'Unpaid Work' using the Ordinary Least Squares (OLS) method[13]. A representative equation for time spent on different activities this model is given by the equation (5):

$$T_i = Z_i\gamma_i + \eta_i \qquad i = 1,2,3 \qquad (5)$$

where T_i is time share of ith activity by the child, Z_i is the vector of the explanatory variables, including the constant. The vector of coefficients is denoted by γ_i and η_i is the error term in the ith equation.

In all the models above, we correct the error terms for possible heteroscedasticity.

5. Empirical Findings

The findings show that the factors affecting parental expectations vary across gender of the child (Table 3). For the girls, the probability that parents will expect them to do a skilled job depends on family's economic status, mother's education, number of siblings and the girl's performance on mathematical test. On the other hand, for the boys, the probability is determined by the economic status of family, father's education, boy's health, boy's academic performance on mathematical test, and the place of residence. As mentioned earlier, the predicted probability from this model is then used to represent parental expectations in the second step equations[14].

The analysis of schooling decisions and time spent on studies shows that the parental expectations about child's future job affect the investment in human capital (Table 4 – 7). Table 4 and 5 report the marginal effects of various explanatory variables on probabilities of schooling and child labour considering their marginal probability density functions for the girls and the boys, respectively. We find that the probability of schooling goes up for both the girls and boys if parents expected them to do a skilled job with higher probability. The share of study hours also goes up with parental expectations for both girls and boys. Another factor that increases probability of schooling and the share of study hours for girls is father's education. Opportunity cost of education is significant determinant of schooling for boys. Child wage reduces the probability of schooling and increases the probability of child labour, both paid and unpaid work, in the case of boys. We discuss these results below in detail for each separate step.

Step 1: Parental expectation

We find that child characteristics are important determinants of parental expectations, particularly for boys. Better health of a boy, as measured by the height-for-age, implies higher probability that parents will expect skill job in future. The academic performance of child, too, affects the parental expectations about the child's profession. If the child scores more on the mathematical test then the chance that parents will expect him/her to do a skilled job is higher[15]. For instance, in the case of boys, if the score on mathematics test increases by one point then the probability of parents expecting them to do a skilled job goes up by 2.3 percentage points.

Apart from the child characteristics, the educational and economic backgrounds of parents affect their expectations. The probability of parents expecting that the girl child will do a skilled job goes up by 1.3 percentage points (p-value = 0.093) with an additional year of education for mother. On the contrary, only father's education affects the probability in case of boys. That is, the probability of parents expecting a boy to do a skilled job goes up by 1.3 percentage points with father's years of education (p-value = 0.019). The economic status of family, measured by per capita consumption expenditure, also influences the parental expectations about the girl child. One percent increase in per capita consumption expenditure increases the probability of parents expecting the girls to do a skilled job by 8.2 percentage points (Table 3).

Table 3: Logit Model for Parental Expectations about Skill Job

Explanatory Variables	**Girls**		**Boys**	
	Marginal Effects	**p-value**	**Marginal Effects**	**p-value**
Background Characteristics				
Log Consumption	0.082	0.044	0.076	0.065
Mother Education	0.013	0.093	0.007	0.355
Father Education	0.005	0.494	0.013	0.019
SC	0.094	0.141	0.069	0.227
ST	0.052	0.509	0.102	0.251
No. of Younger Siblings	-0.050	0.085	0.007	0.808
No. of Older Siblings	-0.039	0.053	-0.009	0.468
Rural	0.069	0.222	0.151	0.002
Skill Premium (2006)	-4.3E-05	0.863	2.3E-04	0.311
Child Characteristics				
Height-for-age	0.020	0.139	0.020	0.048
Score on Mathematics Test	0.024	0.065	0.023	0.031
Parental Attitude towards Education				
Education Helps	0.020	0.835	0.123	0.097
Education Useful	0.093	0.132	0.050	0.394
No. of Observations		384		392
Wald $\chi^2(13)$		35.23		34.54
Prob> χ^2		0.001		0.001
Pseudo R^2		0.078		0.093
Predicted Probability of Skill Job		0.70		0.79
Actual Proportion of Skill Job		0.69		0.79

Siblings have a negative impact on parental expectations about girls. In particular, if the number of older siblings goes up by one then the probability of parental expectations of skilled job decreases by 3.9 percentage points (p-value = 0.053). This may be a consequence of some kind of parental bias towards boys in terms of the child's ability to get a skilled job, post education. Hence, as the number of siblings goes up, the probability of having brother goes up, and so, parental expectations from girl's education goes down.

Step 2: Schooling decision

Now, we consider the determinants of probability of schooling and child labour (Table 4 and 5), and time allocation of the child on various activities (Table 6 and 7). The results suggest that the parental expectations and opportunity costs are important determinants of investment in schooling, particularly for boys. The findings of the multivariate probit model show that decisions about schooling and child labour are interdependent. The correlation coefficient between schooling and paid labour is negative and significant for both girls and boys. This result shows trade-off between schooling and child labour. Moreover, the trade-off is higher for the boys (ρ=-0.964) than that for the girls (ρ=-0.703).

Parental expectations affect both the probability of schooling and the time allocated for studies. A percentage point increase in probability of parents expecting a girl (boy) child will do a skilled job brings about 31 (24.6) percentage points increase in probability of continuation of schooling.[16] Irrespective of gender, the time share allocated for studying goes up with the expectation of getting a skilled job (Table 6 and 7). At the same time, child's involvement in unpaid work goes down as parental expectations about skilled job increase. These results confirm our theoretical prediction that investment in human capital (by the way of child education) goes up with parental beliefs on returns to education, 'p'.

Table 4: Parental Decision about Child Labour and Schooling (Girls)

Explanatory Variables	Study		Paid Labour		Unpaid Labour	
	Marginal Effect	**p-value**	**Marginal Effect**	**p-value**	**Marginal Effect**	**p-value**
Parental Expectations						
P (Skill Job)	0.310	0.071	-0.101	0.445	-0.023	0.909
Opportunity Cost Factors						
Time to School	-0.001	0.331	-1.1E-04	0.884	0.004	0.005
Child Wage	-0.001	0.183	3.2E-04	0.327	0.001	0.008
Household Characteristics						
Log Consumption	0.002	0.943	0.018	0.365	0.038	0.248
No. of Younger Siblings	-0.036	0.152	0.035	0.048	0.022	0.359
No. of Older Siblings	-0.015	0.355	0.015	0.190	0.039	0.042
SC	0.019	0.674	0.019	0.575	-0.019	0.691
ST	0.068	0.306	-0.025	0.594	-0.135	0.010
Rural	-0.024	0.624	0.073	0.118	0.049	0.218
Mother Education	-0.003	0.705	-0.006	0.371	-0.007	0.252
Father Education	0.015	0.004	-0.008	0.059	-0.004	0.458
No. of Observations	384					
	ρ	p-value				
Schooling & Paid Work	-0.703	0.000				
Schooling & Unpaid Work	-0.281	0.006				
Paid & Unpaid Work	0.143	0.230				

Table 5: Parental Decision about Child Labour and Schooling (Boys)

Explanatory Variables	Study		Paid Labour		Unpaid Labour	
	Marginal Effect	**p-value**	**Marginal Effect**	**p-value**	**Marginal Effect**	**p-value**
Parental Expectations						
P (Skill Job)	0.246	0.070	-0.118	0.274	-0.390	0.142
Opportunity Cost Factors						
Time to School	-0.001	0.147	0.001	0.093	-0.001	0.646
Child Wage	-0.001	0.004	0.001	0.009	0.001	0.055
Household Characteristics						
Log Consumption	0.044	0.111	-0.002	0.910	0.120	0.006
No. of Younger Siblings	-0.022	0.301	0.008	0.605	0.037	0.265
No. of Older Siblings	-0.016	0.093	0.017	0.017	0.024	0.223
SC	0.076	0.069	-0.043	0.174	0.006	0.924
ST	0.024	0.685	-0.028	0.548	-0.212	0.024
Rural	-0.053	0.263	0.013	0.713	0.181	0.017
Mother Education	-0.001	0.898	0.003	0.458	-0.029	0.000
Father Education	0.007	0.132	-0.009	0.057	0.014	0.052
No. of Observations	392					
	ρ	p-value				
Schooling & Paid Work	-0.964	0.000				
Schooling & Unpaid Work	-0.032	0.752				
Paid & Unpaid Work	0.013	0.898				

Note that, our theoretical model predicts an ambiguous effect of child wage on time spent on studies. We find similar results in the empirical analysis. For the boys, probability of schooling goes down with child wage. In particular, ten rupee increase in the average child wage decreases the probability of schooling for boys by one percentage points and increases the probabilities of paid and unpaid labour by one percentage points each (Table 5). Also, time share of study in the total time goes down with child wage for boys. At the same time, the time allocated by boys to paid work goes up with child wage. However, for the girls, the child wage is not a significant determinant of investment in schooling. This suggests that sending a girl child to work might have more to do with regressive parental mindset than pecuniary requirements. 'Time to school', which represents opportunity cost in terms of time taken to go to school, affects the probability of unpaid work and time spent on unpaid work for girls.

Apart from these factors, father's education is significant determinant of schooling decision. The father's education increases the probability of schooling and decreases the probability of paid labour. For the girls, one year increase in father's education increases the probability of schooling by 1.5 percentage points and decreases the probability of paid work by 0.8 percentage point. We also find similar results for the boys. Moreover, father's education increases the share of study in time allocation of the girl child. These results bring out the importance of father's education for investment in schooling.

Table 6: Regression for Time Spent on Various Activities (Girls)

Explanatory Variables	Study		Paid Work		Unpaid Work	
	Coefficient	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Parental Expectations						
P (Skill Job)	0.185	0.087	-0.068	0.166	0.044	0.497
Opportunity Cost Factors						
Time to School	-0.001	0.320	-2.9E-04	0.111	0.001	0.030
Child Wage	-2.4E-04	0.237	7.4E-05	0.412	6.8E-05	0.520
Household Characteristics						
Log Consumption	-0.002	0.917	-0.002	0.827	0.001	0.875
No. of Younger Siblings	-0.012	0.384	0.012	0.116	0.020	0.047
No. of Older Siblings	-0.008	0.424	0.003	0.573	0.014	0.006
SC	-0.005	0.851	0.023	0.090	-0.018	0.169
ST	0.039	0.217	-0.010	0.424	-0.024	0.340
Rural	-0.020	0.322	0.013	0.173	0.026	0.015
Mother Education	0.001	0.765	2.3E-04	0.843	-0.001	0.377
Father Education	0.007	0.003	-0.001	0.351	-0.004	0.009
Constant	0.289	0.025	0.048	0.496	0.002	0.978
No. of Observations	384		384		384	
R^2	0.147		0.072		0.126	

Table 7: Regression for Time Spent on Various Activities (Boys)

Explanatory Variables	Study		Paid Work		Unpaid Work	
	Coefficient	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Parental Expectations						
P (Skill Job)	0.245	0.005	-0.055	0.288	-0.088	0.061
Opportunity Cost Factors						
Time to School	-0.001	0.178	0.001	0.121	-9.6E-05	0.554
Child Wage	-3.5E-04	0.065	1.7E-04	0.183	1.9E-04	0.017
Household Characteristics						
Log Consumption	0.021	0.122	-0.002	0.841	0.001	0.914
No. of Younger Siblings	-0.008	0.477	0.001	0.872	0.004	0.402
No. of Older Siblings	-0.006	0.390	0.009	0.104	0.001	0.590
SC	0.040	0.043	-0.016	0.218	0.001	0.922
ST	-0.005	0.870	-0.014	0.352	-0.010	0.441
Rural	-0.032	0.165	-0.005	0.762	0.041	0.000
Mother Education	0.001	0.681	-0.001	0.615	-0.001	0.616
Father Education	0.002	0.244	-0.001	0.469	4.0E-04	0.653
Constant	0.151	0.174	0.070	0.313	0.032	0.579
No. of Observations	392		392		392	
R^2	0.126		0.074		0.086	

The number of siblings in the family also affects the schooling decisions. The results show that the number of younger siblings increases the probability of child labour (paid work) for girls. On the other hand, for boys, it is the number of older siblings that increases the probability of child labour (paid work). These results indicate trade-off among children at family level in terms of investment in schooling.

To sum up, the empirical analysis suggests that the parental expectations about child's future job are formed based on child's educational performance or ability, economic background of family and household composition. In accordance with the theoretical framework, empirical findings show that parental expectations affect schooling positively, whereas child wages negatively affect schooling for boys. Moreover, we find that there is trade-off between schooling and child labour for both boys and girls. Our findings on determinants of schooling are consistent with some earlier papers. However, to the best of our knowledge, there is no other paper that focuses on role of parental expectation in child labour by estimating it from data and using it to model the schooling decision.

6. Concluding Remarks

We have examined the role of parental expectations in determining the extent of child labour and schooling. Our theoretical framework allows for uncertain future income of child and shows that parent's belief about returns to education has a positive relationship with child education. The theoretical model also shows that the effect of child wage is ambiguous and depends on the inter-temporal elasticity of substitution.

In the empirical analysis, we have modeled parental expectations explicitly and examined the determinants of parental expectations. We find that child's ability, parental education and parents' attitude towards education influence the parental expectations about child's future job. We use the predicted probability of child doing a skilled job to estimate the impact of

parental expectations on investment in human capital. Empirical findings suggest that the investment in human capital goes up if parents expect the child to do a skilled job with greater probability. Moreover, in the case of boys, we find negative impact of the average child wage in community on both probability of schooling and the proportion of study hours. These results are consistent with the predictions of our theoretical model.

Two important policy implications of this paper are as follows. One, adult education programme should be strengthened to take advantage of the positive relationship between parents' educational background and parental expectations, which in turn affect child education positively. Since, the results suggest presence of trade-off between schooling and child work, this would be effective in curbing child labour. Two, an awareness programme should be launched to alter the time preference of households in such a way that puts greater weightage on future consumption (so that the inter-temporal elasticity of consumption comes down). Or else, one cannot be sure (as per our theoretical prediction) whether policies impacting child wage would have the desired effect on child labour or not. Empirical verification of this fact could be an area of future research.

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[1] Thus, we do not ascribe to the 'luxury' axiom of Basu and Van (1998) which assumes that parents send children to work only if they are poor, on account of the weak empirical evidence for it as shown by Ray (2000) and Dumas (2007).

[2] Note that this probability p does not depend on the extent of education received in period 1.

[3] We note here that similar results may be obtained by a generalized risk-averse utility function for period 1 and 2, where total utility is additively separable in time. Here, we have presented the results using a specific functional form.

[4] Elasticity of substitution is the percentage decrease in future consumption needed in response to a percentage increase in current consumption, so that the household remains on the same utility level

[5] However, this decrease in future consumption would not make the household worse off in utility terms.

[6] In the 95 percent of the cases, mother of the child has answered this question.

[7] In the sample, parents expect girls to be housewife in 20 percent of the cases.

[8] It may be noted here that we are not able to control for job opportunities outside the residential area given the information available in the dataset.

[9] For instance, parental characteristics such as education may affect both the expectations and decision regarding child labour.

[10] This procedure is used in literature on child labour to correct endogeneity of binary variables (see Akabayashi and Psacharopolulos, 1999).

[11] Alternatively, we may consider different possible combinations of school and work and model them using multinomial logit model as done in Bocolod and Ranjan (2008) and Biggeri et al. (2009). However, these combinations are not likely to independent of each other which is the requirement of multinomial logit model. Thus, we model them as separate choice variables determined jointly.

[12] We label the binary decision variables regarding child labour as paid and unpaid labour, whereas the share of time allocated towards child labour is indicated by variables paid and unpaid work. This labelling is done to distinguish two sets of variables, namely, dichotomous and continuous time shares.

[13] These three equations may be interrelated where Seemingly Unrrelated Regression (SUR) model is more appropriate. However, since we have same explanatory variables in all the regression equations, SUR will give same results as the OLS.

[14] The correlations of predicted probability from the first step model and the second step regressors is reported in the Appendix. We do not find very strong correlations among the variables and thus the second step regressions do not suffer from the multicollinearity problem.

[15] It may be noted that the effect of score on mathematics test is significant only at 10 percent level of significance for the girls.

[16] The relevant p-value for both genders is 0.07.

References:

Akabayashi H., Psacharopoulos G., 1999. The Trade-off between Child Labour and Human Capital Formation: A Tanzanian Case Study. *The Journal of Development Studies*. 35(5): 120-140.

Bacolod M.P., Ranjan P., 2008. Why Children Work, Attend School, or Stay Idle: The Roles of Ability and Household Wealth. *Economic Development and Cultural Change*. 56(4): 791-828.

Baland J-M., Robinson J.A., 2000. Is Child Labour Inefficient? *Journal of Political Economy*. 108(4): 663-679.

Basu K., Van P.H., 1998. The Economics of Child Labor. *The American Economic Review*. 88(3): 412-427.

Biggeri M., Mehrotra S., Sudarshan R M., 2009. Child Labour in Industrial Outworker Households in India. Economic and Political Weekly. XLIV (12): 47-56.

Buchmann C., 2000. Family Structure, Parental Perceptions, and Child Labour in Kenya: What Factors Determine Who is Enrolled in School? *Social Forces*. 78(4): 1349-1378.

Dumas C., 2007. Why DO Parents Make Their Children Work? A Test of the Poverty Hypothesis in Rural Areas of Burkina Faso. *Oxford Economic Papers*. 59: 301-329

Galab S., Kumar S.V., Reddy P.P., Singh R., Vennam U., 2011. *The Impact of Growth on Childhood Poverty in Andhra Pradesh: Initial Findings from India*. Young Lives, U.K.

Greene W. 2003. *Econometric Analysis*. Prentice Hall. USA.

Hao L., Bonstead-Bruns M., 1998. Parent-Child Differences in Educational Expectations and the Academic Achievement of Immigrant and Native Students. *Sociology of Education*. 71(3): 175-198

ILO, 2013. *Global Child Labour Trends 2008 to 2012*. International Labour Office, International Programme on the Elimination of Child Labour. Geneva.

Lee L. 1981. Simultaneous Equation Models with Discrete and Censored Dependent Variables, in C.F. Manski and D. McFadden (eds.) *Structural Analysis of Discrete Data with Econometric Applications*. Cambridge. MIT Press

Pouliot W., 2006. Introducing Uncertainty into Baland and Robinson's Model of Child Labour. *Journal of Development Economics*. 79: 264-272.

Ranjan P., 1999. An Economic Analysis of Child Labour. *Economics Letters*. 64: 99-105.

Ranjan P., 2001. Credit Constraints and the Phenomenon of Child Labor. *Journal of Development Economics*. 64: 81-102.

Ravallion M., Wodon Q., 2000. Does Child Labour Displace Schooling? Evidence on Behavioural Responses to an Enrollment Subsidy. *The Economic Journal*. 110: C158-C175

Ray R., 2000. Analysis of Child Labour in Peru and Pakistan: A Comparative Study. *Journal of Population Economics*. 13: 3-19

Wahba J., 2006. The Influence of Market Wages and Parental History on Child Labour and Schooling in Egypt. *Journal of Population Economics*. 19: 823-852

Zapata D., Contreras D., Kruger D., 2011. Child Labor and Schooling in Bolivia: Who's Falling Behind? The Roles of Domestic Work, Gender, and Ethnicity. *World Developoment*. 39(4): 588-599.

Appendix: Correlation between Predicted Probability of Skilled Wage and the Second Stage Regressors

Second Stage Regressors	Correlation with the Predicted Probability at the First Stage (Girls)	Correlation with the Predicted Probability at the First Stage (Boys)
Time to School	-0.137	-0.052
Child Wage	0.023	-0.123
Log Consumption	0.003	-0.110
No. of Younger Siblings	-0.230	0.061
No. of Older Siblings	-0.353	-0.245
SC	0.050	-0.081
ST	-0.064	0.163
Rural	-0.117	0.246
Mother Education	0.588	0.365
Father Education	0.520	0.476