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CHILD SCHOOLING AND CHILD WORK IN INDIA*

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* Paper prepared for presentation in the Eighth World Congress of the Econometric Society to be held at the University of Washington in Seattle, WA from August 11-16, 2000.

This work is sponsored by the National Council of Applied Economic Research, New Delhi. I am grateful to the Council for providing me the data set and clarifying my queries relating to the data set.

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Abstract

In India, about 62 percent of the children in the age group of 5-14 are currently enrolled in schools, and 4 percent of children are reported to be working. The remaining 34 percent of children in this age group are neither enrolled in school nor reported as participating in work. The twin problems of child schooling and child work in India have not been adequately addressed in the literature. Another important dimension to this problem is the gender disparity in school enrollment. Available data indicate that the enrollment rate of girls is 12 percent below that of boys.

This paper investigates the determinants of schooling and work participation of boys and girls using a large scale national level survey data, 1994, of the NCAER. The main contribution of this paper lies in integrating the child schooling and work participation decisions and bringing the third category of children referred to as the 'invisible' children into the rigorous econometric analysis.

The widely used household demand model is applied in this study to analyze the family's decisions concerning the schooling and work participation of their children. These decisions are formulated in a dichotomous and a trichotomous choice framework and empirically estimated using maximum likelihood probit and multinomial logit methods. The likelihood ratio test suggests that the trichotomous model is the preferred formulation of the family's decisions on children's schooling and work participation.

The empirical estimates based on both the models point to certain interesting findings. Parental education, and family income significantly increase the probability of children's school attendance and reduce the likelihood of children participating in work. Mother's education exerts a much stronger effect of increasing school enrollment and reducing child labor. Availability of middle schools within the village increases the school attendance and reduces child labor.

The estimates of the gender specific differences in the determinants of schooling and work participation of children suggest that maternal education increases more the likelihood of a girl child's school enrollment than boys and also reduces more the work participation of girls over boys.

CHILD SCHOOLING AND CHILD WORK IN INDIA

I. Introduction

It is well known that educational investment in children enhances their productive skills and earning capacity, besides conferring several other benefits such as, better health status, ability to acquire new information, reduce family size, increase geographical mobility etc., These benefits are confined not only to the individual but also extend to the parents and to the society at large.[1] Hence schooling, particularly primary level education, is given high priority and achievement of universal primary education is pursued as a major policy goal in India.

Children in the 5-14 age group are thus meant to be in school. A striking observation is that a substantial percentage of children are out of school and some of them are reported to be working. Child labor is an important problem in India and what ever form it takes it is undesirable and also illegal. In the long-run, these out-of-school children miss the opportunity of benefiting from schooling.

Available evidence from the 1991 population census data show that only 50 percent of the 5-14 age group of children are currently enrolled. 5 percent of children are reported as workers and the 45 are neither in school nor at work. This residual category, which I refer to as the 'nowhere' or 'invisible' children, may perhaps be engaged in 'other activities' such a household chores namely taking care of the younger siblings, fetching water, assisting in housework and the like, and helping in farm or other self-employed activities. No national level survey has effectively captured the activity particulars of this residual category. The NCAER 1994 survey also reveals a similar pattern and according

to this survey, the school enrollment rate of children in rural India is 62 percent, the proportion of working children is 4 percent and 34 percentage are in the 'invisible' group. The evidence thus indicate that the share of children who are neither in school nor reported to be working is indeed sizable which should be taken care of in modeling and empirical analysis.

If the decision to send children to work is the same as the decision to keep the children at home (invisible children), then these two categories can be aggregated and the determinants of schooling or work can be examined within a dichotomous framework. However, the families may not view the decision to let children participate in work or to do other activities as the same. In that case the choice of the family should ideally be modeled in a trichotomous framework. Which model, dichotomous or trichotomous, better captures household behavior has to be tested using available statistical tests.

The twin problems of child schooling and child work and the presence of substantial non-participants in schooling or work have not been adequately addressed in existing Indian studies. Studies on demand for schooling in India (Rosenzweig 1982; Rosenzweig and Wolpin, 1982; Duraisamy, 1988, 1992, M. Duraisamy, 1998; Duraisamy and Malathy, 1990) have focussed on current school enrollment presumably aggregating the working and nowhere children.[2] Similarly studies on child labor (M.Duraisamy, 1997), have not considered child schooling decisions. For the first time, the determinants of child schooling and work participation decisions are examined and the non-participating children explicitly integrated in the analysis. In this sense it is a pioneering work. Further, we also rigorously test whether the dichotomous or the trichotomous

choice is the more appropriate one to understand the child schooling and work behavior in India.

Yet another concern of this paper is to estimate gender specific determinants of the participation of children in schooling, work and other activities so as to shed light on the causes of observed lower school attendance and higher non-participation in schooling or work of girls.[3]

The rest of the paper proceeds as follows: Section II describes the data base and presents some descriptive evidence on children's activities in rural India. Section III outlines the theoretical framework, empirical specification of the model and the estimation strategies. The empirical results are reported in section IV and conclusions given in section V.

II. Data Base and Descriptive Evidence

The data for the present study come from the NCAER, 1994 survey that covers all of rural India. It is a part of the Human Development Survey covering several areas like poverty and income distribution, food security, health, child survival, morbidity, disability, under nutrition, utilization of medical care, and wages and employment. In all, 33,230 households in 1765 villages of 16 major states were surveyed. The sampling framework and the details of the survey are given in NCAER (1998).

The present study is restricted to the sub-sample of children aged 5-19. The sample size used for this analysis consists of 65,694 children. The usual practice is to consider persons in the 5-14 age group as constituting the child population. However, the interest here is to investigate schooling of children, their work, and their non-participation

in schooling or work. For this purpose, I have taken completion of secondary school level education as the target group which extends beyond 14 years to about 17 years. To make allowance for late entry, grade repetition and misreporting of age I have selected persons aged 5-19 years as the sample for study. However, the different age sub-groups will be considered in the analysis.

The survey collected information on the school attendance particulars of children who are currently in school and information on whether the children reported working or not. Although individual level information on days worked, nature of work and wages were collected, the computerized data set provides these information at the household level for all children. Hence it is not possible to go beyond the work participation at the individual level.

Using the data set, I have examined the variation in the schooling, work and other activity particulars of children by household socioeconomic characteristics.

The differentials in the activity rates by age and sex categories are set out in table 1. It can be seen that 55 percent of all children are enrolled, 13 percent of them are workers and nearly a third of them are neither at work nor in schools and hence engaged in other activities. This is no meager proportion. There is no perceptible male-female disparity in work participation rates. Parental education does indeed emerge as an important factor promoting children's education and reducing the work participation as seen from table 2. Households economic status has been demonstrated in many studies as an important factor contributing to child school enrollment and this comes out quite well in this data. Table 3 brings out the fact that the wealthier households have a higher

percentage of their children in schools and lower percentage in the work force compared to those with lower levels of prosperity. Poorer families, seem to be unable to support children's schooling but do encourage children's work participation. No clear association is observed between land-ownership and child schooling or work. The activity participation of children -percentage currently enrolled, work-force participation and neither at work nor in school - and households occupation show the percentage attending schools is highest among the salaried and professional class and lowest among wage earners while as expected the child work participation is highest among those in agriculture. The percent neither reporting work or schooling is the highest in the wage earner category which may mean that they cannot afford to keep their children in school nor are these families able to find work to supplement family income and hence their children perhaps take up tasks at home to relieve the adults to join the work force.

How are the social and cultural factors associated with children's activity choice ? As observed from table 4, compared to SC/STs, and muslims, a higher (lower) percent of children belonging to other caste, and religious groups such as christians and hindus enroll in schools (work) and a lower percentage report 'not in either activity'. If a house is headed by females, a higher percentage is enrolled and work to support the family.

The village level educational facilities indicators capture locational access to schools which is an important supply side factor. If children, particularly girls, have to travel long distance to reach schools, families would be reluctant to enroll them. The better the approach roads, the closer the bus stop, and schools, the more likely are parents to send children to school (table 5).

It would be useful to consider the inter-state disparities in children's school enrollment, work participation and no activity participation (table 6). As expected, the state of Kerala has the highest school participation and lowest work participation and relatively low level of no-work-no-school children. Madhya Pradesh and Bihar have less than 50 percent of their children in the 5-19 age group in schools. Nine out of the sixteen states report above all-India average child work participation. The highest work participation is in the state of Andhra Pradesh. The proportion of children out of school and work is quite high, about 40 percent, in Bihar, Madhya Pradesh and Rajastan and 39 percent in Uttar Pradesh.

III Theoretical Framework, Empirical Specification and Estimation Strategies

The family's decision regarding child schooling, work and other activities can be analyzed using the household production framework developed by Becker (1965) and used in Becker and Lewis (1973), Becker and Tomes (1976), Rosenzweig and Evenson (1977), Duraisamy (1988, 1993) and a number of works included in T.W.Schultz (1974) and others. The family's preference over schooling (S), leisure (L) of their children, home produced goods (Z) and a composite consumption commodity (C), can be expressed as

(1) $U = U(S, Z, L, C; E)$

Where, U is the family utility function and E is the household environment. The utility function is assumed to be twice continuously differentiable and concave. Z refers to that class of goods (fetching water, taking care of younger siblings, tending animals etc.,) that are produced at home using market purchased goods, and children's housework time (H) according to a linear homogenous production function with a given technology (α):

(2) $Z = Z(X,H; \alpha)$

The utility function is maximized subject to the production function (2) and the time and budget constraints:

(3) $T = S + H + M + L + O$

(4) $P_sS + P_zZ + P_cC = W M + Y + V$

where T is the total available time of the child which is spent on schooling (S), market work (M), housework or other activities (H), P_i is the price of i (i = S, Z, C), W is the wage rate of children, Y is the wage income of other members and V is the household non-labor income.

It can be shown that the optimization process results in a set of demand functions for child schooling, child leisure, and other activities as

(5) $i = S(P_s, P_z, P_c, W_c, V; E, \alpha)$, i = S, H, L

Since the child's work time M = T - L - H, the child labor supply function can also be written as

(6) $M = S(P_s, P_z, P_c, W_c, V; E, \alpha)$

The comparative static properties of the model would generate certain interesting hypotheses. An exogenous increase in the non-labor income (income effect) would increase child schooling and child leisure time which in turn would reduce the child's market and house work time. A rise in the price (direct and indirect cost) of schooling would reduce schooling and increase child work.

Empirical Specification of the Model

The data set provides information on whether the children are currently

participating in schooling or work or neither (house or other work) and we do not have information on the weeks or days or hours spend in each activity.[4] So it is possible to estimate only the participation function in these three activities.

The dependent variables namely participation in schooling, work, other activities are defined as dummy variables and treated as dichotomous dependent variable models. Alternatively, no activity (other activity), work and schooling choices are treated as discrete choices taking the values of 0, 1 and 2 respectively and specified as a trichotomous dependent variable model.[4] We use both the specifications of the model. The estimation strategies and test of the appropriate model are discussed below.

The set of exogenous variables include variables to capture the time cost of children namely children's non-agricultural wage rate at the village level, family income and a set of control variables. In rural India, it is difficult to measure the non-labor income, as a large segment of the population are engaged in self-employment activities. Hence family income, instead of non-labor income, is included. The set of variables to control for other factors consist of individual level factors like age, age square, and sex, parental characteristics namely father education and mother's education; household level variables such as caste, religion, availability of electricity in the house, and village level schooling facilities which capture school supply or access factors. Since more than 80 percent of the villages do have primary schools within the village our preliminary investigation showed that availability of primary schools within the village does not significantly affect child school enrollment. Hence availability of middle school within the village and high school within two kilometers from the village are included as dummy

variables. We also control for differences across the states in the schooling facilities, employment opportunities etc., by including a set of state dummy variables. The set of explanatory variables included in the analysis are selected after a preliminary analysis of several related covariates. The definition of variables and the summary statistics are given in table 7.

Estimation Methods

The basic question is whether to treat to the household's decision regarding the activities of the children as a two-way or a three-way choice model. Earlier studies on child schooling analyzed the decision to 'enroll-not enroll' treating all work and other activities as a single category. Similarly, studies on children's labor market participation estimated the decision to 'work-no work' considering only children reporting work hence not explicitly considering the other activities. In both the cases the decision is treated as a dichotomous one and the participation function of interest can be estimated using maximum likelihood bivariate probit or logit method. This method is first applied and the determinants of the probability of being enrolled and work participation are examined.

The above specification imposes the restriction that families view the work in the market and other work around the house as the same. In that case, the factors affecting work in the market should exert the same effect on the decision to participate in other activities. An alternative to this method is to treat these as three distinct choices (schooling, work, other activities) and specify and estimate as a trichotomous model applying maximum likelihood multinomial probit or logit methods.

It is important to test whether the decision to work is different from that to engage

in other activities, that is whether the trichotomous model simply collapses to the dichotomous model. The implied restriction on the dichotomous model can be tested using the likelihood ratio test which can be written as

(7) $\lambda = L(\Omega)/L(\omega)$

where $L(\Omega)$ and $L(\omega)$ are respectively the likelihood values of the constrained (dichotomous) and unconstrained (trichotomous) models. It can be shown that $-2 \log \lambda$ is distributed as chi-square with degrees of freedom equal to the number of constraints (Hausman 1978).

IV. Empirical Results

Bivariate Probit Model of Child Schooling and Work

The maximum-likelihood probit estimates of the school enrollment and work participation equations are reported in table 8. Most of the variables turn out to be statistically significant at the one percent level in both the equations. The results show that variables that affect schooling positively, exert a negative effect on work and vice-versa. Exceptions are child's age, sex, and household religion (hindu).

Children's schooling and participation in work increase at a diminishing rate with the age of the child. Boys are more likely to be enrolled and work than girls. As expected, father's and mother's education levels have the expected positive effect on enrollment and negative effect on work over the reference group, illiterate, and the effects are statistically significant at the 5 percent level. The children of the educated parents are more likely to be in school and less likely to be working compared to children of illiterate parents. Interestingly, maternal education has bigger and stronger effects than father's

education. This implies that maternal education is a very important factor in affecting children's school and work participation. The income effect captured through the household income variable is positive (negative) and significant on schooling (work). The positive income effect on child schooling is also observed in several other countries (See Behrman and Knowles (1999) for a summary table on this). Thus the greater the resources of the household, the higher the demand for children's schooling and lower the demand for current income supplements from children. As discussed earlier, time cost is a very important cost of schooling. The village level non-agricultural child wage rate is used as a proxy for the opportunity cost of time. The wage effect, although negative on child schooling and positive on child work, is not statistically different from zero.

Children from the scheduled caste and tribe households are less likely to attend school and more likely to work than others. Muslim families are less likely to send their children to school than other religious groups. The probability of children participating in work is significantly lower for the 'hindu' and 'christian' families than the children belonging to muslim and other religious groups. If a house is electrified, the higher the likelihood of children enrolling in schools.

Access to middle schools comes out as an important factor influencing child schooling decision. The availability of middle school within the village significantly increases the enrollment of children in schools. Holding all other factors constant, significant influence of state specific (perhaps political) factors are observed. Children belonging to all the states compared to Madhya Pradesh, which is the reference category, are more likely to be enrolled. The probability of children attending schools is

higher in states like Himachal Pradesh, Kerala, Maharashtra, Assam, West Bengal and Andhra Pradesh compared with the other states. In Andra Pradesh, Gujarat, Karnataka and Maharashtra, children are also more likely to work than in Madhya Pradesh.

The variables included in the specification explain about 23 and 33 percent of the variation in the dependent variables namely, enrollment and work status according to the values of the computed pseudo R-square.

The child schooling equations were estimated separately for age groups 5-10, 11-15 and 15-19 (the results are not reported here but are available from the author upon request). The effects of the independent variables are similar to those observed for the pooled sample. In all the age groups, boys are more likely to be in school than girls. As expected, age reduces enrollment probability at an increasing rate for children in the age group of 15-19. Child wage statistically reduces enrollment probability only in the 11-14 age interval. Availability of middle schools significantly increases the likelihood of enrollment in all age groups while the presence of high school within two kilometers distance from the village does not have a significant effect.

The age-group specific estimates of the child work equations (results not reported), show that boys have a higher probability of working over girls only in the 15-19 age category. Age increases at a decreasing rate the work participation of children in the 15-19 age group. The village level child wage included in this study does not show a significant influence on work participation of children.

Gender Difference in Child Schooling and Work Participation

The school enrollment and work choices within a dichotomous choice framework

are estimated separately for girls and boys and reported in table 9. The likelihood ratio test for pooling the sub-samples of boys and girls indicate that the chi-square statistic is 26,324 is significant which implies that the explanatory variables have differential effects on boys and girls. The bigger and stronger effects of maternal education on the schooling of girls over boys comes out very clearly in these estimates. The enrollment depressing effect of child wage is significant in the enrollment of boys and not girls. An interesting finding is that SCs and STs do not appear to differentiate between boys and girls though the enrollment of boys and girls in SC/ST families is lower than others. Hindus and muslims seem not to prefer to enroll girls in schools compared to other religions. All the state dummies bear evidence of bigger and stronger effects than the omitted category state, Madhya Pradesh, other things remaining constant, on school enrollment of girls. One interesting finding is that enrollment probability of girls is the lowest in the state of Rajasthan. This is a clear indication of families' discrimination against the girl child in investment in education in this state.

The gender specific estimates of child work equations are given in table 10. As the level of education of mothers increases they discourage more the work participation of girls than boys and more so than father's education. The likelihood ratio test rejects the null hypothesis that the effects of the exogenous variables on the work participation of boys and girls are the same at the 1 percent level (computed chi-square value is 35, 612 with 35 degrees of freedom).

Trichotomous Multinomial Logit Model

The multinomial logit estimates of the trichotomous model are reported in table 11.

Most of the variables exert statistically significant (at 5 percent level of significance) effects. Boys are more likely to enroll in schools and also to participate in work rather than doing other activities. The positive effects of parental education and household income on school enrollment and their negative effect on work relative to the reference outcome namely, no-work-no-school (other activities) also emerge here as important findings. The effects of the other variables conform to the findings from the dichotomous choice model.

Test of Dichotomous versus the Trichotomous Model

In order to test the appropriate formulation of the modeling of the children's activities we have also estimated a maximum likelihood logit specification of the dichotomous model and the log-likelihood values are used for deriving the likelihood ratio values (the results not reported).[5] A likelihood ratio test is performed on the dichotomous schooling model versus the trichotomous model. The computed chi-square statistic with 36 degrees of freedom is 22,234 which is statistically significant at the 1 percent level revealing that the three-way choice formulation is preferred to the two-way choice. A similar test is applied to the dichotomous work participation model versus the trichotomous model. The estimated test statistic (chi-square = 57,846 with 36 degrees of freedom) is statistically significant at the one percent level.

VI. Conclusion

This study examines the determinants of child schooling and work in rural India using the NCAER, 1994 survey data. The significant contribution of this paper lies in integrating the child schooling and work participation decisions and bringing the third

category of children referred to as the 'invisible' children into the analysis. According to the estimates of school enrollment, work participation and no-activity report rates, 55 percent of children are currently enrolled, 13 percent reported to be working and a sizeable fraction, 32 percent are shown as reporting neither activity. This is indeed a significant proportion. It appears that a majority of children in the third category, particularly girls, should be engaged in productive tasks at home but their activity is not reported.

The children's schooling and work participation decisions are specified in a dichotomous schooling (enrolled, not enrolled) and work (reported working, not working) and trichotomous (enrolled, working, neither) framework and the equations are estimated by maximum likelihood binary probit, logit and mulitinomial logit methods respectively. Age group and gender specific determinants of schooling and work equations are also estimated.

Both the models point to the significant positive effect of parental education, family income, and availability of middle schools within the village, and negative effect of caste (SC/STs) and religion (muslim) on child school enrollment decisions. Mother's education has a much stronger effect than father's education on the schooling of both boys and girls. In contrast, the parental education variables lower the probability that a child would work.

The likelihood ratio test suggests that the trichotomous model is preferred to the dichotomous model in both school enrollment and work participation decisions. The test also indicates that the exogenous variables have distinct effects on boys and girls and

hence these two sub-groups may not be pooled.

Government policies aimed at promoting girls education through incentives should pay off. Special measures are required to draw more children from SC/ST and muslim households into schools. Future surveys should pay more attention to enumerate carefully the activity of those children who are currently reported to be neither in schools nor participating in work.

Endnotes

1. See T.P. Schultz (1988) for a review of the literature on the market and non-market benefits of education.

2. The determinants of child schooling in the developing countries context has been examined in several studies. See Behrman and Wolfe (1984), Behrman and Knowles (1999), Deolalikar (1995), Lavy (1996) and others.

3. A number of studies examined the theoretical and empirical issues on the intrafamily resource allocation to boys and girls within the family. See Rosenzweig and Schultz (1982), Schultz (1995) and others.

4. About 2 percent of the sample of children reported to be attending schools and engaged in economic activities (market work). This group of persons are perhaps those who never took schooling seriously and hence would have taken to some work. From the data it was not possible to figure out what their primary activity was. Hence such persons were included in the 'attending schools' subset as schooling is meant to be the main activity of the children.

5. Related measures are participation in wage work and self employment; occupational participation rates, measures of labor supply which consist of intensity of work such as days or hours worked etc., M. Duraisamy (1994, 1996) examine measures of labor supply and choice of work of women.

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Table 1

Activity Status of Children by Age and Sex

(in percent)

Individual Characteristics	Currently Enrolled	Reported Working	Not working & Not Enrolled	All Children
All	55.3	12.6	32.1	100
Age Groups:				
5-10	59.1	1.3	39.7	100
11-14	67.2	9.8	23.0	100
15-19	37.6	34.7	27.7	100
5-14	61.9	4.3	33.8	100
Sex:				
Age 5-19:				
Boys	62.0	14.0	24.0	100
Girls	47.4	11.0	41.5	100
Age 5-14:				
Boys	67.7	4.0	28.3	100
Girls	55.4	4.7	40.0	100

Notes: Computed form the NCAER-HDI 1994 survey data.

Table 2

Activity Status of Children by Education of Parents

(in percent)

Educational level:	Currently Enrolled	Reported Working	Not working & Not Enrolled	All Children
Father's Education:				
Illiterate	41.9	15.0	43.1	100
Below Primary	60.1	12.4	27.5	100
Primary	65.8	8.0	26.2	100
Middle	71.0	4.9	24.1	100
Secondary & Above	80.8	2.5	16.7	100
Mother's Education:				
Illiterate	50.6	12.6	36.8	100
Below Primary	75.4	7.1	17.6	100
Primary	78.7	4.7	16.6	100
Middle	84.7	2.2	13.1	100
Secondary & above	86.1	0.6	13.3	100

Notes: Computed form the NCAER-HDI 1994 survey data.

Table 3

Activity Status of Children by Household's Income, Land Holding and Occupation

(in percent)

Characteristics	Currently Enrolled	Reported Working	Not working & Not Enrolled	All Children
Household Income:				
Upto 20,000	49.8	13.2	37.0	100
20,001-40,000	57.5	13.7	28.8	100
40,001-62,000	63.5	10.7	25.8	100
62,001-86,000	67.0	9.6	23.5	100
Above 86,000	73.3	6.9	19.8	100
Land Holding Size:				
Landless:				
Wage earners	55.0	12.5	32.5	100
Others	61.2	9.3	29.6	100
Land owning:				
Marginal	57.7	11.8	30.5	100
Small	58.6	11.2	30.2	100
Medium	62.6	9.7	27.7	100
Large	42.3	19.0	38.7	100
Occupation:				
Agriculture	56.4	11.6	32.0	100
Salaried & self emp	72.2	6.2	21.6	100
Wage earners	42.7	10.5	37.9	100
Others	56.8	10.6	32.6	100

Notes: Computed form the NCAER-HDI 1994 survey data.

Table 4

Activity Status of Children by Social and Cultural Characteristics

(in percent)

Household Characteristics	Currently Enrolled	Reported Working	Not working & Not Enrolled	All Children
Caste:				
Scheduled Tribes	45.3	15.7	39.0	100
Scheduled Castes	48.1	14.9	37.0	100
Others	58.9	11.5	29.6	100
Religion:				
Hindu	55.8	12.5	31.7	100
Muslim	46.4	13.2	40.3	100
Christian	76.5	7.1	16.3	100
Others	60.6	16.2	23.2	100
Household Size Group:				
Upto 4	54.6	18.0	27.4	100
5-7	56.2	12.1	31.7	100
8 and above	54.0	11.4	34.6	100
Head of Household:				
Male	55.3	12.4	32.3	100
Female	54.9	17.6	27.5	100

Notes: Computed form the NCAER-HDI 1994 survey data.

Table 5

Activity Status of Children by Village Facilities Indicators

(in percent)

Village Characteristics	Currently Enrolled	Reported Working	Not working & Not Enrolled	All Children
Approach Road:				
Foot Path	52.0	13.0	34.0	100
Kutcha	52.7	13.3	34.1	100
Pucca	60.2	11.5	28.4	100
Distance to Bus Stop:				
>9 Kms.	48.0	12.6	39.4	100
6-8 Kms.	46.2	12.6	41.2	100
3-5 Kms.	51.5	12.1	36.4	100
2 Kms	54.3	12.4	33.4	100
Within Village	61.2	13.0	25.8	100
Dist to Primary School				
>6 Kms.	52.2	9.6	38.2	100
3-5 Kms.	57.1	12.0	31.0	100
2 Kms.	59.2	9.5	31.3	100
Within Village	55.4	13.0	31.6	100
Dist. to Middle School				
>6 Kms.	52.5	11.9	35.6	100
3-5 Kms.	53.7	14.0	32.3	100
2 Kms.	56.9	13.0	30.2	100
Within Village	57.6	12.6	29.8	100
Dist. to Higher Sec.				
>9 Kms.	52.1	12.9	35.0	100
6-8 Kms.	56.4	13.0	30.6	100
3-5 Kms.	60.2	11.6	28.2	100
2 Kms.	53.2	13.1	33.7	100
Within Village	64.0	11.1	25.0	100

Notes: Computed form the NCAER-HDI 1994 survey data.

Table 6

State-wise Activity Status of Children

(in percent)

State	Currently Enrolled	Reported Working	Not working & Not Enrolled	All Children
Andhra Pradesh	57.0	20.6	22.4	100
Bihar	48.9	10.6	40.5	100
Gujarat	57.7	17.0	25.2	100
Haryana	60.5	10.7	28.8	100
Himachal Pradesh	78.6	10.3	11.1	100
Karnataka	58.2	15.8	26.0	100
Kerala	80.4	4.8	14.8	100
Maharastra	65.0	16.3	18.7	100
Madhya Pradesh	46.7	12.9	40.4	100
Orissa	51.5	13.8	34.7	100
Punjab	66.0	14.1	19.9	100
Rajasthan	50.1	9.5	40.4	100
Tamil Nadu	59.8	14.1	26.1	100
Uttar Pradesh	51.9	9.1	39.0	100
West Bengal	51.3	15.1	33.5	100
Assam	65.2	7.2	27.6	100
All States	55.3	12.6	32.1	100

Notes: Computed form the NCAER-HDI 1994 survey data.

Table 7
Variable Definition and their Means and Standard Deviations

Variable	Mean	Std. Dev.
Dependent Variables:		
Enrolled (Yes=1, No=0)	.549	.498
Reported Working (Yes=1, No=0)	.128	.334
Not Enrolled & not working	.323	.468
Completed Primary Level Age11-14	.347	.476
Explanatory Variables:		
Sex (Boys=1)	.532	.498
Age	11.372	4.259
Age square	147.476	100.908
Father's Education Dummy:		
Illiterate		
Below Primary	.105	.307
Primary	.123	.329
Middle	.117	.322
Secondary & Above	.082	.274
Mother's Education Dummy:		
Illiterate		
Below Primary	.063	.244
Primary	.083	.277
Middle	.048	.214
Secondary & Above	.026	.159
Household Income (/1000 Rs.)	30.902	41.079
Child Non Ag. Wage(/100 Rs.)	.167	.584
Caste (scst=1)	.349	.476
Religion Dummy:		
Hindu	.826	.378
Muslim	.117	.321
Christian	.019	.136
Electricity in the House	.495	.499
Schools within the Village:		
Primary School(Yes=1, No=0)	.882	.321
Middle School (Yes=1, No=0)	.402	.490
High School(within 2Kms=1,No=0)	.215	.410
State dummy:		
Andhra Pradesh	.051	.220
Bihar	.071	.257
Gujarat	.044	.206
Haryana	.058	.234
Himachal Pradesh	.037	.189
Karnataka	.079	.270
Kerala	.031	.174
Maharastra	.074	.263
Madhya Pradesh	.134	.340
Orissa	.057	.232
Punjab	.037	.189
Rajasthan	.069	.254
Tamil Nadu	.027	.164
Uttar Pradesh	.144	.351
West Bengal	.047	.213
Assam	.032	.177
Number of Observations	65694	

Source: Computed using NCAER-HDI 1994 Survey

Table 8
Maximum Likelihood Probit Estimates of the Child Schooling and Child Work Equations, Rural India, 1994

	Work		Enrollment	
Explanatory Variable	Coef.	t	Coef.	t
Sex (Boys=1)	.5114	45.92	.1785	11.43
Age	.7198	86.16	.3216	16.87
Age square	-.0325	-90.59	-.0036	-5.25
Father's Education:				
Below Primary	.2108	11.32	-.0810	-3.05
Primary	.2780	15.80	-.1824	-6.67
Middle	.4197	22.32	-.3664	-11.33
Secondary & Above	.5473	22.97	-.4997	-11.58
Mother's Education:				
Below Primary	.4669	18.73	-.2713	-7.19
Primary	.5037	21.76	-.3943	-10.04
Middle	.6758	21.41	-.7062	-10.36
Secondary & Above	.7640	17.47	-1.0220	-8.33
Household Income	.0021	13.30	-.0015	-6.78
Child Non Ag. Wage	-.0154	-1.61	.0121	0.91
Caste (scst=1)	-.1982	-16.17	.1731	10.13
Religion dummy:				
Hindu	-.0724	-1.85	-.1831	-3.61
Muslim	-.4485	-10.50	.0255	0.45
Christian	.0284	0.47	-.3175	-3.57
Electricity	.4074	31.27	-.3759	-20.36
School Within Village:				
Middle School	.0709	6.09	-.0307	-1.88
High School	.0017	0.13	.0730	3.91
State Dummy:				
Andhra Pradesh	.3038	10.69	.4400	12.03
Bihar	.1710	6.60	-.1830	-4.84
Gujarat	.1748	5.79	.2951	7.34
Haryana	.1993	7.25	-.0887	-2.18
Himachal Pradesh	.8697	23.93	-.1146	-2.40
Karnataka	.2152	8.72	.2530	7.58
Kerala	.8184	19.18	-.5823	-8.83
Maharastra	.3937	15.27	.3135	9.14
Orissa	.2227	7.92	-.0363	-0.93
Punjab	.2976	7.16	.0695	1.25
Rajasthan	.0321	1.27	-.1497	-3.95
Tamil Nadu	.2593	7.05	.0433	0.87
Uttar Pradesh	.2414	11.36	-.3225	-10.21
West Bengal	.3264	10.89	-.0525	-1.28
Assam	.3373	9.33	-.2070	-3.56
Constant	-4.1330	-65.52	-4.4230	-31.69
Log Likelihood	-34719		-16907	
Pseudo R2	0.2318		0.3267	
Number of Observations	65663		65663	

Table 9
Maximum Likelihood Probit Estimates of the Child Schooling and
By Sex, Rural India, 1994

	Boys		Girls	
Explanatory Variable	Coef.	t	Coef.	t
Age	.7452	66.24	.7280	56.65
Age square	-.0325	-68.21	-.0343	-60.90
Father's Education:				
Below Primary	.2010	7.79	.2174	7.98
Primary	.3052	12.46	.2425	9.45
Middle	.4452	16.94	.3961	14.55
Secondary & Above	.5320	15.82	.5698	16.72
Mother's Education:				
Below Primary	.4450	12.55	.4903	13.86
Primary	.4265	12.95	.572	17.50
Middle	.5541	12.42	.7853	17.53
Secondary & Above	.636	10.40	.8900	14.18
Household Income	.0023	9.98	.0020	8.93
Child Non Ag. Wage	-.0318	-2.35	.00322	0.38
Caste (scst=1)	-.2046	-12.25	-.2007	-10.94
Religion dummy:				
Hindu	-.0049	-0.08	-.1436	-2.57
Muslim	-.4145	-6.94	-.4994	-8.10
Christian	.0734	0.88	-.0018	-0.02
Electricity	.3711	20.72	.4830	24.98
School within Village:				
Middle School	.0656	4.12	.0818	4.73
High School	.0100	0.54	.0020	0.10
State Dummy:				
Andhra Pradesh	.2786	7.10	.3395	8.13
Bihar	.1616	4.68	.2158	5.40
Gujarat	.1492	3.60	.2122	4.76
Haryana	.1959	5.22	.18	4.62
Himachal Pradesh	.8768	16.53	.8969	17.54
Karnataka	.1356	4.03	.3104	8.48
Kerala	.5901	9.89	1.079	17.46
Maharastra	.3674	10.24	.4335	11.54
Orissa	.224	5.73	.2573	6.27
Punjab	.2502	4.35	.3577	5.91
Rajasthan	.2990	8.81	-.3317	-8.33
Tamil Nadu	.2219	4.30	.3259	6.14
Uttar Pradesh	.3154	11.10	.1644	5.06
West Bengal	.1775	4.32	.5165	11.71
Assam	.2591	5.41	.5073	9.16
Constant	-3.945	-45.78	-3.963	-42.87
Log Likelihood	-18556		-15680	
Pseudo R2	0.2018		0.2613	
Number of Observations	34963		34963	

Table 10
Maximum Likelihood Probit Estimates of the Child Work Equation
By Sex, Rural India, 1994

	Boys		Girls	
Explanatory Variable	Coef.	t	Coef.	t
Age	.2564	9.26	.4202	15.45
Age square	.0002	0.26	-.0088	-8.89
Father's Education:				
Below Primary	-.1275	-3.52	-.0535	-1.35
Primary	-.2206	-6.01	-.1662	-3.97
Middle	-.4759	-10.91	-.2689	-5.49
Secondary & Above	-.6094	-10.32	-.3998	-6.19
Mother's Education:				
Below Primary	-.2321	-4.58	-.3377	-5.87
Primary	-.3973	-7.35	-.4129	-7.10
Middle	-.7117	-7.84	-.7384	-7.06
Secondary & Above	-1.074	-6.19	-1.006	-5.71
Household Income	-.0015	-4.76	-.0017	-4.85
Child Non Ag. Wage	.0352	1.93	-.00627	-0.31
Caste (scst=1)	.1374	5.82	.2192	8.72
Religion dummy:				
Hindu	-.1781	-2.46	-.174	-2.42
Muslim	.1149	1.45	-.0641	-0.78
Christian	-.3056	-2.45	-.3285	-2.54
Electricity	-.4073	-15.99	-.346	-12.73
School within Village:				
Middle School	-.0595	-2.64	-.0091	-0.37
High School	.0664	2.57	.0879	3.19
State Dummy:				
Andhra Pradesh	.2944	5.71	.6170	11.66
Bihar	-.2221	-4.41	-.1329	-2.28
Gujarat	.165	2.95	.4553	7.75
Haryana	.0193	0.36	-.3400	-4.85
Himachal Pradesh	-.5323	-7.38	.2769	4.25
Karnataka	.1987	4.37	.3338	6.66
Kerala	-.5849	-6.60	-.5757	-5.60
Maharastra	.1102	2.27	.5325	10.71
Orissa	-.0934	-1.69	.0524	0.94
Punjab	.0483	0.63	.128	1.58
Rajasthan	-.1901	-3.76	-.0898	-1.54
Tamil Nadu	.0207	0.29	.107	1.53
Uttar Pradesh	-.3622	-8.64	-.2948	-5.96
West Bengal	-.1383	-2.44	.050	0.83
Assam	-.1704	-2.23	-.2531	-2.70
Constant	-4.069	-19.95	-4.820	-24.47
Log Likelihood	-8993		-7631	
Pseudo R2	0.3745		0.2847	
Number of Observations	34963		34963	

Table 11
Maximum Likelihood Multinomial Estimates of the Child Schooling and Child Work Equations, Rural India, 1994

	Work		Emrollment	
Explanatory Variable	Coef.	t	Coef.	t
Sex (Boys=1)	.9537	31.45	1.098	53.44
Age	1.506	36.12	1.234	79.00
Age square	-.0433	-29.63	-.0522	-77.12
Father's Education:				
Below Primary	.0789	1.48	.3984	11.47
Primary	-.0447	-0.81	.4762	14.65
Middle	-.2970	-4.48	.6702	19.53
Secondary & Above	-.375	-4.11	.8796	19.81
Mother's Education:				
Below Primary	.0907	1.13	.8114	16.86
Primary	-.0920	-1.10	.8361	18.99
Middle	-.5896	-3.88	1.104	18.68
Secondary & Above	-1.219	-4.14	1.232	15.01
Household Income	-.0007	-1.38	.0037	11.48
Child Non Ag. Wage	.00791	0.30	-.0281	-1.61
Caste (scst=1)	.1484	4.52	-.2959	-13.25
Religion dummy:				
Hindu	-.5019	-4.87	-.2965	-3.92
Muslim	-.4536	-4.02	-.9177	-11.26
Christian	-.6304	-3.54	-.1266	-1.11
Electricity	-.3321	-9.30	.5987	25.07
School within Village:				
Middle School	-.0028	-0.09	.1187	5.58
High School	.1472	4.06	.0446	1.79
State Dummy:				
Andhra Pradesh	1.268	17.29	.9040	16.41
Bihar	-.2487	-3.52	.213	4.60
Gujarat	.7691	9.80	.4952	8.79
Haryana	-.0074	-0.09	.3383	6.90
Himachal Pradesh	.9123	8.92	1.765	23.35
Karnataka	.6732	10.38	.5375	11.75
Kerala	-.3877	-2.97	1.266	16.16
Maharastra	1.132	16.28	1.006	20.12
Orissa	.1108	1.52	.3844	7.65
Punjab	.4376	3.99	.6112	7.78
Rajasthan	-.2503	-3.59	.0087	0.19
Tamil Nadu	.2915	3.06	.4924	7.34
Uttar Pradesh	-.4089	-6.99	.3182	8.47
West Bengal	.1593	2.06	.5740	10.64
Assam	-.1514	-1.36	.5254	8.10
Constant	-12.86	-41.20	-7.194	-60.66
Log likelihood		-45834.587		
Pseudo R2		0.2708		
Number of Observations		65663		