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Women's Status and Child Labour in Nepal

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Abstract

This paper uses data from the Nepal Living Standards Survey 2 (2003/2004) to find evidence to whether children are less likely to work and more likely to attend school in a household where the mother has a say in the intra-family decision-making, than in one where the father holds all the power. This is done by using a bivariate probit model with two dependent variables: child labour and school attendance. The results support the hypothesis that in households where mothers have bargaining power, measured in particular with mother's non-labour income (remittances), mother's marriage age and her awareness of fertility controlling, children are less likely to be sent to work. They are also more likely to attend school.

Keywords: women's status, gender, child labour, schooling, Nepal, Asia

JEL classification: J08, J21, I20, J16

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Acknowledgements

The tables appear at the end of the paper.

1 Introduction

According to UNICEF, 218 million children are engaged in child labour worldwide. Over 58 per cent of the figure comes from the Asian and Pacific regions. Child labour is often hard and hazardous to a child's physical, mental and moral wellbeing and it is found to perpetuate poverty (e.g. Wahba 2000). The research on child labour often employs household decision-making models. Recent studies have brought evidence, that the balance of power between spouses makes it impossible to view the household as a single unit (Basu 2004). Moreover the household consumption patterns are found to differ depending on who takes the decisions and who earns the income (e.g. Udry 1996; Browning et al. 1994). Basu (2004) noted that women show stronger preference for children's wellbeing and are seen as more sensitive to the cost of child labour than men. Duflo in Gender Equality in Development (2005) stated that children are healthier in families where the woman has bargaining power. Thus this paper examines the effects of mother's intra-family status on child labour[1] and school attendance using the Nepal Living Standards Survey data (2003-2004).

Albeit it is widely acknowledged that the main cause of child labour is parental poverty and that concentrating on economic development reduces child labour most effectively, the mechanisms to alleviate child labour are not straightforward (Basu and Van 1998). In reality, child labour persists with a host of interrelated problems such as unskilled adult labour force, poor and exploitative work conditions and gender bias. In some previous models that take children only as assets with no bargaining power, child labour can be decreased by constraining parents' choices by public policies and regulation (Brown et al. 2003). Another set of models supposes that parents are altruistic towards their offspring, but adult labour markets have rigidities, which drive child labour (Basu and Van 1998). A household chooses child labour, if the returns to education are not sufficient to compensate families with the lost income on schooling (Brown et al. 2003). Yet, the option for child labour is not always school attendance, but being idle. Children's education is a luxury good in the sense that a poor family begins consuming it as soon as the household income rises sufficiently, taking into consideration the expected future utility of schooling (Basu and Van 1998). However the expected costs and returns to education in the future labour market with respect to child work are difficult to measure (Rosati and Deb 2004). School fees in public education add up to the cost of education. It very likely contributes to the fact that every third school-aged child in Nepal does not attend school or work (ILO-IPEC 1996). This may suggest, that many families are wealthy enough not to send children to work, but not quite enough to be able to educate them.

This paper tests the hypothesis of Basu (2004) stating that in a family where the power is evenly balanced between the parents, children will be least likely to work. The econometric approach for doing this utilizes a bivariate probit model with two dependent variables; school attendance and working. A set of previously studied indicators is used to characterize the intra-family power relations. Cigno et al. (2001) have found evidence that mother's education level has an effect on children's school attendance. In Vietnam children are less likely to work if parents are educated (Rosati and Tzannatos 2006). On the other hand, Rosati and Deb (2004) point out, that poorer

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[1] Child labour is economic activity performed by a person under the age of fifteen.

households with lower schooling may have a greater respect for education than other families, which may affect their propensity to send children to school. Labour income, which is often used in child labour studies, is a tricky indicator for measuring women's bargaining power, since female labour supply function is negatively sloping for low-income districts and positively sloping for high income districts (Dasgupta and Goldar 2005). Moreover the labour supply decisions are possibly subject to intra-household bargaining, which may cause endogeneity to these estimates. Therefore the non-labour income indicator (remittances) most likely receives more straightforward evidence in the analysis. The mother's characteristics such as a higher marriage age and her ability to control fertility are found to improve a woman's bargaining power (e.g. Jejeebhoy 1995; Chiappori and Oreffice 2007). This study finds evidence that the effect of mother's status is essential on children's schooling and working, measured with mother's marriage age, birth controlling awareness and her remittances. Parents' education has a very positive sign for the estimate upon children's schooling. The gender bias can be seen in school participation rates in Nepal; one fourth of school-aged girls were out of school in 2004, whereas the corresponding figure for boys was 15 per cent (UIS). Albeit the number of economically active children by gender is almost equal, girls work almost double the hours relative to boys (NLSS 2). Alas, girls seem to be the first ones to stay home when the relative cost of schooling rises.

Nepal is one of the poorest countries in Asia with one of the highest child labour force participation rates in Asia. The country ratified the ILO child labour convention in 1997 with a minimum working age of 14 years. Nevertheless, one in every three children is still engaged in child work (Gilligan 2003). Poverty, inequality and the social mentality have led to low productivity and discontentment in Nepal, which still remains in an unstable state after a decade long civil war. One central constraint in Nepal's economic development has been the inadequate human capital development (UNESCO 2006).

This paper is organized as follows. Section 2 describes the data and the variables. Section 3 outlines the model. Section 4 presents the results. Section 5 concludes.

2   Data and variables

This study examines the Nepal Living Standards Survey 2 (NLSS 2) data, conducted by the staff of the Central Bureau of Statistics Nepal and World Bank in 2003-2004.[2] The sample size for the total survey is 3,912 families. The number of families analysed is 2,155, in which the number of children aged 5 to 14 is 4,473. No family clustering is done, thus a few children have the same mother in the sample. This may cause a slight bias in the standard deviations and significance levels, but does not affect the estimates. The survey covers a wide range of information on a member, household and community level. Household level information encompasses e.g. family assets, adequacy of consumption and the presence of physical infrastructure. On a member level the data covers demographics, activities, income, migration and education etc. This study does not utilize the data on children away from home,[3] because the information concerning their actual use of time, parents, and id-codes, is not complete enough in NLSS 2.

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[2]   The collection period of NLSS 2 was a tense and uncertain period of the civil war in Nepal

[3]   These children were working, studying or their activity was unknown.

Each child labour study uses a slightly different framework and set of explanatory variables. Here the explanatory variables include the essential child, parent, family, community and the key intra-family status variables. Moreover, the model (outlined in the next section) was tested separately for the key status indicators for both parents to avoid multicollinearity, but more importantly to see the differences in the estimates upon child labour and school attendance. The status variables include both parents' labour hours, incomes, remittances, ages, education levels, mother's marriage age and her awareness of birth control methods. In particular the two aforementioned are expected to have an impact on a woman's intra-family status (as e.g. in Chiappori and Oreffice 2007; Quisumbing and Hallman 2006). Remittances are a form of non-labour income, which is found to have an impact on children's wellbeing depending on the receiver in the previous research (e.g. Duflo 2005). These are represented in 1,000 Nepalese Rupees and were calculated by summing up all remittances coming from different donors. Comparing the estimates show how assets depending on the receiver affect child labour and schooling. Labour income can be thought to improve the bargaining power of the person earning the money and is central in determining children's time use in working and studying. The variables were calculated by adding together all separate incomes from different activities and occupations that the parent had done during the preceding 12 months. The payment basis for different activities was either fixed, hourly based or cash or in-kind and these were summed to make up the total value in 1,000s of Rupees. However there may be some endogeneity in mothers' indicators, since the total female labour is possibly subject to a preliminary intra-family bargaining. Labour hours in twelve months' time were calculated by adding up all work hours from different activities. A correlation analysis showed that maternal education correlates with less child work and more studies.[4] Parents' education variables are recoded in a manner that being illiterate is one. If the parent is literate, but has no formal education the education code is two. Code three represents one year of completed classes and so forth. The completed SLC has the code 13. The class 12 is coded 14 and a completed Bachelor's degree has the code 15. The code for a completed Master's degree is 17 and for a Doctorate it is 20.[5] A dichotomous variable measures the unemployment of either parent in the model, which could be thought to be a reason for sending children to work. However parental unemployment has received different evidence from Brazil. Parikh and Sadoulet (2005) found that child labour negatively linked to parental unemployment. The inter-spousal age difference, which in some marital bargaining models is found important to wife's bargaining power is tested here as the husband-wife difference in years. Parents' ages in years were also tested separately in the model. Mother's chronic illnesses, a dichotomous variable, is expected to have an impact on the workload left for the rest of the family. Household's engagement in self-employment (e.g. family-owned enterprises) has in previous research received significant evidence to have an impact on children's school attendance and child labour (e.g. Canagarajah and Coulombe 1997). House sale value as a control for wealth is presented in 1,000s of Rupees. The data for the hunger variable was collected by asking the household head that: 'Do you consider that you or any member of your family eats too little food to live a healthy and active live?'.[6] The

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4   All correlations of the explanatory variables in the model were checked and found moderate.

5   Thus the codes represent the completed years of studies + 2.

6   26 per cent answered 'yes'.

distance to a water source or to school is represented in minutes. The toilet variable is plugged into the model, since having a toilet increases hygiene, which through better health affects a child's ability to participate in education or work. Having piped water in the house decreases the time needed in carrying water and it may increase the time available for schooling. These amenities are both also proxies for the communal infrastructure and wealth. In rural areas women's status is usually lower in terms such as education, income, work burden and mobility. Mother's intra-family status varies as well according to the ethnic group, religion and caste. In Nepal the ethnic diversity is considerable[7] and a person's status and social ranking continues to be determined by the caste system. In the analysis the ethnic group is classified into 15 largest groups.

The child's characteristics, such as age, are essential in the model, since activeness and productivity tends to increase with age. As the child gets older the relative cost of schooling goes up, since he or she becomes increasingly productive in the work place. The ages are represented dichotomously in classes.[8] The birth order is classified to firstborns, secondborns and fourthborns or more,[9] since in NLSS 2 the firstborns tend to be the most active. The family size is important in determining whether the child works, since big families may have multiple adult wage earners living under the same roof. The child's gender is playing an important role in working and schooling decisions in Nepal, since traditionally males receive the bulk of investments. Information on migration is included in the model, since moving from one district to another may improve working conditions.

2.1 Descriptive statistics

See the Appendix. Table 1 presents the descriptive statistics of the data. The incidence of child labour in the sample is 31 per cent. 13 per cent of the children only work. The overall gender distribution of working children is balanced (works remotely variable in Table 2), but working males often attend school simultaneously, whereas working females do not (Table 3). Females have a higher incidence of exclusive work and housework than males in both age categories, as 50 per cent of females between 10 to 14 years carry out housework (Table 8). Children tend to work more when the mother works (Table 5). The girls in particular work almost double. On average 10 per cent of the children are idle. When the mother receives labour income, fathers seem to be working less and family size tends to be smaller by one child. Table 4 presents a graph of school enrolment ratios by age. The highest rate, 83 per cent, is for 10-year-olds. It decreases by age and already one fourth of 14-year-olds have dropped out of school. School participation rate in the total sample is 76 per cent. A child in a small family usually attends school more often than a child in a big one. Child labour increases significantly with age, since 10-14 year-olds work three times more often than 5-9 year-olds (Table 6). Rural and poor areas have a clearly higher incidence of child labour than urban and richer areas. Children in rural contexts attend school far less often. Only 52 per cent attend school in rural areas. Nearly 82 per cent of urban children attend school and in the capital city the figure is already 93 per cent. A small family size is related

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[7] There are dozens of different ethnic groups and over 120 spoken languages in Nepal (Gordon 2005).

[8] 6 years is the reference category.

[9] Third born is the reference category.

with more schooling and clearly less exclusive working. Table 7 shows that on average children attend school more often in families that are self employed in Nepal. The percentage of children involved in exclusive child labour is over seven times higher for children in the poorest consumption quintile. The average number of labour hours in an average week among working children is 11 hours. One fourth of child labourers work for over 20 hours a week on average. Poverty, measured with the consumption quintile and adequacy of food (Table 9), is central in driving children to work. Child labour decreases and schooling increases while moving up from one consumption quintile to another. In the richest quintile 80 per cent of the children (age of 5 to 14 years) attend school. In Nepal the majority of the child labour takes place in the agriculture, mostly as unpaid family workers (CDPS 1997). Other major sectors employing children are the service, communication and transportation sectors (CDPS 1997).

3   Bivariate probit model

The connection between children's time allocation and relative female power is studied with the following econometric model. This paper does not go through the formal intra-household game theory, which can be reviewed e.g. in Lundberg and Pollak (1994) and Hoddinott et al. (1993). A bivariate probit model tries to encompass the factors that influence the probability of child's school attendance and working in a reduced form model (the presentation follows Canagarajah and Coulombe 1997). Schooling and working decisions are assumed interdependent. They are not assumed to solely follow a sequential choice process. Therefore, a bivariate probit model is used to test the likelihood of child labour and school attendance, with individual and household characteristics. It allows the existence of correlated disturbances between the two probit equations and enables analysing whether this joint estimation makes a significant difference in regard to two univariate probit models. The model uses two binary dependent variables; whether child attends school and or works. In this paper the child labour is regarded as remunerative or non-remunerative work, excluding all household work. School attendance is defined dichotomously as 1, if the child attends school. It is an input of child's participation to education, but as such, it does not reveal how many hours a day a child spends at school. Therefore it may co-exist with child labour. Child labour, which is as well a dichotomous variable, gets a value one if the child has worked in the past.[10]

Briefly, y^*_1 represents the decision of child work[11] and y^*_2 the decision of attending school. The general definition of the model is:

$$y^*_1 = \beta'_1 X_1 + \varepsilon_1, \qquad y_1 = 1 \text{ if } y^*_1 > 0, \ 0 \text{ otherwise}$$

$$y^*_2 = \beta'_2 X_2 + \varepsilon_2, \qquad y_2 = 1 \text{ if } y^*_2 > 0, \ 0 \text{ otherwise}$$

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[10] A univariate tobit model for a dependent variable of child labour hours was tested as well to see whether the cumulative sum of child labour hours during the preceding 12 months gives different results than the dichotomous variable in the bivariate probit model. It showed that the tobit-model results are in line with the bivariate probit.

[11] All economic work of children aged 5-14 (except housework) is taken into account when coding the second dependent variable. Thus, a distinction between the forms of child work; child labour (prevents school attendance) and child work (allows simultaneous school attendance), is not made.

$$E\ [\varepsilon_1] = E\ [\varepsilon_2] = 0, \quad Var\ [\varepsilon_1] = Var[\varepsilon_2] = 1, \qquad\qquad Cov\ [\varepsilon_1, \varepsilon_2] = \rho.$$

The likelihood function for maximization:

$$L = \prod \int_{-\infty}^{\beta_1'X_1} \int_{-\infty}^{\beta_1'X_1} \Phi_2\ (z_1, z_2\ ;\ \rho)\ dz_2\ dz_1$$

where Φ_2, the bivariate normal density function is:

$$\Phi_2\ (z_1, z_2\ ;\ \rho) = [2\pi(1-\rho^2)^{\frac{1}{2}}]^{-1} \exp\ [-1/2\ (1-\rho^2)^{-1}\ (z_1{}^2 + z_2{}^2 - 2\rho z_1 z_2)]$$

ρ is a coefficient of correlation between the error terms in the two equations. β_1 and β_2 are the parameter column vectors (in transpose). X_1 and X_2 are column vectors of exogenous variables which determine respectively, working and schooling propensities. The variables in the vectors X_1 and X_2 are shown in the first column in the Table 10. To avoid the correlation issues between parents' status variables testing was done one at a time by removing the equivalent father's variable (Table 10) and plugging in mother's variable (Table 11). Thus the father's estimates can be compared with mother's estimates since all else is equal.

4   Results

Tables 10-13 present the results from bivariate probit analyses for the total, male and female samples.[12] Tables 10 and 11 show that the age is a considerable factor in defining child's time use. Albeit school starts normally by the age of 6, 56 per cent of the children attend preschool in NLSS 2. Children tend to quit school when they get older very likely because they are increasingly needed as wage earners. Accordingly, the results in Table 10 show first a rise and then a drop in school attendance by age. Working shows an increasing path by age. The birth order and working are linked, since the firstborns have a significant positive sign for the estimate upon working, suggesting that they are very likely sent to work before their younger siblings.

A key variable, remittances accrued to mothers show a negative sign upon child labour, suggesting that non-labour income that is allocated to the mother has a considerable effect on child labour. Father's remittances on the other hand seem to have an opposite effect on child labour (positive sign). Nevertheless, fathers' remittances have a positive sign upon children's school attendance. The nature of the remittances may differ when accruing to the fathers than to the mothers, but this shows that the effect of income on child labour is clearly different depending on the recipient. The estimates show that parents' work burden has an increasing effect on child labour and an opposite effect upon schooling. The estimate for mother's labour hours (Table 11) has a positive significant sign upon child labour, whereas the corresponding figure for the father is negative (but significant only at 15 per cent significance level), suggesting that when the mother works children work more likely as well. This may be an implication of a low maternal bargaining power. Father's work burden has a significant negative sign upon

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12 The number of iterations that the SAS achieved to run in the bivariate probit model is less than 200 due to the total number of variables (51). The probit model was tested as well with a smaller number of variables. The analysis received parallel results.

children's education, suggesting that father's labour burden affects children's school attendance negatively. Poverty and the area may be linked with parents who work a lot, which may imply that these families cannot afford to send their children to school, but instead they have to send children to work. Estimates show that both parents' schooling affects child labour negatively and children's school attendance positively. Father's estimates are slightly more significant. This possibly suggests that decreasing the inter-spousal education gap does not increase wife's bargaining power in deciding over children's time use, since educated fathers possibly appreciate children's schooling as much. Mother's awareness of birth control issues has a positive estimate for children's schooling. This is in line with the hypothesis; these mothers may have more bargaining power and thus children are sent to work less often. The estimates show that mother's marriage age has a negative effect on child labour. This implies that women who have tied the knot later may have more bargaining power in the family and thus children are sent off to work less often. However many issues are connected to later marriage age that improve mother status, such as usually they have a higher level of completed studies and a smaller family size. Father's unemployment affects children's schooling negatively, which very likely implies that families with unemployed household head cannot afford sending children to school. Table 12 shows that the father's unemployment affects female child labour negatively, which is in line with the evidence from Brazil (Parikh and Sadoulet 2005). The inter-spousal age difference has a positive sign for the estimate upon studying and negative sign for working, suggesting that the age difference does not increase child labour. Furthermore father's age has a negative estimate upon child labour (Table 11 second column on the left), suggesting that the older the father is the less the child works. In Nepal the age difference is not striking, but there are clear ethnicity related differences (Casterline et al. 1986).

The negative signs of the bivariate probit-model estimates suggest that when the family is self-employed, children attend school less likely. In these families children are more likely needed as a work force.[13] The estimates show that when the family owns their house (a proxy for wealth) children attend school more probably and work less. Piped water (this affects the amount of housework and is a sign of wealth) has a positive sign for the schooling estimate, suggesting that families that have piped water are wealthier and can afford to send children to school. Not having a toilet has a negative sign for the schooling estimate and a positive sign for working. The estimates show that hunger affects both schooling and working negatively. Household size affects working negatively according to the estimates, which suggests that big families can afford to send more of their offspring to school, due to multiple wage earners (e.g. extended households). As expected, child labour is more visible in rural households. The distance to school decreases school attendance. The ethnic group affects child labour and schooling. Higher castes such as Brahman, Magar, Tharu and Newar educate their children more likely, whereas Tamangs and Muslims do not. Child labour is more probable among Chhetri, Magar, Kami and Tamang. Muslim children are less active as their parents send them to work or school less often than other ethnic groups.

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13 In Table 7 it is shown that on average children in self-employed families attend school more often than children in non-self employed families. The reason for the difference in the bivariate probit-model and in the averages produced by cross tabulation is that the model controls all other factors such as family wealth (self-employed families are e.g. on average 2.5 times wealthier, which affects school attendance positively).

Child's gender clearly affects schooling and working. The estimates in Table 12 show that males are more often sent to school, whereas girls are working in or outside the household. Mother's remittances affect male labour differently than female labour. The estimates show that male children work less often than female children if mother receives remittances, which is a sign of a male preference. Very likely young mothers favour male children, because the male offspring has an important role in the Nepalese culture in performing rituals and inheriting family properties etc. (Leone et al. 2003). Male child is often mother's most important asset in bargaining for old age benefits (Karki 1988). Father's remittances have an opposite sign for the estimate, suggesting an increase in male child labour. This may be explained by possible differences in the nature of the remittances to men and women. Mother's labour income (Table 13) has a positive sign upon male child labour, which most likely is suggesting that mothers and sons work because the family is poor.[14] In this case also the mother very likely has a lower bargaining power which affects her status in the bargaining process of sending boys to work or not.[15] Mother's marriage age has an effect of decreasing female child labour, which possibly suggests that, older mothers have more bargaining power, have already produced sons and can start favouring daughters and may thus send girls to work less often. According to the estimates self-employed families send boys to school clearly less often than families that are not self-employed. The house sale value seems to have a bigger effect on female children's schooling, possibly suggesting that families start educating girls only when the income is sufficient enough. The distance to a water source affects female child labour positively, suggesting that when the water source is further away girls need to work more often than boys. The distance to a school has a negative impact on female children's school attendance, which again is a sign of male preference in the society.

5   Conclusion

The previous research has devoted some attention to examining the effect of mother's intra-family status on child labour. This paper uses data from the Nepal Living Standards Survey 2 to analyse whether children use their time differently in a situation where the mother has a say in the intra-household decision-making process. The relation was studied with a bivariate probit model with a set of bargaining power indicators. The results show that the non-labour income (remittances) has a reverse impact depending on the receiver. Moreover the mother's remittances have an effect of decreasing child labour, whereas the father's remittances do the opposite, suggesting that the non-labour income in the hands of a woman decreases child labour more than in the hands of a man. Rising the mother's marriage age has an effect of decreasing child labour. The mother's birth controlling awareness affects the propensity to send children to school positively. The parents' education affects significantly children's school attendance and working. The impact is almost equal for the father and the mother, suggesting that decreasing the inter-spousal education gap does influence children's time use significantly. The distance to a water source has an effect of increasing female child labour and the distance to a school affects especially girls' school attendance negatively.

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[14] Over 3.26 times poorer measured with average house sale values.

[15] The bargaining power of the working mothers was lower compared with non-working mothers in NLSS 2 measured with indicators such as education, marriage age and remittances.

Moreover females have higher probabilities to leave school when the relative cost of education rises. The fees on education, as well as discrimination in families should be eliminated to increase poor children's, especially females' welfare in Nepal. This paper brought evidence to the hypothesis that improving the balance of power in a household decreases child labour and enhances their school attendance, which contributes in stopping the transmission of child labour to the next generation.

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Appendix

Table 1: Summary statistics

Variable	Mean	Std. dev.	Min.	Max.	NOB
Child-level variables					
Age of the child	9.20	2.81	5	14	4473
Birth order of the child	2.86	1.82	1	11	4473
Gender (male = 1)	0.51	0.50	0	1	4473
Student	0.76	0.43	0	1	4473
Idle	0.10	0.30	0	1	4473
Only works	0.13	0.34	0	1	4473
Chores and remote work	0.40	0.49	0	1	4473
Works and studies	0.26	0.44	0	1	4473
Chores	0.18	0.39	0	1	4473
Remote work	0.31	0.46	0	1	4473
Total child labour hours last 12 months	278.75	573.20	0	5760	4473
Average child labour hours last week	7.25	14.04	0	112	4473
Total chore hours last 12 months	93.65	283.68	0	2880	4473
Total chore hours last week	2.18	6.44	0	70	4473
Child has migrated	0.07	0.26	0	1	4473
Interspousal differences					
Labour income differential	0.31	0.41	0	1	3109
Education differential	2.72	3.73	-11	15	4433
Age differential	4.65	4.76	-30	32	4059
Working hour differential (mother/father)*	0.83	1.97	0.00	99.50	3655
Mother's characteristics					
Mother can write	0.28	0.45	0	1	4473
Mother's education	1.64	3.32	0	15	4473
Mother is unemployed	0.13	0.34	0	1	4473
Mother has migrated	0.78	0.41	0	1	4473
Mother's remittances	6080.76	32378.80	0	900000	4473
Mother's age	34.31	6.37	20	49	4473
Mother is chronically ill	0.06	0.24	0	1	4473
Mother's age at marriage	16.82	3.20	5	35	4458
Mother is aware of birth control	0.77	0.42	0	1	4458
Mother's burden of chores (hours 12 ms)	1058.98	587.26	0	4320	4473
Mother's labour income	3542.86	24425.98	0	1438400	4473
Mother's total work hours 12 months	2713.49	1079.76	0	8102	4473
Father's characteristics					
Father's total work hours 12 months	2360.41	953.97	0	6510	3695
Father lives in the household	0.83	0.37	0	1	4472
Father's education	4.35	4.49	0	18	4433
Father can write	0.64	0.48	0	1	3690
Father is unemployed	0.12	0.33	0	1	4473
Father has migrated	0.34	0.48	0	1	3692
Father's remittances	1638.78	10538.75	0	250000	4473
Father's age	39.16	7.93	5	69	4059
Father's labour income	24930.44	315096.28	0	20800000	4473

continued .....

Variable	Mean	Std. dev.	Min.	Max.	NOB
Household level variables					
hhsize	6.76	3.11	2	32	4473
Self employment	0.28	0.45	0	1	4472
Family owns the house	0.92	0.27	0	1	4473
House sale value in 100,000 Rs.	2.75	7.86	0.01	20	4118
Piped water dummy	0.16	0.37	0	1	4473
No toilet	0.61	0.49	0	1	4473
Education is not adequate	0.27	0.44	0	1	4227
Family has experienced hunger lately	0.26	0.44	0	1	4473
Rural household	0.77	0.42	0	1	4473
Water situation is bad	0.24	0.43	0	1	3363
Ethnicity					
Cchetri	0.15	0.36	0	1	4473
Brahman (hill)	0.13	0.34	0	1	4473
Magar	0.06	0.24	0	1	4473
Tharu	0.07	0.25	0	1	4473
Tamang	0.07	0.25	0	1	4473
Newar	0.08	0.27	0	1	4473
Muslim	0.07	0.25	0	1	4473
Kami	0.04	0.19	0	1	4473
Yadav	0.03	0.16	0	1	4473
Rai	0.03	0.18	0	1	4473
Gurung	0.02	0.15	0	1	4473
Damain_Dholi	0.02	0.15	0	1	4473
Limbu	0.01	0.11	0	1	4473
Thakuri	0.02	0.13	0	1	4473
Sarki	0.02	0.13	0	1	4473
Teli	0.01	0.12	0	1	4473
Chamar/Harijan/Ram	0.01	0.12	0	1	4473
Dhanuk	0.02	0.12	0	1	4473
Mallah	0.01	0.12	0	1	4473
Other ethnicity group	0.13	0.34	0	1	4473
Distances in minutes					
School	17.39	26.55	0	1200	4473
Health post	48.47	67.64	0	1440	4473
Buss stop	347.68	1115.47	0	12960	4473
Dirt road	282.25	1046.37	0	12960	4473
Shops	43.97	297.44	0	8640	4473
Bazaar	30.88	132.48	0	2880	4473
Market	208.00	633.49	0	14400	4473
Water source	4.14	36.95	0	1440	4473
Post office	58.25	135.18	0	2880	4473

Note: * excludes housework.

Table 2: Summary statistics on selected variables by gender

	Males		Females	
Variable	Mean	Std dev	Mean	Std dev
Child's characteristics				
Child's age	9.24	2.78	9.15	2.84
Birth order	2.85	1.85	2.88	1.79
Student	0.81	0.39	0.71	0.45
Idle	0.10	0.30	0.11	0.31
Only works	0.09	0.28	0.18	0.39
Works in the hh and remotely	0.34	0.47	0.46	0.50
Works and studies	0.25	0.43	0.28	0.45
Does chores	0.05	0.22	0.32	0.47
Works remotely	0.31	0.46	0.32	0.47
Total child labour hours	189.77	441.06	372.26	672.68
Remote work days a week	1.68	3.23	3.36	4.97
Remote hours a day	1.11	2.21	1.93	3.18
Remote work hours last week	5.07	11.16	9.55	16.23
Total chore hours last 12 months	19.85	127.90	171.20	368.98
Chore days a week	0.19	1.06	1.58	2.74
Chore hours a day	0.09	0.50	0.71	1.34
Total chore hours a week	0.47	2.99	3.98	8.32
Migrated	0.07	0.26	0.07	0.26
Status variables				
Age differential	4.71	4.67	4.60	4.86
Mother's income as a fraction of parental income	0.31	0.41	0.30	0.40
Education differential	2.64	3.71	2.80	3.74
Mother's characteristics				
Household chores a year	1064.23	578.71	1053.47	596.21
Can write	0.29	0.46	0.27	0.45
Education level	1.68	3.37	1.59	3.27
Unemployed	0.13	0.34	0.12	0.33
Migrated	0.78	0.41	0.78	0.41
Remittances	6116.25	32173.90	6043.46	32600.08
Age	34.40	6.48	34.22	6.25
Yearly labour income	3731.53	32040.75	3344.58	12039.53
Father's characteristics				
Lives at home	0.83	0.37	0.83	0.37
Can write	0.63	0.48	0.65	0.48
Education level	4.32	4.47	4.39	4.50
Unemployed	0.13	0.33	0.11	0.32
Migrated	0.34	0.47	0.35	0.48
Remittances	1834.29	12074.88	1433.31	8632.94
Age	39.31	7.95	39.00	7.90
Yearly labour income	28676.23	437350.98	20994.01	51252.70
Sample size	2292		2181	

Table 3: Distribution of children by economic activity status

	School only	School and work	Work only	Not active	Total
Age group					
5-9	64.8	8.4	5.4	21.4	100
10-14	45.2	33.5	16.6	4.7	100
Gender					
Male	59.3	22.7	7.5	10.4	100
Female	51.1	18.3	14.2	16.4	100
Development region					
East	55.6	19.6	11.3	13.5	100
Central	50.5	18.2	14.3	17	100
West	66.4	22.4	3.9	7.2	100
Mid West	53.6	22.5	11	12.9	100
Far West	50.9	26.4	10.6	12.2	100
Ecological zone					
Mountains	44.2	32	10.3	13.5	100
Hills	55.3	25.1	10.1	9.6	100
Terai	56.8	15.3	11.5	16.5	100
Urban	81.9	8.4	4	5.7	100
Kath. Valley	92.7	3	2	2.3	100
Other	77.3	10.6	4.9	7.2	100
Rural	51.7	22.2	11.7	14.4	100
East Mts./Hills	41.5	30.7	13.7	14.2	100
West Mts./Hills	56.3	26.5	9	8.1	100
East Terai	51.8	12.9	15.5	19.8	100
West Terai	59.2	22.2	5.8	12.8	100
Consumption quintile					
Poorest	38.7	13.4	20.5	27.3	100
Second	48	23.2	11.4	17.5	100
Third	57.5	24.5	9.7	8.2	100
Fourth	62.2	26.6	5.7	5.5	100
Richest	80	15	2.7	2.3	100
Nepal	55.3	20.6	10.8	13.3	100

Table 4: School enrolment ratios in each age group
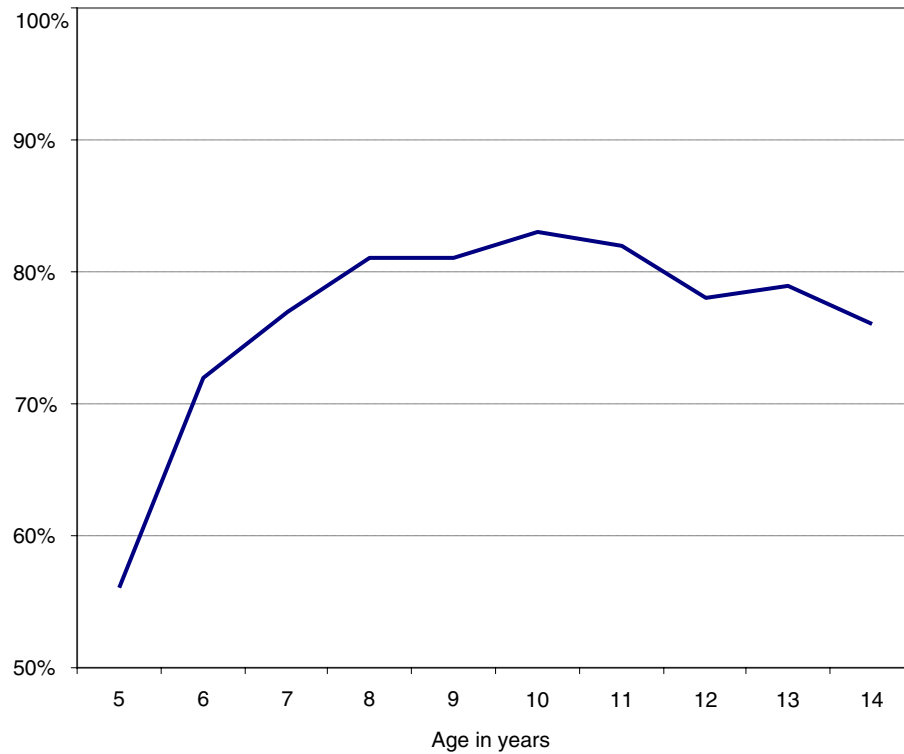
Table 5: Mother's labour income status and children's (aged 5-14) activities

		Mother does not receive labour income	Mother receives labour income
No. of obs.		3330	1143
Family size		7.0	6.1
Working time of fathers (hours in 12 months)		2384.7	2285.3
Children aged 5-14			
Goes to school (1 = yes)	male	0.83	0.76
	female	0.75	0.59
Is idle (1 = yes)	male	0.08	0.14
	female	0.10	0.14
Only works (1 = yes)	male	0.08	0.10
	female	0.15	0.28
Does chores and works remotely (1 = yes)	male	0.33	0.35
	female	0.44	0.53
Works and studies (1 = yes)	male	0.25	0.24
	female	0.29	0.25
Does household chores (1 = yes)	male	0.05	0.06
	female	0.29	0.42
Works remotely (1 = yes)	male	0.31	0.31
	female	0.31	0.35
All work during last 12 months (hours)	male	185.4	202.9
	female	325.7	504.7
Total chores during last 12 months (hours)	male	18.1	24.9
	female	141.3	256.3

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Table 6: Children's time use by birth order and family size (NLSS 2)

	NOB	Student	Only works	Work and study	HH chores	Idle
NOB		3411	603	1786	813	459
Birth order		2.78	2.9	2.87	2.62	3.4
Family size		6.59	7.18	6.6	6.51	7.5
By birth order						
First born	1722	0.80	0.13	0.27	0.22	0.07
Second born	1090	0.78	0.13	0.25	0.18	0.09
Third born	815	0.74	0.15	0.25	0.19	0.11
Fourth born	578	0.74	0.13	0.29	0.17	0.12
Fifth born or more	768	0.71	0.14	0.27	0.13	0.15
By family size						
4 or less	770	0.86	0.08	0.27	0.16	0.06
From 5-6	1826	0.78	0.13	0.3	0.2	0.09
From 7-8	1052	0.69	0.18	0.24	0.19	0.13
Over 9	825	0.72	0.14	0.21	0.14	0.13

Table 7: Self-employment and children's time use

	Household self employed (in agriculture or other)	
Children's time use	Yes	No
Attends school	0.79	0.75
Is idle	0.09	0.11
Only works	0.12	0.14
Works in hh or out	0.35	0.42
Works and studies	0.23	0.28
Does household chores	0.16	0.19
Other work than hh chores	0.27	0.33

Table 8: Time use of children by gender

	Aged 5-9			Aged 10-14		
	Boys	Girls	Total	Boys	Girls	Total
No. of obs.	1202	1210	2412	1090	971	2061
Is a student (1 = yes)	0.78	0.68	0.73	0.85	0.74	0.80
Is idle (1 = yes)	0.17	0.19	0.18	0.02	0.01	0.01
Only works (1 = yes)	0.05	0.13	0.09	0.13	0.25	0.19
Does chores and works remotely (1 = yes)	0.16	0.27	0.21	0.54	0.71	0.62
Works and studies (1 = yes)	0.11	0.14	0.12	0.40	0.46	0.43
Does household chores (1 = yes)	0.03	0.17	0.10	0.07	0.50	0.28
Works remotely (1 = yes)	0.13	0.16	0.14	0.51	0.52	0.51
All work during last 12 months (hours)	82.3	185.3	134.0	308.2	605.2	448.2
Total chores during last 12 months (hours)	15.0	97.4	56.3	25.2	263.1	137.2

Table 9: Characteristics of the sample households by their hunger status

	No hunger	Hunger
No. of obs.	3301	1172
Age of the father	39.1	39.3
Age of the mother	34.3	34.1
Education of the father (years)	4.9	2.9
Education of the mother (years)	1.9	0.8
Household size	6.9	6.4
Value of the house Rs.	333,698	110,520

Table 10: Bivariate probit analysis

Variable	Studies				Works			
	Estimate	Std Error	t Value	Approx Pr > |t|	Estimate	Std Error	t Value	Approx Pr > |t|
Child's characteristics								
5 years old	-0.82	0.11	-7.46	***	-1.07	0.16	-6.62	***
7 years old	0.15	0.11	1.30		-0.37	0.12	-3.06	***
8 years old	0.28	0.11	2.43	**	0.08	0.11	0.76	
9 years old	0.30	0.12	2.52	**	0.32	0.11	2.80	***
10 years old	0.47	0.12	4.05	***	0.60	0.11	5.66	***
11 years old	0.34	0.13	2.65	***	0.70	0.12	6.08	***
12 years old	0.19	0.11	1.72	*	1.16	0.11	10.80	***
13 years old	-0.08	0.12	-0.61		1.13	0.12	9.74	***
14 years old	0.06	0.13	0.48		1.47	0.12	12.20	***
Firstborn	-0.08	0.08	-0.96		0.20	0.08	2.54	**
Secondborn	0.02	0.08	0.21		0.06	0.08	0.72	
Fourth born or over	0.06	0.08	0.79		-0.10	0.07	-1.37	
Is male	0.54	0.05	9.88	***	-0.14	0.05	-2.74	***
Child migrated	0.16	0.18	0.91		0.05	0.14	0.39	
Key variables								
Remittances in 1,000 Rs. to mother	0.00	0.00	0.27		-0.01	0.00	-1.90	*
Remittances in 1,000 Rs. to father	0.00	0.00	1.77	*	0.00	0.00	1.77	*
Fathers labour income	0.00	0.00	-0.11		0.00	0.00	0.53	
Fathers labour in 1,000 hrs	-0.09	0.03	-2.77	***	-0.04	0.03	-1.42	
Father's education attainment	0.06	0.01	7.94	***	-0.04	0.01	-6.28	***
Interspousal age difference	0.01	0.01	2.17	**	-0.01	0.01	-2.65	***
Birthcontrol aware mother	0.51	0.06	8.35	***	-0.03	0.06	-0.47	
Mother's marriage age	0.01	0.01	1.18		-0.03	0.01	-2.92	***
Parent's characteristics								
Father migrated	-0.04	0.07	-0.67		-0.08	0.06	-1.24	
Mother migrated	-0.04	0.07	-0.56		0.04	0.06	0.69	
Mother is unemployed	-0.13	0.09	-1.46		-0.10	0.08	-1.14	
Father is unemployed	-0.14	0.08	-1.89	*	-0.05	0.08	-0.64	
Mother chronically ill	0.12	0.12	1.06		0.05	0.10	0.50	
Other characteristics								
HH is self employed	-0.12	0.06	-1.91	*	-0.09	0.06	-1.57	
House sale value in 1,000 Rs.	0.00	0.00	3.54	***	0.00	0.00	-5.75	***
HH has piped water	0.19	0.12	1.65	*	-0.02	0.09	-0.19	
No toilet	-0.61	0.08	-7.81	***	0.11	0.07	1.64	
Hunger	-0.15	0.06	-2.53	**	-0.13	0.06	-2.09	**
Household size	-0.01	0.01	-1.26		-0.04	0.01	-4.01	***
Cchetri	0.05	0.10	0.53		0.23	0.09	2.54	**
Brahman (hill)	0.42	0.12	3.49	***	-0.02	0.10	-0.21	
Magar	0.27	0.14	2.00	**	0.25	0.12	2.04	**
Tharu	0.24	0.12	2.07	**	0.05	0.11	0.44	
Tamang	-0.29	0.11	-2.69	***	0.25	0.11	2.20	**
Newar	0.26	0.15	1.66	*	0.12	0.13	0.93	
Muslim	-0.26	0.11	-2.35	**	-0.34	0.12	-2.84	***
Kami	0.16	0.15	1.09		0.26	0.15	1.77	*
Yadav	-0.13	0.16	-0.80		0.17	0.17	0.98	
Rai	0.17	0.16	1.09		0.21	0.16	1.32	

continued ....

	Studies				Works			
Variable	Estimate	Std Error	t Value	Approx Pr > |t|	Estimate	Std Error	t Value	Approx Pr > |t|
Gurung	0.30	0.23	1.28		0.00	0.21	-0.01	
Damain/Dholi	0.28	0.19	1.49		0.11	0.18	0.61	
Sarki	0.12	0.21	0.56		0.14	0.20	0.67	
Thakuri	0.33	0.28	1.20		0.08	0.20	0.38	
Dhanuk	-0.15	0.21	-0.72		0.12	0.20	0.59	
Rural household	-0.14	0.09	-1.55		0.37	0.08	4.50	***
Distance to water	0.00	0.00	-0.50		0.00	0.00	0.50	
Distance to school	0.00	0.00	-2.73	***	0.00	0.00	1.23	
Intercept	0.27	0.27	1.01		-0.01	0.25	-0.06	

Note: *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 11: Estimates for variables tested one by one in the above bivariate probit model (table 10)

	Studies				Works			
Key variable tested separtely in the bivariate model (previous table)	Estimate	Std Error	t Value	Approx Pr > |t|	Estimate	Std Error	t Value	Approx Pr > |t|
Mother's labour income instead of father's labour income	0.00	0.00	0.23		0.00	0.00	1.29	
Mother's labour in 1,000 hrs instead of father's labour	-0.05	0.03	-1.45		0.17	0.03	5.73	***
Mother's education attainment instead of father's education	0.08	0.02	4.99	***	-0.07	0.01	-5.71	***
Mother's age instead of age differential	-0.01	0.01	-1.20		0.01	0.01	2.35	**
Father's age instead of age differential	0.00	0.00	-0.04		-0.01	0.00	-1.90	*

Table 12: Bivariate probit results: male and female samples

| | Males | | | | | | Females | | | | | |
| | Studies | | | Works | | | Studies | | | Works | | |
Variable	Coeff	t Value	Pr>|t|	Coeff	t Value	Pr>|t|	Coeff	t Value	Pr>|t|	Coeff	t Value	Pr>|t|
Child's characteristics												
5 years old	-0.89	-5.59	***	-1.00	-4.34	***	-0.46	-3.02	***	-1.23	-4.05	***
7 years old	0.34	1.97	**	-0.44	-2.50	**	0.18	1.18		0.32	1.79	*
8 years old	0.25	1.51		0.07	0.45		0.42	2.56	**	0.68	3.90	***
9 years old	0.34	1.89	*	0.28	1.68	*	0.31	1.95	*	0.88	5.08	***
10 years old	0.49	2.92	***	0.61	4.12	***	0.48	2.98	***	1.11	6.60	***
11 years old	0.41	2.20	**	0.73	4.49	***	0.37	2.13	**	1.27	6.86	***
12 years old	0.29	1.77	*	1.22	8.13	***	0.21	1.28		1.67	9.60	***
13 years old	-0.04	-0.19		1.14	6.95	***	-0.01	-0.05		1.72	9.41	***
14 years old	0.13	0.72		1.47	8.53	***	0.06	0.34		2.08	11.00	***
Firstborn	-0.08	-0.63		0.28	2.54	**	-0.03	-0.29		0.04	0.36	
Secondborn	-0.02	-0.15		0.10	0.89		0.08	0.71		-0.02	-0.19	
Fourth born or over	0.06	0.56		0.00	-0.02		0.15	1.43		-0.20	-1.88	*
Child migrated	0.11	0.44		0.12	0.64		0.54	2.01	**	-0.22	-1.07	
Key variables												
Remittances in 1,000 Rs. to mother	0.04	1.24		-0.05	-1.95	*	0.00	-0.43		-0.01	-1.48	
Remittances in 1,000 Rs. to father	0.00	1.13		0.01	2.22	**	0.01	1.32		0.00	-0.03	
Fathers labour income	0.00	-0.38		0.00	0.90		0.00	0.52		0.00	0.63	
Fathers labour in 1,000 hrs	-0.04	-0.80		-0.06	-1.48		-0.01	-0.29		-0.05	-1.13	
Father's education attainment	0.06	4.86	***	-0.03	-2.73	***	0.07	6.60	***	-0.06	-5.63	***
Interspousal age difference	0.01	0.86		-0.01	-1.02		0.02	2.38	**	-0.02	-1.90	*
Birthcontrol aware mother	0.61	6.96	***	-0.06	-0.73		0.45	5.23	***	0.03	0.33	
Mother's marriage age	0.01	0.67		-0.01	-0.89		0.02	1.30		-0.02	-1.66	*
Parent's characteristics												
Father migrated	-0.05	-0.54		-0.17	-1.91	*	-0.06	-0.69		0.05	0.55	
Mother migrated	0.08	0.87		-0.17	-1.95	*	-0.04	-0.43		0.18	1.94	*
Mother is unemployed	-0.13	-1.05		-0.15	-1.28		-0.13	-0.98		0.01	0.07	
Father is unemployed	-0.15	-1.36		0.12	1.10		-0.07	-0.61		-0.24	-2.12	**
Mother chronically ill	0.12	0.70		0.03	0.19		0.05	0.29		0.01	0.03	
Other characteristics												
HH is self employed	-0.23	-2.43	**	-0.11	-1.24		-0.05	-0.55		-0.06	-0.63	
House sale value in 1,000 Rs.	0.00	1.63		0.00	-5.15	***	0.00	4.13	***	0.00	-3.27	***
HH has piped water	0.19	1.01		-0.04	-0.29		0.21	1.34		-0.01	-0.09	
No toilet	-0.62	-5.27	***	-0.02	-0.23		-0.28	-2.67	***	0.25	2.57	**
Hunger	-0.24	-2.75	***	-0.17	-2.02	**	-0.05	-0.59		-0.13	-1.46	
Household size	-0.01	-0.36		-0.04	-2.71	***	-0.01	-1.15		-0.04	-2.97	***
Cchetri	-0.21	-1.51		0.20	1.55		0.64	4.79	***	0.29	2.13	**
Brahman (hill)	0.24	1.30		-0.03	-0.22		0.92	5.62	***	0.06	0.39	
Magar	0.12	0.60		0.34	2.00	**	0.77	4.04	***	0.35	1.90	*

| | Males | | | | | | Females | | | | | |
| | studies | | | works | | | studies | | | works | | |
Variable	Coeff	t Value	Pr>ltl	Coeff	t Value	Pr>ltl	Coeff	t Value	Pr>ltl	Coeff	t Value	Pr>ltl
Tharu	0.01	0.05		0.02	0.15		0.74	4.44	***	0.12	0.70	
Tamang	-0.48	-3.06	***	0.30	1.80	*	0.35	2.25	**	0.33	2.00	**
Newar	0.33	1.26		0.14	0.78		0.50	2.50	**	0.18	0.96	
Muslim	-0.12	-0.73		-0.44	-2.43	**	-0.07	-0.44		-0.23	-1.33	
Kami	0.00	-0.02		0.41	2.04	**	0.77	3.86	***	0.12	0.54	
Yadav	-0.07	-0.32		0.18	0.74		-0.22	-0.94		0.70	2.73	***
Rai	0.03	0.13		0.35	1.54		0.77	3.50	***	0.12	0.53	
Gurung	0.19	0.54		0.00	0.00		1.06	3.09	***	0.13	0.41	
Damain/Dholi	0.22	0.81		0.19	0.77		0.97	3.51	***	0.09	0.32	
Sarki	0.01	0.05		0.03	0.09		0.48	1.47		0.76	2.32	**
Thakuri	0.25	0.66		0.16	0.60		1.13	2.46	**	0.07	0.21	
Dhanuk	-0.10	-0.37		0.16	0.63		-0.50	-1.47		0.30	0.91	
Rural household	-0.12	-0.86		0.30	2.53	**	-0.07	-0.53		0.47	3.94	***
Distance to water	0.00	-0.19		0.00	-0.05		0.00	-0.93		0.01	1.76	*
Distance to school	0.00	-0.82		0.00	1.03		-0.01	-4.52	***	0.00	0.69	
Intercept	0.64	1.64		-0.12	-0.32		-0.79	-2.10	**	-0.90	-2.42	**

Table 13: Variables tested in the above model one by one for comparisons

| | Males | | | | | | Females | | | | | |
| | student | | | work | | | student | | | work | | |
Variable	Coeff	t Value	Pr>ltl	Coeff	t Value	Pr>ltl	Coeff	t Value	Pr>ltl	Coeff	t Value	Pr>ltl
Mother's labour income instead of father's labour income	0.00	0.37		0.00	1.75	*	0.00	-0.84		0.00	0.47	
Mother's labour in 1000 hours instead of father's labour hours	0.02	0.50		0.13	2.98	***	0.01	0.17		0.13	2.88	***
Mother's education attainment instead of father's education	0.09	3.57	***	-0.05	-3.14	***	0.07	2.94	***	-0.08	-4.83	***