Hi-Stat

Discussion Paper Series

No.136

Parental Attitudes toward Children and Child Labor:
Evidence from Rural India

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January 2006

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Abstract

This paper empirically investigates the determinants of child labor in rural India using household survey data. While a growing number of empirical studies have shown that child labor in developing countries is associated with a variety of factors, such as household poverty, low parental educational attainment, and the absence of schools, this study pays particular attention to parents' attitudes toward children in the household as a crucial determinant of child labor. In order to examine the role of parental attitudes, we estimate a probit model, controlling for individual, household, and community characteristics, and find that children are more likely to work if their parents show less concern for them. We also show that children are more likely to work if their father has greater bargaining power in the household than their mother. Moreover, the results indicate that the incidence of child labor is

positively associated with household poverty. These findings suggest that in order to reduce or eliminate child labor, the government should implement policies to address the various factors causing child labor, such as parents' lack of concern for their children, imbalances in the power structure within households, and household poverty.

1   Introduction

Although the number of working children has been decreasing around the world in recent years, child labor continues to be a widespread problem today, especially in developing countries. IPEC (2004) reports that in 2000, about 182 million children in the developing world aged 5-14 years were engaged in work.[1] Against this background, governments, international organizations, and non-governmental organizations (NGOs) have focused their efforts on tackling in particular the worst forms of child labor such as forced and bonded labor, which put children in physically and mentally harmful working conditions.

Economists, too, have tried to examine the problem, and over the past decade or so the literature on child labor-related issues has grown rapidly. A number of theoretical studies have tried to explain why child labor exists and often is so persistent. Basu and Van (1998), for example, have shown that there exist two stable equilibria in the labor market, one with a higher wage where no children work and another with a lower wage where all children work.[2] Emerson and Souza (2003),

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[1]The report defines child labor as work performed by children aged 5-14, excluding work by children aged 12-14 that is not hazardous in nature and does not exceed 14 hours per week. The term "developing world" here refers to Asia, Latin America, Sub-Saharan Africa and North Africa, the Middle East, and the transition countries of Eastern Europe.

[2]Their model is based on the "luxury axiom" which states that child labor arises from household poverty and the "substitution axiom" which posits that adult labor and child labor are substi-

meanwhile, have developed an overlapping generations model that indicates that lower levels of human capital investment in the household can persist over generations, implying that child labor also persists over generations (the "child labor trap").[3] And Baland and Robinson (2000) have developed a two-period model that examines household welfare and suggests that even if child labor is socially inefficient, it may arise if capital markets are imperfect or parents leave no bequests to their children.[4]

Many recent studies have attempted to identify the key factors that give rise to child labor in developing countries using a wide variety of theoretical or empirical approaches.[5] One typical theoretical approach starts with a unitary household model and then shows that a household's decision on child labor is affected by factors such as household income, ownership of assets, credit constraints, income inequality, future transfers from children to parents, and a child's innate ability.[6] Another type of approach employs a collective household model incorporating the preferences of individual household members. Studies along these lines suggest that the incidence of child labor is affected by the balance of bargaining power in the household between the mother and the father of the child.[7]

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tutes.

[3] The authors show that the lower parents' human capital is the lower is the investment in the education of their children. They provide empirical support for their theoretical prediction using household survey data from Brazil.

[4] Bommier and Dubois (2004) show that by introducing a child's disutility from labor into Baland and Robinson's (2000) model, the level of child labor can be inefficiently high even if capital markets are perfect and parents' transfers to children are positive.

[5] For reviews of both theoretical and empirical studies on child labor, see, for example, Basu (1999), Basu and Tzannatos (2003), Brown, Deardorff, and Stern (2002), Dar et al. (2002), and IPEC (2003).

[6] See, for example, Bacolod and Ranjan (2004), Bhalotra and Heady (2003), Ranjan (1999, 2001), Rosati and Tzannatos (2003), and Tanaka (2003), some of which also contain empirical investigations using household survey data.

[7] See, for example, Basu (2004) and Basu and Ray (2002).

Along with the increasing availability of household survey data from developing countries, the number of empirical studies exploring the determinants of child labor in Africa, Asia, and Latin America has also grown over the last decade or so. These studies typically estimate a probit or logit model where the incidence of child labor in households is regressed on various individual, household, and community characteristics. The results indicate that households' decision on child labor is affected by variables such as children's age and sex; parents' educational attainment, employment status, and religion; households' income level and credit constraints, the presence of a school, and education costs.[8] Relying on a collective household model, Basu and Ray (2002) obtain particularly interesting results for Nepal suggesting that the incidence of child labor is associated with the balance of bargaining power in the household between father and mother. A few studies, using panel data, show that exogenous economic shocks also affect the incidence of child labor in households.[9] In addition, there are some studies using cross-country data to explain differences in the prevalence of child labor across countries.[10]

One country in which the problem of child labor continues to be widespread is India and there are a few studies concentrating on this case. Nielsen and Dubey (2002), using household survey data collected by the National Sample Survey Organization (NSSO) for 1983, 1987-88, 1993-94, and 1999-2000, estimate a multinomial logit model that examines what determines which of four mutually

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[8]For recent studies, see, for example, Maitra and Ray (2002), Nielsen (2004), and Ray (2000, 2002).

[9]See, for example, Beegle, Dehejia, and Gatti (2003), Duryea and Arends-Kuenning (2003), and Edmonds and Pavcnik (2003).

[10]See, for example, Admassie (2002) and Shelburne (2001). Dehejia and Gatti (2002) and Cigno, Rosati, and Guarcello (2002) use cross-country panel data.

exclusive activities — attending school, working for a wage, working at home, or other (residual) activities — children aged 10-14 years engaged in during work hours. Controlling for various individual, household, and regional characteristics, they showed that the incidence of child labor in rural India is negatively associated with household income and parental years of schooling.

Another approach is that pursued by Deb and Rosati (2002), who used unobserved household heterogeneity to explain the incidence of child labor. Using the data from the Human Development of India Survey (HDIS) conducted in 1994, which covers rural children aged 6-15 years, they estimate a latent class random effects multinomial logit model to examine the determinants of three mutually exclusive activities: working, attending school, and being idle. Controlling for various individual, household, and village characteristics, they found that unobserved household heterogeneity plays a much greater role in explaining rural Indian children's activities than observed household income heterogeneity.

Thus, there have been a growing number of empirical studies exploring the determinants of child labor in developing countries. While these studies have mainly focused on testing the plausible hypothesis that child labor is caused by household poverty, the purpose of this study is to concentrate on the role factors other than poverty play in explaining the incidence of child labor in the developing world. The rationale for this approach is that some of the empirical results in previous studies suggest the possibility that household poverty is not the only or the most important cause of child labor. Among the non-poverty factors we examine, we pay particular attention to parents' attitudes toward their children. Different parents can have different attitudes toward their children or, more specifically, unique preferences with regard to child labor. The purpose of this study is to

provide empirical evidence that households' decision on child labor is associated with parents' attitudes toward their children.

Of course, many of the variables used in previous studies, such as parents' educational attainment or the household heads' religion, provide indicators of parental attitudes toward their children. However, no study to date has explicitly addressed the role of parents' attitudes toward their children as a determinant of child labor. We here hypothesize that differences in parental attitudes or preferences are one factor underlying variations in the incidence of child labor across households. In other words, child labor may arise as a result of a lack of parental concern for their children and the purpose of this paper is to examine this proposition empirically. If work conflicts with school attendance and even is physically and mentally harmful to a child's health and growth, parents who care more for their children may hesitate to send them to work and prefer to send them to school. At the same time, parents who are less concerned about their children may have fewer reservations about making them work and therefore choose to send their children to work to increase the household's income. Thus, parents in households can treat their children in different manners. We explicitly investigate how parents' attitudes toward their children affect the incidence of child labor.

It should be noted here that even within the same household, parental attitudes — those of the father and those of the mother — may diverge. The father may have different attitudes from those of the mother and therefore parents may disagree about where to send their children, work or school. If this is the case, we need to consider separately each parent's attitudes or preferences in the household's decision making process, which raises a bargaining problem between parents within the household. Collective household models suggest that individ-

uals' preferences are reflected in the household's decision through their relative bargaining power. We therefore also examine how the incidence of child labor is affected by the balance of bargaining power between father and mother in the household. In addition, we investigate a number of individual, household, and community characteristics such as birth order among siblings, household income, and education costs as determinants of child labor.

The remainder of this paper is organized as follows. Section 2 introduces the empirical approach and then describes the data used. Section 3 interprets the empirical results, while Section 4 concludes.

2 Empirical model and data description

In order to test our hypothesis discussed above, we estimate a binomial probit model explaining the probability that child i from household j in tola/bustee[11] k in village l works. Using the latent variable y^* for the observed y, the model looks as follows:

$$y^*_{ijkl} = \alpha + \beta'_1 \, \mathbf{individual}_i + \beta'_2 \, \mathbf{household}_j + \beta'_3 \, \mathbf{tola}_k + \beta'_4 \, \mathbf{village}_l + \varepsilon_i$$

$$y_{ijkl} = 1[y^*_{ijkl} > 0]$$

where $\mathbf{individual}_i$, $\mathbf{household}_j$, $\mathbf{tola}_k$, and $\mathbf{village}_l$ are vectors of the characteristics of child i, household j, tola k, and village l. α is a constant, the βs are the parameter vectors to be estimated, and ε_i is an error term following the stan-

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[11] A tola/bustee is a collection of households within a village.

dard normal distribution. We calculate the marginal effects from the βs and then examine how various factors, especially parents' attitudes toward their children, affect the incidence of child labor.

The data used for the estimation come from a household survey for two Indian states carried out by the World Bank's Living Standards Measurement Study (LSMS), the "Survey of Living Conditions, Uttar Pradesh and Bihar, December 1997 - March 1998." The survey covers 2,250 rural households drawn from 120 villages selected from 25 districts in southern and eastern Uttar Pradesh and northern and central Bihar.[12] Thus, unlike previous studies, which commonly use a sample from a nationwide survey such as a census, we concentrate our attention on the poorest parts of the country.[13]

Our analysis focuses on children aged 10-14. This is because the survey only inquires into the activities of individuals aged 10 years and above and because in Uttar Pradesh and Bihar, children who start school at the age of six are expected to complete compulsory education (five years of primary and three years of middle school) at the age of 14.[14] We limit our sample to households in which both

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[12]The survey covers 1,035 households from 57 villages in 13 districts of Bihar and 1,215 households from 63 villages in 12 districts of Uttar Pradesh.

[13]In terms of state domestic product per capita, both Bihar and Uttar Pradesh are among the most economically deprived states in India.

[14]Education systems somewhat differ across states in India. Formal education in both Uttar Pradesh and Bihar consists of five years of primary school, three years of middle school, two years of secondary school, and two years of intermediate school and the minimum age for admission to primary school is five or six years. Therefore, 10-14 year-old school children can be enrolled in the fourth to ninth grade, that is, in the last two years of primary school, the whole of middle school, and the first year of secondary school, except for cases of late entrance into school or grade repetition, which is not uncommon in India. Of the 970 school children aged 10-14 years in the sample, 625 children (64.4 percent) were enrolled in fourth to ninth grade, while 289 children (29.8 percent) were enrolled in third grade or below. The central government has proposed free compulsory education for children aged 6-14 years, but enforcement of compulsory education has so far been at the discretion of the state governments. In practice, primary and middle school are almost compulsory. For details of the Indian education system, see <http://education.nic.in/NatPol.asp>.

parents are present in order to relate child labor to parent characteristics. Based on this selection, the sample used in the estimation consists of 1,418 children (629 females)[15] aged 10-14 years from 975 households in 276 tolas/bustees in 120 villages of the two states. The dependent and explanatory variables used in the estimation are shown in Tables 1 and 2 and are described in detail in the following subsections.

2.1   Child labor: A classification

Children can be engaged in four activities. They can be only working, only attending school, both working and attending school, or neither working nor attending school. This classification of a child's activities implies that there is not a simple trade-off relationship between work and school attendance in a child's time allocation: children not attending school are not necessarily working, and children that are working are not always absent from school.

Children in developing countries are engaged in a wide variety of activities.[16] While some children work for wages in a factory or workshop or help out on a family-owned farm or in a family-owned business, others carry out domestic chores. A nonnegligible problem here is whether to count domestic chores as child labor or not. Domestic chores performed by children range from just giving the mother a helping hand after school to full-time activities such as cooking, washing, sweeping, babysitting, drawing water, and collecting firewood. To take

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[15]The sex ratio of children in the sample, measured as the number of females per 1,000 males, is 797, which may raise a sampling problem. It is, however, usually the case that males heavily outnumber females, as is the case in the 2001 census, which reports that the sex ratio of the population aged 7 years and above is 924 for rural Bihar and 899 for rural Uttar Pradesh.

[16]A vivid description of child labor in India is provided by Burra (1995), who shows that many children are working under hazardous conditions and in a variety of sectors.

account of such diversity in children's activities, we use two different definitions of child labor when estimating the empirical model: a broad definition which includes any type of work, including domestic chores, and a narrow definition which excludes such domestic chores.[17]

Since the present study uses a binomial probit model to examine the role of non-poverty factors in explaining child labor, we simply divide children into those that work and those that do not, irrespective of whether they attend school, and apply both definitions of child labor. We identify children in the sample as engaged in work if they worked in the preceding 12 months.[18]

Table 1 shows the distribution of children by activity for both definitions. Of the 1,418 children aged 10-14, 28.3 percent were engaged in work including domestic chores, while 71.7 percent were not. There is a clear difference between boys and girls, with 44.5 percent of girls working but only 15.3 percent of boys. If we narrow the definition of child labor and exclude domestic chores, 11.4 percent of children were working while 88.6 percent were not. In this case, we do not observe a great difference between the share of boys who were working (12.2 percent) and that of girls who were working (10.5 percent). This is because girls performing domestic chores, who under the broad definition were identified as working, were not counted as working under the narrow definition. Because of this significant difference in the share of working children depending on which definition of child labor is used, we need to estimate the empirical model sepa-

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[17]The broad definition of child work appears to be more appropriate because of all the parents who responded in the survey questionnaire that a child's activities included "domestic duties" almost none chose "does not work", implying that most parents perceive the domestic chores performed by their children as work and not as light help.

[18]Child labor includes own farm activities, casual labor (farm and non-farm), long-term agricultural employment, salaried non-agricultural employment, personal services, employment in petty or major business/trade/manufacturing, collection/foraging, and begging.

rately for each definition.

2.2 Individual characteristics

Demographic attributes such as sex, age, birth order among siblings, and marital status, are fundamental factors that determine whether a child works. We expect first-born children to be more likely to work because they are more productive than their younger siblings. First-borns also often are in charge of babysitting younger siblings, a work typically done by children. It is, however, difficult to identify which child is first-born because households sometimes have children from different generations and therefore the sibling relationship between children in the household is not so simple. In fact, in the sample, 80.0 percent of children are the household head's own child, 17.3 percent household head's grandchild, 2.3 percent the nephew or niece, 0.4 the sibling (with 0.1 percent not falling into any of these categories). Children of several of these categories can be living in the same household. To avoid the complexity of identifying the exact relationship among siblings, we simply define the oldest child in any of these four categories as the first-born child in the household.[19]

Table 2 shows that 44.4 percent of the children in the sample are girls and 30.4 percent of the children are first-borns; only 1.6 percent are married. The average age is 11.7 years.

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[19]Note that based on the categorization above, there can be up to four first-born children in a household. What is more, the oldest child in each category is not necessarily the true first-born child because his/her older sibling(s) may have moved out.

2.3 Household characteristics

Since whether a child works or not exclusively depends on the household and, more specifically, on the parents' decision, parental and household characteristics are likely to be among the determinants of child labor. One possible determinant is parents' educational attainment, which may greatly affect households' decision with regard to child labor. More educated parents can be assumed to show greater concern for the education of their children than their less educated counterparts because they recognize the future returns to education. We thus expect that children with more educated parents are more likely to attend school and therefore less likely to work.[20] We classify fathers' educational attainment into four categories (no formal education, primary school,[21] middle school, and secondary school and above) and mothers' educational attainment into two categories (no formal education and primary school and above). Table 2 shows that there is a large gender difference in parents' educational attainment. While the fathers of 46.2 of the children have received no formal education, the mothers of 83.6 of the children are without formal education. The fathers of 24.1 percent of the children completed secondary school and above.

An issue addressed in previous studies concerns the substitutability or complementarity of adult labor and child labor. In particular, many studies have discussed the substitutability of domestic labor between a mother and her daughter. It may well be that a child, especially a daughter, substitutes for a busy mother in domes-

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[20]Parents' educational attainment can have a negative income effect on the incidence of child labor because more educated parents presumably receive higher wages than their less educated counterparts. In the estimation, the income effect is controlled for by the insertion of a direct measure of household income, as will be explained further below.

[21]This category includes those who completed primary school as well as those who dropped out.

tic chores. Since, as Table 1 has shown, many girls tend to be engaged in domestic chores, the likelihood of whether they work may depend on whether their mother can carry out all the domestic chores by herself. Therefore, we would expect that girls are more likely to work if their mother is working outside the home, on the family farm, or in the family business. The mothers of 50.6 percent of the children (and the fathers of 98.2 percent of the children) were working.[22]

Regarding the relationship between parental work status and the incidence of child labor, we are faced with a potential endogeneity problem. This is because the presence of a child that could perform household chores may be a factor determining whether a mother decides to work, either on the family farm/in the family business, or outside the home. However, this danger appears negligible because it seems reasonable to assume that self-employed parents do not change their work status very often and that there are few available jobs outside the home in a poor rural economy.

A larger household size may be associated with a larger number of productive members in the household, which in turn may result in higher household income. In addition, the presence of a greater number of adult members in the household may reduce the demand for child labor. Thus, we expect that the incidence of child labor is negatively related to household size. The average household size is 8.4 family members.

In India, religion and caste play a critical role in explaining household behavior, including decisions with regard to child labor. While 90.2 percent of children are from households whose head is Hindu, only 9.8 percent are from Muslim households. We classify castes into four categories, irrespective of religion: upper

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[22]We identify parents as working if they are engaged in any work excluding domestic chores.

castes, middle castes, backward castes, and scheduled castes/scheduled tribes. As many as 55.3 percent of children belong to backward castes and 24.2 percent belong to scheduled castes/scheduled tribes. 20.5 percent are from upper or middle castes.

Another possible determinant of child labor are the work opportunities in a household. In a self-employed household, there may be more such opportunities than in a salaried household. In addition, parents in a self-employed household may have less reservation about making their children work under their own supervision within the home than if they were to send them to work outside the home. Therefore, we expect that children in self-employed households are more likely to work. We identify households as self-employed if more than half of the livelihood of the household derives from own farm activities or petty or major business. 61.4 percent of children are from self-employed households.

Given that there are more working children in poor countries or regions than in rich ones, it seems clear that household poverty is one of the most important causes of child labor. Yet, it is less clear that household poverty always gives rise to child labor: several empirical studies have failed to provide clear evidence that the incidence of child labor is positively associated with households' poverty status.

The most frequently used proxies to measure the poverty status of households are household income and expenditure per capita. But we again encounter an endogeneity problem, since household income is likely to rise if a child helps out on a family-operated farm/in a family-operated business or works outside the home for wages. Even if a child only performs domestic chores which do not directly generate any income, household income may increase because the child's

help in the household frees the mother to engage in income-generating work.

To cope with the endogeneity problem between the incidence of child labor and household income, we refrain from using a continuous measure of household income and instead devise a dummy variable that represents the chronic poverty status of households.[23] We identify households as falling into the upper income quantile if they are above the poverty line[24] *and* had sufficient food for all household members more than one year old;[25] all other households, which were *either* below the poverty line *or* had insufficient food, were counted as falling into the lower income quantile. This dummy variable seems to be less susceptible to the influence of child labor because it is less likely to be greatly affected by any income change as a result of child labor than a continuous measure of household income. In the sample, 33.0 percent of children were from lower income quantile households, while 67.0 percent belonged to upper income quantile households.

The central concern of this paper is to examine the role of parental attitudes in explaining the incidence of child labor. To create a measure of the extent to which parents care about the welfare of their children, we simply consider the utility maximization problem of the household. Suppose that parents and their children each have their own utility function over the consumption of different goods (adult and child goods, respectively) and that altruistic parents maximize a weighted sum of both utilities by choosing a consumption level of adult and child goods. In this case, we can distinguish between parents who show greater concern

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[23]The endogeneity problem could also be solved by relying on econometric methods such as using instrumental variables, as a number of previous studies have done.

[24]A household that is below the poverty line qualifies for the newly introduced Below the Poverty Line (BPL) subsidy for food grains offered through the revamped Public Distribution System (PDS). BPL households are identified by the state government in terms of monthly expenditures per capita.

[25]All household members got two satisfying meals a day around the year.

for the welfare of their children by putting a greater weight on their children's utility and hence choosing to consume more child goods and fewer adult goods to maximize the household's utility, and those who do not. We can easily see that the level of consumption of child goods relative to adult goods in a household is higher the greater parents' concern for their children is. To measure the extent of parents' concern for their children, we calculate the ratio of yearly household expenditure on clothing per child to that on clothing per adult. The average ratio is 0.936, which means that households' clothing expenditure per child on average is equivalent to 93.6 percent of clothing expenditures per adult. The maximum ratio is 13.3. The ratio is zero if a household spends nothing on children's clothing.

We should note here that the children's clothing expenditure ratio may be positively correlated with household income because consumption of luxury goods, such as children's clothing, tends to be greater in high-income households. This raises the possibility that the children's clothing expenditure ratio is endogenous to the incidence of child labor. To solve this endogeneity problem, we need an appropriate instrumental variable, which is not available in our data set. Therefore, we have to settle for an approach in which household income is explicitly controlled for so as to ensure that the children's clothing expenditure ratio only captures the extent of parents' concern for their children. Since the poverty status dummy mentioned above does not seem to fully eliminate the income effect from the children's clothing expenditure ratio, we attempt to control for the income effect by adding to the empirical model a continuous measure of household income, the yearly household expenditure per capita on non-food goods such as wood, coal, and clothing, which is admittedly endogenous to the incidence of child labor. The average household expenditure per capita on non-food items is 1,329

rupees per year.

When examining the relationship between parental attitudes toward their children and the decision on child labor, we also need to consider the bargaining problem between the father and the mother in the household because each has his/her own different attitude toward children and treats them in a different manner. Therefore, based on the collective household model, we attempt to investigate how the balance of bargaining power between father and mother affects the household's decision on child labor.

Differences between fathers' and mothers' attitudes toward their children are naturally difficult to observe. In order to identify such differences, we therefore rely on empirical results from earlier studies that explore patterns of resource allocation using the collective household model. Quisumbing and Maluccio (2003), for example, investigate how the balance of bargaining power between husband and wife affects resource allocation in the household using household survey data from four developing countries. They find that in Bangladesh and South Africa, greater bargaining power of a wife (which the authors measure using wives' assets at marriage) significantly raises the share of education expenditure in total household expenditure. This suggests that a household's decision to spend more on education reflects the wife's preference rather than the husband's, implying that wives are more likely than their husbands to prefer investing in their children's education.[26] Based on such results, we hypothesize that a household is

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[26]The authors also use years of schooling as a proxy for the bargaining power of husband and wife and find that the education expenditure share decreases with the wife's years of schooling in the case of Indonesia and increases with the husband's years of schooling in the case of Bangladesh, which may contradict the results obtained using wives' assets at marriage. The main result in their study is an empirical rejection of the unitary household model hypothesis for Bangladesh, Ethiopia, Indonesia, and South Africa.

more likely to send children to school instead of work the greater the mother's say in the household is.

In order to make the best of the limited information available in the data set on power structures within the household, we focus on the balance of bargaining power between males and females in the household instead of that between the father and the mother. Male household members can be the child's grandfather, uncle, or brother, as well as the father, while female household members can be the child's grandmother, aunt, or sister, as well as the mother. Shifting the focus from the power balance between father and mother to that between male and female household members does not substantially change our argument. Rather, this focus may in fact be preferable because it is easy to imagine cases in which family members other than the child's parents have some influence in the household's decision on child labor.

We create three kinds of dummy variables to indicate the power structure in the household. The first dummy addresses a family member's contribution to total household income. Since household members who earn a greater income may have greater bargaining power than those who earn less, we identify households as male-dominated if their main breadwinner is male. The second dummy relates to the occurrence of violence by men against women. The presence of domestic violence would suggest that men have a dominant position over women. However, since the survey questionnaire, in order to encourage women to respond honestly, did not ask directly about violence at home, the only information we have available is on the presence of violent men in the tola/bustee. Therefore, we identify households as male-dominated if their female members responded that a woman in the tola/bustee had been harmed by a (male) family member during

the preceding two years. The third dummy refers to the freedom of women in the household, i.e., the degree to which women are restricted in their actions by men. We use information on whether women need the permission of a male household member to visit a doctor[27] and households where this is the case we identify as male-dominated. Table 2 indicates that as many as 98.6 percent of children are from households where the breadwinner is male; 26.1 percent of children are from tolas/bustees where there has been violence by men against women, and 68.2 percent are from households where women cannot visit a doctor without the permission of a male family member.

2.4 Tola/bustee characteristics

Parents' decision regarding their children's activities may be affected by the surrounding circumstances. For example, if schooling for children is uncommon and child labor is widely prevalent in the neighborhood, this is likely to increase the probability that parents will send their children to work. Similarly, if schooling is common in the neighborhood, this is likely to make parents more inclined to send their own children to school. Therefore, we construct a dummy variable that indicates the prevalence of schooling in a tola/bustee and then examine how this affects the incidence of child labor.

However, we should note here that the prevalence of schooling in a tola/bustee is admittedly endogenous to the household's decision on child labor because work often conflicts with school attendance in a child's time allocation. Looking at the survey results, we find that while 76.6 percent of children live in a tola/bustee

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[27]An example of the questions asked is: "Can you visit a doctor without male permission when your child is sick?"

where half or more of all children attend primary school, the remaining children live in a tola/bustee where less than half of all children attend primary school.

2.5 Village characteristics

There are also a number of village characteristics that are likely to affect households' decisions with regard to child labor. The presence of a school in the village, for example, makes it possible or easier for children to attend school, which may lead to more widespread school attendance and therefore a lower incidence of child labor, assuming that school attendance often conflicts with work.[28] We create three dummy variables, indicating the presence of a primary, a middle, and/or a secondary school in the village. 83.1 percent of children live in a village that has a primary school and 25.8 percent live in a village that has a middle school. Only 9.2 percent of children live in a village with a secondary school.

In a poor economy, the cost of education is an important consideration in parents' decision on whether to send children to school. A possible proxy for the cost of education is household expenditure on education, but again we encounter endogeneity problems with regard to child labor because household expenditures clearly rise if parents send their children to school instead of work. To mitigate this endogeneity problem, as a proxy for households' education costs we use the village mean of yearly household expenditures on education per child enrolled in the fourth to ninth grade.[29] The sample mean is 731 rupees per child per year.

A further possible determinant of child labor is households' access to credit.

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[28]In fact, children can and do attend schools outside their village. Of the 970 school children in the sample, 332 (34.2 percent) went to a school outside their village.

[29]Children aged 10-14 years are supposed to be enrolled in the fourth to ninth grade except in the case of late entrance or grade repetition. Education expenses include, for example, tuition, uniforms, books, private tutoring, and transportation fees.

Although poor rural households do not solely rely on financial institutions for borrowing,[30] the presence of a bank in the village may improve their access to credit and therefore reduce the effect of household poverty on the incidence of child labor. In our sample, only 5.2 percent of children live in a village with a bank.

Yet another potential determinant of child labor is the availability of child care services. In the two states on which our survey concentrates, some villages have so-called Anganwadi centers, which provide natal and child care services for preschool children for local households.[31] The presence of an Anganwadi center in a village is likely to lessen the burden of babysitting for older children within the home. This may reduce the incidence of child labor in the village. 33.1 percent of children live in a village that has an Anganwadi center.

3   Empirical results

This section presents the results of the probit estimation of the empirical specification provided above. Estimation results based on the two different definitions of child labor are shown in Tables 3 and 4. Values shown are the marginal effects evaluated at the mean. As a whole, the results based on the broad definition of child labor including domestic chores (Table 3) support our hypotheses. The first column represents a conventional model focusing on the relationship between households' poverty status and the incidence of child labor. The results indicate

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[30]Rural households often borrow from their relatives or employers.

[31]Anganwadi centers (courtyard play centers) are child care centers which provide community-level services under the Integrated Child Development Services (ICDS) program. Services include early childhood care, preschool education, and nutrition and health improvement for children below six years of age, for pregnant and nursing mothers, and for adolescent girls. For details, see <http://wcd.nic.in/udisha/htm/anganwadi.htm>.

that children from lower income quantile households are more likely to be engaged in work, including domestic chores, than those from upper income quantile households. This confirms the common perception that household poverty gives rise to child labor.

Column 2, which controls for parental attitudes toward children, shows that the incidence of child labor is negatively correlated with the children's clothing expenditure ratio, our measure of parental concern for their children, and that the effect of lower household income shown in column 1 diminishes. This suggests that the poverty effect is overestimated in column 1 in that the poverty variable also captures the effect of the children's clothing expenditure ratio because household poverty is likely to lead to lower expenditure on children's clothing.

The negative correlation between the incidence of child labor and the children's clothing expenditure ratio indicates that children are less likely to work if their parents show greater concern for them. This effect is still significant even when we control for household non-food expenditure per capita (using the log value), a continuous measure of household income, to rule out the possibility that the children's clothing expenditure ratio captures any income effect (column 3).[32] When we include village or district dummies to control for village- or district-level fixed effects (columns 4 and 5), the effect of the children's clothing expenditure ratio is still negative but it becomes insignificant.[33] It is only just significant at the 15 percent level when district fixed effects are controlled for. However, this

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[32]As discussed in the preceding section, this treatment is admittedly insufficient to resolve the endogeneity problem with regard to the children's clothing expenditure ratio because this continuous measure of household income can be endogenous to the incidence of child labor.

[33]Each of the villages or districts can have a different tendency to consume children's clothing because preferences regarding and the relative price of children's clothing possibly differ across villages or districts.

result does not seriously weaken our argument regarding the relationship between parents' concern for their children and the incidence of child labor if households' attitudes toward their children within a village or district are similar.

In addition, we find that male-dominated households are more likely to send their children to work. Children from households where the main breadwinner is male or where a male member is violent are more likely to work. Column 4, which controls for village fixed effects, shows that children from households where a female needs the permission of a male to visit a doctor are also more likely to work.[34] These results suggest that the father's greater bargaining power in the household raises the probability that a child works, supporting our hypothesis that parents' individual attitudes toward their children affect households' decisions regarding child labor through the balance of bargaining power between father and mother.

Individual characteristics of a child are also relevant for the incidence of child labor. Column 1, which does not control for parents' attitudes, indicates that first-born children are more likely to work than their younger siblings. This is probably because parents usually make use of more productive members to make a living and feed younger children. Married children are also more likely to work, possibly because parents may regard married children as adults.[35]

As shown in previous studies, greater parental educational attainment reduces the probability that a child works. This is probably because more educated parents place greater value on investment in their children's education and therefore prefer sending them to school instead of work.[36] The interaction terms between the

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[34]Coefficients are significant at the 15 percent level.

[35]In all the cases where children are married their spouses do not live in the household.

[36]Parents' educational attainment may have a negative income effect on the incidence of child

parental education dummy and the female dummy show some interesting results. The negative effect of the fathers' middle school-level education dummy is overwhelmed by the positive effect of its interaction term with the female dummy, suggesting that fathers who have completed middle school are less likely than those who have received no formal education to send male children to work but slightly more likely to send female children to work. At the same time, we find that both the dummy indicating that a father received secondary school-level education and its interaction term with the female dummy have a negative effect, implying that fathers who have completed secondary school and above are less likely to send either female or male children to work. These results may indicate that while fathers show greater interest in educational investment in male children the more education they have received themselves, the importance of education for female children is recognized only by those who have received at least secondary school-level education. Mothers who have completed primary school and above are also less likely to send their children to work than mothers with no formal education.

Children are much less likely to work if their father is working, but the working status of mothers has no impact on the incidence of child labor. This indicates that fathers' work and child labor are substitutes. Since mothers' work here excludes domestic chores, this result does not necessarily reject the conventional argument that children, especially daughters, often substitute for their mother in domestic chores.

There is a negative correlation between household size and the incidence of

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labor because more educated parents tend to receive a greater income than their less educated counterparts. This effect is controlled for by the inclusion of the household income and poverty status measures.

child labor, probably because the presence of a greater number of adult members in a household reduces the demand for child labor. Although religion (Hindu or Muslim) has no impact on the incidence of child labor, caste has a significant effect. Children from upper castes are less likely to work than those from scheduled castes/scheduled tribes, suggesting that the incidence of child labor is in part attributable to the Indian caste system. Whether households are self-employed does not appear to have any impact on the incidence of child labor. This is probably because even children from salaried households can work as employees outside the home or perform domestic chores.

In addition, we find that tola/bustee characteristics are among the determinants of child labor. Children in tolas/bustees where at least half of the children attend school are less likely to work than those in tolas/bustees where less than half of all children go to school,[37] indicating that the prevalence of schooling in the neighborhood reduces the incidence of child labor (column 3). However, we should note that this result may not be robust because of endogeneity problems, given that work often conflicts with school attendance.

What is more, some characteristics of the village in which children reside are found to affect the incidence of child labor. Children in villages with a middle school are less likely to work because it is easier for parents to send their children to school. However, children in villages with only a primary school are more likely to work. This is probably because if a primary school is available, children aged 10-14 years are likely to already have completed primary education and begun to work; in contrast, if a village has no primary school, children are less likely to have completed primary education and therefore more likely to still be facing

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[37]Coefficients are significant at the 15 percent level.

the trade-off between work and attending primary school outside the village. The presence of a secondary school in the village has no effect on the incidence of child labor, mainly because most children of this age group can normally attend a primary or a middle school.

We also find that the higher the cost of education in a particular village, as measured by the village mean of per child household expenses on education, the more likely it is that children work. If education costs are too high, parents give up sending their children to school and choose to make them work instead. Since an Anganwadi center provides child care services and helps to free children from domestic chores such as babysitting, children in villages with Anganwadi centers are found to be less likely to work. The presence of a bank in the village, which serves as measure of households' access to credit, has no significant effect on the incidence of child labor. This may be due to the fact that households have alternatives to bank loans, such as borrowing from relatives, employers, and other informal financial facilities.

If we narrow the definition of child work and exclude domestic chores, the estimation shows some interesting results (Table 4). Among children's individual characteristics, birth order among siblings has a more stable effect on the incidence of child labor under this definition than in the case where child labor includes domestic chores, i.e., first-born children are more likely to be engaged in work other than domestic chores. A possible explanation of this finding is that first-borns are more likely to help out in households' own-farm or own-business activities, while domestic chores are shared by all children in a household.

With regard to parents' work status, as before, we find that if a father is working, children are less likely to work; on the other hand, if a mother is working,

girls are more likely to work, though not boys. This interesting result suggests that daughters tend to perform family work such as farming or own-business activities together with their mothers, possibly because mothers are unwilling to leave their daughters alone at home to prevent any violence against them.[38]

We also find that children from self-employed households are more likely to work. This is probably because self-owned farms or businesses present greater opportunities for children to work. What is more, parents may have less reservation about making their children work on their own farm or in their own business because work within the home is much safer for children than work outside the home.

Among tola/bustee and village characteristics, the presence of an Anganwadi center in the village does not reduce the incidence of child labor. This is because these centers can only lessen the burden of domestic chores imposed on children by providing child care services for village households.

4   Conclusion

Using household survey data from rural India, we empirically showed that households' decision with regard to child labor is affected by parental attitudes toward their children. Our probit model examining the incidence of child labor in terms of various individual, household, and community characteristics suggests that greater parental concern for their children, as measured by the children's clothing expenditure ratio in the household, reduces the probability that a child works. This result confirms that parents' lack of concern for their children's welfare is one

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[38]On this point, see, e.g., Burra (1995).

factor giving rise to child labor.

Moreover, the probit estimates have shown that children from male (father)-dominated households are more likely to work, suggesting that the balance of bargaining power between father and mother affects the household's decision on child labor. This result indicates that the incidence of child labor is in part a reflection of fathers' preference for child labor and that therefore child labor occurs as a result of fathers' greater bargaining power in the household.

In line with earlier studies, we found that lower household incomes are associated with an increase in the incidence of child labor. This supports the conventional view that child labor is caused by household poverty. Thus, while this study shows that non-poverty factors such as a lack of parents' concern for their children's welfare and imbalances in the power structure within households are determinants of child labor, household poverty is obviously an important cause of child labor. What is more, poverty ultimately appears to be the major factor giving rise to child labor because it also seems to be the case that parents' attitudes toward their children are influenced by the level of household income.

We also confirm that the incidence of child labor is closely related to parents' educational attainment, the Indian caste system, and the presence of a school in a village. A new finding of this paper is that the presence of an Anganwadi center in a village tends to lower the incidence of child labor when this is defined as including domestic chores. This indicates that Anganwadi centers help to free children from work that otherwise would be performing domestic chores. And while previous studies have failed to show a clear association between the incidence of child labor and the cost of education, the present study has shown that higher costs for

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education in a village contribute to the incidence of child labor.[39] This suggests that parents are sensitive to the cost of education when deciding whether to send their children to school.

A number of policy conclusions can be drawn from the above findings to reduce or eliminate child labor in developing countries. Policy measures should aim at changing parents' attitudes toward their children. For example, the government should educate the public about the benefits of children's education and the costs of child labor. If parents were to evaluate children's education from a long-term perspective and considered the expected future returns to schooling, they would be more inclined in sending their children to school. If parents were more aware of the harmful effects of work on children's physical and mental development, they might be more reluctant to send their children to work.

In addition, changing the power structure within the household may help to reduce the incidence of child labor. In many developing countries, it is often the case that men have much greater bargaining power in the household than women due mainly to longstanding cultural practices or religious norms. Since a higher incidence of child labor is associated with men's dominant position, addressing the power imbalance between men and women in the household would lead to a reduction in child labor. The government should therefore educate the public on gender issues and seek to advance the empowerment of women in the country.

Obviously, measures for poverty alleviation play an important role in reducing the incidence of child labor because household poverty is found to cause child la-

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[39]A number of previous studies have shown that higher education costs can be associated with a reduction in child labor. The typical interpretation of this finding is that higher costs for education tend to reflect a higher quality of schooling, which increases school attendance and reduces child labor.

bor. In addition to such direct effects, poverty reduction may have indirect effects, for example, in that improvements in households' economic status allow parents to pay greater attention to their children's welfare, which in turn would contribute to a reduction in child labor.

Finally, the government should reform the Indian caste system which is regulating the nation's way of life, because children from lower castes are much more likely to work. Since easier access to education in terms of both school availability and education expenses reduces the incidence of child labor, the government should also facilitate the construction of schools and lower or abolish tuition fees. An increase in the availability of Anganwadi centers, which provide child care services, would also be effective in reducing child labor.

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Table 1 Summary statistics of dependent variables

Variable	Description	Obs.	Mean	Std. Dev.	Min.	Max.

(1) Child work (domestic chores included)

<u>All children</u>

Variable	Description	Obs.	Mean	Std. Dev.	Min.	Max.
workd	1 if working	1418	0.2828	0.4505	0	1
noworkd	1 if not working	1418	0.7172	0.4505	0	1
workonlyd	1 if only working	1418	0.2694	0.4438	0	1
schoolonlyd	1 if only attending school	1418	0.6707	0.4701	0	1
bothd	1 if both working and attending school	1418	0.0134	0.1150	0	1
neitherd	1 if neither working nor attending school	1418	0.0465	0.2107	0	1

<u>Male children</u>

Variable	Description	Obs.	Mean	Std. Dev.	Min.	Max.
workd	1 if working	789	0.1534	0.3606	0	1
noworkd	1 if not working	789	0.8466	0.3606	0	1
workonlyd	1 if only working	789	0.1420	0.3492	0	1
schoolonlyd	1 if only attending school	789	0.7871	0.4096	0	1
bothd	1 if both working and attending school	789	0.0114	0.1063	0	1
neitherd	1 if neither working nor attending school	789	0.0596	0.2368	0	1

<u>Female children</u>

Variable	Description	Obs.	Mean	Std. Dev.	Min.	Max.
workd	1 if working	629	0.4452	0.4974	0	1
noworkd	1 if not working	629	0.5548	0.4974	0	1
workonlyd	1 if only working	629	0.4293	0.4954	0	1
schoolonlyd	1 if only attending school	629	0.5246	0.4998	0	1
bothd	1 if both working and attending school	629	0.0159	0.1252	0	1
neitherd	1 if neither working nor attending school	629	0.0302	0.1713	0	1

(2) Child work (domestic chores excluded)

<u>All children</u>

Variable	Description	Obs.	Mean	Std. Dev.	Min.	Max.
work	1 if working	1418	0.1142	0.3182	0	1
nowork	1 if not working	1418	0.8858	0.3182	0	1
workonly	1 if only working	1418	0.1072	0.3095	0	1
schoolonly	1 if only attending school	1418	0.6770	0.4678	0	1
both	1 if both working and attending school	1418	0.0071	0.0837	0	1
neither	1 if neither working nor attending school	1418	0.2087	0.4066	0	1

<u>Male children</u>

Variable	Description	Obs.	Mean	Std. Dev.	Min.	Max.
work	1 if working	789	0.1217	0.3271	0	1
nowork	1 if not working	789	0.8783	0.3271	0	1
workonly	1 if only working	789	0.1141	0.3181	0	1
schoolonly	1 if only attending school	789	0.7909	0.4069	0	1
both	1 if both working and attending school	789	0.0076	0.0869	0	1
neither	1 if neither working nor attending school	789	0.0875	0.2827	0	1

<u>Female children</u>

Variable	Description	Obs.	Mean	Std. Dev.	Min.	Max.
work	1 if working	629	0.1049	0.3067	0	1
nowork	1 if not working	629	0.8951	0.3067	0	1
workonly	1 if only working	629	0.0986	0.2983	0	1
schoolonly	1 if only attending school	629	0.5342	0.4992	0	1
both	1 if both working and attending school	629	0.0064	0.0796	0	1
neither	1 if neither working nor attending school	629	0.3609	0.4806	0	1

(3) School attendance

<u>All children</u>

Variable	Description	Obs.	Mean	Std. Dev.	Min.	Max.
school	1 if attending school	1418	0.6841	0.4651	0	1
noschool	1 if not attending school	1418	0.3159	0.4651	0	1

<u>Male children</u>

Variable	Description	Obs.	Mean	Std. Dev.	Min.	Max.
school	1 if attending school	789	0.7985	0.4014	0	1
noschool	1 if not attending school	789	0.2015	0.4014	0	1

<u>Female children</u>

Variable	Description	Obs.	Mean	Std. Dev.	Min.	Max.
school	1 if attending school	629	0.5405	0.4988	0	1
noschool	1 if not attending school	629	0.4595	0.4988	0	1

Table 2 Summary statistics of explanatory variables

Variable	Description	Obs.	Mean	Std. Dev.	Min.	Max.
Individual characteristics						
female	1 if female	1418	0.4436	0.4970	0	1
age	age	1418	11.72	1.43	10	14
firstborn	1 if first-born or the oldest among siblings or cousins	1416	0.3044	0.4603	0	1
married	1 if married	1418	0.0162	0.1264	0	1
Household characteristics						
fedno*	1 if father has no formal education	1418	0.4619	0.4987	0	1
fedpri	1 if father completed at most primary school	1418	0.1340	0.3408	0	1
fedmid	1 if father completed middle school	1418	0.1629	0.3694	0	1
fedsecabove	1 if father completed secondary school or above	1418	0.2412	0.4280	0	1
medno*	1 if mother has no formal education	1418	0.8357	0.3707	0	1
medpriabove	1 if mother completed primary school or above	1418	0.1643	0.3707	0	1
fwork	1 if father works, excluding domestic chores	1401	0.9822	0.1324	0	1
mwork	1 if mother works, excluding domestic chores	1404	0.5064	0.5001	0	1
hhsize	number of household members	1418	8.39	4.06	3	29
muslim	1 if religion of household head is Muslim, not Hindu	1417	0.0981	0.2975	0	1
casteup	1 if upper caste	1417	0.1793	0.3837	0	1
castemid	1 if middle caste	1417	0.0261	0.1595	0	1
casteback	1 if backward caste	1417	0.5526	0.4974	0	1
castesched*	1 if scheduled caste/scheduled tribe	1417	0.2421	0.4285	0	1
mselfhh	1 if the major source (more than half) of livelihood of the household is self-employed activities, incl. own farm activities and petty and major business	1410	0.6135	0.4871	0	1
lower	1 if lower income quantile household	1388	0.3300	0.4704	0	1
nfoodexpypc	yearly non-food expenditures per capita, Rupee	1407	1329	1814	68	25430
cclothratio	ratio of clothing expenditure per child to clothing expenditure per adult	1396	0.9357	1.0721	0	13.333
bwinnermale	1 if main breadwinner in the household is male	1408	0.9858	0.1184	0	1
harmtf	1 if any woman in the tola/bustee was harmed by a family member in the preceding two years, answered by each household	1401	0.2605	0.4391	0	1
permit	1 if women in the household need male permission to visit a doctor	1401	0.6824	0.4657	0	1
Tola/bustee characteristics						
tprimarymore	1 if half or more of the children in the tola/bustee attend primary	1404	0.7657	0.4237	0	1
tprimaryless*	1 if less than half of the children in the tola/bustee attend primary school	1404	0.2343	0.4237	0	1
Village characteristics						
vvbank	1 if bank is present in the village	1414	0.0516	0.2214	0	1
vanganwadi	1 if Anganwadi center is present in the village	1409	0.3314	0.4709	0	1
vprimary	1 if primary school is present in the village	1416	0.8312	0.3747	0	1
vmiddle	1 if middle school is present in the village	1416	0.2578	0.4376	0	1
vsecondary	1 if secondary school is present in the village	1416	0.0918	0.2889	0	1
edcost4_9	village mean of household yearly educational expenses per child in fourth to ninth grade, incl. tuition, uniforms, books, private tutoring, transportaion fees, Rupee	1400	731	460	70	2882

Note: Dummy variables with * are omitted as the reference category in the estimation.

Table 3 Probit estimates on child labor participation (domestic chores included)

workd	Marginal Effect (1)	z (1)	Marginal Effect (2)	z (2)	Marginal Effect (3)	z (3)	Marginal Effect (4)	z (4)	Marginal Effect (5)	z (5)
female	0.2337	1.18	0.2591	1.42	0.2891	1.56	0.2607	1.34	0.3276 *	1.75
age	0.0428 ***	4.92	0.0461 ***	5.10	0.0474 ***	5.14	0.0603 ***	5.91	0.0521 ***	5.80
firstborn	0.0465 *	1.76	0.0378	1.35	0.0291	1.03	0.0271	0.87	0.0294	1.07
married	0.1950 **	2.03	0.1912 **	1.99	0.1880 *	1.94	0.1114	0.99	0.2042 **	2.06
fedpri	−0.0577	−1.23	−0.0657	−1.39	−0.0526	−1.08	−0.0526	−0.91	−0.0222	−0.45
fedpriXfemale	−0.0914	−1.47	−0.0908	−1.44	−0.0958	−1.53	−0.0733	−1.00	−0.0938	−1.60
fedmid	−0.2026 ***	−3.84	−0.2050 ***	−3.92	−0.1995 ***	−3.76	−0.1872 ***	−3.20	−0.1713 ***	−3.35
fedmidXfemale	0.2248 **	2.19	0.2119 **	2.05	0.2047 **	1.99	0.2259 **	2.03	0.1751 *	1.79
fedsecabove	−0.1130 **	−2.42	−0.1132 **	−2.39	−0.1032 **	−2.08	−0.0635	−1.08	−0.0867 *	−1.73
fedsecaboveXfemale	−0.1231 **	−2.16	−0.1255 **	−2.19	−0.1222 **	−2.07	−0.1617 ***	−2.79	−0.1180 **	−2.04
medpriabove	−0.2154 ***	−2.68	−0.2180 ***	−2.76	−0.2190 ***	−2.75	−0.2548 **	−2.09	−0.2057 ***	−2.63
medpriaboveXfemale	0.0951	0.67	0.1091	0.77	0.1169	0.81	0.2091	0.79	0.0949	0.67
fwork	−0.4506 ***	−2.73	−0.5210 ***	−3.43	−0.5036 ***	−3.24	−0.6667 ***	−4.22	−0.4788 ***	−3.18
fworkXfemale	0.0812	0.42	0.0521	0.29	0.0234	0.13	0.1663	0.87	0.0036	0.02
mwork	0.0239	0.65	0.0231	0.61	0.0147	0.38	0.0623	1.31	0.0294	0.74
mworkXfemale	0.0229	0.46	0.0354	0.70	0.0398	0.77	0.0101	0.17	0.0274	0.55
hhsize	−0.0073 **	−2.12	−0.0096 ***	−2.67	−0.0097 ***	−2.70	−0.0047	−1.09	−0.0066 *	−1.84
muslim	0.0537	1.17	0.0442	0.95	0.0401	0.86	0.0421	0.66	0.0226	0.47
casteup	−0.1118 **	−2.54	−0.1152 **	−2.55	−0.1079 **	−2.32	−0.1786 ***	−3.70	−0.0986 **	−2.11
castemid	0.0624	0.74	0.0383	0.44	0.0404	0.46	0.0471	0.40	0.0589	0.65
casteback	−0.0093	−0.31	−0.0122	−0.40	−0.0102	−0.33	−0.0120	−0.31	0.0019	0.06
mselfhh	0.0322	1.23	0.0299	1.11	0.0295	1.08	0.0169	0.52	0.0230	0.84
lower	0.0784 ***	2.80	0.0583 **	2.08	0.0481 *	1.69	0.0449	1.30	0.0646 **	2.18
lognfoodexpypc					−0.0280	−1.56	−0.0486 **	−2.23	−0.0269	−1.43
cclothratio			−0.0297 **	−2.06	−0.0304 **	−2.06	−0.0107	−0.61	−0.0222	−1.49
bwinnermale			0.1605 *	1.95	0.1643 **	2.06	0.1490 **	2.04	0.1520 **	2.08
harmtf			0.0587 **	2.02	0.0653 **	2.19	0.0306	0.89	0.0687 **	2.31
permit			0.0271	1.03	0.0282	1.05	0.0496	1.64	0.0183	0.66
tprimarymore					−0.0476	−1.59				
vvbank	0.0407	0.56	0.0480	0.64	0.0232	0.32			0.0027	0.03
vanganwadi	−0.0676 ***	−2.64	−0.0678 ***	−2.60	−0.0645 **	−2.45			−0.0579 **	−2.03
vprimary	0.0910 ***	2.90	0.1075 ***	3.47	0.1118 ***	3.61			0.0790 **	2.11
vmiddle	−0.0670 **	−2.24	−0.0768 **	−2.50	−0.0753 **	−2.42			−0.0789 **	−2.17
vsecond	0.0041	0.07	0.0206	0.35	0.0389	0.64			0.0700	1.05
logedcost4_9	0.0559 **	2.48	0.0595 ***	2.60	0.0658 ***	2.82			0.0213	0.74
Village fixed effects							Yes			
District fixed effects									Yes	
Obs. P	0.2808		0.2837		0.2838		0.3132		0.2837	
Pred. P (at x−bar)	0.2026		0.2010		0.2016		0.1912		0.1850	
Number of obs	1321		1283		1265		1194		1276	
Wald chi2(# of restrictions in parentheses)	305.19 (29)		334.32 (33)		335.55 (35)		420.20 (134)		354.97 (58)	
Prob > chi2	0.0000		0.0000		0.0000		0.0000		0.0000	
Pseudo R2	0.2673		0.2800		0.2821		0.3958		0.3188	
Log pseudo−likelihood	−574.71		−550.97		−541.68		−448.45		−518.40	

Note:
Marginal effects are evaluated at the mean.
z−ratios are calculated using the heteroskedasticity−consistent standard error.
Village fixed effects are controlled for by 119 village dummies and district fixed effects by 24 district dummies.
Because of perfect prediction, 13 village dummies and corresponding observations are dropped.
Statistically significant at the 10 % level (*), 5 % level (**), and 1 % level (***).

Table 4 Probit estimates on child labor participation (domestic chores excluded)

work	Marginal Effect (1)	z (1)	Marginal Effect (2)	z (2)	Marginal Effect (3)	z (3)	Marginal Effect (4)	z (4)	Marginal Effect (5)	z (5)
female	−0.1029	−1.41	−0.0774	−1.14	−0.0726	−1.08	−0.1048	−1.26	−0.0584	−0.96
age	0.0178 ***	4.08	0.0190 ***	4.32	0.0192 ***	4.32	0.0291 ***	5.17	0.0191 ***	4.72
firstborn	0.0416 ***	2.99	0.0414 ***	2.81	0.0378 ***	2.56	0.0546 ***	2.89	0.0310 **	2.35
married	−0.0407	−1.32	−0.0412	−1.41	−0.0406	−1.38	−0.0607 **	−2.17	−0.0322	−1.14
fedpri	−0.0215	−1.04	−0.0263	−1.32	−0.0213	−1.04	−0.0179	−0.59	−0.0136	−0.69
fedpriXfemale	−0.0163	−0.47	−0.0163	−0.48	−0.0186	−0.56	−0.0259	−0.65	−0.0145	−0.47
fedmid	−0.0637 ***	−2.89	−0.0630 ***	−2.95	−0.0605 ***	−2.80	−0.0697 ***	−2.74	−0.0476 **	−2.37
fedmidXfemale	0.1105 *	1.74	0.1107 *	1.75	0.1057 *	1.70	0.1744 **	2.09	0.0993 *	1.74
fedsecabove	−0.0346 *	−1.71	−0.0348 *	−1.75	−0.0321	−1.55	−0.0192	−0.62	−0.0268	−1.37
fedsecaboveXfemale	0.0157	0.39	0.0152	0.38	0.0211	0.52	0.0110	0.21	0.0231	0.59
medpriabove	−0.0754 **	−2.45	−0.0744 **	−2.53	−0.0734 **	−2.50	−0.0783 *	−1.88	−0.0637 **	−2.31
medpriaboveXfemale	0.0628	0.75	0.0596	0.74	0.0600	0.74	0.0641	0.53	0.0432	0.58
fwork	−0.3022 ***	−2.77	−0.3542 ***	−3.01	−0.3430 ***	−2.92	−0.4934 ***	−3.39	−0.2957 ***	−2.74
fworkXfemale	0.0188	0.25	−0.0093	−0.14	−0.0143	−0.22	−0.0067	−0.08	−0.0169	−0.28
mwork	−0.0121	−0.72	−0.0108	−0.65	−0.0153	−0.90	0.0111	0.44	−0.0111	−0.66
mworkXfemale	0.1627 ***	4.14	0.1746 ***	4.31	0.1796 ***	4.37	0.2372 ***	4.27	0.1682 ***	4.37
hhsize	−0.0017	−0.98	−0.0023	−1.27	−0.0023	−1.29	−0.0013	−0.54	−0.0019	−1.14
muslim	0.0005	0.02	−0.0032	−0.13	−0.0014	−0.06	−0.0198	−0.52	−0.0023	−0.09
casteup	−0.0808 ***	−3.38	−0.0800 ***	−3.26	−0.0791 ***	−3.24	−0.0992 ***	−3.88	−0.0707 ***	−3.27
castemid	−0.0155	−0.37	−0.0114	−0.26	−0.0107	−0.25	−0.0352	−0.78	−0.0100	−0.27
casteback	−0.0213	−1.49	−0.0202	−1.42	−0.0213	−1.48	−0.0301	−1.49	−0.0155	−1.15
mselfhh	0.0302 **	2.32	0.0293 **	2.25	0.0303 **	2.34	0.0531 ***	3.04	0.0230 *	1.89
lower	0.0249 *	1.76	0.0207	1.47	0.0159	1.12	0.0249	1.24	0.0206	1.54
lognfoodexpypc					−0.0112	−1.27	−0.0345 **	−2.56	−0.0125	−1.35
cclothratio			−0.0066	−0.85	−0.0065	−0.83	0.0006	0.06	−0.0041	−0.57
bwinnermale			0.0532	1.62	0.0532 *	1.72	0.0641 **	2.02	0.0475 *	1.83
harmtf			0.0084	0.58	0.0105	0.71	0.0269	1.29	0.0170	1.21
permit			0.0130	1.01	0.0120	0.93	0.0179	1.04	0.0120	0.96
tprimarymore					−0.0135	−0.92				
vvbank	0.0236	0.63	0.0171	0.47	0.0085	0.24			0.0118	0.29
vanganwadi	−0.0165	−1.28	−0.0169	−1.32	−0.0146	−1.13			−0.0155	−1.19
vprimary	0.0273 *	1.76	0.0293 *	1.95	0.0291 *	1.92			0.0070	0.39
vmiddle	−0.0100	−0.64	−0.0123	−0.81	−0.0112	−0.74			−0.0116	−0.68
vsecond	0.0019	0.07	0.0099	0.36	0.0164	0.57			0.0179	0.59
logedcost4_9	0.0126	1.09	0.0133	1.16	0.0163	1.39			−0.0132	−0.94
Village fixed effects							Yes			
District fixed effects									Yes	
Obs. P	0.1136		0.1154		0.1138		0.1668		0.1193	
Pred. P (at x−bar)	0.0614		0.0591		0.0587		0.0666		0.0503	
Number of obs	1321		1283		1265		923		1232	
Wald chi2(# of restrictions in parentheses)	129.53 (29)		134.86 (33)		130.62 (35)		. (102)		173.30 (57)	
Prob > chi2	0.0000		0.0000		0.0000		.		0.0000	
Pseudo R2	0.1730		0.1857		0.1845		0.2742		0.2180	
Log pseudo−likelihood	−386.58		−373.58		−365.65		−302.03		−352.20	

Note:

Marginal effects are evaluated at the mean.

z−ratios are calculated using the heteroskedasticity−consistent standard error.

Village fixed effects are controlled for by 119 village dummies and district fixed effects by 24 district dummies.

Because of perfect prediction, 45 village dummies, a district dummy, and corresponding observations are dropped.

Statistically significant at the 10 % level (*), 5 % level (**), and 1 % level (***).