

Economic Causes of Child Labor from Recent Empirical Research:

Household Poverty and Credit Constraints

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1. Introduction

There have been a growing number of empirical studies on the determinants of child labor in the developing world by virtue of the increasing availability of datasets that contain rich information on the activities of children. While some research use microdata, such as household survey data, others use aggregate cross-country data. Therefore, the incidence of child labor has been empirically explained by a variety of individual, household, and community characteristics as well as aggregate country-level characteristics. Because most children choose either to work or go to school, many studies investigate the determinants of schooling as well as of child labor.

In this paper, we review the empirical literature that examines how parents allocate the child's time between working and schooling when facing poverty and credit constraints. We here focus on the studies that use the cross-section data, including both household- and country-level data. Each study is reviewed in detail by estimation method and dataset used.

2. Some problems in estimation

Before proceeding to the literature review, it is worth considering the kinds of estimation methods employed in empirical investigation of this sort. Using regression models, most studies explain the probability of children's labor in a probit or logit model, whereas a few explain the hours worked by children in an Ordinary Least Squares (OLS) or tobit model. If it is the case that working hours vary across children, then the probability of working does not fully represent the activities of children and, hence, "hours worked" by children is preferable in the regression.

In addition, if one estimates the probability of working in a discrete choice model, there are a few methods to investigate the factors that affect child activities¹. The simplest one is to estimate a single equation such that the choice between working and schooling is

made. However, this is appropriate only if child labor and schooling are independent. To take into account the interdependence of child labor and schooling, one needs to estimate separately each schooling and working choice equation in a bivariate model. However, this approach fails to consider the possibility that children can combine working and schooling, or can do neither. From this point of view, preferable estimation methods include a sequential probit model and a multinomial logit model that explicitly take into account four mutually exclusive activities of children: working only, schooling only, combining both, and doing neither.

3. Poverty and credit constraints

Psacharopoulos (1997) estimates a logit model to examine the determinants of child labor in Bolivia and Venezuela in the early 1990s. He finds that in urban Bolivia, children who are older, male, indigenous, and from a female-headed household are more likely to work and, unexpectedly, that the level of household income has no significant negative effect on child labor. He shows that in Venezuela, male children who are older and from a female-headed household as well as with a larger family are more likely to work and that the level of household income has a significant but positive impact on child labor. The results also indicate that in Venezuela, children in urban areas are less likely to work than rural children.

Along with the determinants of child labor, he also investigates the factors that affect the educational attainment of children in school and then finds that in Bolivia, child labor has a positive effect on grade failure in school and that in both countries, the years of schooling completed by children is reduced by working.

Ray (2000) investigates the determinants of child labor in Peru and Pakistan and compares the results across countries. He estimates a logit model and then finds that in both countries increased years of education of the most educated female in the household reduces child labor and that household poverty status has no significant impact on child labor. He also shows that in Peru, a maximum wage earned by the male in the household has a negative effect on child labor, whereas in Pakistan the same earned by the female has a positive effect, implying that in Peru, adult male labor and child labor are substitutes and that in Pakistan, adult female labor and child labor are complements. He proposes that the lack of good schools and child care facilities might be the reason why an increased female wages never reduce child labor in Pakistan.

In addition, the empirical results demonstrate that improved water storage in Pakistan and improved sewage disposal in Peru reduce child labor and that in both countries, urban children are less likely to work than their rural counterparts.

Empirical results by Ray (2002) indicate the sharp difference between the rural and urban areas in Ghana. In the rural areas, poverty is a significant determinant of child

labor, whereas in the urban setting it is not. He shows that in rural areas, household poverty gives rise to child labor and increases child labor hours. In addition, only in rural areas are child labor hours reduced by increasing the education of females in the household and increased by the greater number of children in the household.

Using pooled data that contain both rural and urban households, he also finds that the quality of schooling, measured by school enrollment costs per household in the cluster, reduces child labor hours². Moreover, he verifies the trade-off between child labor and schooling. He provides evidence from both the rural and urban areas that school attendance has a negative effect on child labor hours and, similarly, that child labor hours has a negative effect on child schooling years, the former effect being much larger in the rural than in urban areas.

He also indicates that in the rural areas, the cluster poverty rate³ increases child labor hours. Thus, the results suggest that lowering the cluster poverty rate leads to a reduction in child labor hours in the rural areas and that encouraging child schooling by, for example, compulsory education and a schooling subsidy, is an effective measure to reduce child labor hours in both areas, especially in the rural ones.

Nielsen (2004) casts doubt on the positive link between household poverty and child labor. She investigates the determinants of child labor and schooling using household survey data from rural and urban Zambia for 1993. Based on information on a child's activities during the last seven days before the survey, she analyzes factors that affect the choices of working only and attending school only; thus, children who combine working and schooling are excluded in the analysis⁴.

Controlling for unobserved community effects as well as individual and household characteristics, she shows in a bivariate probit model that in the rural area, expenditure per adult equivalent reduces the probability of working but the negative effect is very small, suggesting that household poverty is not a main cause of child labor. She also finds that in the rural areas, access to credit from banks seems to reduce⁵ the probability of working and that ownership of assets increases the probability of attending school. Besides, the results show that in rural areas, more years of education of the household head reduces the probability of working while it increases the probability of attending school in both areas.

On the supply side of schooling, she finds that higher costs of education⁶ slightly reduce the probability of attending school in both areas. In addition, she emphasizes that in the rural areas, transportation costs are critical to the choices of working and schooling by the findings that all-year passable roads in the community reduces the probability of working and increases the probability of attending school and that such a negative effect on child labor is greater than that of household expenditure. Besides, the results show that in the rural areas, availability of a primary school, shorter walking distance to school in hours and improved school quality in the community increase the probability of attending

school. She finally indicates the importance of unobserved community effects such as social traditions and attitudes toward education in the community as determinants of child labor and schooling.

Canagarajah and Coulombe (1997) investigate the determinants of child labor and schooling using household survey data from Ghana for 1991/1992. Controlling for individual, household, and community characteristics, they estimate bivariate probit equations for both working⁷ and schooling decisions of children aged 7–14 years with the subsamples of rural and urban, male and female, as well as a pooled sample. They find that in both the rural and urban areas, boys are more likely to attend school than girls and that in the rural areas, older children are more likely to work.

In addition, they show that in the rural areas, per capita household expenditure⁸ unexpectedly has an inverted U-shaped relationship with the probability of working, whereas it has no significant effect in the urban areas. The results show that in both areas, household expenditure increases the school participation of children.

Moreover, they indicate that in the rural areas, the presence of a father in the household and more education of the father reduce the probability of working and increase the probability of attending school while more education of the mother only increases the probability of schooling. For the rural areas, they also find that the presence of an adult male reduces the probability of working and the presence of female siblings aged 7–14 years increases the probability of attending school and that, children from nonagricultural self-employment enterprise households are less likely to work and those from female-headed households are more likely to attend school. For both areas, they show that children from agricultural self-employment households are more likely to work and those from Christian households are more likely to attend school.

In addition, the results show that in the rural areas, the cost of schooling⁹ increases both the probabilities of working and schooling, which suggests that working and schooling are not substitutes. This finding is interesting in terms of the efficacy of schooling-enhancing policies through lower educational costs as a measure to reduce child labor. However, they also find that there is a trade-off between working and schooling by showing that the correlation between the two equations estimated is significantly negative, which suggests that increasing school attendance helps reduce child labor.

Based on their own theoretical model that determines the quantity of child labor supply, Bhalotra and Heady (2000) pay particular attention to the effects of farm size and household income on child labor in a farm. Using household survey data from Ghana and Pakistan for 1991/92 and 1991, respectively, they explain the incidence of child labor, measured by the probability of working and the hours worked by children aged 7–14 years for Ghana and 10–14 years for Pakistan, by individual, household, and community characteristics including parental education, household size and composition and the mode of land operation¹⁰ as well as farm size and household income of particular interest.

They hypothesize from the theoretical model that farm size has both positive and negative substitution effects on child labor as well as a direct negative income effect. The substitution effects are expected to work as follows: an increase in farm size can increase child labor through the higher marginal product of child labor (the higher implicit child wage) arising from an increase in land-labor ratio, whereas it can reduce child labor through the lower interest rates arising from the holding of collateral land. By including both farm size and household income in the equation, they expect the latter to capture the negative income effect on child labor and the former to capture the substitution effects only.

Employing the IV estimation method to correct the endogeneity of household income in the equation¹¹, they find theoretically expected results only for some subgroups of children in both countries. In Ghana, only female child labor decreases with household food expenditure per capita, a proxy for household income, and with household size, and increases with acres of land, a proxy for farm size, whereas in Pakistan only male child labor decreases with household food expenditure and with household size, and only female child labor increases with acres of land.

They also show that for some subgroups of children, more education of the mother and the presence of a middle or secondary school and public transport in the cluster reduce child labor while children from female-headed households and from a rent farm¹² are more likely to work.

Nielsen and Dubey (2002) empirically test four hypotheses regarding the incidence of child labor: substitution, subsistence, capital market and parental education hypotheses, using household survey data from rural India for the years of 1983, 87-88, 93-94, and 1999-2000. They classify a child's activities into four categories: schooling, wage work, home work, and other activities and then estimate a bivariate logit model for children aged 5-9 years (choice between attending school or not) and a multinomial logit model for those aged 10-14 years (simultaneous choice between four activities), controlling for individual and household characteristics.

They first test the substitution hypothesis that child and adult labor are substitutes by investigating the effect of the child-adult wage ratio in each region on activities of children. They find that children in the region where the child-adult wage ratio is higher are more likely not to attend school for both age groups, suggesting that adult labor with low wages is replaced by child labor. They also show that if the household head is female and working outside, then the children are more likely to engage in home work, implying that a female household head and children are substitutes for household work. These results are supportive of the substitution hypothesis.

Next, the subsistence hypothesis that lower household income causes child labor is empirically supported by the finding that for the poor households among the sample¹³, per capita monthly expenditure in the household has a negative effect on the probability of

working, though the effect is smaller for the non-poor households. This suggests that child labor is caused by lower household income.

In addition, the capital market hypothesis is tested through an asset effect associated with the credit constraints that households face. They find that for some of survey years, land holdings reduce the probability of wage work and other activities but increases the probability of home work, implying that households with land never face credit constraints but demand more child labor on the land. Moreover, they find that more parental years of schooling¹⁴ reduce the probability of working, which confirms the parental education hypothesis.

In addition to the four main hypotheses, they show that children from the households of scheduled castes, scheduled tribes, Muslims¹⁵, or with younger children are less likely to attend school, whereas those from households of larger size and with older members are more likely to attend school. They conclude that lower household income and less parental education are the main causes of child labor.

Maitra and Ray (2002) use household survey data from Peru for 1994, Pakistan for 1991, and Ghana for 1988/89 to investigate the factors that affect the activities of children in each country. Based on four mutually exclusive choices of a child's activities, such as attending school only, combining schooling and working, doing neither, and working only, they estimate a multinomial logit model with the baseline put on the choice of combining schooling and working. Children aged 6–17 years for Peru, 10–17 years for Pakistan, and 7–17 years for Ghana are covered in this research, which indicates that relatively older children are included in the analysis.

Controlling for individual, household, and community characteristics, they find that older and male children are more likely to combine working and schooling in all three countries and that the probability of combining both increases with female wages in Pakistan and with schooling years of the most educated female in the household in Ghana. Such a result being unique to Pakistan indicates that female adult and child labor are complementary.

For the effects of household poverty, measured by a poverty dummy, and household expenditure per adult equivalent¹⁶, the results show the following: that Pakistani children from poorer households are more likely to specialize in working or to do neither and less likely to combine both; that Ghanaian children from poorer households are less likely to specialize in schooling and more likely to combine both; and that Peruvian children from poorer households are less likely to combine both and more likely to do neither. They also find that the availability of credit for the household, measured by the amount of credit lent and borrowed, does not have a clear effect on the activities of children in all countries.

Moreover, they estimate an ordered probit model¹⁷ and then find that in all three countries, a household poverty dummy reduces the probability of specializing in schooling and increases the probability of specializing in working.

Grootaert (1999b) examines the determinants of child labor for those aged 7–17 years in both rural and urban Cote d'Ivoire using household survey data for 1988. He estimates a sequential probit model based on each of a child's activities¹⁸. At the first stage, the probability of schooling only is estimated over all the children in the sample, which is followed by the second stage, where the probability of combining schooling and working is estimated over the remaining sample, which was excluded at the first stage. At the final stage, the probability of working only is estimated over the rest of the sample¹⁹.

Though he controls for schooling costs²⁰ and regional location²¹ as well as a number of individual and household characteristics, he does not include household income in the equation because it is endogenous to child labor. He expects that the income effect is captured by household endowments of human and physical capital such as parental education, employment status and ownership of income-generating assets including a farm and a non-farm household enterprise. In addition, a dummy whether the household falls in the lowest income quintile is included in the equation to capture the effect of lack of access to credit and insurance.

For the urban areas, he finds at the first stage that female children are less likely to engage in schooling only, though a child's age has, unexpectedly, no significant effect. He also shows that a father's years of schooling, a mother's employment status, the age of household head, and the number of other children aged 10–15 years in the household increases the probability of going to school and not working. Moreover, his results indicate that children from households that own non-farm enterprises or from the poorest households are less likely to specialize in schooling and more likely to do any type of work. Note that as he explains, ownership of a non-farm enterprise represents adverse income rather than positive assets given that in Cote d'Ivoire, ownership of a non-farm enterprise is associated with higher poverty in the informal sector and that wage employment is associated with more income. Hence, such results suggest that lower household income and lack of access to credit reduce the probability of specializing in schooling. He finds no significant effect of schooling costs.

At the second stage, he finds that older children are more likely to combine working and schooling till the age of 11 years, after which they are more likely to drop out of school and that girls are less likely to combine working and schooling and more likely to drop out of school than boys. The results also show that more parental years of education, the older the household head, and the presence of boys aged 6–9 and 16–17 years and of girls aged 10–15 years increase the probability of combining working and schooling and reduces the probability of dropping out of school. For the household poverty status, he finds that ownership of a non-farm household enterprise, a proxy for adverse household income, and the poorest poverty status of households, a proxy for lack of access to credit, reduce the probability of combining and increase the probability of dropping out of school. In addition, the results show that although the activities of children are not affected by schooling

costs, children in other cities than Abidjan are more likely to combine both and less likely to drop out of school.

At the final stage, he shows that older children are more likely to work for wages or in a household and that girls are less likely to do so and more likely to do home care tasks or not work. The results also show that if the mother is employed, then girls are more likely to work for wages or in a household and less likely to do home care tasks or not work, which conflicts with the conventional argument that female adult and female child labor are substitutes in domestic work. In addition, he finds that though the poorest poverty status of the household has no significant effect, ownership of a farm or a non-farm enterprise increases the probability of working for wages or in a household.

Moreover, he estimates an OLS model to investigate the determinants of the hours worked by children and then finds that after the age of 12 years, children work more hours and that more education years of the mother reduces the hours worked by boys and increase the hours worked by girls. He also finds that children in cities other than Abidjan work more hours and that the ownership of a farm and the poorest poverty status of the household reduce the hours worked by children, the latter of which contradicts with the results of a sequential probit analysis²².

4. Conclusion

Empirical results based on data from a variety of developing countries in Latin America, Africa, and Asia makes it clear that a number of economic factors account for the incidence of child labor. Given that child labor is much more prevalent in developing countries, a lower level of household income, i.e., household poverty, is of the greatest interest as a determinant of child labor in the empirical literature. In fact, every paper intends to investigate the effect of the level of household income on child labor.

While some papers include as a proxy for household income family expenditures or a dummy that represents the household's poverty status in the economy in the equation estimated, others expect physical or human capital in the household to capture the income effect. As a result, some provide definite evidence for a positive relationship between household poverty and child labor and others do not.

However, they differ in dealing with the endogeneity of household income in the equation estimated. Household income is likely to be endogenous to child labor because household income partly depends on earnings from child labor. In fact, some studies report that child labor significantly contributes to household income. While some papers never take into account the endogeneity of household income in the estimation, others explicitly deal with the endogenous household income in such a manner that household income is excluded in the equation; that is, only income from non-child labor is counted as household income and household income is instrumented by other variables.

In any case, more important in these empirical results is that household poverty is never a sole cause of child labor in developing countries. A number of individual, household, and community characteristics account for the incidence of child labor. In addition to household income, overall, the age and gender of the child, parental education and employment status, the age and gender of the household head, the presence of siblings, household size, physical assets such as a farm or family enterprise in the household, schooling costs or quality, geographical location, and rural and urban settings are closely associated with the incidence of child labor.

Notes

- 1 Estimation problems related to the analysis of child labor are discussed in Grootaert (1999a) and Maitra and Ray (2002).
- 2 The author notes that the price of schooling is an imperfect proxy for the quality of schooling.
- 3 A cluster poverty rate refers to cluster-level poverty as measured by a head count poverty rate of a cluster.
- 4 A five percent of children are combining working and schooling in the sample.
- 5 The coefficient is significant at the 85 percent level.
- 6 Costs of education are measured by the community average of household education expenses per student.
- 7 The definition of work excludes household chores in the analysis.
- 8 Per capita household expenditure is deflated by time and spatial price index.
- 9 Schooling costs are measured by the cluster median of household schooling expenditures on fees, books, clothes, and others.
- 10 This includes sharecropping, rent and free or village land.
- 11 They note that the estimates of the effect of endogenous household income on child labor was biased when estimating the equation without instrumenting it.
- 12 The reference group is a self-owned farm.
- 13 A household with per capita monthly expenditure below 150 rupees is defined as poor.
- 14 Schooling years of the household head is used.
- 15 The reference group is Hindus.
- 16 Poverty as defined based on non-child income.
- 17 From the viewpoint of child welfare, four activities of children in descending order are schooling only, combining schooling and working, doing neither, and working only.
- 18 Activities of children are classified into four categories: going to school and not working, going to school and working, not going to school and working, and not going to school and not working or working only on home care activities.
- 19 This means that while at the first stage the probability is estimated over all the children in the sample, at the second stage the probability is estimated over the children engaging in any type of work or not working, and at the final stage the probability is estimated over the children not in school.
- 20 Cluster average of household expenditure on education per pupil and distance from school are used as measures of schooling costs.
- 21 A dummy for Abidjan or not is used.
- 22 The author notes that this OLS model is subject to selection bias.

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