Mothers' Employment and their Children's Schooling: A Joint Multilevel Analysis for India

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Summary. — This paper studies the relationship between mothers' employment and children's schooling in India. Using the second National Family Health Survey, the results of a multilevel probit model show that the correlation between mothers' employment and their children's schooling is negative. Women in poorer households are more likely to work but, given the negative correlation, their additional income does not seem sufficient to enable children's school attendance. A sensitivity analysis on wealth deciles shows that this negative relationship disappears in urban areas and becomes weaker in rural areas at the top wealth deciles.
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1. INTRODUCTION

Child schooling is universally acknowledged as one of the prerequisites of human development. However, official statistics show that school enrollment as a percentage of the population of children aged 5–14 years may vary considerably among less developed countries.[1] In the poorest regions of the developing world, there are still many factors that constrain households' decisions concerning investment in children's human capital. For families in poverty, children's education can result in being a luxury good, unaffordable with the available resources (Basu & Van, 1998). Unexpected shocks, such as their own or other household members' illness, or death (Yamano & Jayne, 2005) or adults' unemployment (Duryea, Lamb, & Levison, 2007) may also negatively affect children's school attendance. Even households that are neither facing risks nor particular resource constraints may decide not to invest in children's education when the comparative return of child work is higher with respect to the returns to education (Bhalotra & Heady, 2003; Chamarbagwala, 2007). When the immediate benefit deriving from child labor to households outweighs the future loss in terms of lower returns to education, the child labor choice is still a rational choice aimed at the optimization of the child's (or family's) well-being in the long run (Cigno, 2004).

Although child labor does not always compete with schooling and some children manage to combine work and study activities, an extensive literature shows that the time children dedicate to work often has negative effects on their education (Psacharopoulos, 1997; Patrinos & Psacharopoulos, 1997). Lancaster and Ray (2004), for example, examining the trade-off between child labor and schooling for seven countries, finds that the time children devote to work generally negatively affects their school performance and increases the probability of dropping out.[2] On the earnings side, Beegle, Dehejia, and Gatti (2009) estimate that the forgone earnings attributable to lost schooling exceed any earnings gain associated with child labor, and that the net present discounted value of child labor is positive for very high discount rates.

In many cases, children contribute substantially with their work helping their families to meet subsistence needs (Bhalotra, 2007; Edmond, 2005, 2008). Some studies show that children who are paid for their work may earn up to one fifth of family income (see, for example, DeGraff & Levison, 2009). Even when involved in unpaid activities, children substitute for other family members in household work or work for the family business, allowing adults to employ their time in the labor market (Cigno & Rosati, 2005).

Given the evidence on the connection between children's activities and household income, the relationship between children's school attendance and their parents' employment represents a crucial issue to be further investigated. Also,

distinguishing between fathers' and mothers' employment may add some relevant features to the analysis. While data show high male participation rates in employment worldwide, the same evidence is not observed for females (see Table 1a in ILO, 2006–2007). Moreover, most female workers in developing countries, particularly in South Asia and Africa, often do not have salaried jobs, being involved in paid economic activities much less than male workers. Women often produce goods at home for market sale, work on the family farm, or work in a small family-run business.[3] This kind of employment is very common in South Asia, where it represented 64.6% and 51.7% of total female employment in 1998 and 2008 respectively, the highest figures among the world regions (Table 3 in ILO, 2006–2007). Wage and salaried female workers, instead, amounted to 10% and 14.5% of female employment in 1998 and 2008 respectively, while the corresponding figures for males were 21% and 24.4%. Furthermore, most women in developing countries are engaged in economic activities that do not normally figure in labor statistics or are not recognized as work at all, such as subsistence agriculture and housework. As documented by several time use surveys for developing countries, women have to decide, more often than men, how to distribute their time among child care, domestic work, work for a family business and/or outside work activities (Budlener, 2008).[4]

While economists have studied separately children's schooling (see, for example, Dostie & Jayaraman, 2006; Glewwe, 2002; Ota & Moffatt, 2007) and female employment (see, for example, Bhalotra & Umana-Aponte, 2010; Mammen & Paxson, 2000; Mathur, 1994; Olsen & Mehta, 2006) in developing countries, a few studies address the potential nexus between children's schooling and women's earnings or economic autonomy (see, for example, Kambhampati, 2009). Although there is some concern on the social benefits deriving from female work on children's schooling—a mother staying home to teach her children may yield a greater social return in terms of the growth of human capital than if she goes to work (Behrman, Foster, Rosenzweig, & Vashishtha, 1999; Behrman & Rosenzweig, 2002)—it is hard to disagree on the empowering function of employment in increasing women's ability to make decisions about personal and household conditions. Moreover, even if the level of female education has improved in recent years, the rate of illiteracy among mothers in many developing countries remains dramatically high and only a small percentage of mothers are able to engage in teaching and training their own children (see, for India, Motiram & Osberg, 2010). Instead, several studies show that women who contribute to household resources through a paid activity have a higher command of them, since earnings from their own work represent an easier resource to control (Anderson & Eswaran, 2009; Basu, 2006; Desai & Jain, 1994).

This paper aims at investigating the relationship between children's schooling and mothers' employment with a joint model. We study the case of India, a country in which school attendance of children is still problematic[5] and labor market opportunities for women are very poor. Using a sample of mothers and children drawn from the National Family Health Survey for 1998/9 (NFHS-2, International Institute for Population Sciences and ORC Macro, 2000), we estimate a bivariate probit model for mothers' employment and children's school attendance. The model is multilevel, with a mother level and a child level. Among the three surveys available for India (1992/3, 1998/9, and 2005/6), NFHS-2 1998/9 is the only one that provides the information needed to associate each child present in the household to her own mother. Under the assumptions that children of the same mother share the same

mother level error, the child equation becomes a random effects probit. Also, the mother equation has an error structure that allows for correlation between the mother and child equations. Our multilevel bivariate probit model for mothers' employment and children's school attendance represents a methodological novelty with respect to the bivariate probit model used for the analysis of mothers' employment and children's employment in Brazil by DeGraff and Levison (2009). Consistent with the argument that anti-poverty programs that target women's employment could result in increased child labor, they find substantial evidence of positive correlation between the two outcomes.

The paper is structured as follows. Section 2 illustrates the research background and strategy. Section 3 outlines the econometric model, Section 4 describes the data and the variables, Section 5 presents and discusses the results. Section 6 concludes.

2. RESEARCH BACKGROUND AND STRATEGY

In a simple family labor supply model, apart from their own income and substitution effects of a change in their own wage, each family member's labor supply is potentially affected by cross-substitution and income effects arising from a change in the other members' wages (DeGraff & Levison, 2009). When family resources are pooled together, as the wage increases for any family member, the income effect considered alone would induce the other family members to increase their consumption of nonmarket work time (total available time minus time spent working in the market) and decrease hours worked in the market. The substitution effect, in contrast, implies that the person whose wage has improved would work more in the market and other family members may work less. In order to investigate the relationship between mothers' employment and children's schooling, we may start by considering the mother's participation decision in a framework where parents decide for their children. For our purpose, it is not crucial to distinguish between a unitary or collective approach to household utility maximization. We may assume that parents maximize either a unitary utility function, or that the mother maximizes her own separate utility where time children spend in school is one of the arguments, together with domestic and market goods, given the father's hours of market work and unearned income. The inclusion of time spent in school by children in the utility function can have a double interpretation. First, an altruistic interpretation, according to which, the mother derives utility from the fact that her children go to school. The parental altruism assumption goes mainly unchallenged in the theoretical literature on child labor (e.g., Baland & Robinson, 2000; Basu & Van, 1998) and some empirical support to it may be found in Manacorda (2006). The second interpretation is egoistic, since the mother may guarantee herself future consumption through her child support, investing in her/his education (Cigno, 2006).

We also have to take into account the domestic work that would normally be performed by mothers and children. Thus, if female wages increase, some mothers may decide to participate if their reservation wages are lower than the market wage, thus reducing their domestic work and/or leisure. Family income would increase, if their earnings are pooled with their partners' earnings. The income effect alone would lead to an increase in nonmarket work time for the other members. In particular, for children it may become more probable to be sent to school, since the family may afford it, thus giving rise to a positive relationship between children's schooling and