What Determines Demand for Skilled and Unskilled Child Labor?

Evidence from Bangladeshi Manufacturing

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1 Introduction

Countless children in developing countries work as child laborers.[1] Child labor is a serious problem because working children often lose educational opportunities and suffer employment-related physical or psychological damage. In recent years, the worst forms of child labor − work in hazardous environs, debt bondage, slavery, drug trafficking, prostitution, and military conscription − have attracted increasing attention worldwide. Governments, international organizations,[2] and non-governmental organizations continue to tackle child labor in the developing world.

Against this backdrop, increasing numbers of economic studies have addressed issues concerning child labor since the mid-1990s.[3] Typical studies examine the supply of child labor from households in Africa, Asia, and Latin America. Using individual-level data for children from household surveys, they attempt to explain how the incidence of child labor is associated with individual, household, and village characteristics.[4] Their supply-side approach would be suitable if most working children labored for their families' farms or businesses. However, large numbers of children work outside their homes in firms or establishments. That being so, research needs to investigate demand for child labor, and little research has done so. This study addresses that gap in scholarship.

Using establishment-level data from Bangladeshi manufacturing, we empirically examine how firms decide to employ children, focusing primarily on their employment of children with differing skill levels. We first clarify firm-specific factors crucial in determining demand for child labor and then draw policy implications for reducing child labor

in developing countries.

2 Costs of employing children

Child workers have different characteristics from adult workers, and firms may incur extra non-wage costs to employ them. For example, they may be more difficult to recruit than adults because employment of children is illegal. Therefore, firms expend time and effort finding child employees. In addition, child workers, who usually have less education and experience than adult workers, may need elementary job training. Child workers are more vulnerable to disease and injury than adults. Moreover, firms that employ illegal child labor may bear social "stigma costs."

Conversely, employing children can reduce labor costs. Child workers are less likely to complain about working conditions and to engage in collective bargaining, thereby suppressing the firm's cost of building labor-management cooperation. Children are easy to train for firm-specific needs, reducing costs of human resource development.

We thus assume that a firm should pay non-wage costs or receive benefits when employing child workers instead of adult workers. Costs or benefits vary among firms because each firm has different characteristics. For example, firms with established personnel networks likely pay less to locate child workers, whereas firms without networks likely pay more. We hypothesize that the costs or benefits of employing child workers, as affected by firm-specific characteristics, determine the firm' s demand for child labor. Therefore, we estimate the demand function using data from Bangladeshi manufacturers to show how firms decides to employ children, especially those with differing skill levels.[5]

3 Data

We used establishment-level data from baseline surveys for the automobile, welding, and battery recharging/recycling sectors in Bangladesh. The Bangladesh Bureau of Statistics undertook the surveys during 2002–2003 under the framework of the National Child Labor Survey.[6] The baseline surveys selected sample establishments by two-stage sampling. First the whole country was divided into three mutually exclusive strata: metropolitan (six metropolitan/divisional cities), urban (58 district towns/cities, or district headquarters/*pourashavas*), and rural (all areas except those included in metropolitan and urban stratum). During the first stage, 50% of all *Upazillas/Thanas* (the second-lowest administrative unit in Bangladesh) in the metropolitan and urban areas and 12.5% in the rural areas were selected randomly.[7] At the second stage, firms were drawn within the selected *Upazillas/Thanas* proportionate to the number of firms in each. Firms not employing children were excluded from the sample. This procedure generated data consist-

ing of 1,170 establishments from the automobile (350), welding (404), and battery recharging/recycling (416) sectors.

For survey purposes child laborers were defined as employees aged 5–17. We found that 45.1% of firms in the sample employed only one child, 24.8% employed two, and 10 was the largest number of children employed per establishment. The average was 2.2 children.

We categorized child workers as skilled or unskilled. We did so believing firms are likely to regard skilled child workers as different from unskilled child workers and to employ them differently. No skilled child workers were employed in 73.0% of surveyed firms, whereas 13.4% employed no unskilled children. On average, sampled firms employed 0.4 skilled and 1.8 unskilled child workers.

To represent demand for child labor, the estimation used as the dependent variable the firm's man-hour input of child labor per day or per week. As Panel (a) of Table 1 shows, sampled firms on average employed 3.5 man-hours of skilled and 16.2 man-hours of unskilled child labor daily; weekly, the statistically average sampled firm employed 21.6 man-hours of skilled and 99.1 man-hours of unskilled child labor.

As explanatory variables to determine demand for child labor in the estimation, we

Table 1 Summary Statistics

Sample size: 1170

(a) Dependent variables

Variables	Mean	Std. Dev.	Min	Max
Skilled child labor input (man-hour per day)	3.47	7.47	0	80
Unskilled child labor input (man-hour per day)	16.15	15.52	0	110
Skilled child labor input (man-hour per week)	21.63	46.73	0	480
Unskilled child labor input (man-hour per week)	99.09	95.99	0	660

(b) Explanatory variables

Variables	Mean	Std. Dev.	Min	Max
Lower wages (less wages could be paid)	0.414	0.493	0	1
Better work performance (good, suitable, or flexible at work)	0.698	0.459	0	1
Easier manageability (no trade union problem or obedient)	0.645	0.479	0	1
Costly recruitment (personal arrangement, spot recruitment, labor contractor, others)*	0.279	0.449	0	1
As bonded labor (employs as bonded labor)	0.043	0.202	0	1
On parents' request (employs on parents' request)	0.678	0.468	0	1
Owned in partnership (not individual or family owned establishment)	0.041	0.198	0	1
Years of operation	8.97	7.35	0.08	50
Employer's less concern for children's welfare (doing nothing when children get sick)	0.049	0.215	0	1
Number of employees	5.18	4.03	1	42
Automobile sector	0.299	0.458	0	1
Welding sector	0.345	0.476	0	1
Battery recharging/recycling sector*	0.356	0.479	0	1
Metropolitan area	0.144	0.352	0	1
Urban area	0.268	0.443	0	1
Rural area*	0.587	0.493	0	1

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

used the costs or benefits of employing children instead of adults. The costs or benefits for each firm are represented by what firms said they perceive as advantages or disadvantages of employing child workers. We, in fact, used data concerning sampled employers' perceptions of the advantages of employing child workers.

If a firm cited "less wages could be paid" as an advantage of employing child workers, we thought it reasonable to assume it pays children less than adults. We used the employer's declaration as a proxy for wage costs of child workers. As Panel (b) of Table 1 shows, 41.4% of sampled firms pay lower wages to child workers.

If an employer cited as advantages of employing children "good at work," "suitable for work," or "work can be made as and when required," we presumed that child workers in the establishment should be better in terms of work performance than adult workers, suggesting the establishment benefits by employing children. We found that 69.8% of sampled firms enjoyed better work performance from child workers.

We assumed that firms regard children as more manageable than adults if they cited "no trade union problem" or "obedient" as advantages of employing child workers. These qualities reduce the firm's costs of building labor-management cooperation. We found that 64.5% of sampled firms enjoyed easier manageability of child workers.

Recruiting costs are likely to be higher for firms that said they locate child workers through "personal/informal arrangements," "spot recruitment on a first-come basis," or "labor contractor." In these cases an employer must expend time and money to obtain child workers. Recruiting costs likely are lower among firms that replied they employed children "as bonded labor" or "on their parents' request." We found that 27.9% of sampled firms recruit child workers in the more costly manner, 4.3% employ children as bonded labor, and 67.8% employ children at their parents' request.

Recruiting costs also can relate to the firm' s type of ownership and years of operation. For example, establishments owned "in partnership" may have difficulty agreeing on employment of children compared to "individual or family-owned" establishments. Older firms may have networks that more easily locate child workers. Among sampled firms, 4.1% were partnerships, and on average firms had been in operation 9.0 years.

Moreover, we presumed that employers bear stigma costs for using illegal child labor, depending on the extent to which they care about children's welfare. We identified a sampled employer as indifferent to children's welfare if it reported "doing nothing" when child workers get sick. In this case, an employer apparently faces lower stigma costs, suggesting that it uses more child labor. We found that 4.9% of sampled employers expressed little concern for the welfare of child workers.

We also controlled for such variables as number of employees, industry dummies, and area dummies. On average, sampled firms employed 5.2 persons. By percentage, 29.9% are from the automobile sector, 34.5% from welding, and 35.6% from battery recharging/recycling. By location, 14.4% are in metropolitan, 26.8% in urban and 58.7% in rural areas.

4 Estimation results

We estimated the demand function for skilled and unskilled child workers separately. Since the dependent variable − man-hours of skilled or unskilled child labor − is zero for some establishments, we estimate the equation using censored regression. Table 2 presents

Table 2 Censored Regression Results

(a) Skilled Child Labor

Variables	Man-hour input per day		Man-hour input per week	
	Coef.	t	Coef.	t
Lower wages	−1.124	−0.74	−6.884	−0.73
Better work performance	5.255***	3.12	32.971***	3.13
Easier manageability	−0.454	−0.30	−2.655	−0.28
As bonded labor	−13.988***	−3.16	−86.800***	−3.14
On parents' request	−5.624***	−3.47	−35.091***	−3.47
Owned in partnership	−2.588	−0.67	−16.831	−0.69
Years of operation	0.128	1.26	0.807	1.27
Employer's less concern	−3.323	−0.95	−19.476	−0.89
Number of employees	0.495**	2.41	3.103**	2.42
Automobile	−1.533	−0.76	−10.270	−0.81
Welding	0.532	0.27	1.358	0.11
Metropolitan	−3.667*	−1.63	−22.102	−1.58
Urban	−6.055***	−3.36	−37.771***	−3.35
Constant	−11.562***	−4.43	−72.117***	−4.42
Number of obs	1170		1170	
LR chi2(13)	49.97		49.31	
Prob > chi2	0.0000		0.0000	
Pseudo R2	0.0140		0.0104	
Log likelihood	−1763.8		−2342.8	
854 left-censored observations at skilled child labor input ≦ 0				
316 uncensored observations				

(b) Unskilled Child Labor

Variables	Man-hour input per day		Man-hour input per week	
	Coef.	t	Coef.	t
Lower wages	3.358***	4.12	21.238***	4.16
Better work performance	−0.588	−0.68	−2.300	−0.42
Easier manageability	1.358	1.59	7.861	1.47
As bonded labor	5.299***	2.58	32.159**	2.50
On parents' request	1.488	1.63	8.564	1.50
Owned in partnership	−2.621	−1.30	−15.326	−1.22
Years of operation	−0.043	−0.77	−0.296	−0.85
Employer's less concern	3.207*	1.74	23.270**	2.01
Number of employees	2.061***	17.99	12.417***	17.29
Automobile	7.491***	6.89	47.827***	7.01
Welding	5.095***	4.77	29.145***	4.36
Metropolitan	4.101***	3.41	25.706***	3.41
Urban	3.797***	4.05	23.543***	4.00
Constant	−3.985***	−2.84	−23.754***	−2.70
Number of obs	1170		1170	
LR chi2(13)	568.08		539.67	
Prob > chi2	0.0000		0.0000	
Pseudo R2	0.0632		0.0426	
Log likelihood	−4207.0		−6066.2	
157 left-censored observations at unskilled child labor input ≦ 0				
1013 uncensored observations				

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

estimation results indicating how firms determine daily or weekly man-hour input of skilled or unskilled child labor.

As Panel (a) shows, better work performance has a significantly positive effect on employment of skilled child workers. The recruitment method also displayed significant effects, but the signs of its coefficient are unexpected. Firms employing children as bonded labor or at their parents' request use less skilled child labor, implying that such establishments do not seek skilled child workers. In addition, the number of employees has a significantly positive impact on employment of skilled child workers. Less skilled child labor is used in metropolitan or urban than in rural areas. No significant effects appear for wage costs of child workers or stigma costs.

Different results are shown in Panel (b) for unskilled child workers. Lesser wage costs are positively associated with employment of unskilled child workers, indicating that lower wages are important in demand for unskilled child labor. In addition, establishments that employ children as bonded labor use more unskilled child labor, suggesting that children working as bonded labor are unskilled. Moreover stigma costs significantly affect employment of unskilled child workers. Employers who are indifferent to children's welfare employ more unskilled child labor. The number of employees also has a significantly positive relationship to employment of unskilled child workers. The automobile and welding sectors use more unskilled child labor than the battery recharging/recycling sector. Metropolitan or urban firms use more unskilled child labor than rural firms.

Our results found that manageability of children, form of ownership, and years in operation have no significant effects on demand for skilled or unskilled child labor.

5 Conclusion

Estimation results indicate that sampled Bangladeshi firms have different demand functions for skilled and unskilled child labor. Lower wage costs are an important determinant of demand for unskilled child workers, whereas better work performance is significant in determining demand for skilled child workers.

In addition, we found that stigma costs are associated with employment of unskilled child workers. Employers who proclaimed less concern for children's welfare tend to use more unskilled child labor.

Previous studies that analyzed factors influencing the supply of child labor emphasized household poverty as a determinant of child labor. Our study suggests that lower wages and an employer's indifference toward children are the main determinants of demand for child labor.

Notes

1 IPEC (2004) reports suggest that there were up to 182 million working children in the developing world in 2000. Its report defines child labor as work performed by children aged 5–14, excluding work by children aged 12–14 that is not hazardous and does not exceed 14 hours per week. The term "developing world" here refers to Asia, Latin America, Sub-Saharan and North Africa, the Middle East, and the transition countries of Eastern Europe.

2 Since December 2000, for example, the International Labour Organization, UNICEF, and the World Bank have promoted the interagency research project Understanding Children's Work to address child labor problems in developing countries.

3 For reviews of both theoretical and empirical studies of child labor, see Basu (1999), Basu and Tzannatos (2003), Brown, Deardorff, and Stern (2002), Dar et al. (2002), and IPEC (2003).

4 They suggest child labor is caused by household poverty, parents' low education, and absence of schools. As additional determinants, Sakamoto (2006) points to parents' lesser concern for their children, and Basu (2004) and Basu and Ray (2002) emphasize the father's power in the household.

5 Although no studies have estimated the child labor demand function, a few have analyzed child labor problems in Bangladesh. Ravallion and Wodon (2000) examine how the school enrollment subsidy from the Food for Education program affects rural children's work participation and school enrollment. Amin, Quayes, and Rives (2004) and Delap (2001) explore factors contributing to child labor using individual-level data on children. Amin, Quayes, and Rives (2006) investigate whether child labor reduces the probability of continuous schooling.

6 The automobile and welding sectors were surveyed during November 2002–January 2003. The battery recharging/recycling sector was surveyed during September–October 2003.

7 The smaller sampling of *Upazillas/Thanas* from rural areas is due to the low number of firms and employed children.

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