

Wage Determinants for Child Labor in Bangladesh

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Abstract

This paper empirically examines the determinants of wages for child labor. Using individual-level data from the National Child Labor Survey in Bangladesh, we estimate a wage equation for child workers and find that older children with more work experience are paid higher wages. This result suggests that a child's age and tenure are important determinants of wages for child labor. We also find that educational attainment of children, measured in terms of school attendance or literacy, has no significant effect on their wages.

1. Introduction

According to the ILO's estimates, more than 167 million children in developing countries were engaged in some kind of work in 2012, accounting for 10.6 percent of the total population in the corresponding age group.¹ Child labor, which often leads to the loss of educational opportunities for children and may even have harmful effects on their physical and mental development, is a lingering problem in the contemporary world. Thus, eliminating or reducing it continues to be a global concern.

In order to explain why child labor is so persistent in the developing world, a growing number of economic studies have both theoretically and empirically examined the determinants of child labor.² These prior studies have shown that the incidence of child labor is closely related to a wide variety of characteristics pertaining to children, parents, households, and villages: e.g., sibling structure, parents' educational attainment, household income, credit constraints, and accessibility to school.

Nevertheless, the stark reality of child labor has not been well investigated in terms of economics. For instance, how different is child labor from ordinary adult labor? Under what conditions do children work in reality? It is useful, perhaps, to cast the real situation of child labor in the developing world.

1 For more details on statistics of child labor, see ILO-IPEC (2013).

2 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), ILO-IPEC (2003), and Fors (2012).

In this paper, we pay particular attention to children who work for wages and then examine how they are paid. Using individual data on child workers in Bangladesh, we aim to empirically explain what determines the wage level for child labor.³

2. The empirical model

We estimate a wage equation for child workers in Bangladesh using individual-level data. The basic model we employ is:

$$\ln wage_i = \alpha + \beta_1 age_i + \beta_2 education_i + \beta_3 tenure_i + \varepsilon_i$$

where $\ln wage_i$ is the logarithm of wages paid to the child i , age_i is the age in years, $education_i$ is the educational attainment in terms of school attendance or literacy, $tenure_i$ is the tenure in terms of months of employment in the present workplace, and ε_i is an error term. α and β s are parameters to be estimated. While a number of previous studies estimate this type of wage equation for ordinary adult workers in developing countries,⁴ there are no studies that estimate a wage equation for child labor.

3. Data

We use individual-level data on children found in baseline surveys for automobile, battery recharging/recycling, welding, and road transport sectors, which were gathered by the Bangladesh Bureau of Statistics during 2002–2003 under the framework of the National Child Labor Survey.⁵

Out of the 1,672 children surveyed, we eliminated those who had work experience prior to taking their present job⁶ and dropped erroneous observations, which netted 1,295 children. Of those, 306 children (23.6 percent) received no wage in spite of their positive work hours. This might reflect the fact that some children work as a bonded labor. Thus, we eliminated those children who received no wage,⁷ leaving a sample of 989 children from

3 There are only a few studies that address wages for child workers. For example, Rammohan (2001) examines the relationship between returns to child work, child labor, child schooling, and fertility. Gupta (2000) investigates the bargaining problem between an employer and parents over a child's share of wage payment in the form of meals. ILO-IPEC (2007) analyzes the demand side of child labor using the data for Ghana, India, the Philippines, and Uganda. Shafiq (2007) pays attention to child wages as a determinant of child labor in Bangladesh.

4 For Bangladesh, see Asadullah (2006).

5 Bangladesh Bureau of Statistics conducted the Labour Force and Child Labour Survey in 2013, reporting that the number of children involved in child labor has significantly decreased from 3.2 million to 1.7 million for the past decade. For more details, see Bangladesh Bureau of Statistics (2015). For child labor in Bangladesh, see, for example, Ahamed (2013) and Aktar and Abdullah (2013).

6 This elimination enables us to calculate a child's age, which is among explanatory variables in the equation, by adding the child's tenure to the age when he started to work.

7 This might cause a sample selection problem.

Table 1 Summary statistics

Variables	Description	Obs	Mean	Std. Dev.	Min.	Max.
wage	hourly wages (<i>taka</i>)	989	3.688	2.933	0.026	18.754
age	age in years	989	14.34	1.88	9	17
school attendance	1 if a child was then attending or had ever attended any level of school	989	0.674	0.469	0	1
literacy	1 if a child could read and write	989	0.351	0.477	0	1
tenure	months of employment at the present workplace	989	24.12	15.82	1	102
automobile*	1 if a child was employed in the automobile sector	989	0.228	0.419	0	1
battery	1 if a child was employed in the battery recharging/recycling sector	989	0.174	0.379	0	1
welding	1 if a child was employed in the welding sector	989	0.311	0.463	0	1
transport	1 if a child was employed in the road transport sector	989	0.287	0.453	0	1
urban	1 if a child was in the urban areas	989	0.505	0.500	0	1

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

9–17 years old for use in our estimation.

Table 1 summarizes the dependent and explanatory variables. The dependent variable is measured by hourly wages paid to children. The wage was on average 3.69 *taka* (the currency of Bangladesh). The maximum wage was 18.75 whereas the minimum was 0.026.

The average child's age was 14.3 years. Educational attainment of children is measured in two ways: school attendance and literacy. While a dummy variable for school attendance indicates 1 if a child was then attending or had ever attended any level of school and 0 if not, a dummy variable for literacy indicates 1 if a child could read and write and 0 if not. In sum, 67.4 percent of children had received formal education at school, and 35.1 percent could read and write.

The tenure of children was measured by months of employment at their present workplace. Children had on average been employed for 24.1 months. The longest tenure was 102 months whereas the shortest was only 1 month.

In addition to variables explained above, we included dummy variables for sectors and areas. 989 children were working in each of four sectors: automobile (22.8 percent), battery (17.4 percent), welding (31.1 percent), and transport (28.7 percent). Also, 50.5 percent of children were in urban areas and the rest were in rural ones.

4. Estimation results

We estimated the wage equation for child labor in Bangladesh using ordinary least squares (OLS). At the same time, we separately estimated the equation for children aged 11–14 years because that age group was likely to contain both educated and uneducated

Table 2 OLS estimates

(a) children aged 9–17 years

log of hourly wages	(1)		(2)		(3)		(4)	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
age	0.0822***	6.26	0.0818***	6.22	0.0825***	6.36	0.0829***	6.40
school attendance	-0.0111	-0.22	0.0446	0.49				
literacy					-0.0358	-0.75	0.1404	1.62
tenure	0.0187***	4.50	0.0209***	4.11	0.0187	4.51	0.0222***	5.07
tenure squared	-0.0002***	-3.30	-0.0002***	-3.37	-0.0002***	-3.31	-0.0002***	-3.58
sch.attend. X tenure			-0.0022	-0.74				
literacy X tenure							-0.0073**	-2.44
battery	0.2356***	3.25	0.2357***	3.25	0.2474***	3.45	0.2375***	3.32
welding	0.1673***	2.72	0.1665***	2.70	0.1700***	2.76	0.1657***	2.69
transport	0.9762***	15.13	0.9764***	15.13	0.9882***	15.37	0.9820***	15.30
urban	-0.0698	-1.55	-0.0702	-1.55	-0.0697	-1.54	-0.0683	-1.52
_cons	-0.8027***	-4.35	-0.8405***	-4.39	-0.8085***	-4.39	-0.8813***	-4.74
Number of obs	989		989		989		989	
F	51.63(8,980)		45.94(9,979)		51.72(8,980)		46.87(9,979)	
Prob>F	0.0000		0.0000		0.0000		0.0000	
R-squared	0.2965		0.2969		0.2969		0.3011	
Adj R-squared	0.2908		0.2904		0.2911		0.2947	
Root MSE	0.6970		0.6971		0.6968		0.6951	

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

(b) children aged 11–14 years

log of hourly wages	(1)		(2)		(3)		(4)	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
age	0.0866***	2.64	0.0852***	2.59	0.0887***	2.71	0.0883***	2.70
school attendance	0.0586	0.81	0.1163	0.89				
literacy					0.0227	0.31	0.1255	0.95
tenure	0.0127*	1.71	0.0153*	1.73	0.0125*	1.68	0.0153*	1.90
tenure squared	0.0000	-0.21	0.0000	-0.33	0.0000	-0.20	0.0000	-0.36
sch.attend. X tenure			-0.0028	-0.53				
literacy X tenure							-0.0053	-0.93
battery	0.2294**	2.12	0.2283**	2.11	0.2059*	1.91	0.1992*	1.84
welding	0.0835	0.94	0.0834	0.94	0.0816	0.91	0.0801	0.90
transport	0.9659***	10.14	0.9652***	10.13	0.9431***	10.06	0.9379***	9.98
urban	-0.1296*	-1.94	-0.1279*	-1.91	-0.1267*	-1.90	-0.1195*	-1.78
_cons	-0.8298**	-1.96	-0.8567**	-2.01	-0.8136*	-1.92	-0.8534**	-2.01
Number of obs	445		445		445		445	
F	22.98(8,436)		20.42(9,435)		22.88(8,436)		20.43(9,435)	
Prob>F	0.0000		0.0000		0.0000		0.0000	
R-squared	0.2966		0.2970		0.2957		0.2971	
Adj R-squared	0.2837		0.2825		0.2828		0.2826	
Root MSE	0.6904		0.6910		0.6908		0.6909	

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

children (through primary school), which might possibly generate an education effect on wages.

Table 2 shows the OLS estimates pertaining to the child's wage equation. As is the case with ordinary adult workers, age and tenure have a significant effect on a child's

wage. Older children tended to receive higher wages. Not surprisingly, months of employment had a diminishing positive impact on a child's wage.

In contrast, educational attainment of children, measured in terms of school attendance or literacy, had no significant effect on a child's wage, indicating that there are no returns to education for child labor.

We also found that, when compared to the automobile sector, the other three sectors tended to pay higher wages to children. In addition, children in urban areas experienced a slight tendency to receive lower wages.

5. Conclusion

Our estimation results indicate that wages varied for different children. Older children with more work experience were paid higher wages. Age and tenure were important determinants of wages for child labor, akin to prior studies dealing with ordinary adult workers.

However, we found no education effects on a child's wage, indicating that educational attainment is not among the determinants of wages for child labor. This result makes sense because even educated children, still in the middle of adolescent school education, have little useful knowledge for their jobs and, moreover, the work performed by children typically requires less knowledge or skills.

We shed light on the reality of child labor by examining wage determinants for child workers in Bangladesh. Since wages are a fundamental condition for employment, even for child workers, it should be quite important to investigate how child labor is paid.

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