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The Joint Estimation of Child Participation in Schooling and Employment: Comparative Evidence from Three Continents

PUSHKAR MAITRA & RANJAN RAY

ABSTRACT *This paper uses data from Peru, Pakistan and Ghana to analyse simultaneously child labour and child schooling, and compares them between these countries. We use a multinomial logit estimation procedure that analyses the participation and non-participation of children in schooling and in employment and, in particular, allows the possibility that a child combines schooling with employment or does neither. We also use an ordered probit estimation procedure based on a ranking of the various child schooling/employment/non-schooling/non-employment outcomes. The results point to both similarities and striking dissimilarities in the nature of child labour and child schooling between the chosen countries. For example, in Pakistan, but not in Peru, the girl child's ordering of schooling/employment outcomes shows her at a position of extreme disadvantage. Household poverty discourages a child from achieving superior outcomes, but the effect varies markedly across the three countries.*

1. Introduction

The prominence accorded to the subject of child labour at the recent World Trade Organization (WTO) meeting in Seattle is a reflection of its pivotal importance for the setting of international labour standards in an era of rapid globalization. There have been calls to set up a multi-country organization that might help design policies to reduce the incidence of child labour.¹ Though the International Labour Organization's (ILO) (1996) estimates on labour force participation rates for children aged 10–14 years show a declining trend, in absolute terms the size of the child labour force is and will continue to be large enough to be of serious concern. There is no universal agreement on the magnitude of the child labour force, reflecting differences in the definition of child labour and in its measurement. According to the ILO (1996), 120 million children world-wide between the ages of 5 and 14 years have been engaged in full-time paid work. If one includes part-time work as well, then the ILO (1996) estimate goes up to 250 million working children. The estimate of child labour would

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vary depending on how we define work, how we define a child and how we collect the data, but few would disagree that this is a problem of gigantic proportions.

Notwithstanding almost universal agreement that child labour is undesirable, there is wide disagreement on how to tackle this problem. The formulation of policies that are effective in curbing child labour requires an analysis of its key determinants, namely, identification of variables that have a significant effect on child employment. For example, Bonnet (1993) argues in the African context that the poor quality of children's schooling and its apparent lack of relevance to the child's employment skills encourage parents to take their children out of schools and put them into employment. The evidence presented in Ray (2000a) shows that the nature of child labour, its key determinants and, consequently, the strategies aimed at reducing it, vary between countries. Child labour takes different form in different regions. Cross-country comparisons, especially involving vastly different cultures and continents, enable better understanding of differences in the policies required to maximize their effectiveness in specific regional contexts. This paper extends Ray's (2000a, b) earlier research and jointly estimates school attendance and child labour market participation in Pakistan, Peru and Ghana. These countries span a wide and diverse geographical area and are sufficiently heterogeneous to make this comparative study of considerable interest.

The primary aims of this paper are to estimate jointly school attendance and child labour market participation, and to examine cross-country differences in these categories. A large part of the literature has used single equation-based models to estimate the probability of school attendance and child labour market participation (see, e.g. Patrinos & Psacharopoulos, 1997; Psacharopoulos, 1997; Jensen & Nielsen, 1997; Ray, 2000a). However, these studies have two significant limitations. First, they overlook the fact that the decisions on school attendance and child labour market participation are not independent. Second, they do not take into account all the possibilities—in particular, the possibility that some children attend school and work in the labour market while some children do neither.² In fact, there are four possible alternatives to choose from: (a) child attends school only (and does not work); (b) child attends school but also works; (c) child works and does not attend school; and (d) child does neither.

This paper adds to a limited but expanding literature on the joint estimation of child schooling and child employment equations that recognizes their interdependence and simultaneity. There are different ways of jointly estimating a child's school attendance and his/her labour market participation. The first is the bivariate probit model used by Canagarajah & Coulombe (1997) and Nielsen (1999). This approach, while recognizing the interdependence of child schooling and child labour decisions, does not consider all the possibilities. The second approach (see Cartwright, 1999; Grootaert, 1999³) uses a sequential probit model where the schooling/labour choices occur in multiple stages. In the first stage, the choice is between the most preferred option (which is attending school full-time) and all other options. The second stage models the choice between the second best option and the remaining options, conditional on not having opted for the first best. The process continues until all choices are exhausted. The third approach, which is adopted in the present study (see also Cigno *et al.*, 2000; Rosati & Tzannatos, 2000), is the simultaneous choice model based on the multinomial logit and the ordered probit models where the choice between the various alternatives is made at one particular point in time rather than sequentially. While the sequential approach to modelling the supply of child labour is interesting in its own right, we see no *a priori* reason to choose the sequential model over the simultaneous choice model. The latter, which is preferred in this study, entails estimation of one equation, which we think is more easily understood.⁴

The rest of this paper is organized as follows. Section 2 discusses the estimation procedures. Section 3 describes the data sets and presents some selected descriptive statistics. Section 4 presents and discusses the estimation results. Concluding comments are presented in Section 5.

2. Estimation Methodology

The decision to send a child to work is described by the following latent variable model.

$$W_i^* = X_{1i}\beta_1 + \varepsilon_{1i} \quad (1)$$

W_i^* is the net benefit attained by the family by sending child i to work, X_{1i} is a vector of child, family and community characteristics that determine W_i^* , and ε_{1i} is a random error, with zero mean and unit variance. However, W_i^* is not observed—what we do observe is the following binary variable:

$$W_i = \begin{cases} 1, & \text{if the child works } (W_i^* > 0) \\ 0, & \text{otherwise} \end{cases} \quad (1a)$$

Correspondingly, the decision to send a child to school is described by the following latent variable model:

$$S_i^* = X_{2i}\beta_2 + \varepsilon_{2i} \quad (2)$$

S_i^* is the net benefit to the family from sending the child to school, X_{2i} is the vector of child, family and community characteristics that determine S_i^* , and ε_{2i} is a random error with zero mean, unit variance. S_i^* is not observed—what we do observe is the following binary variable:

$$S_i = \begin{cases} 1, & \text{if the child works } (S_i^* > 0) \\ 0, & \text{otherwise} \end{cases} \quad (2a)$$

In the multinomial logit estimation procedure we convert the two-equation system (given by equations (1a) and (2a)) into an observable form (Y) involving four states as follows:

- (i) $Y_i = 0: W_i^* \leq 0, S_i^* > 0$ (child does not work, attends school),
- (ii) $Y_i = 1: W_i^* > 0, S_i^* > 0$ (child works and attends school),
- (iii) $Y_i = 2: W_i^* \leq 0, S_i^* \leq 0$ (child neither works nor attends school) and
- (iv) $Y_i = 3: W_i^* > 0, S_i^* \leq 0$ (child works, does not attend school).

The estimated equation is given by:

$$Y_i = X_i\beta + \varepsilon_i \quad (3)$$

The reduced form parameters of this equation are estimated using maximum likelihood based on a multinomial logistic distribution of ε . Since the probabilities of being in the four states (i)–(iv) must add to unity for each child, the multinomial logit strategy involves estimating three equations. In this study, we have normalized category (ii), i.e. adopted the state of child working and attending school as the baseline case in the multinomial logit regressions.

The four choices mentioned above can easily be ranked in a descending order from the viewpoint of child welfare. The welfare-based ordering is as follows: only school ($y = 0$), both school and work ($y = 1$), neither school nor work ($y = 2$), only work ($y = 3$). Equation (3) is re-estimated as an ordered probit model that respects this welfare ordering. We assume that ε is normally distributed across observations. The

coefficients, β , have an unambiguous interpretation only with respect to the two extreme states ($y=0,3$), not with respect to the middle ones ($y=1,2$). The ordered probit model used here contrasts with the sequential probit model used by Grootaert & Patrinos (1999), recognizing the ordering of the four alternatives. While the sequential probit model is interesting we stick to the ordered probit model because we think that the choices are made simultaneously rather than sequentially.

3. Data and Descriptive Statistics

The child labour data for the study came from the Peru Living Standards Measurement Survey (PLSS) in 1994, the Pakistan Integrated Household Survey (PIHS) in 1991 and the Ghana Living Standards Measurement Survey (GLSS) in 1988/89. These surveys were conducted jointly by the respective governments and the World Bank as part of the Living Standards Measurement Study (LSMS) household surveys in a number of developing countries.⁵ The purpose of the LSMS surveys is to provide policy-makers and researchers with individual, household and community-level data needed to analyse the impact of policy initiatives on living standards of households. The PIHS covered 4800 households, the PLSS involved 3623 households and the GLSS involved 3192 households. While the Peruvian sample contained information on child labour and child schooling of 5231 children aged 6–17 years, the Pakistani data set yielded 5866 observations on children aged 10–17 years and the Ghanaian sample on 5245 children aged 7–17 years. Some of these observations could not be used, however, because of poor quality. In this study, we follow the ILO definition of child labour (see Ashagrie, 1993) in classifying a child as a ‘labourer’ if the child does full-time, paid work. While this limits our analysis to only a subset of child work, it makes our study comparable with others in the literature.⁶

Table 1 contains description of the variables used in this study. Tables 2a–d present comparative figures, for the three countries, of the percentage of children belonging to the four mutually exclusive and exhaustive employment/schooling states considered in this study. The figures, which also provide information on the gender differential, show some interesting dissimilarities and similarities between the three countries. First, a sizeable proportion of Pakistani and Ghanaian children are not in employment or in school. In contrast, the corresponding proportion of Peruvian children who belong to this category is considerably smaller. The large numbers of Pakistani children in this category are typical of the entire South Asian region (see Weiner, 1996). Ravallion & Wodon (2000) recently observed that a targeted enrolment subsidy in rural Bangladesh increased schooling by far more than it reduced child labour. This is possibly explained by the fact that a large number of children, who were previously not in employment or in schooling, enrolled as a result of this subsidy. It is, perhaps, not unreasonable to expect a large number of these children to be involved in domestic duties. On this interpretation, the gender differential in favour of a higher proportion of girls, *vis-à-vis* boys, involved in domestic duties exists in all countries. However, the size and statistical significance of such gender imbalance are nowhere as large or as pronounced as those in Pakistan. The actual gender differential will be still greater in Pakistan than these figures suggest since a girl that does not go either to work or to school is much more likely to be helping out with household chores than her brother in the same category. Second, the gender imbalance in Pakistan in domestic duties reverses itself for older children (15–17 years) in the direction of greater participation by boys as we move to the category of full-time, “economically active” children—more boys work than girls. The Pakistani experience is not, however, shared by Peruvian or Ghanaian children.

Table 1. Description of variables

Variable	Description
<i>AGE</i>	Age of child
<i>AGE2</i>	Age of child squared
<i>GIRL*</i>	Gender of Child (1 = girl, 0 otherwise)
<i>URBAN*</i>	Region of residence (1 = urban, 0 = rural)
<i>NCHILD</i>	Number of children in household
<i>NADULT</i>	Number of adults in household
<i>AMOUNTL</i>	Amount lent (Pakistan, Ghana)
<i>AMOUNTB</i>	Amount borrowed (Pakistan, Ghana)
<i>FHH*</i>	Gender of household head (1 = female, 0 = male)
<i>HEADAGE</i>	Age of household head
<i>LANGHH*</i>	Language of household head (1 = dominant language, 0 otherwise)
<i>MAXFEMED</i>	Number of years of schooling of the most educated female in the household
<i>POV*</i>	= 1 if household is poor, 0 otherwise
<i>PCEX</i>	Expenditure per equivalent adult
<i>MAXMWAGE</i>	Maximum wage earned by male members in the household
<i>MAXFWAGE</i>	Maximum wage earned by female members in the household
<i>MAXFWAGE2</i>	Maximum female wage squared
<i>WATER1*</i>	= 1 if household has access to piped water, 0 otherwise (Pakistan only)
<i>ROAD</i>	= 1 if road is available, 0 otherwise (Pakistan only)
<i>CLOSEDDR*</i>	= 1 if closed drains near house, 0 otherwise (Pakistan only)
<i>DISPOS1*</i>	= 1 if household has no waste disposal method, 0 otherwise (Pakistan only)
<i>DWATER*</i>	= 1 if the main source of drinking water is river, lake, spring or pond, 0 otherwise (Ghana only)
<i>TOILET*</i>	= 1 if toilet facility for the household is pit latrine, 0 otherwise (Ghana only)
<i>LIGHT*</i>	= 1 if main source of lighting for the household is kerosene, oil or gas lamp, 0 otherwise (Ghana only)
<i>ELECTR*</i>	= 1 if main source of illumination is electricity, 0 otherwise (Peru only)
<i>WATER2*</i>	= 1 if water supply is inside the house, 0 otherwise (Peru only)
<i>WATERC*</i>	= 1 if water is not contaminated, 0 otherwise (Peru only)
<i>DISPOS2*</i>	= 1 if main form of waste disposal is public connection inside house, 0 otherwise (Peru only)
<i>BOYSC</i>	Number of boys' schools in cluster (Pakistan only)
<i>GIRLSC</i>	Number of girls' schools in cluster (Pakistan only)
<i>COEDSC</i>	Number of coeducation schools in cluster (Pakistan only)
<i>BOYCLOS*</i>	= 0 if any boys' school in cluster is closed, 1 otherwise (Pakistan only)
<i>GIRLCLOS*</i>	= 0 if any girls' school in cluster is closed, 1 otherwise (Pakistan only)
<i>COEDCLOS*</i>	= 0 if any coeducation school in cluster is closed, 1 otherwise (Pakistan only)
<i>PRIMYES*</i>	= 1 if there is any primary school in Cluster, 0 otherwise (Ghana only)

* Denotes a dummy variable.

Third, as noted in Patrinos & Psacharopoulos (1997) and Ray (2000a), a much higher proportion of Peruvian children combine employment with schooling than in other countries. There exists a pronounced and large gender differential in favour of Pakistani and Peruvian boys in this category. It is also worth noting that in Ghana, though not in Pakistan, the proportion of children, especially boys, who combine employment with schooling rises quite sharply in the later age categories. Fourth, in case of pure school-going children with no work involvement, while the enrolment rate in Peru starts to decline markedly only beyond 13 years, in the case of Pakistan and Ghana the enrolment rate peaks at around 11 and 9 years, respectively, and falls to alarmingly low levels, especially for older girls. Finally, the schooling participation rates of Peruvian children in all age groups are considerably higher than their Pakistani and Ghanaian counterparts. Moreover, the gender bias in favour of boys' schooling in Pakistan

Table 2a. Percentage of children who attend school and do not work

Age	Peru			Pakistan			Ghana		
	Overall	Boys	Girls	Difference	Overall	Boys	Girls	Difference	Difference
6	0.797	0.817	0.774	0.043	—	—	—	0.5	0.504 0.496 0.008
7	0.808	0.792	0.825	-0.033	—	—	—	0.619	0.647 0.594 0.053
8	0.816	0.788	0.840	-0.052	—	—	—	0.559	0.591 0.524 0.067
9	0.796	0.777	0.814	-0.037	—	—	—	0.614	0.631 0.596 0.035
10	0.707	0.679	0.735	-0.056	0.591	0.698	0.478	0.583	0.609 0.554 0.055
11	0.704	0.674	0.738	-0.064	0.637	0.734	0.522	0.518	0.535 0.500 0.035
12	0.649	0.594	0.703	-0.109 ^a	0.544	0.627	0.443	0.471	0.496 0.438 0.058
13	0.662	0.654	0.669	-0.015	0.499	0.577	0.428	0.404	0.420 0.385 0.035
14	0.559	0.494	0.623	-0.129 ^a	0.439	0.527	0.356	0.397	0.381 0.417 -0.036
15	0.523	0.472	0.574	-0.102 ^a	0.376	0.450	0.295	0.315	0.387 0.241 0.146 ^a
16	0.490	0.475	0.505	-0.030	0.336	0.402	0.270	0.266	0.311 0.222 0.089 ^a
17	0.365	0.311	0.416	-0.105 ^a	0.324	0.358	0.278	0.220	0.254 0.179 0.075

^aDenotes that the gender difference is statistically significant at the 5% significance level.

Table 2b. Percentage of children who attend school and work

Age	Peru			Pakistan			Ghana		
	Overall	Boys	Girls	Difference	Overall	Boys	Girls	Difference	Difference
6	0.081	0.071	0.092	-0.021	—	—	—	—	—
7	0.115	0.121	0.109	0.012	—	—	—	0.032	0.036
8	0.123	0.156	0.096	0.060 ^a	—	—	—	0.066	0.087
9	0.177	0.186	0.169	0.017	—	—	—	0.087	0.097
10	0.237	0.281	0.196	0.085 ^a	0.054	0.074	0.033	0.125	0.133
11	0.253	0.302	0.200	0.102 ^a	0.060	0.088	0.027	0.191	0.221
12	0.288	0.338	0.238	0.100 ^a	0.081	0.108	0.048	0.161	0.176
13	0.242	0.290	0.199	0.091 ^a	0.083	0.147	0.025	0.199	0.203
14	0.310	0.376	0.246	0.130 ^a	0.088	0.143	0.035	0.212	0.274
15	0.294	0.377	0.213	0.164 ^a	0.081	0.119	0.040	0.202	0.247
16	0.267	0.337	0.201	0.136 ^a	0.058	0.105	0.011	0.201	0.220
17	0.203	0.302	0.111	0.191 ^a	0.077	0.130	0.005	0.150	0.204

^aDenotes that the gender difference is statistically significant at the 5% significance level.

Table 2c. Percentage of children who do not attend school but work

Age	Peru			Pakistan			Ghana		
	Overall	Boys	Girls	Difference	Overall	Boys	Girls	Difference	Difference
6	0.014	0.007	0.021	-0.014	—	—	—	—	—
7	0.010	0.017	0.004	0.013	—	—	—	—	0.028 ^a
8	0.016	0.013	0.018	-0.005	—	—	—	—	0.001
9	0.002	0.005	0.000	0.005	—	—	—	—	0.015
10	0.011	0.014	0.009	0.005	0.113	0.074	0.154	-0.080 ^a	0.083
11	0.011	0.008	0.013	-0.005	0.118	0.073	0.169	-0.096 ^a	0.017
12	0.030	0.038	0.021	0.017	0.161	0.147	0.178	-0.031	0.001
13	0.042	0.023	0.059	-0.036 ^a	0.171	0.154	0.188	-0.034	0.114 ^a
14	0.075	0.089	0.061	0.028	0.234	0.218	0.249	-0.031	0.118
15	0.100	0.104	0.097	0.007	0.269	0.279	0.258	0.021	0.258
16	0.113	0.109	0.117	-0.008	0.330	0.407	0.253	0.154 ^a	0.299
17	0.182	0.236	0.132	0.104 ^a	0.312	0.354	0.254	0.100 ^a	0.341
									0.366

^aDenotes that the gender difference is statistically significant at the 5% significance level.

Table 2d. Percentage of children who neither attend school nor work

Age	Peru				Pakistan				Ghana			
	Overall	Boys	Girls	Difference	Overall	Boys	Girls	Difference	Overall	Boys	Girls	Difference
6	0.019	0.105	0.113	-0.008	—	—	—	—	0.500	0.496	0.504	-0.008
7	0.066	0.071	0.061	0.010	—	—	—	—	0.328	0.290	0.363	-0.07
8	0.045	0.043	0.046	-0.003	—	—	—	—	0.330	0.277	0.388	-0.011 ^a
9	0.024	0.032	0.017	0.015	—	—	—	—	0.251	0.216	0.2887	-0.071
10	0.044	0.027	0.061	-0.034	0.242	0.153	0.335	-0.182 ^a	0.210	0.169	0.254	-0.085 ^a
11	0.032	0.017	0.049	-0.032 ^a	0.186	0.105	0.282	-0.177 ^a	0.173	0.134	0.213	-0.079
12	0.039	0.030	0.038	-0.008	0.214	0.118	0.330	-0.212 ^a	0.219	0.179	0.271	-0.092 ^a
13	0.053	0.033	0.073	-0.040 ^a	0.246	0.123	0.359	-0.236 ^a	0.215	0.145	0.302	-0.157 ^a
14	0.056	0.042	0.070	-0.028	0.239	0.112	0.361	-0.249 ^a	0.188	0.181	0.196	-0.015
15	0.082	0.047	0.116	0.031 ^a	0.274	0.152	0.407	-0.255 ^a	0.226	0.149	0.305	-0.156 ^a
16	0.130	0.079	0.178	-0.108	0.277	0.086	0.465	-0.379 ^a	0.232	0.209	0.256	-0.047
17	0.250	0.151	0.342	-0.191 ^a	0.287	0.158	0.464	-0.306 ^a	0.287	0.218	0.375	-0.157 ^a

^aDenotes that the gender difference is statistically significant at the 5% significance level.

Table 3. Percentage share of income from child labour

	All	Boys	Girls
Peru			
<i>Only work</i>	9.77	14.11	4.77
<i>Both work and school</i>	3.58	3.79	3.26
Pakistan			
<i>Only work</i>	23.37	30.33	16.05
<i>Both work and school</i>	10.18	8.56	10.57
Ghana			
<i>Only work</i>	30.14	30.33	31.22
<i>Both work and school</i>	19.87	25.77	13.96

contrasts sharply with a more even gender balance in the case of Ghana and a reversal in favour of girls' schooling in the case of Peru.

Further evidence on the difference between the nature of child labour in the three countries is contained in Table 3, which presents the share of household income contributed by child labour earnings.⁷ The following features are worth noting. First, the Peruvian household is much less dependent on child labour earnings than its counterpart in Pakistan or Ghana. Second, as we move from children who only work to those who combine schooling with employment, the share of child labour earnings in household income drops in all cases. Note, however, that the drop is the least in the case of Peruvian girls, suggesting that schooling has relatively little impact on their ability to contribute to the household income through their labour earnings. Third, the sizeable proportion of household income that comes from child labour, especially in Pakistan and Ghana, points to the high vulnerability of several households to poverty, if their access to child labour earnings is reduced or removed through legislation without corresponding improvement in credit availability or the employment opportunity of their adults.

4. Results

Tables 4–6 present the multinomial logit regression estimates (by country) for the child's employment/schooling choices as follows: (a) attends school but does not work (Table 4); (b) works but does not attend school (Table 5); (c) neither attends school nor works (Table 6). As mentioned earlier, the choice category where the child attends school and works, i.e. combines schooling with employment, has been adopted as the baseline category for normalization. The corresponding marginal probabilities are presented in Table 7.

Let us turn to the results. In all these countries, older children are more likely to combine schooling with employment than younger children. This is seen from the significantly negative estimate of the child age coefficient in each of the nine cases presented in these three tables (Tables 4–6). A comparison of the tables shows that, for each country, the absolute magnitude of the estimated age coefficient is highest in the case of category (c), i.e. when the child is neither in school nor in formal wage-based employment. This means that, as the child grows older, the inflow into the base category where the child combines schooling with employment is the highest from those

Table 4. Multinomial logit estimates for category^a: school only

Variable	Peru		Pakistan		Ghana	
	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio
<i>AGE</i>	− 0.432 ^c (0.097)	0.649	− 0.692 ^c (0.350)	0.501	− 1.052 ^c (0.129)	0.349
<i>AGE2</i>	0.007 (0.004)	1.007	0.018 (0.013)	1.018	0.032 ^c (0.005)	1.033
<i>GIRL</i>	0.745 ^c (0.083)	2.107	0.910 ^c (0.135)	2.485	0.240 ^c (0.100)	1.272
<i>URBAN</i>	1.782 ^c (0.128)	5.944	1.123 ^c (0.292)	3.075	0.116 (0.147)	1.123
<i>NCHILD</i>	− 0.051 (0.026)	0.951	− 0.015 (0.021)	0.985	− 0.043 ^c (0.022)	0.958
<i>NADULT</i>	0.106 ^c (0.038)	1.112	0.081 ^c (0.029)	1.085	0.032 (0.041)	1.033
<i>AMOUNTL</i>	—	—	− 0.000 ^c (0.000)	1.000	− 0.000 ^c (0.000)	1.000
<i>AMOUNTB</i>	—	—	− 0.000 (0.000)	1.000	0.000 ^c (0.000)	1.000
<i>FHH</i>	0.030 (0.170)	1.031	− 0.411 (0.377)	0.663	0.337 ^c (0.112)	1.400
<i>HEADAGE</i>	− 0.001 (0.004)	0.999	0.000 (0.005)	1.00	− 0.006 (0.004)	0.994
<i>LANGHH</i>	—	—	0.149 (0.170)	1.161	− 0.431 ^c (0.120)	0.650
<i>MAXFEMED</i>	0.037 ^c (0.011)	1.037	0.070 ^c (0.018)	1.072	0.007 (0.011)	1.007
<i>MAXMWAGE</i>	0.040 (0.025)	1.041	0.000 (0.004)	1.000	0.000 (0.000)	1.000
<i>MAXFWAGE</i>	− 0.008 (0.032)	0.992	− 0.103 ^c (0.016)	0.902	0.000 (0.000)	1.000
<i>MAXFWAGE2</i>	0.000 (0.000)	1.000	0.001 (0.000)	1.001	0.000 (0.000)	1.000
<i>POV</i>	− 0.048 (0.110)	0.953	0.256 (0.215)	1.292	− 0.523 ^c (0.185)	0.593
<i>PCEX</i>	0.000 ^c (0.000)	1.000	0.000 (0.000)	1.000	0.000 (0.000)	1.000
<i>WATER 1</i>	—	—	0.353 ^c (0.135)	1.423	—	—
<i>ROAD</i>	—	—	0.209 (0.125)	1.232	—	—
<i>CLOSEDDR</i>	—	—	0.244 (0.184)	1.277	—	—
<i>DISPOS1</i>	—	—	0.037 (0.177)	1.037	—	—
<i>DWATER</i>	—	—	—	—	− 0.668 ^c (0.120)	0.513
<i>TOILET</i>	—	—	—	—	− 0.768 ^c (0.119)	0.464
<i>LIGHT</i>	—	—	—	—	− 0.150 (0.171)	0.861
<i>ELECTR</i>	0.008 (0.191)	1.008	—	—	—	—
<i>WATER2</i>	− 0.563 ^c (0.174)	0.569	—	—	—	—

Table 4. *Continued*

Variable	Peru		Pakistan		Ghana	
	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio
<i>WATERC</i>	0.138 (0.130)	1.148	—	—	—	—
<i>DISPOS2</i>	0.116 (0.214)	1.123	—	—	—	—
<i>BOYSC</i>	—	—	− 0.012 (0.035)	0.988	—	—
<i>GIRLSC</i>	—	—	− 0.306 ^c (0.065)	0.736	—	—
<i>COEDSC</i>	—	—	− 0.057 (0.053)	0.945	—	—
<i>BOYCLOS</i>	—	—	− 0.260 (0.273)	1.297	—	—
<i>GIRLCLOS</i>	—	—	− 0.543 ^c (0.245)	1.721	—	—
<i>COEDCLOS</i>	—	—	0.050 (0.182)	0.951	—	—
<i>PRIMYES</i>	—	—	—	—	− 0.364 ^c (0.121)	0.695

^aThe normalized category is: both school and work.

^b(Heteroskedasticity consistent) standard errors in parentheses.

^cDenotes significance at the 5% significance level.

who are engaged in neither activity. The positive age square coefficient suggests, however, that this inflow weakens in the higher age groups. The gender coefficient is positive and mostly significant, suggesting that girls are more likely than boys to specialize in either schooling or in employment, or do neither, than in combining the two activities. Differences exist between countries with respect to the region of residence variable. For example, Table 5 shows that the urban child in Ghana is *less* likely to specialize in work and *more* likely to combine schooling with employment. The exact reverse is indicated for Peru. Table 6 shows that in Peru, with urbanization, a child engaged in both schooling and employment tends to withdraw from both. Neither of the other two countries shares this result.

Household composition, generally, does not exert a significant impact on the child's schooling/employment decision and, where it does, it is through the number of adults rather than the number of children in the household. This is quite surprising in that it implies that there is no quality/quantity trade-off in schooling. In Peru and Ghana, though not in Pakistan, an increase in the number of adults in the household leads to children withdrawing from both schooling and employment (Table 6). The gender of the household head matters in Ghana (Tables 4 and 5), but not much in the other countries.

Of particular interest in these calculations are the estimated coefficients of the poverty dummy and per adult equivalent expenditure variables. The household's poverty status is defined over non-child household income.⁸ In a sense this assumes that decisions on child labour are taken *after* adult and other non-child earnings are determined and this avoids the possible endogeneity of the poverty variable. This also underlies the "Luxury Axiom" of Basu & Van (1998), who postulate that a family will

Table 5. Multinomial logit estimates for category^a: work only

Variable	Peru		Pakistan		Ghana	
	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio
<i>AGE</i>	-0.805 ^c (0.225)	0.447	-0.464 (0.373)	0.629	-0.433 ^c (0.176)	0.649
<i>AGE2</i>	0.043 ^c (0.009)	1.044	0.024 (0.014)	1.025	0.025 ^c (0.007)	1.025
<i>GIRL</i>	0.128 (0.152)	1.137	1.547 ^c (0.138)	4.699	0.828 ^c (0.125)	2.289
<i>URBAN</i>	1.727 ^c (0.255)	2.069	0.405 (0.302)	1.500	-0.589 ^c (0.202)	0.555
<i>NCHILD</i>	-0.036 (0.049)	0.965	0.011 (0.022)	1.011	-0.038 (0.026)	0.962
<i>NADULT</i>	0.106 (0.058)	1.111	-0.075 ^c (0.033)	0.928	0.118 ^c (0.048)	1.125
<i>AMOUNTL</i>	—	—	-0.000 (0.000)	1.000	-0.000 (0.000)	1.000
<i>AMOUNTB</i>	—	—	-0.000 (0.000)	1.000	0.000 (0.000)	1.000
<i>FHH</i>	0.554 ^c (0.282)	1.740	-0.259 (0.406)	0.772	-0.360 ^c (0.152)	0.698
<i>HEADAGE</i>	0.010 (0.008)	1.010	0.006 (0.005)	1.006	-0.004 (0.005)	0.996
<i>LANGHH</i>	—	—	-0.141 (0.182)	0.869	-0.535 ^c (0.171)	0.585
<i>MAXFEMED</i>	-0.070 ^c (0.021)	0.932	-0.081 ^c (0.022)	0.922	-0.206 ^c (0.017)	0.814
<i>MAXMWAGE</i>	-0.038 (0.050)	0.963	-0.014 ^c (0.005)	0.986	0.000 (0.000)	1.000
<i>MAXFWAGE</i>	-0.061 (0.070)	0.941	-0.033 ^c (0.016)	0.967	-0.000 (0.000)	1.000
<i>MAXFWAGE2</i>	0.001 (0.001)	1.001	0.001 ^c (0.000)	1.001	0.000 (0.000)	1.000
<i>POV</i>	0.154 (0.195)	1.166	0.743 ^c (0.225)	2.102	0.331 (0.198)	1.393
<i>PCEX</i>	0.000 (0.000)	1.000	-0.000 ^c (0.000)	1.000	0.000 (0.000)	1.000
<i>WATER1</i>	—	—	-0.136 (0.147)	0.873	—	—
<i>ROAD</i>	—	—	-0.136 (0.134)	0.873	—	—
<i>CLOSEDDR</i>	—	—	-0.038 (0.203)	0.963	—	—
<i>DISPOS1</i>	—	—	0.224 (0.193)	1.251	—	—
<i>DWATER</i>	—	—	—	—	-0.615 ^c (0.138)	0.541
<i>TOILET</i>	—	—	—	—	-0.963 ^c (0.135)	0.382
<i>LIGHT</i>	—	—	—	—	-0.028 (0.210)	0.973
<i>ELECTR</i>	-0.947 ^c (0.245)	0.388	—	—	—	—
<i>WATER2</i>	-0.602 ^c (0.211)	0.548	—	—	—	—

Table 5. *Continued*

Variable	Peru		Pakistan		Ghana	
	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio
<i>WATERC</i>	-0.105 (0.153)	0.901	—	—	—	—
<i>DISPOS2</i>	0.110 (0.310)	1.116	—	—	—	—
<i>BOYSC</i>	—	—	0.009 (0.034)	1.009	—	—
<i>GIRLSC</i>	—	—	-0.183 ^c (0.058)	0.833	—	—
<i>COEDSC</i>	—	—	0.112 ^c (0.049)	1.118	—	—
<i>BOYCLOS</i>	—	—	-0.011 (0.268)	1.011	—	—
<i>GIRLCLOS</i>	—	—	-0.298 (0.239)	1.347	—	—
<i>COEDCLOS</i>	—	—	0.081 (0.170)	0.922	—	—
<i>PRIMYES</i>	—	—	—	—	-0.035 (0.136)	0.966

^aThe normalized category is: both school and work.

^b(Heteroskedasticity consistent) standard errors in parentheses.

^cDenotes significance at the 5% significance level.

send the child to the labour market only if the family's income from non-child sources drops to very low levels. Though both the poverty dummy and per adult equivalent expenditure measure the changing economic circumstances of the household, the former refers to a discrete effect due to the household crossing the poverty line, while the latter measures the propensity of the child to change states due to small changes in the continuous expenditure variable. There are some interesting differences between the country estimates of these effects. For example, Tables 5 and 6 show that, when a Pakistani household falls into poverty, there is a strong tendency for a child who was combining schooling with employment either to specialize wholly in the latter, or to withdraw completely from both activities, possibly to do domestic chores. This is consistent with the prediction of the "Luxury Axiom" of Basu & Van (1998) and with the previous Pakistani evidence contained in Ray (2000a, b). Note, however, that such a "poverty effect" on child behaviour is much weaker in the other two countries.

The coefficients of the adult wage variables show the nature of interaction between the adult and child labour markets. As the recent analysis of Basu (2000) shows, the nature of such interaction determines the effectiveness of minimum wage legislation in reducing the incidence of child labour. The tables show that, in general, the impact of adult wages on the child's choice of categories is larger in Pakistan than in the other countries. In Pakistan, an increase in female wages leads to a significant movement from each of the three choice categories, depicted in Tables 4–6, to the base category where the child combines schooling with employment. The movement out of category (a) ("school only") and category (c) ("neither in school nor in work"), consequent on an increase in female wages, is the disaggregated picture underlying the complementarity between the adult female and child labour markets observed in Pakistan using the

Table 6. Multinomial logit estimates for category^a: neither in school nor in work

Variable	Peru		Pakistan		Ghana	
	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio
<i>AGE</i>	-1.745 ^c (0.143)	0.175	-1.232 ^c (0.374)	0.292	-1.891 ^c (0.136)	0.151
<i>AGE2</i>	0.072 ^c (0.006)	1.075	0.047 ^c (0.014)	1.048	0.072 ^c (0.006)	1.074
<i>GIRL</i>	1.106 ^c (0.030)	3.023	2.566 ^c (0.142)	13.012	0.918 ^c (0.109)	2.505
<i>URBAN</i>	1.344 ^c (0.198)	3.835	0.290 (0.302)	1.337	-0.009 (0.159)	0.992
<i>NCHILD</i>	0.020 (0.040)	1.020	0.012 (0.022)	1.012	-0.038 (0.023)	0.963
<i>NADULT</i>	0.151 ^c (0.051)	1.163	0.020 (0.032)	1.020	0.136 ^c (0.044)	1.146
<i>AMOUNTL</i>	—	—	-0.000 ^c (0.000)	1.000	-0.000 (0.000)	1.000
<i>AMOUNTB</i>	—	—	-0.000 ^c (0.000)	1.000	0.000 ^c (0.000)	1.000
<i>FHH</i>	-0.051 (0.246)	0.950	-0.257 (0.412)	0.774	0.193 (0.126)	1.213
<i>HEADAGE</i>	0.014 ^c (0.007)	1.014	0.005 (0.005)	1.005	-0.008 (0.004)	0.992
<i>LANGHH</i>	—	—	-0.353 (0.182)	0.702	-0.448 ^c (0.135)	0.639
<i>MAXFEMED</i>	0.025 ^c (0.017)	1.026	0.027 (0.020)	0.973	-0.177 ^c (0.014)	0.838
<i>MAXMWAGE</i>	0.033 (0.030)	1.034	-0.012 ^c (0.004)	0.988	-0.000 ^c (0.000)	1.000
<i>MAXFWAGE</i>	-0.022 (0.050)	1.023	-0.102 ^c (0.017)	0.903	0.000 ^c (0.000)	1.000
<i>MAXFWAGE2</i>	-0.001 (0.002)	0.999	0.002 ^c (0.000)	1.002	0.000 (0.000)	1.000
<i>POV</i>	0.461 ^c (0.170)	1.586	0.818 ^c (0.229)	2.267	0.038 (0.187)	1.038
<i>PCEX</i>	0.000 ^c (0.000)	1.000	0.000 (0.000)	1.000	0.000 (0.000)	1.000
<i>WATER1</i>	—	—	0.218 (0.150)	1.243	—	—
<i>ROAD</i>	—	—	0.056 (0.135)	1.057	—	—
<i>CLOSEDDR</i>	—	—	-0.184 (0.199)	0.832	—	—
<i>DISPOS1</i>	—	—	0.125 (0.191)	1.133	—	—
<i>DWATER</i>	—	—	—	—	-0.668 ^c (0.120)	0.513
<i>TOILET</i>	—	—	—	—	-0.768 ^c (0.119)	0.464
<i>LIGHT</i>	—	—	—	—	-0.150 (0.171)	0.861
<i>ELECTR</i>	0.008 (0.191)	1.008	—	—	—	—
<i>WATER2</i>	-0.563 ^c (0.174)	0.569	—	—	—	—

Table 6. *Continued*

Variable	Peru		Pakistan		Ghana	
	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio	Coefficient estimate ^b	Relative risk ratio
<i>WATERC</i>	0.138 (0.130)	1.148	—	—	—	—
<i>DISPOS2</i>	0.116 (0.214)	1.123	—	—	—	—
<i>BOYSC</i>	—	—	− 0.012 (0.035)	0.988	—	—
<i>GIRLSC</i>	—	—	− 0.306 ^c (0.065)	0.736	—	—
<i>COEDSC</i>	—	—	− 0.057 (0.053)	0.945	—	—
<i>BOYCLOS</i>	—	—	− 0.260 (0.273)	1.297	—	—
<i>GIRLCLOS</i>	—	—	− 0.543 ^c (0.245)	1.721	—	—
<i>COEDCLOS</i>	—	—	0.050 (0.182)	0.951	—	—
<i>PRIMYES</i>	—	—	—	—	− 0.364 ^c (0.121)	0.695

^aThe normalized category is: both school and work.

^b(Heteroskedasticity consistent) standard errors in parentheses.

^cDenotes significance at the 5% significance level.

binomial logit estimation procedure in Ray (2000a). Note that, unlike female wages, movement in Pakistani male wages does not have any impact on children who are exclusively in schooling (Table 4). Nor do adult wage movements in Ghana or Peru have much of an impact on children who specialize in either activity (Tables 4 and 5). It is worth emphasizing from these results that the complementarity between the adult female and child labour markets is quite unique to Pakistan.

A few other interesting results are worth noting. With increasing education of the adult female in the household, there is a strong tendency for the child in Ghana, less so in Pakistan and Peru, to move out of the “work only” and “neither in school nor in work” categories to one where she/he combines schooling with employment (Tables 5 and 6). Canagarajah & Coulombe (1997) find that mother’s education increases the probability of the child’s school attendance but does not affect the probability of the child working. Jafarey & Lahiri (2000) have, recently, systematically explored the link between credit markets and child labour. The Pakistani and Ghanaian data sets provide information on the amount of money lent and borrowed by the households. The effects, even when they are statistically significant, are weak. The relative risk ratio is unity for the credit coefficients, thus denying a strong link between credit variables and child labour. We have not, in this study, attempted a formal test of the relationships between credit markets and child labour, discussed in Jafarey & Lahiri (2000), since it requires an estimation framework that treats a household’s credit market behaviour and child labour as jointly endogenous. While such an exercise is beyond the scope of the present study, it is a useful area for further research. Finally, community variables have significant effects in several cases. For example, the provision of an improved electricity facility in Peru encourages schooling at the expense of employment (Tables 4 and 5), while the provision of improved water supply facilities in Peru encourages children to

Table 7. Multinomial logit marginal probabilities for a selection of variables

Variable	Peru				Pakistan				Ghana			
	School only	Both school and work	Neither school nor work	Work only	School only	Both school and work	Neither school nor work	Work only	School only	Both school and work	Neither school nor work	Work only
<i>AGE</i>	0.0212	0.0735	-0.0887	-0.0060	0.0275	0.0412	-0.1173	0.0486	0.0518	0.1137	-0.2168	0.0513
<i>GIRL</i>	0.0797	-0.1029	0.0321	-0.0089	-0.2363	-0.0754	0.2858	0.0259	-0.1159	-0.0449	0.1344	0.0264
<i>URBAN</i>	0.2733	-0.2587	-0.0028	-0.0118	0.2029	-0.0412	-0.1055	-0.0562	0.0493	-0.0026	-0.0102	-0.0364
<i>NCHILD</i>	-0.0100	0.0060	0.0040	0.0000	-0.0061	0.0002	0.0035	0.0024	-0.0033	0.0037	-0.0003	-0.0001
<i>NADULT</i>	0.0105	-0.0148	0.0041	0.0002	0.0246	-0.0019	-0.0036	-0.0190	-0.0178	-0.0065	0.0206	0.0037
<i>FHH</i>	-0.0007	-0.0050	-0.0055	0.0112	-0.0468	0.0207	0.0154	0.0107	0.0652	-0.0206	-0.0071	-0.0375
<i>HEADAGE</i>	-0.0010	-0.0001	0.0009	0.0002	-0.0012	-0.0001	0.0007	0.0006	-0.0002	0.0006	-0.0006	0.0001
<i>MAXFEMED</i>	0.0064	-0.0045	-0.0002	-0.0017	0.0283	-0.0009	-0.0104	-0.0169	0.0373	0.0062	-0.0333	-0.0103
<i>POV</i>	-0.0385	-0.0006	0.0364	0.0027	-0.1144	-0.0225	0.0890	0.0479	-0.1494	0.0224	0.0790	0.0481

Table 8. Ordered^a probit estimates^b by country

Variable	Peru	Pakistan	Ghana
<i>AGE</i>	− 0.268 ^c (0.042)	0.017 (0.093)	− 0.196 ^c (0.037)
<i>AGE2</i>	0.018 ^c (0.002)	0.005 (0.003)	0.013 ^c (0.002)
<i>GIRL</i>	− 0.117 ^c (0.036)	0.426 ^c (0.032)	0.268 ^c (0.033)
<i>URBAN</i>	− 0.582 ^c (0.059)	− 0.240 ^c (0.079)	− 0.167 ^c (0.050)
<i>NCHILD</i>	0.024 ^c (0.011)	0.014 ^c (0.006)	0.002 (0.007)
<i>NADULT</i>	0.000 (0.016)	− 0.051 ^c (0.009)	0.045 ^c (0.013)
<i>AMOUNTL</i>			0.000 (0.000)
<i>AMOUNTB</i>		0.000 (0.000)	0.000 (0.000)
<i>FHH</i>	0.062 (0.076)	0.083 (0.113)	− 0.208 ^c (0.040)
<i>HEADAGE</i>	0.004 ^c (0.002)	0.003 (0.001)	0.001 (0.001)
<i>LANGHH</i>		− 0.154 ^c (0.049)	− 0.025 (0.045)
<i>MAXFEMED</i>	− 0.022 ^c (0.005)	− 0.066 ^c (0.006)	− 0.090 ^c (0.004)
<i>MAXMWAGE</i>	− 0.009 ^c (0.007)	− 0.006 ^c (0.001)	0.000 (0.000)
<i>MAXFWAGE</i>	0.006 (0.013)	0.024 ^c (0.005)	0.000 (0.000)
<i>MAXFWAGE2</i>	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
<i>POV</i>	0.131 ^c (0.047)	0.286 ^c (0.054)	0.326 ^c (0.055)
<i>PCEXP</i>	0.000 (0.000)	0.000 ^c (0.000)	0.000 (0.000)
<i>ELECTR1</i>	− 0.287 ^c (0.055)		
<i>WATER1</i>	0.015 (0.047)		
<i>WATERC1</i>	0.053 (0.037)		
<i>DISPOS1</i>	− 0.149 ^c (0.064)		
<i>WATER1</i>		− 0.193 ^c (0.039)	
<i>ROAD1</i>		− 0.131 ^c (0.035)	
<i>CLOSEDDR</i>		− 0.170 ^c (0.048)	
<i>DISPOS4</i>		0.074 (0.048)	
<i>BOYSC</i>		0.001 (0.010)	
<i>GIRLSC</i>		− 0.041 (0.020)	

Table 8. Continued

Variable	Peru	Pakistan	Ghana
COEDSC		0.049 ^c (0.015)	
BOYCLOS		0.000 (0.073)	
GIRLCLOS		0.067 (0.063)	
COEDCLOS		−0.088 (0.051)	
DWATER10			−0.060 (0.038)
LIGHT2			0.187 ^c (0.053)
PRIMYES			−0.057 (0.038)
<i>Thresholds</i>			
	−0.504	0.702	−0.745
μ_1	(0.247)	(0.615)	(0.214)
μ_2	0.394 (0.250)	0.922 (0.615)	−0.369 (0.214)
μ_3	1.010 (0.246)	1.742 (0.615)	0.682 (0.210)

^aCategories ordered in terms of child welfare.

^b(Heteroskedasticity consistent) standard errors in parentheses.

^cDenotes significance at the 5% significant level.

combine schooling at the expense of exclusive work or exclusive school. The community variables also exert a strong impact on the child's choice of categories in Ghana. Improvements in communal facilities encourage children who are specializing in work or doing neither activity to combine schooling with employment. The Pakistani data set provides additional information on the availability of schools in the cluster of residence of the child. The availability of girls' schooling and an increase in their number in the neighbourhood encourage Pakistani children who are not in employment or in schooling to take up both. The presence of primary schools in the neighbourhood has a similar effect in Ghana (Table 6).

Table 8 presents ordered probit estimates. The corresponding marginal probabilities are presented in Table 9. The outcomes, it may be recalled, are arranged in a decreasing order from the viewpoint of child welfare. With respect to the sign and magnitude of the marginal probabilities, Pakistan and Ghana are closer to one another than to Peru. The gender effect is particularly strong in Pakistan, placing the girl child there in a position of disadvantage *vis-à-vis* Pakistani boys in trying to attain the most desirable outcome. The marginal results (Table 9) show that if we hold all other explanatory variables at their respective sample means, replacing a boy by a girl increases participation in school by only 4.1% points in Peru but reduces participation in school by only 16.8% points in Pakistan and 10.6% percentage points in Ghana. The poverty status of the household also has a significant effect on the probability of schooling. The ordered probit estimates show that children belonging to poor households have a significantly higher probability of attaining the worst outcome (work only). The marginal results show that children belonging to poor households have 4.6, 11.2 and 12.6% lower probability of attaining the best outcome (school only) in Peru,

Pakistan and Ghana, respectively, while they have a 0.7, 7.8 and a 6.3% higher probability of attaining the worst outcome (work only) in Peru, Pakistan and Ghana, respectively. In Pakistan and Ghana (but not in Peru) household poverty reduces the probability of child participation in the school and work category also. An increase in the number of girls' schools in the cluster in Pakistan or the presence of primary schools in the neighbourhood in Ghana have strong beneficial effects in helping the child attain the most desirable outcome. The rest of the results are quite similar to those obtained from the multinomial logit estimates and will not be discussed in detail.

5. Conclusion

The issue of child labour, which is at the heart of development literature today, has attracted considerable attention in recent years. Notwithstanding continuous and significant reductions during much of the previous century, the child labour force is still large enough to be of serious concern. Strategies aimed at reducing or eliminating child labour need, for their effectiveness, identification of its key determinants. A comparative study of child labour on disparate data sets, using a common estimation framework, is therefore of considerable policy importance. This paper uses high quality, comparable data from countries located in different continents to compare and analyse the phenomenon of child labour in these regions. The chosen countries, Peru, Pakistan and Ghana, provide considerable heterogeneity through their data sets to make the results of this study significant.

The central message of this paper is that one needs to recognize the regional diversity in the nature of child labour in formulating policies to reduce or eliminate it. For example, while improved provision of good quality schools helps to reduce child labour everywhere, such schools need to be located near places of child employment in Peru, and in the residential neighbourhood in Pakistan. This recognizes the fact that, while Peruvian children tend to combine schooling with employment, large numbers of Pakistani children, especially girls, are at home doing neither. The Pakistani results also highlight the need to target households living below the poverty line and, especially, girls in such households for effective child welfare-enhancing policies. Moreover, in Pakistan steps need to be directed at breaking the close nexus that exists there between the adult female and the child labour markets.

While the overall goal of such policies must be to move the child from a "work only" to "school only" status, such a strategy can only be a long-term one. In the short run, any policy that moves a child from a "work only" or "neither in work nor in school" status to one where she/he combines schooling with employment must be considered to be a significant success. This prompts the need to widen the definition of child work to include domestic hours and other forms of non-remunerative child work.

Notes

1. See, for example, Fallon & Tzannatos (1998), who discuss ways in which the World Bank can assist member nations in reducing child labour.
2. For example, in Latin American countries a large number of children combine schooling and labour market participation, while in South Asian countries a large number of children do neither.
3. See also the volume edited by Grootaert & Patrinos (1999).
4. There are studies that examine other aspects of child labour market participation. Ray (2000b) examines the hours of work and the interaction between child wages and adult wages. Bhalotra (1999) uses hours of work to examine whether child labour is "necessary".
5. See Grosh & Glewwe (1995) for an overview and general description of the LSMS data sets.

6. In particular, this ignores the huge number of children who work at home helping the adults in domestic activity (e.g. cleaning or taking care of children) or providing an additional hand in own-farm activities.
7. We only consider the child earnings from formal wage labour and ignore, for lack of data, the child's contribution to domestic work or to work on family farms.
8. The poverty line was set at 50% of the median sample per adult equivalent non-child household income.

References

- Ashagrie, K. (1993) Statistics on child labour, *Bulletin of Labour Statistics*, No. 3 (Geneva, ILO).
- Basu, K. (2000) The intriguing relation between adult minimum wage and child labour, *The Economic Journal*, 110, pp. C50–C61.
- Basu, K. & Van, P.H. (1998) The economics of child labour, *American Economic Review*, 88, pp. 412–427.
- Bhalotra, S. (1999) Is child work necessary?, Mimeo, Cambridge University.
- Bonnet, M. (1993) Child labour in Africa, *International Labour Review*, 132, pp. 371–389.
- Canagarajah, S. & Coulombe, H. (1997) Child labor and schooling in Ghana, Mimeo, World Bank, Washington, DC.
- Cartwright, K. (1999) Child labour in Colombia, in: C. Grootaert & H.A. Patrinos (Eds) *The Policy Analysis of Child Labour: A Comparative Study*, Chapter 4 (New York, St Martin's Press).
- Cigno, A., Rosati, F. & Tzannatos, Z. (2000) Child labour, nutrition and education in rural India: an economic analysis of parental choice and policy options, *World Bank Conference on Child Labour*, Washington, DC, 11–13 April.
- Fallon, P. & Tzannatos, Z. (1998) *Child Labour: Issues and Directions for the World Bank* (Washington, DC, Human Development Network, The World Bank).
- Grootaert, C. (1999) Child labour in Cote d' Ivoire, in: C. Grootaert & H.A. Patrinos (Eds) *The Policy Analysis of Child Labour: A Comparative Study*, Chapter 3 (New York, St Martin's Press).
- Grootaert, C. & Patrinos, H.A. (1999) *The Policy Analysis of Child Labour: A Comparative Study* (New York, St Martin's Press).
- Grosh, M. & Glewwe, P. (1995) *A Guide to Living Standards Measurement Surveys and their Data Sets*, LSMS Working Paper No. 120, World Bank, Washington, DC.
- ILO (1996) *Economically Active Populations: Estimates and Projections, 1950–2010* (Geneva, ILO).
- Jafarey, S. & Lahiri, S. (2000) Will trade sanctions reduce child labour? The role of credit markets, Mimeo, University of Essex.
- Jensen, P. & Nielsen, H.S. (1997) Child labour or school attendance? Evidence from Zambia, *Journal of Population Economics*, 10, pp. 407–424.
- Nielsen, H.S. (1999) Child labor and school attendance: two joint decisions, Mimeo, Aarhus School of Business.
- Patrinos, H.A. & Psacharopoulos, G. (1997) Family size, schooling and child labour in Peru: an empirical analysis, *Journal of Population Economics*, 10, pp. 387–406.
- Psacharopoulos, G. (1997) Child labour versus educational attainment: some evidence from Latin America, *Journal of Population Economics*, 10, pp. 377–386.
- Ravallion, M. & Wodon, Q. (2000) Does child labour displace schooling? Evidence on behavioural responses to an enrolment subsidy, *The Economic Journal*, 110(462), pp. C158–C175.
- Ray, R. (2000a) Analysis of child labour in Peru and Pakistan: a comparative study, *Journal of Population Economics*, 13(1), pp. 3–19.
- Ray, R. (2000b) Child labour, child schooling and their interaction with adult labour, *The World Bank Economic Review*, 14, pp. 347–367.
- Rosati, F.C. & Tzannatos, Z. (2000) Child labor in Vietnam, Mimeo, The World Bank Washington.
- Weiner, M. (1996) Child labour in India: putting compulsory primary education on the political agenda, *Economic and Political Weekly*, 31, pp. 45–46.