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What Happened to Child Labor in Indonesia during the Economic Crisis: The Trade-off between School and Work

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ABSTRACT

Although in general less prevalent than other developing countries at similar stage of development, the problem of child labor in Indonesia is significant. Like in other countries, this study finds that there is a strong link between the child labor phenomenon and poverty. The profile of child labor largely mirrors the profile of poverty. Furthermore, poverty is found as an important determinant of working for children. However, working does not always completely eliminate a child's opportunity to obtain formal education. In fact, children from poor households can still go to school by undertaking part-time work to pay for their education, implying that banning working for these children may force them to drop out of schools instead. Since the phenomenon of child labor is strongly associated with and determined by poverty, the most effective policy for eliminating child labor is through poverty alleviation. Other policies that can foster the rate of reduction in child labor are to make it easier for children from poor families to access education and to increase the opportunity cost of working by improving the quality of education to increase the rate of return to education.

Key words: child; labour.

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I. INTRODUCTION

Child labor is a troubling phenomenon and a serious problem in developing countries. According to a 2002 report of the International Labor Organization (ILO), around 211 million children aged five to fourteen years are active in labor markets all over the world.¹ Around 119 million children, 56% of all working children, are involved in the worst forms of work for children, comprising hazardous work and the unconditional worst forms of work for children. Among the latter, over eight million children are 'trapped' in slavery, prostitution, pornography, and illicit activities such as selling drugs.²

The issue of child labor has regained attention in Indonesia during the recent economic crisis, which started in mid 1997. During the peak of the crisis in 1998, the Indonesian economy contracted by an unprecedented magnitude of over 13%. This is a sharp turn around from the high economic growth averaging around 7% annually over the previous three decades. As Indonesian households were forced to adjust to the substantial fall in real income, it was feared that parents would be forced to withdraw their children from schools and send them to work to supplement family income.

The evidence emerging so far has indicated that this has not happened. There was no evidence of a widespread increase in the child labor phenomenon. During the first year of the crisis, the proportion of children aged ten to fourteen years who worked increased slightly from around 7% in 1997 to around 8% in 1998. However, by 1999 the rate has fallen back to around 7%. Confirming this, school enrolment rates were relatively steady during the crisis and even increased slightly afterwards. Nevertheless, the crisis has temporarily halted the declining trend in the incidence of child labor in Indonesia, which has been steadily observed since the early 1970s.³

Indonesia has ratified the core ILO convention on minimum age for employment, which stipulates that the minimum age of workers is fifteen years old.⁴ The law practically prohibits employers from employing workers younger than fifteen years. One of the main reasons for the prohibition of child labor is that it perpetuates poverty.⁵ The link between current child labor and future poverty is through lack of education. Children who spend most or a significant amount of their time working will have very little opportunity to obtain proper education. Consequently, these

¹ ILO (2002).

² Due to various conceptual, measurement, and data problems, these numbers should be taken as indicative only.

³ See Cameron (2001, 2002) and Manning (2000).

⁴ Law No. 20/1999 on The Ratification of ILO Convention No. 138/1973 Concerning the Minimum Age for Admission to Employment.

⁵ ILO (2002).

children will most likely grow up as poorly educated adults with low skill levels, forcing them to work in low productivity and low wage jobs. Hence, the children who were forced to work because of poverty will have little opportunity to escape poverty as adults. Furthermore, it is likely that in turn their own children will also have to work because of poverty. This means that poverty produces child labor while child labor leads to future poverty.⁶

The incidence of child labor in Indonesia has always been relatively low compared to other Asian countries.⁷ Nevertheless, the problem of child labor in the country is significant. In cities, children work on the streets selling newspapers, candies, and drinks, or become street singers or beggars at intersections and on public buses. Some children become 'slaves' in fishing posts (*jermal*) in the ocean and in the sex industry. However, the majority of working children are found in agricultural fields in rural areas.

It is clear that in Indonesia, as well as in other developing countries, nearly all children who work do so in the informal sector.⁸ This could have adverse consequences for the working children as in general the informal sector provides worse working conditions and less protection for workers compared to the formal sector.⁹ However, child labor may be actually closely linked to the formal sector as firms may contract out some production processes to small or family enterprises, which may employ children.¹⁰

Drawing from the experience during the recent economic crisis, this study aims to assess the nexus between poverty, school, and work for children in the context of Indonesia with possible lessons for other developing countries. The rest of this paper is organized as follows. Section two describes the data used in this study. Section three explores the profile of child labor in Indonesia. Section four formally investigates the determinants of child labor. Section five analyzes the trade-off between school and work for children. Finally, section six provides the conclusions and policy implications of this study.

⁶ For an opposing view, see Ravallion and Wodon (1999).

⁷ Manning (2000).

⁸ See Manning (2000), Morice (1981), Sharma and Mittar (1990).

⁹ See, for example, Cross (1998) and Portes and Walton (1981).

¹⁰ ILO (2002).

II. DATA ON CHILD LABOR

In general, child labor is defined as children who regularly participate of in the labor market, either to earn a living for themselves or to supplement household incomes. Children who are involved in housekeeping activities and perform household chores – such as cleaning, cooking, or washing that may be conducted after school hours or in holidays – are not considered to be child labor because their activities are not strictly intended to generate income.¹¹ In accordance with the law, in this study child labor is defined as children aged less than fifteen years who participate in the labor market.¹²

Hitherto, Sakernas (the National Labor Force Survey) is the source of national data on child labor in Indonesia. The survey is conducted annually by Statistics Indonesia (BPS). However, Sakernas only collects data on activities of individuals in the sampled households who are at least ten years old. Therefore, it cannot capture the phenomenon of child labor for those aged less than ten years. Consequently, this data underestimates the extent of child labor in Indonesia.¹³

Fortunately, during the recent economic crisis in 1998 and 1999, BPS – with support from UNICEF – conducted four rounds of the ‘100 Village Survey’. Each round of this survey collected data from 12,000 households in 100 villages, which are located in ten districts spread across eight provinces. When Indonesia was struck by the economic crisis in mid 1997, during the first one year of the crisis there was a lack of data on the social impact of the crisis. In order to overcome this, four rounds of the ‘100 Village Survey’ were implemented over fourteen months, respectively in August 1998, December 1999, May 1999, and October 1999. This study utilizes the data collected in the first round of the survey in August 1998 and the last round in October 1999 (hereafter referred to as the 1998 and 1999 data respectively). The sampling of the survey was designed to create a panel household data. The actual sample size for the 1998 and 1999 data is 12,000 and 11,997 households respectively. Due to some replacements, however, the number of sampled households who were visited in both survey rounds is 10,640.

One type of data collected in this survey concerned the activities of individuals aged five years and older. Hence, this data provides a more comprehensive picture of child labor in Indonesia in terms of younger aged working children than that provided by Sakernas. However, the ‘100 Village Survey’ has its own weaknesses. Firstly, while the sample was relatively large, it was not designed to be statistically representative of the country overall. Secondly, the intention of this survey was to

¹¹ See Basu (1999) and Canagarajah and Coulombe (1997) for various definitions of child labor.

¹² In this paper, the terms ‘child labor’ and ‘working children’ are used interchangeably.

¹³ This is not the only source of underestimation, as underreporting is thought to be prevalent in child labor data in Indonesia (Manning, 2000) as well as everywhere (Basu, 1999).

focus on rural and relatively poor areas, therefore it is not representative of all social strata within the country.

In light of these weaknesses, it is necessary to test first whether the ‘100 Village Survey’ data can be reliably used as a source of data for analyzing the phenomenon of child labor in Indonesia. Table 1 provides a comparison on the incidence of child labor among children in the age bracket of ten to fourteen years, as indicated by both Sakernas and the ‘100 Village Survey’ data in 1998 and 1999.¹⁴

**Table 1. The Incidence of Child labor Aged 10-14 Years
Based on Sakernas and 100 Village Survey Data (%)**

Location	Sakernas		100 Village Survey	
	1998	1999	1998	1999
Urban	3.84	3.12	4.83	3.45
Rural	11.11	9.64	12.48	11.70
Total	8.24	7.09	10.96	10.04

Source: Sakernas and 100 Village Survey.

Table 1 shows that the incidence of child labor in the ‘100 Village Survey’ data is higher than indicated by Sakernas. In 1998, the incidence of child labor in the 100 Village Survey sample is 11% while in Sakernas is only 8%. Similarly for 1999, the incidence of child labor in the 100 Village Survey data is 10% while in Sakernas is only 7%. This is not surprising considering that the sample of the 100 Village Survey is poorer than the general population.¹⁵

However, both data produce similar and consistent patterns of the incidence of child labor across locations and their changes over time. First, both data sources indicate that the incidence of child labor in rural areas is roughly three times higher of that in urban areas. Second, both data sources also indicate that the incidence of child labor both in urban and rural areas slightly declined between 1998 and 1999. This proves that the 100 Village Survey data can be reliably used as a data source for analyzing the phenomenon of child labor in Indonesia. Therefore, the source of all data analyzed and presented in the rest of the paper is the 100 Village Survey.

¹⁴ Every year Sakernas is conducted in the month of August.

¹⁵ An alternative data source for child labor in Indonesia is the National Socio-economic Survey (Susenas). This nationally representative data indicates that the incidence of child labor among children aged ten to fourteen years in 1999 is 6.89%, which is quite close to the figure from Sakernas.

III. THE PROFILE OF CHILD LABOR

Consistent with the slight decline in the incidence of child labor among children aged ten to fourteen years (see Table 1), the 100 Village Survey data indicates that the incidence of child labor among children aged five to fourteen years also slightly declined from approximately 6% in 1998 to 5.4% in 1999.¹⁶ This decline in the incidence of child labor is in line with the stabilization of the general macroeconomic environment in 1999 after the economic turbulence during 1998.¹⁷

The child labor phenomenon is related to the characteristics of the individual children themselves, as well as the characteristics of their families and the communities where they live. To identify the factors that are associated with the child labor phenomenon in Indonesia, this section explores these characteristics. Guided by findings from previous studies, the characteristics considered include those of the children themselves as well as those of the households and the household heads.

A. Child Labor Characteristics

Age

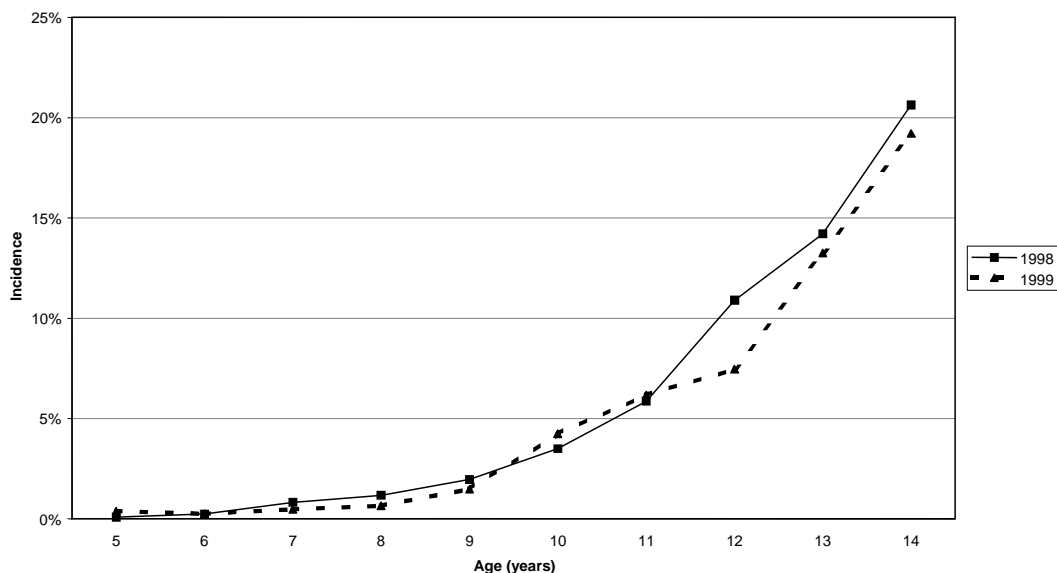
The labor market participation of children is importantly influenced by their age. The older a child, the higher its mental and physical ability to work, and hence, *ceteris paribus*, the higher the probability to enter the labor market.¹⁸ This is clearly shown by Figure 1, which points out that labor market participation of children increases by age at an increasing rate. The figure shows that the incidence of child labor among children at the age bracket of five to nine years is quite low and more prevalent at the age bracket ten to fourteen years. Among children aged between five and seven years, the incidence of child labor is less than 1%. Likewise, among children aged eight and nine years, those who worked still constitute less than 2%. Afterward, the incidence of child labor increases exponentially from around 4% among children aged ten years to around 20% among children aged fourteen years. Because of this, more than 90% of working children are aged between ten to fourteen years.

¹⁶ ILO (2002) estimates that in the year 2000 the incidence of child labor among children aged five to fourteen years in Asian and Pacific countries is around 19%, in Latin America around 16%, in Sub-Saharan Africa around 29%, while in developed countries only around 2%. This confirms that the incidence of child labor in Indonesia is relatively low compared to other developing countries.

¹⁷ See Suryahadi *et al.* (2003).

¹⁸ The relationship between age and labor market participation for adult is more complicated, but in general tends to have a reversed-U shape. See, for example, Killingsworth (1983).

Figure 1. The Incidence of Child Labour by Age



Source: 100 Village Survey

Gender

Similar to the findings from other countries, there are differences in the child labor phenomenon between boys and girls in Indonesia. Table 2 shows the incidence and distribution of child labor by gender. The table indicates that child labor is significantly more prevalent among boys than girls. The incidence of child labor among boys is approximately 7 to 8%, while among girls the incidence is only a half of it at around 4%. As a result, boys make up around 65% of all working children and girls make up the remaining 35%.

Table 2. The Incidence and Distribution of Child labor by Gender of Children (%)

Gender of Children	1998		1999	
	Incidence of Child Labor	Distribution of Child Labor	Incidence of Child Labor	Distribution of Child Labor
Male	7.79	65.92	6.80	64.45
Female	4.20	34.08	3.99	35.55
Total	6.03	100.00	5.44	100.00
N	11,822	713	11,892	647

Note: N in the incidence column shows the total number of children in the sample, while N in the distribution column shows the number of children who work.

Source: 100 Village Survey.

This pattern is consistent with the findings from Peru and Pakistan reported in Ray (2000). In these countries, the incidence of child labor is also higher for boys than girls. However, this is in contrast with the findings in Ghana reported in Blunch and Verner (2000), where the incidence of child labor in this country is higher among girls than boys. They argue that this is the result of discrimination by favouring boys over girls for access to education, so the probability that girls will be sent to work is higher than boys.

B. Household and Household Head Characteristics

Gender

The child labor phenomenon is also related to the gender of the household heads. However, contrary to the pattern of child labor according to the gender of the children, child labor is more prevalent among households headed by females than by males. Table 3 shows the incidence and distribution of child labor by gender of household heads. While the incidence of child labor among male-headed households is around 5 to 6%, the incidence among female-headed households is significantly higher at around 9 to 10%. Nevertheless, since households headed by females make up only a small minority of the population, working children who come from male-headed households still make up more than 90% of the all working children.

Table 3. The Incidence and Distribution of Child labor by Gender of Household Head (%)

Gender of Household Head	1998		1999	
	Incidence of Child Labor	Distribution of Child Labor	Incidence of Child Labor	Distribution of Child Labor
Male	5.84	91.87	5.24	91.19
Female	9.45	8.13	8.88	8.81
Total	6.03	100.00	5.44	100.00
N	11,822	713	11,892	647

Note: N in the incidence column shows the total number of children in the sample, while N in the distribution column shows the number of children who work.

Source: 100 Village Survey.

In qualitative poverty studies, female-headed households are often identified as the poorest of the poor. However, this has been difficult to corroborate in quantitative studies. Such studies usually find that the poverty rates among female-headed households are more or less equal to the poverty rates among male-headed households.¹⁹ The finding of this study, which demonstrates that child labor is more prevalent among female headed households than among male headed households, lends some support to the findings from qualitative studies that indeed, in general, female headed households are more vulnerable than male headed households.

Education Level

Studies in other countries have shown that the higher the level of education of the household head, the lower the incidence of child labor.²⁰ This is also observed in the case of Indonesia as shown in Table 4. It clearly demonstrates that the incidence of child labor quickly diminishes with higher levels of education of household heads. The incidence of child labor among households headed by those who do not complete primary education is 7.5-8%, while the incidence among households headed by those who attain tertiary education is only around 1% or less.

¹⁹ See, for example, Dreze and Srinivasan (1997), Glewwe and Hall (1998), and Suryahadi and Sumarto (2003).

²⁰ See Canagarajah and Coulombe (1997) for Ghana and Ray (2000) for Peru and Pakistan.

**Table 4. The Incidence and Distribution of Child labor
By Level of Education of Household Heads (%)**

Education Level of Household Heads	1998		1999	
	Incidence of Child Labor	Distribution of Child Labor	Incidence of Child Labor	Distribution of Child Labor
Not completed primary school	7.89	62.83	7.45	59.20
Completed primary school	5.10	27.77	4.68	31.38
Completed junior secondary school	4.51	5.75	3.67	5.87
Completed senior secondary school	2.31	3.65	1.80	3.09
Completed tertiary education	0.00	0.00	1.12	0.46
Total	6.03	100.00	5.44	100.00
N	11,822	713	11,892	647

Note: N in the incidence column shows the total number of children in the sample, while N in the distribution column shows the number of children who work.

Source: 100 Village Survey

This finding implies that households headed by persons with higher levels of education are less likely to send their children to work than households headed by persons with lower levels of education. In fact, more than 90% of all working children come from households headed by persons who only have primary school education or less, while the rest are almost all come from households headed by persons with secondary education.

Socio-Economic Level

The literature often characterizes the phenomenon of child labor as a symptom of poverty. Hence it is often argued that child labor is a function of family income.²¹ Table 5 shows the incidence and distribution of child labor by quintiles of per capita household expenditure. The table confirms that the higher the per capita expenditure quintile, which implies the better off the households, the lower the incidence of child labor. While the incidence of child labor in the two poorest

²¹ See, for example, Edmonds and Turk (2002) and Grootaert (1998).

quintiles is around 6 to 7%, the incidence of child labor in the richest quintile is only around 2 to 3%. As a result, around 60% of all working children come from households in the two poorest quintiles.

Table 5. The Incidence and Distribution of Child labor by Quintiles of Per Capita Household Expenditure (%)

Quintile of Per Capita Household Expenditure	1998		1999	
	Incidence of Child Labor	Distribution of Child Labor	Incidence of Child Labor	Distribution of Child Labor
I (poorest)	6.85	34.36	6.31	36.63
II	6.85	26.93	6.10	26.58
III	5.62	17.81	4.84	16.85
IV	5.71	15.15	5.56	15.46
V (richest)	3.18	5.75	2.29	4.48
Total	6.03	100.00	5.44	100.00
N	11,822	713	11,892	647

Note: N in the incidence column shows the total number of children in the sample, while N in the distribution column shows the number of children who work.

Source: 100 Village Survey.

While Table 5 confirms that the child labor phenomenon is related to poverty, one might expect that the pattern would be sharper than suggested by this table. There are two possible explanations for this. First, as mentioned earlier, the 100 Village Survey focuses on relatively poor areas. Therefore, households in higher quintiles in this data might still be considered relatively poor compared to the general population. Second, the total household expenditure calculated here includes those financed by incomes of child labor. Excluding this source of family income will lower the relative position of households with child labor in the higher quintiles and sharpens the pattern.

Urban-Rural Location

In many countries, child labor are mostly found as a rural phenomenon.²² This is also confirmed in the case of Indonesia. Table 6 highlights the incidence and distribution of child labor across urban and rural areas. The table indicates that the incidence of child labor in rural areas is approximately 6 to 7%, much higher than the incidence in urban areas, which is around 2 to 3%. Because of this, working children in rural areas make up more than 90% of all child labor.

**Table 6. The Incidence and Distribution of Child labor
by Urban-Rural Location (%)**

Location	1998		1999	
	Incidence of Child Labor	Distribution of Child Labor	Incidence of Child Labor	Distribution of Child Labor
Urban	2.67	8.84	1.84	6.80
Rural	6.87	91.16	6.34	93.20
Total	6.03	100.00	5.44	100.00
N	11,822	713	11,892	647

Note: N in the incidence column shows the total number of children in the sample, while N in the distribution column shows the number of children who work.

Source: 100 Village Survey.

Sector of Employment

Since child labor is mostly a rural phenomenon, it is not surprising that most of child labor work in the agricultural sector.²³ In Indonesia, not only most child labor work in the agricultural sector, most of them also come from households headed by people who work in agriculture. Table 7 shows that more than three-quarters of all child labor are employed in agriculture. Likewise, about the same proportion come from households whose heads are employed in agriculture.

²² For example, based on the results of the Ghana Living Standard Survey, Canagarajah and Coulombe (1997) find that more than 90% of child labor exists in rural areas. Similarly, Edmonds and Turk (2002) find that children in rural Vietnam are more likely to work than those in urban areas. See also Basu (1999).

²³ Canagarajah and Coulombe (1997) find that the fluctuation in the incidence of child labor corresponds with the trend in agricultural income and most of the children who were working were involved in household level agricultural activities in family farms and enterprises.

Table 7. The Relationship Between Child Labor's Employment Sector and Household Head's Employment Sector (%)

Child Labor's Employment Sector	Household Head's Employment Sector			Total
	Agriculture	Industry	Services	
1998:				
Agriculture	83.64	52.70	42.70	75.32
Industry	8.91	37.84	14.61	12.62
Services	7.45	9.46	42.70	12.06
N	550	74	89	713
Row percentage	77.14	10.38	12.48	100
1999:				
Agriculture	83.14	44.44	61.54	76.66
Industry	10.39	36.11	9.23	13.14
Services	6.47	19.44	29.23	10.20
N	510	72	65	647
Row percentage	78.83	11.13	10.05	100

Source: 100 Village Survey.

Furthermore, the table shows that no matter what employment sector the household heads have, the majority of their children who work do so in the agricultural sector. Nevertheless, the table also indicates that the choice of employment sector of child labor is still affected to some degree by the employment sector of their household heads. This is shown by the fact that quite a significant proportion of the working children have the same employment sector as their parents.

C. Comparison with Poverty Profile

The profile of child labor as discussed in this section turns out to largely mirror the profile of poverty. Like child labor, poverty in Indonesia is largely a rural phenomenon, most of the poor have a livelihood in the agricultural sector, as well as very much determined by the educational attainment of household heads.

In 1999, while the incidence of poverty in the urban areas was around 17%, the poverty incidence in rural areas was around 35%, doubled the incidence in urban areas.²⁴ Since the population in rural areas make up 60% of the total population, this implies that fully 75% of the poor live in rural areas.

²⁴ Suryahadi and Sumarto (2003).

In terms of employment sector, agriculture is the sector that always has the highest poverty incidence. In 1999, the poverty incidence among households with the heads working in the agricultural sector is around 40%, much higher than poverty incidence in the industry and services sectors. As a result, around 60% of all the poor come from households with the heads working in the agricultural sector.²⁵

Finally, poverty is very much determined by educational attainment of household heads. The lower the education level of household heads, the higher the poverty incidence. In 1999, the poverty incidence among households with heads who did not complete primary schools and illiterate is around 48%, while among households with heads who did not complete primary schools but literate the poverty incidence is around 37%, and among households with heads who completed primary schools the incidence is around 30%. Beyond primary education, the poverty incidence drops very significantly. Among households with heads who completed lower secondary schools the poverty incidence is around 17%, drops further to around 9% among households with heads who completed upper secondary schools, while among households with heads who completed tertiary education the poverty incidence is only less than 2%. As a result, more than 85% of all the poor come from households with heads who have only primary education or less.²⁶

This description clearly points out that the profile of child labor mirrors the profile of poverty. This confirms evidence from other countries, which also suggests that there is a strong link between child labor and poverty. Because of this, poverty is generally viewed as the main determinant of child labor.²⁷ The following section formally examines the determinants of child labor in Indonesia.

²⁵ Pradhan *et al.* (2000).

²⁶ Pradhan *et al.* (2000).

²⁷ See Blunch and Verner (2000), Krueger (1996), and Ray (2000).

IV. DETERMINANTS OF CHILD LABOR

The previous section explores some individual and household characteristics associated with the child labor phenomenon, where each characteristic is examined independently of each other. In this section, the effects of these characteristics on influencing whether or not a child works are examined simultaneously, controlling for each other effect. The purpose is to estimate the net effect of each characteristic on the decisions of households whether to send their children to the labor market or not. The analysis here is done at household level in keeping with the literature where most formal analyses of child labor are closely related to the modelling of household behaviour and household decision-making.²⁸

The model estimated is a limited-dependent-variable model, where the dependent variable is a dummy variable of whether or not a household has at least one child aged five to fourteen years who works. Meanwhile, the independent variables are age and gender of child²⁹; per capita expenditure, size, dependency ratio.³⁰ and urban-rural location of household; age, gender, education level, employment sector, and working status of household head; controlled by district dummy variables. The model is estimated using a panel data of households in the sample who were interviewed in both the 1998 and 1999 survey rounds and have at least one child aged five to fourteen years.

Two estimation methods are employed: probit and iv-probit. To take into account the panel nature of the data, in both estimation methods the standard errors calculated are the robust standard errors with clustering at the household level. The instrumental variable (iv) probit method is employed to take into account the fact that a child's participation in the labor market affects household income and expenditure. Therefore, there is a high probability that the per capita household expenditure variable in the model is endogenous. To overcome this problem, in the iv-probit estimation this variable is instrumented using household ownership of various assets.

The estimation results are presented in Table 8. Using probit, the coefficient of per capita household expenditure variable is statistically insignificant. When the model is estimated using iv-probit, however, the coefficient becomes much larger and highly statistically significant. This indicates that indeed the per capita household expenditure variable in the model is endogenous. Therefore, the discussion in this section is based on the results of the estimation using iv-probit.

²⁸ See Basu (1999), Basu and Van (1998), Rosenzweig and Evenson (1977).

²⁹ When a household has more than one children aged five to fourteen years, the age variable is represented by the age of the oldest child, meanwhile the gender variable is defined as whether or not the household has a male child.

³⁰ Dependency ratio here is defined as the ratio of the number of household members not in the labor force to the number of household members in the labor force.

Table 8. The Determinants of Child labor at the Household Level

Independent variable	Probit	IV-Probit ^a
Age of child	0.0119** (0.0007)	0.0118** (0.0007)
Male child	0.0154** (0.0023)	0.0153** (0.0022)
Per capita household expenditure	-0.0038 (0.0029)	-0.0219** (0.0052)
Household size	0.0003 (0.0007)	0.0007 (0.0007)
Dependency ratio	0.0473** (0.0080)	0.0444** (0.0079)
Rural	0.0151** (0.0024)	0.0131** (0.0025)
Age of household head	0.0002* (0.0001)	0.0002 (0.0001)
Female household head	0.0297** (0.0085)	0.0264** (0.0080)
Education of household head: Senior secondary & tertiary	-0.0116** (0.0031)	-0.0085* (0.0035)
Employment sector of household head: Agriculture	0.0163** (0.0025)	0.0141** (0.0025)
Working status of household head: Unpaid family worker	0.0072* (0.0028)	0.0074* (0.0027)
District dummies	Yes	Yes
Pseudo R-squared	0.2544	0.2575
Number of observations	12,829	12,829

Notes: - The coefficients are in terms of marginal probability (dF/dx).

- Number in parentheses are standard errors.

^a The instrumental variables used are household ownership of assets.

** = significant at 1% level.

* = significant at 5% level.

The estimation results confirm that both children's and households' characteristics affect the decision of households whether or not to send their children to work. The coefficient of age of child variable is positive and statistically significant, confirming that the older a child the higher the probability to be sent to work. Furthermore, the coefficient of the male child variable, which is positive and significant, also confirms that male children have higher probability to be sent to work than female children.

Meanwhile, the coefficient of per capita household expenditure variable, which is negative and significant, indicates that higher per capita expenditure leads to lower probability of households sending their children to work, confirming that consumption poverty is a determinant of child labor. The coefficient of household size is not significant, but the coefficient of dependency ratio is positive and significant. This indicates that it is the structure rather than the size of household which is more important in determining whether or not a child will be sent to work. Households with higher dependency ratio have a higher tendency to send their children to work. As expected, rural households have greater tendency to send their children to work than urban households.

The estimation results also indicate that household head characteristics have important contributions to household decision on whether or not to send a child to work. While age of household head has no effect on the decision to send a child to work, gender does. Households headed by females have significantly higher probability to send their children to work than households headed by males. The level of educational attainment of household head has a negative effect on the incidence of child labor, confirming that better-educated household heads are less likely to send their children to work.³¹ Household heads who work in the agricultural sector are more likely to require their children to work than those who work in the non-agricultural sector. Finally, household heads who themselves work as family workers are also more likely to have their children work than those who work as self-employed or wage laborers.

³¹ This is net of the effect of higher level of education through higher household income. This finding is consistent with the existence of a strong intergeneration educational link found by studies in developed countries. However, there is still a controversy on its reasons between education spillover (e.g. Chevalier, 2003) and genetic (e.g. Black *et al.*, 2003) effects.

V. TRADE-OFF BETWEEN SCHOOL AND WORK

Recent studies on child labor have focused on the economic question of whether child labor is 'efficient' or not. The choice for parents is whether to send their children to school or to work. By sending children to school, they lose current income but gain through higher future income. On the other hand, if parents send their children to work they gain in current income but, by hampering the human capital development of children achieved through education, they suffer with lower future income. Some conditions may force parents to demand too much labor from children, so that child labor becomes inefficient. Examples of such conditions include: when the private returns to education are lower than the social returns; or when the capital market is imperfect, so that parents cannot borrow for either financing their children's education or smoothing consumption.³²

The consequence of this situation is undesirable. The ILO argues that child labor perpetuates poverty. This is because child labor interferes with the human capital development of children by either forcing children to drop out of schools or making learning process in schools ineffective.³³ Some studies have examined the relationship between child labor phenomenon and school participation rate of children. In general, the findings of these studies confirm that working has a negative impact on the rate of school participation for children.³⁴

Yet, other studies have found that, in some areas, both working and attending school are actually compatible. Studies in India demonstrate that child labor in rural areas is often 'light',³⁵ so that children are able to obtain an education without seriously affecting their work commitments.³⁶ Child labor can assist poor families to fulfil their needs without sacrificing the children's future. In fact, some children may not be able to go to school without working. In this case, education and work go together, so that there are also positive effects from the phenomenon of child labor. To examine the relationship between attending school and working for children in Indonesia, this section analyzes the trade-off between the two activities. This is done by first comparing the school enrolment status of children who work and who do not work, then examining the amount of time allocated for work by children who work full-time and who work part-time, and finally looking deeper at the role of poverty in influencing children to drop out of schools and take up work.

³² See Baland and Robinson (2000), Basu (1999), Dehejia and Gatti (2002), Grootaert and Kanbur (1995), Jacoby and Skoufias (1997), and Ranjan (2001).

³³ ILO (2002). See also Edmonds and Turk (2002).

³⁴ See, for example, Ray (2000).

³⁵ ILO describes light work for children as work that is appropriate for their age and level of maturity. By doing light work, children learn to take responsibility, gain skills, and add to their families' and their own well-being and income, and contribute to their countries economies (ILO 2002).

³⁶ See Basu (1999).

A. School Enrolment

The reasons for children participating in the labor market are mostly related to economic hardship. Consequently, many children enter the labor market either to support their families in maintaining their consumption levels or to pay for their education. With a light workload, working and attending school can be compatible. In Vietnam, for example, for the majority of child labor it is possible to both go to school and simultaneously work in the agricultural sector.³⁷

As hours of work increase, however, work and school become less and less compatible. A working child may still be enrolled in school, but being enrolled in school does not ensure the time is spent in class. Moreover, despite school enrolment, working could reduce the children's energy to study properly and do their homework. Hence, being in class is only a necessary but not a sufficient condition for learning.³⁸

The first step for examining the trade-off between attending school and working is to look at the school enrolment status of all children who currently work. Although it is true that school enrolment does not provide all information about learning, it is still useful to know to what extent work displaces formal schooling. Table 9 shows the school enrolment status of child labor across age groups. Approximately half of the child labor aged five to fourteen years are still enrolled in schools.³⁹ This confirms that working does not always completely eliminate the opportunity for children to obtain a formal education. Among the remaining that do not attend schools, around 45% are school dropouts, while the rest 5% have never or not yet enrolled in school. Among this latter group, some might eventually enrol in school, but some others might never obtain any formal education at all.

³⁷ Edmonds and Turk (2002).

³⁸ Furthermore, apart from school and work, children are also involved in other activities, which Ravallion and Wodon (1999) group together as 'leisure'. Therefore, they argue that in reality there is no one-to-one relationship between school and work.

³⁹ Canagarajah and Coulombe (1997) find that in Ghana in 1992, around two thirds of the total number of children who worked were also going to school.

Table 9. School Enrolment Status of Child Labor by Age Group (%)

School Enrolment Status	1998			1999		
	5-9 yr	10-14 yr	5-14 yr	5-9 yr	10-14 yr	5-14 yr
Never/not yet enrolled	19.61	3.32	4.49	25.64	3.45	4.79
Still enrolled	72.55	49.24	50.91	66.67	50.16	51.16
No longer enrolled	7.84	47.43	44.60	7.69	46.38	44.05
N	51	662	713	39	608	647

Source: 100 Village Survey.

However, it is important to bear in mind that the figures in Table 9 do not necessarily imply causality. It is not the case that all of the 50% working children that do not attend schools do so because they have to work. It is true that for some children the need to work for income causes them to drop out of school or delay enrolment. For others, however, it could be the case that they first dropped out of schools for various reasons and later take up some work to utilize idle time.

To examine to what extent working actually reduces school enrolment rates, Table 10 compares the rate of school participation between child labor and children who do not work. Each cell in this table has two numbers, where the top number shows the row percentage and the bottom number shows the column percentage. For example, in 1998, among all children who attended school (the first row), 96% did not work and 4% are classified as child labor. Meanwhile, among all children who did not work in 1998 (the first column), 79% attended school and 21% did not attend school.

Table 10. School Participation Rates of Children by Working Status (%)

School enrolment status	1998			1999		
	Not working	Working	Total	Not working	Working	Total
Attending school	96.03	3.97	100.00	96.42	3.58	100.00
	79.07	50.91	77.37	79.20	51.16	77.67
Not attending school	86.92	13.08	100.00	88.10	11.90	100.00
	20.93	49.09	22.63	20.80	48.84	22.33
Total	93.97	6.03	100.00	94.56	5.44	100.00
	100.00	100.00	100.00	100.00	100.00	100.00
N	11,109	713	11,822	11,245	647	11,892

Note: In each cell, the top number is a row percentage and the bottom number is a column percentage.
Source: 100 Village Survey.

Table 10 indicates that while around 50% of working children attend school, around 80% of children who do not work attend school. Hence, there is a difference of approximately 30% in the enrolment rates between the two groups of children. This 30% difference more or less indicates the extent of reduction in school enrolment rate among children due to working. In other words, children who work on average have 30% lower probability to attend school than those who do not work.⁴⁰

On the other hand, among children who drop out of schools, and in particular for dropped-out girls, the majority of them do not take up work. Table 11 shows the level of educational attainment and working status of dropped-out children. It shows that among all the children who dropped out of school, approximately 95% left their education at the primary level. This is true for both male and female dropouts as well as for both working and non-working dropouts. Furthermore, the table points out that among male dropouts, around 45 to 50% take up work, while among female dropouts only around 20% who take up work. This indicates that the need to work to earn income is not the most important reason for children, in particular for girls, to drop out of school.

⁴⁰ Edmonds and Turk (2002) also find that school enrolment rates in Vietnam are higher for children who do not work. In 1993, 88% of children aged twelve to thirteen years who were not working were enrolled in schools, but only 71% of the same age children who were working attended schools that year.

Table 11. Level of Educational Attainment and Working Status of Children Who Dropped-out of School

Educational Attainment	Male Children			Female Children		
	Working	Not working	Total	Working	Not working	Total
1998						
Primary school	50.00	50.00	100.00	20.81	79.19	100.00
	96.46	94.37	95.40	94.57	94.03	94.14
Junior secondary school	38.10	61.90	100.00	19.23	80.77	100.00
	3.54	5.63	4.60	5.43	5.97	5.86
Total	49.45	50.55	100.00	20.72	79.28	100.00
	100.00	100.00	100.00	100.00	100.00	100.00
N	226	231	457	92	352	444
1999						
Primary school	45.70	54.30	100.00	21.41	78.59	100.00
	94.90	92.86	93.78	92.13	94.36	93.87
Junior secondary school	37.04	62.96	100.00	28.00	72.00	100.00
	5.10	7.14	5.96	7.87	5.64	6.13
Total	45.16	54.84	100.00	21.81	78.19	100.00
	100.00	100.00	100.00	100.00	100.00	100.00
N	196	238	434	89	319	408

Note: In each cell, the top number is a row percentage and the bottom number is a column percentage.
Source: 100 Village Survey.

B. Time Allocation

The extent of the trade-off between working and attending school among child labor also depends on how much time is spent for working. Table 12 compares the number of working days and working hours between working children who attend school and those who do not. The table shows that even though these two groups of child labor have a similar average work days of six days per week, the average work hours of working children not attending school is clearly much higher than those still attending. Working children attending schools on average work approximately seventeen hours per week, or less than three hours per day. Meanwhile, those who do not attend school on average work twenty-nine to thirty hours per week, or approximately five hours per day. In addition, the table also indicates that male and

female child labor have similar average work days per week. However, the average work hours per week of male child labor is around one to three hours longer than that of female child labor.

Table 12. Average Work Days and Work Hours per Week of Child Labor

	N	Work Days per Week			Work Hours per Week		
		Total	Male	Female	Total	Male	Female
1998							
All child labor	713	6.02 (1.57)	5.97 (1.59)	6.11 (1.54)	22.78 (14.44)	23.58 (14.67)	21.22 (13.90)
- Attending school	363	6.03 (1.67)	6.00 (1.67)	6.09 (1.66)	16.66 (9.45)	16.95 (9.18)	16.19 (9.87)
- Not attending school	350	6.01 (1.47)	5.95 (1.50)	6.13 (1.37)	29.12 (15.93)	29.61 (16.07)	27.94 (15.60)
1999							
All child labor	647	5.86 (1.46)	5.91 (1.42)	5.77 (1.53)	23.17 (13.76)	24.02 (13.86)	21.63 (13.49)
- Attending school	331	5.76 (1.50)	5.86 (4.49)	5.61 (1.50)	16.64 (7.89)	17.06 (7.83)	15.97 (7.98)
- Not attending school	316	5.97 (1.41)	5.96 (1.35)	5.97 (1.54)	30.01 (15.22)	30.61 (15.07)	28.74 (15.51)

Note: Numbers in parentheses are standard deviations.

Source: 100 Village Survey.

Table 12 clearly shows that working full-time is not compatible with attending school. On the other hand, working part-time may still provide some room for children to pursue their education. In fact, it is quite possible that without taking the part-time work, these children will not be able to attend school due to financial reason. This, however, has to be discounted by the probability that working children have less time to study and do homework outside school hours compared to those who do not work. Nevertheless, a combination of attending school and part-time work may still be considered more desirable than not attending school at all.

C. The Role of Poverty

Canagarajah and Coulombe (1997) find that poverty is negatively correlated with household decision to send children to school. They also find that there is a significant negative relationship between going to school and working. Therefore, they believe that increasing the demand for schooling is the effective way to reduce the child labor phenomenon.

Similarly in Indonesia, the data strongly suggests that poverty is the main reason for children dropping out of school. Table 13 outlines the reasons for children to drop out of school. Among the children in the sample who are school dropouts, around 95% left school at the primary level. The table indicates that “costs and other financial reasons” dominates the reasons for children to leave school. Around 50 to 80% of the dropouts cite this as the reason they left school. Furthermore, another closely related reason, “helping parents work”, is cited by 8 to 17% of child labor, while only a small number of children who do not work considers this as a reason for leaving school. Presumably, the necessity to help parents work is due to more severe poverty and hence cited much more by the dropouts who work.

Table 13. Reasons of Children Dropping-out of School (%)

	Primary School		Junior Secondary School	
	Working	Non-working	Working	Non-working
	Children	Children	Children	Children
1998				
Costs and other financial reasons	68.20	74.13	76.92	79.41
Helping parents work	12.46	0.91	7.69	5.88
Doing household chores	0.33	1.82	-	-
Too long distance to school	6.89	7.47	-	5.88
Enough education	4.26	4.01	-	5.88
Getting married	0.66	1.28	-	-
Academically unable	7.21	10.38	15.38	2.94
N	305	549	13	34
1999				
Costs and other financial reasons	60.07	71.26	52.94	68.57
Helping parents work	16.79	1.53	11.76	-
Doing household chores	0.37	0.96	-	2.86
Too long distance to school	7.84	14.94	5.88	5.71
Enough education	6.72	4.41	11.76	-
Getting married	0.37	-	-	5.71
Academically unable	7.84	6.9	17.65	17.14
N	268	522	17	35

Source: 100 Village Survey.

Other reasons to leave school that are related to poverty are “doing household chores” and “too long distance to school”. Doing household chores is obviously not an important reason for children to drop out of schools as very few of the dropouts cite this reason. Distance to school, on the other hand, seems to be a major obstacle for a significant number of children to attend school. Therefore, providing school facilities closer to the residences of these children, reducing the transportation cost, or subsidizing these children (or their families) to attend school are policy options that can be considered to assist them maintaining school enrolment.

While poverty is the most important reason for children to leave school, more severe poverty is the reason for children to take up work. Table 14 compares the means of real per capita household expenditure for various groups of children. As expected, the mean of per capita household expenditure of child labor is always lower than that of children who do not work. Similarly, children who do not attend school come from households that have lower real per capita expenditure than those who attend schools.

Table 14. Mean of Household Real per Capita Expenditure of Various Groups of Children (Rp/month)

School Enrolment Status	1998			1999		
	Not working	Working	Total	Not working	Working	Total
Attending school	80,266 (48,307)	68,376 (33,708)	79,794 (47,868)	87,448 (46,636)	70,957 (31,379)	86,857 (46,276)
Not attending school	71,024 (40,030)	65,453 (29,508)	70,295 (38,857)	79,619 (41,232)	67,289 (29,096)	78,152 (40,176)
Total	78,332 (46,846)	66,941 (31,728)	77,645 (46,154)	85,820 (45,674)	69,166 (30,318)	84,914 (45,130)
N	11,109	713	11,822	11,245	647	11,892

Note: Numbers in parentheses are standard deviations.

Source: 100 Village Survey.

Furthermore, the table shows that working children not attending schools are indeed the poorest group of children. Slightly above this group are working children who still attend school. These two groups of child labor have around 5% difference in their means of household per capita expenditure. Interestingly, the mean of household per capita expenditure of working children who still attend school is even lower than the mean of household per capita expenditure of dropped-out children who do not work. This implies that child labor is indeed the poorest among children.

VI. CONCLUSION

Although lower than other developing countries at a similar stage of development, the problem of child labor in Indonesia is significant. Confirming findings from other countries, this study finds that there is a strong link between child labor and poverty. The profile of child labor largely mirrors the profile of poverty, and poverty is found to be an important determinant of working for children. Both child labor and poverty in Indonesia are largely rural and agricultural phenomena, and both are very much related to the education levels of household heads. Moreover, this study finds that indeed child labor is the poorest group among children.

However, this study finds that working does not always completely eliminate a child's opportunity to obtain a formal education, as only a half of child labor do not attend school. Nevertheless, children who work have 30% lower probability to attend school than those who do not work. The difference between child labor who attend school and those who do not is also related to poverty. The latter group of children apparently comes from poorer households than the former, which indicates that more severe poverty is the reason for children taking up full-time work.

These findings support the notion that there is a vicious cycle between poverty and child labor. The supply of child labor mostly comes from poor households headed by persons with no or very low levels of formal education. On the other hand, to some extent, working is found to hamper a child's schooling. Hence, child labor have a high probability to grow up as poorly educated adults themselves and will remain poor.

Another interesting finding is that children who drop out of school but do not take up work come from households which are less poor than children who work but still attend school. This suggests that a proportion of children who come from poor households can still attend school by taking part-time work to pay for their education. This in turn implies that banning these children from working will not be of assistance. Instead, it may force them to drop out of school.

Since the phenomenon of child labor is strongly associated with and determined by poverty, the most effective policy for reducing the incidence of child labor is through poverty reduction. However, this may take a long time and, hence, other policies can be utilized to help enhancing the rate of reduction in child labor. First, since most children drop out from schools due to financial reasons, access to education for children from poor families should be made easier and cheaper. This may take the forms of building schools in the vicinity of where the poor live or subsidizing the children from poor families to attend school. Second, to reduce the incentive for households to send children to work, the opportunity cost of working needs to be increased. This requires efforts to improve the quality of education to increase the rate of return to education.

REFERENCES

- Baland, J. M. and J. A. Robinson (2000) 'Is Child Labor Inefficient?', *Journal of Political Economy* 108(4): 663-79.
- Basu, K. (1999) 'Child Labor: Cause, Consequence, and Cure, with Remarks on International Labor Standards', *Journal of Economic Literature* 37(3): 1083-119.
- Basu, K. and P. H. Van (1998) 'The Economics of Child Labor', *American Economic Review* 88(3): 412-27.
- Black, S. E., P. J. Devereux, and K. G. Salvanes (2003) 'Why the Apple Doesn't Fall Far: Understanding the Intergenerational Transmission of Human Capital', NBER Working Paper no. 10066. Cambridge, M.A.: National Bureau of Economic Research.
- Blunch, N. H. and D. Verner (2000) 'Revisiting the Link Between Poverty and Child Labor: The Ghanaian Experience', Policy Research Working Paper no. 2488. Washington, D.C.: The World Bank.
- Cameron, L. A. (2001) 'The Impact of the Indonesian Financial Crisis on Children: An Analysis Using the 100 Villages Survey', *Bulletin of Indonesian Economic Studies* 37(1): 43-64.
- Cameron, L. A. (2002) 'Did Social Safety Net Scholarships Reduce Dropout Rates during the Indonesian Economic Crisis?', Policy Research Working Paper no. 2800. Washington, D.C.: The World Bank.
- Canagarajah, S. and H. Coulombe (1997) 'Child Labor and Schooling in Ghana', Policy Research Working Paper no. 1844. Washington, D.C.: The World Bank.
- Chevalier, A. (2003) 'Parental Education and Child's Education: A Natural Experiment', mimeo. Dublin: Institute for the Study of Social Change, University College Dublin.
- Cross, J. C. (1998) 'The Informal Sector', in P. O'Hara (ed.) *Encyclopedia of Political Economy*. London: Routledge.
- Dehejia, R. H. and R. Gatti (2002) 'Child Labor: The Role of Income Variability and Access to Credit Across Countries', NBER Working Paper no. 9018. Cambridge, M.A.: National Bureau of Economic Research.
- Dreze, J. and P. V. Srinivasan (1997) 'Widowhood and Poverty in Rural India: Some Inferences from Household Survey Data', *Journal of Development Economics* 54(2): 217-34.

- Edmonds, E. and C. Turk (2002) 'Child Labor in Transition in Vietnam', Policy Research Working Paper no. 2774. Washington, D.C.: The World Bank.
- Glewwe, P. and G. Hall (1998) 'Are Some Groups More Vulnerable to Macroeconomic Shocks Than Others? Hypothesis Tests Based on Panel Data from Peru', *Journal of Development Economics* 56(1): 181-206.
- Grootaert, C. (1998) 'Child Labor in Côte d'Ivoire: Incidence and Determinants', Policy Research Working Paper no. 1905. Washington, D.C.: The World Bank.
- Grootaert, C. and R. Kanbur (1995) 'Child Labor: An Economic Perspective', *International Labor Review*, 134(2): 187-203.
- ILO (2002) *A Future without Child Labor*. Geneva: International Labor Office.
- Jacoby, H. G. and E. Skoufias (1997) 'Risk, Financial Markets, and Human Capital in a Developing Country', *Review of Economic Studies* 64(3): 311-35.
- Killingsworth, M. R. (1983) *Labor Supply*. New York: Cambridge University Press.
- Krueger, A. (1996) 'Observations on International Labor Standard and Trade', NBER Working Paper no. 5632. Cambridge, M.A.: National Bureau of Economic Research.
- Manning, C. (2000) 'The Economic Crisis and Child Labor in Indonesia', IPEC Working Paper. Geneva: International Programme on the Elimination of Child Labor, International Labor Office.
- Morice, A. (1981) 'The Exploitation of Children in the 'Informal Sector'', in G. Rodgers and G. Standing (eds) *Child Work, Poverty and Underdevelopment*. Geneva: International Labor Office.
- Portes, A. and J. Walton (1981) *Labor, Class and the International System*. New York: Academic Press.
- Pradhan, M., A. Suryahadi, S. Sumarto, and L. Pritchett (2000) 'Measurements of Poverty in Indonesia: 1996, 1999, and Beyond', Policy Research Working Paper no. 2438. Washington, D.C.: The World Bank.
- Ranjan, P. (2001) 'Credit Constraints and the Phenomenon of Child Labor', *Journal of Development Economics* 64(1): 81-102.
- Ravallion, M. and Q. Wodon (1999) 'Does Child Labor Displace Schooling? Evidence on Behavioral Responses to an Enrollment Subsidy', Policy Research Working Paper no. 2116. Washington, D.C.: The World Bank.

- Ray, R. (2000) 'Child Labor, Child Schooling, and Their Interaction with Adult Labor: Empirical Evidence for Peru and Pakistan', *World Bank Economic Review* 14(2): 347-67.
- Rosenzweig, M. R. and R. Evenson (1977) 'Fertility, Schooling and the Economic Contribution of Children in Rural India: An Econometric Analysis', *Econometrica* 25(5): 1065-79.
- Sharma, B. and V. Mittar (1990) *Child Labor and the Urban Informal Sector*, New Delhi: Deep and Deep Publications.
- Suryahadi, A. and S. Sumarto (2003) 'Poverty and Vulnerability in Indonesia Before and After the Economic Crisis', *Asian Economic Journal* 17(1): 45-64.
- Suryahadi, A., W. Widyanti, and S. Sumarto (2003) 'Short-term Poverty Dynamics in Rural Indonesia during the Economic Crisis', *Journal of International Development* 15(2): 133-44.