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Determinants, consequences, and policy implications of child labor in the Philippines

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Abstract

The paper gives a profile of the child labor situation in the country using data from the 1995 Child Labor Survey (CLS) of the National Statistics Office (NSO) and the 1998 Annual Poverty Indicator Survey (APIS) data set. It then proceeds to analyze the socioeconomic determinants of child labor in the Philippines using the 1995 CLS. A sequential probit model is estimated to measure the impact of household and individual characteristics and location variables on the probability of child labor. The paper also does a correlation analysis of the effect of economic growth on the incidence of child labor.

The results indicate that household characteristics such as poverty, family size, the education of the household head, and ownership of a family-operated enterprise impact on the labor supply and school participation of children. Locational variables reflecting demand-side aspects of child labor were also important determinants. At the macro level, economic growth is negatively correlated with the participation of children in market work.

Success in the elimination of child labor involves a comprehensive approach requiring better enforcement of child labor laws complemented by policies and programs to alleviate poverty, achieve sustained growth, provide educational access especially to the children of poor households, and help poor households achieve their desired family size.

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1. Introduction

A picture of the labor situation in the country is incomplete without an analysis of the magnitude and nature of child labor. Although official statistics on the

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country's labor force exclude children, a significant number of them are in fact economically active.

Why in the first place should there be any concern for child labor? The foremost reason is humanitarian. For many, the sight of children working long hours in sweatshops or under poor, inhumane, or dangerous working conditions is deplorable. Some feel that childhood ought to be a carefree period in a person's life devoted solely to learning and play. Society may perceive children, who are likely to have weak bargaining power in the household or workplace, as vulnerable to abuse and exploitation and therefore in need of special protection from hazardous and other unsafe forms of work as pointed out by Anker [2000].[1] Given society's "distaste" for child labor, state intervention can be justified on grounds that, like poverty reduction, it is a public good that cannot be adequately addressed by private groups because of "free rider" problems.

There may also be "too much" child labor in that the social costs of child labor far exceed the private costs. For one thing, child labor may interfere with school attendance and school performance, and a nation may forego some of the positive externalities from education when children drop out of school. Hence, interventions aimed at keeping children in school or focused on schoolwork rather than working may be socially desirable. Moreover, some forms of labor may jeopardize the health of children. As in education, poor health outcomes for children may impose costs on society, which private households do not take into account in their decisions on whether to allow their children to work or not.

Not all child labor, however, is necessarily bad for children. Anker [2000] makes a distinction between "child work"—which he considers neutral or even, to some extent, "good" for children—and "child labor", which is "bad" for children. The former consists of light nonhazardous work (including household chores) done under the supervision of parents that does not interfere with a child's schooling and may in fact instill positive values like work ethic, self-reliance, and responsibility in children while adding to family income. This kind of work can help children develop productive skills that may be useful to them when they reach adulthood. On the other hand, child labor consists of work involving the production of market goods and services that is hazardous or difficult and interferes with a child's education, whether done inside or outside the home.

Adopting this distinction, the International Labour Organization–International Programme on the Elimination of Child Labor (ILO-IPEC) defines child labor as "work that deprives children of their childhood and their dignity, which hampers their access to education and the acquisition of skills, and which is performed under deplorable conditions harmful to their health and their development" [ILO 1997:3].

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[1]This view is disturbing because it implies that society cares more about the well-being of children than the parents do. This may be true in some instances but not in most. Parents may not be aware of the consequences of their labor allocation decisions on the welfare of their children. Moreover, in their calculations, the private benefits that a family receives from child labor may far exceed the private costs (in terms of the child's welfare) given the constraints faced by the household.

National legislation also recognizes this distinction by defining child labor as the illegal employment of children below 15 years old who are not directly under the sole responsibility of their parents or legal guardian. Work performed by children under the supervision of parents and guardians is also deemed illegal when it endangers the life, safety, health, and morals of children or impairs their normal development, including schooling. The law also forbids the employment of children below 18 years old in hazardous occupations.

2. A conceptual framework

In the analysis of child labor issues, this study develops and employs a modified version of the conceptual framework proposed by Lim [2001]. Figure 1 provides a schematic illustration of the framework.

At the outset, we have to be clear about what we mean by child labor. When people speak of child labor they often mean remunerated work by children or, even if unpaid, work that results in the production of goods or services destined for the market. This definition leaves out household chores and any work producing goods or services directly consumed by the household. The study uses this conventional interpretation of child labor.

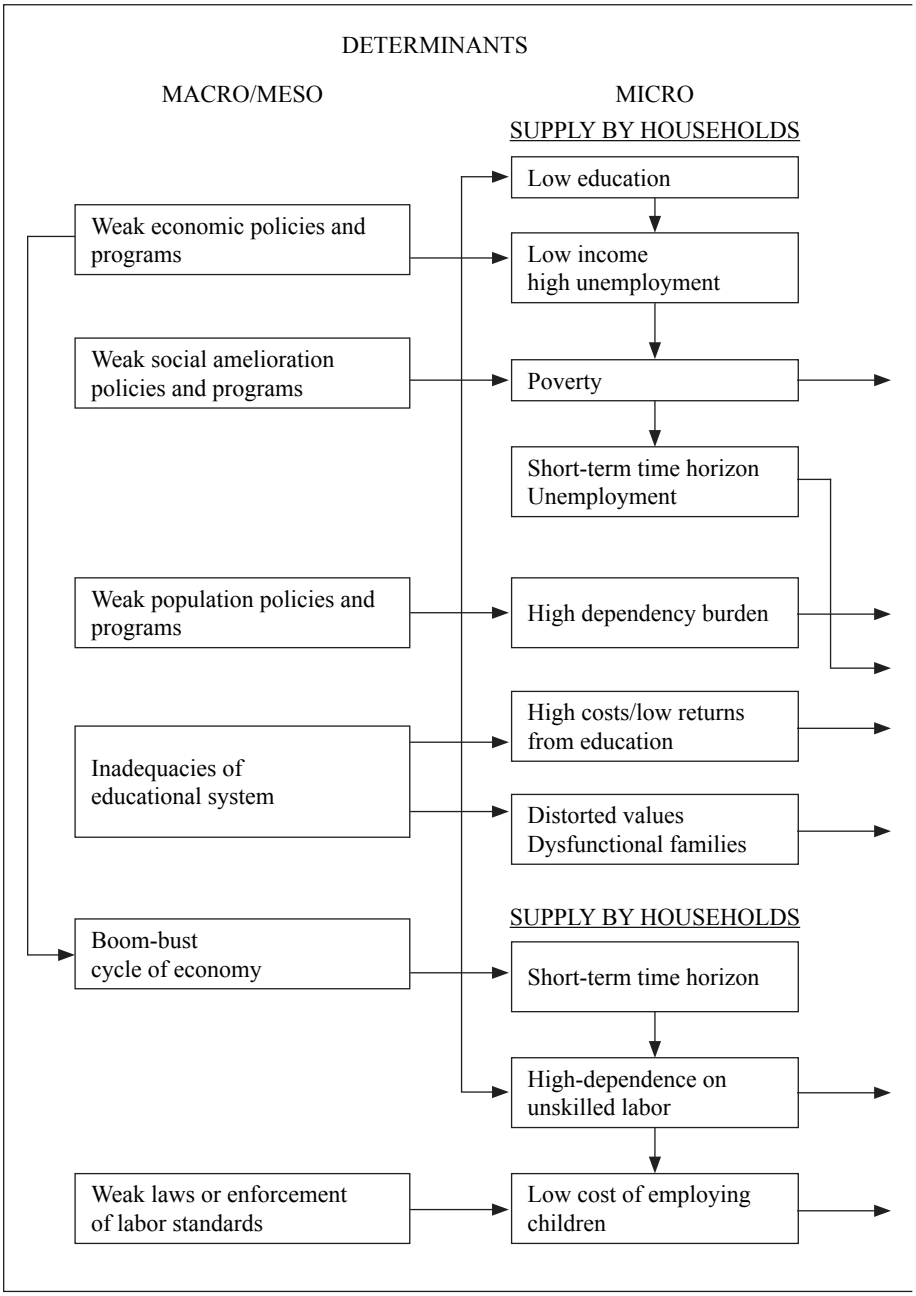
The economic and social consequences of child labor are far-reaching, encompassing both the short term and the long term. As shown in Figure 1, the impact of tolerable forms of child labor may be beneficial, particularly for poor families. The additional income provided by children may enable these households to increase expenditures on the children's education, nutrition, and other health needs. This increased investment in the human capital of the child will have positive long-term effects not only on the child but also on the household and the society.

"Bad" child labor has the opposite effect. It leads to low levels of education, poor health, and even psychological trauma when, in the course of work, the child is exposed to various forms of abuse. The child's future productivity and therefore capacity to earn are prejudiced. The long-term effect is the perpetuation of poverty and the negative externalities that inevitably arise when a significant proportion of the population of a country remains poor, uneducated, and in poor health.

Figure 1 also shows the micro factors that push families to supply child labor. When a family chooses to send young children to work at the expense of investments in their human capital, it exchanges higher future income and consumption for lower immediate income and consumption. Why would families send young children to work that interferes with their education and exposes them to health risks? The usual explanation for behavior that may seem irrational is the need for additional income by extremely poor families. Poor households need children's income when the resources and opportunities available to them are not sufficient to allow them to meet subsistence needs. Intense poverty shrinks the time horizon of households to

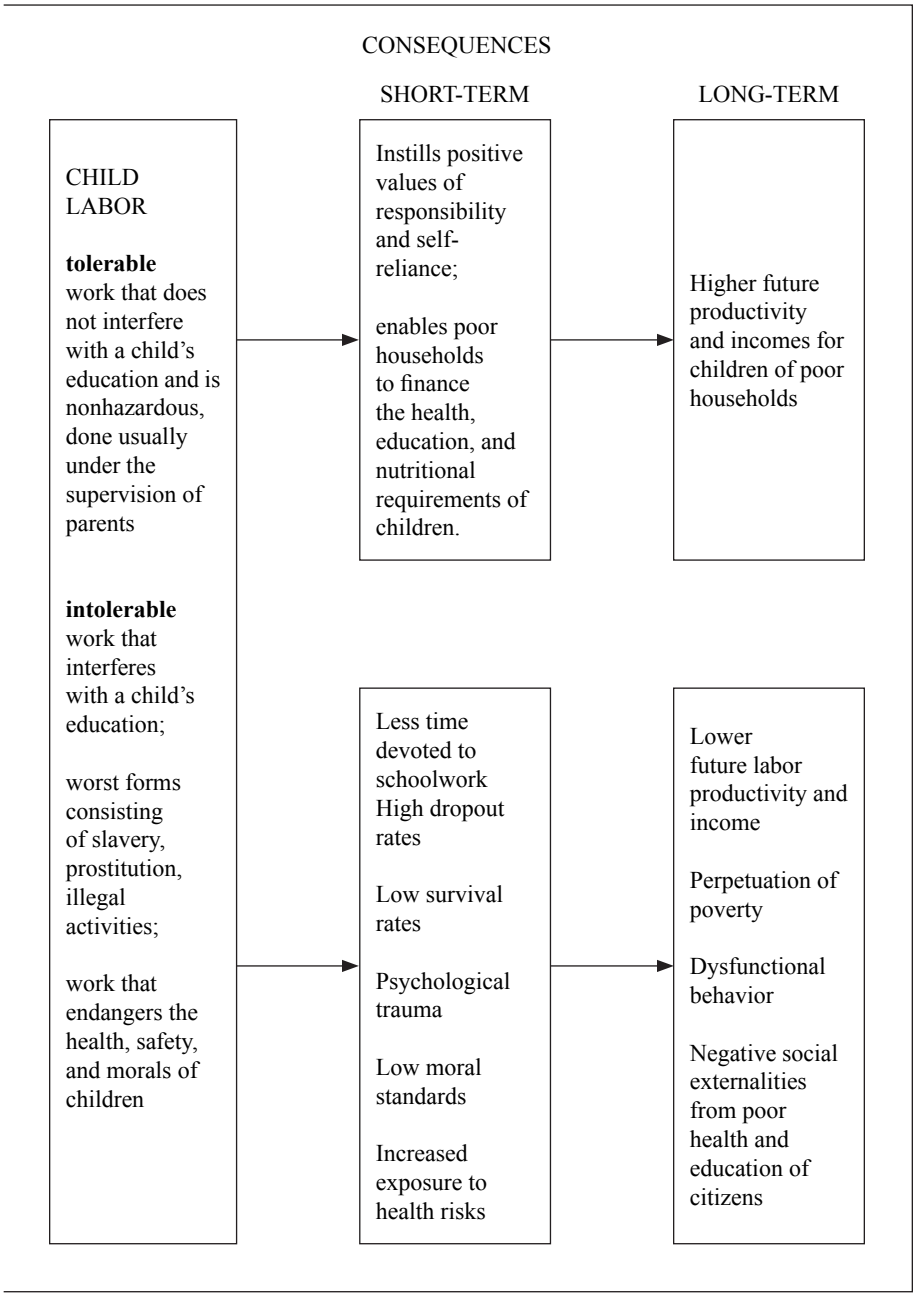
the short term. Future benefits have very little value to households whose immediate concern is survival.[2]

Figure 1. Child labor: a conceptual framework



[2]In the language of economists, the rate of time preference or the discount rate for future benefits tends to be high.

Figure 1. Child labor: a conceptual framework (continued)



Another strand in the literature tries to explain child labor as a means by which poor households cope with risk [Jacoby and Skoufias 1994]. Children work so that poor households can diversify their portfolio of income sources, a kind of insurance against fluctuations in adult income or unforeseen losses in income that may threaten the survival of the household. Child labor is more prevalent among poorer households because they are unable to save and/or do not possess assets that would enable them to borrow and smoothen out household consumption over time.

A review of the evidence by Lloyd [1994] suggests that a larger household size reduces the investment of parents in the education of children and therefore increases the likelihood that children will engage in market work. These findings are qualified by a study in the Philippines of DeGraff, Bilsborrow, and Herrin [1993] who discover that the presence of older siblings who work decreases the probability of market work by the younger siblings. These findings imply that families with a higher dependency burden are more likely to have children involved in market work. High dependency burdens are, in turn, the consequence of high fertility rates among the poor who often have little information on fertility control and limited access to more effective contraceptive methods.

The failures of the education system can be a strong factor in the supply of child labor. Poor households are likely to be headed by individuals with low levels of education and, often, their poverty can be attributed precisely to low level of human capital. The high costs of education to poor families in terms of school materials, transportation, and travel time may discourage families from enrolling children. The low quality of basic education may also reduce the returns from education and discourage families from investing in the education of their children.

The value system and personality of parents are also important factors affecting the supply of child labor. Ignorance and or distorted values may lead to decisions that are not always in the best interests of children. At the extreme, children escaping from dysfunctional households and abusive parents are forced to fend for themselves and are likely to end up in the worse forms of child labor in order to survive.[3]

The magnitude and nature of child labor are also influenced by the demand for child labor by employers.[4] Backward production technologies that rely extensively on unskilled labor favor the use of child labor as a substitute for adult labor. Many factors contribute to the proliferation of backward production methods. For one thing, firms may be constrained by the low supply of skilled workers or workers who are at least trainable. This in turn can be attributed to the low quality of education provided by schools. The preference for backward technologies may also reflect failures in credit markets. Small entrepreneurs may find it difficult or too costly to source funds for the purchase of modern skill-intensive technologies.

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[3]Dysfunctional behavior is perpetuated when children who were victims of abuse become abusive parents themselves.

[4]In the figure, we make use of the word "firm", which is loosely defined as any entity that transforms inputs into marketable outputs.

The relative importance of the informal sector also determines the demand for child labor. In particular, many children are employed in family-based enterprises where they work as unpaid laborers. These informal household activities include farming, retail trade, or small-scale manufacturing, which are undertaken directly by households or subcontracted to them by other enterprises.

Children may be preferred to unskilled adults because the former are more docile and compliant and are willing to work for lower wages. Children are favored in some illegal activities such as drug trafficking because they are more difficult to detect. The personal preferences of some individuals also play a role, such as in child prostitution.

Individuals, households, and firms also respond to the characteristics of the community in which the household or firms are situated (the meso variables) and the policies of the state (the macro variables). Overall, the level of economic development and the existing social infrastructure affect the incidence of child labor. The incidence of child labor is likely to be high under conditions where economic development is low, where poverty is pervasive, and where social amelioration programs are weak or nonexistent. These in turn are strongly affected by government policies.

Government policies may be ineffective or may inadvertently impede economic growth and the objective of reducing poverty and income disparities. Stabilization programs, for instance, may slow down growth and exacerbate poverty and, indirectly, the incidence of child labor. Structural adjustment programs may incorporate reductions and reallocations of government expenditure, particularly on social expenditures, with damaging implications on poverty alleviation and child labor.

Spending on education can be misdirected and can impede the goal of reducing the costs of education on the poor. Rapid population growth, high fertility rates, and high dependency burdens can be traced to weak or ineffective population policies and programs. Child labor becomes a profitable alternative when the cost of employing children is low because laws on child labor are below acceptable standards or when enforcement of existing laws is weak.

The essential point is that, ultimately, any program to reduce child labor should have as key elements policies and programs to promote economic development and poverty alleviation. At the same time, policies and programs to promote development should explicitly take into account their intended or unintended consequences on household decisions regarding child labor.

3. Child labor in the Philippines: a profile

We present a profile of the child labor situation in the country using information contained in the July 1995 National Survey of Children (CLS)[5] and the 1998-1999 Annual Poverty Indicator Survey (APIS) data sets.[6] The two data sets are not comparable, however, since they use different sampling frames and reference periods. Nevertheless, both surveys define child labor as paid or unpaid work by children for the production of goods or services destined for the market. This definition leaves out household chores and any work producing goods or services directly consumed by the household.

The CLS shows that in 1995, about 1.9 million of a total of 17.5 million children aged 5-14 engaged in market work in one form or another over the last 12 months (Table 3.1). This means that one in every ten children in the country worked for a living. Males made up the bulk of child laborers with 180 boys working for every 100 working girls. The table also indicates that child labor is an overwhelmingly rural phenomenon. There were over 1.3 million child laborers in the rural areas constituting close to 70 percent of the total number of working children.

The APIS data sets report a smaller number (about half of that of the CLS) of child workers. The APIS survey, however, uses the past week as a reference period in contrast to the past year reference period used by the CLS. Nevertheless, the APIS reinforces the view that most child labor consists of work done in the rural areas by male children.

To get a better idea of the magnitude of child labor in the country, it would be useful to look into child labor incidence, that is, the percentage of children of a particular age group, sex, or location who work (Table 3.2). For both males and

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[5]The survey was undertaken by the National Statistics Office in close collaboration with the Bureau of Labor and Employment Statistics of the Department of Labor and Employment as a component of the ILO's International Program for the Elimination of Child Labor. The survey, a rider to the July Labor Force Survey (LFS), covered all children, aged 5-17, of a sample of households. Two questionnaires were designed. The first questionnaire gathered information on the socioeconomic characteristics of Filipino households in the sample. It included information on household membership and their characteristics such as age, sex, education, own-household-operated activities, migration, family income and expenditures, and the activity of children, 5-17 years old. The respondent to this questionnaire was either the head of the family or the spouse. The second questionnaire had working children 5-17 years old in the sample of households as respondents. Information was gathered on their work situation such as occupation, industry, nature and status of employment, working hours, place of work, etc., for the past 12 months and past week. Information on working conditions, exposure to hazards, illnesses and injuries, recreation and leisure time, schooling and economic status, etc., was also collected. The survey covered all provinces of the country.

[6]The APIS was also conducted by the NSO to provide a more comprehensive picture of Philippine poverty than that provided by the Family Income and Expenditure Survey (FIES). Apart from household income and expenditures, the APIS also provides more comprehensive data on household characteristics, including child labor.

females and in both urban and rural areas, the proportion of working children increases with age. It is noted, however, that proportionally more children in the younger age group (5-9 years old) worked in the rural areas than in urban areas. The table also shows that children of all age groups in the rural areas were more likely to be employed in market work than their urban counterparts. Child labor incidence was two times higher in the rural areas than in the urban areas. To a large extent, this can be explained by the participation of family members in the work required in family-operated farms during the planting and harvesting seasons.

In both urban and rural areas, males were more likely to engage in market work than females. However, the gap between male participation and female participation is much larger in the rural areas than it is in the urban areas. Rural families often reserve farm work for male children who are perceived to be physically stronger while female children are usually assigned to do household chores that often include the care of younger siblings. However, the advantages that males have in farm work are likely to be considerably reduced in an urban setting where females can easily find employment in the retail trade and the informal service sector.

Table 3.1. Working children aged 5-14 years by sex and location

Survey source	*Total no. of children*	*Total working children*
CLS (1995)		
Philippines	17,506,518	1,863,307
Male	8,979,135	1,196,990
Female	8,527,382	666,317
Sex ratio (M/F)	105.3	179.6
Urban	8,092,370	561,247
Rural	9,414,148	1,302,059
APIS (1998)		
Philippines	16,533,719	895,818
Male	8,519,371	572,549
Female	8,014,348	323,269
Sex ratio (M/F)	106.3	177.1
Urban	7,091,592	155,059
Rural	9,442,126	740,760
APIS (1998)		
Philippines	19,737,323	925,611
Male	10,196,410	616,584
Female	9,540,913	309,026
Sex ratio (M/F)	106.9	199.5
Urban	8,366,342	159,436
Rural	11,370,982	766,175

Table 3.2. Child labor incidence by age, sex, and location

CLS (1995)		5 to 9	10 to 14	5 to 14
	Both sexes	2.5	18.7	10.6
Philippines	Male	3.1	23.5	13.3
	Female	1.9	13.6	7.8
	Both sexes	1.7	12.0	6.9
Urban	Male	1.8	14.5	8.3
	Female	1.5	9.4	5.5
	Both sexes	3.2	24.5	13.8
Rural	Male	4.1	31.4	17.7
	Female	2.3	17.2	9.8
APIS (1998)		5 to 9	10 to 14	5 to 14
	Both sexes	1.8	9.5	5.4
Philippines	Male	2.0	12.0	6.7
	Female	1.6	6.8	4.0
	Both sexes	0.6	3.9	2.2
Urban	Male	0.6	4.7	2.5
	Female	0.7	3.1	1.8
	Both sexes	2.7	13.6	7.8
Rural	Male	3.1	17.4	9.8
	Female	2.2	9.6	5.7
APIS (1999)		5 to 9	10 to 14	5 to 14
	Both sexes	0.9	8.6	4.7
Philippines	Male	1.0	11.3	6.0
	Female	0.7	5.8	3.2
	Both sexes	0.4	3.5	1.9
Urban	Male	0.4	4.3	2.3
	Female	0.3	2.7	1.5
	Both sexes	1.3	12.3	8.3
Rural	Male	1.5	16.2	8.8
	Female	1.0	8.1	7.7

3.1. Employment characteristics of child labor

Table 3.3, derived from the 1995 CLS, provides a summary of the distribution of children by industry. More than 70 percent of working children are engaged in farming, fishing, and forestry. This is consistent with the earlier observation of child labor being a predominantly rural phenomenon. Eighty percent of the children employed in this sector are males while females constitute a smaller fraction. Females, on the other hand, dominate in urban-based economic activities such as trade (which consist primarily of market vending), manufacturing, and other services, particularly in personal and domestic services.

Table 3.4 shows that most working children, about 59 percent, work in farms and another 18 percent work in their own homes in family-owned businesses. Compared to males who tend to work in farming outside the home, a larger proportion of females work at home in home-based enterprises. This suggests that the vast majority of child laborers work alongside and under the direct supervision of parents or other family members. Most countries hesitate to ban child labor in family-owned enterprises on the assumption that parents, in general, are concerned with the well-being of their own children and are less likely to expose them to difficult, hazardous, and exploitative work conditions. Nevertheless, one should note that 74 percent of all children who work in another employer's house are females. This shows the preference for females in domestic services.

Despite the illegal nature of employment in these sectors, a disturbingly significant number of children, mostly boys, can be found in hazardous occupations, such as those who work in mining, quarrying, and construction sites.

Table 3.5 shows that 74.1 percent of child labor consists of unpaid family members in household enterprises, a great part of which would be engaged in farming. The rest work as paid laborers in other private establishments or as domestics in private households. A large number of working children, mostly in the urban areas, are self-employed as street hawkers and vendors.

A great deal of the employment of children (over 50 percent) is of a seasonal, short-term, or part-time nature and usually undertaken during school break (Table 3.6). This is not at all surprising since most child laborers work in farms where the demand for labor is seasonal and highest during the planting and harvesting seasons. It is unlikely that work of this sort would seriously interfere with their schooling. However, a large proportion of working children (21 percent) are permanently employed. These children are working on a regular basis and it is likely that they have dropped out of school.

Table 3.3. Working children 5-14 years old by industry

Industry	*Both sexes*	*% to Total*	*Male*	*% to Total*	*Female*	*% to Total*	*% Distribution*		
							Both sexes	*Male*	*Female*
TOTAL	1,802,901	100.0	1,145,651	100.0	657,251	100.0	100.0	63.5	36.5
Farming, fishing, and forestry	1,268,747	70.4	906,271	79.1	362,475	55.2	100.0	71.4	28.6
Mining and quarrying	5,897	0.3	5,357	0.5	540	0.1	100.0	90.8	9.2
Trade	322,179	17.9	143,376	12.5	178,804	27.2	100.0	44.5	55.5
Transport and communications	408	0.0	408	0.0	0	0.0	100.0	100.0	0.0
Construction	10,479	0.6	9,909	0.9	570	0.1	100.0	94.6	5.4
Utilities	0	0.0	0	0.0	0	0.0	100.0	0.0	0.0
Services	17,524	1.0	5,631	0.5	11,893	1.8	100.0	32.1	67.9
Manufacturing	79,960	4.4	38,074	3.3	41,887	6.4	100.0	47.6	52.4
Personal services	90,174	5.0	30,715	2.7	59,459	9.0	100.0	34.1	65.9
Other business/ industry	7,533	0.4	5,910	0.5	1,623	0.2	100.0	78.5	21.5

Source: NSO 1995 Child Labor Survey.

Table 3.4. Working children 5-14 years old by place of work

Place of work	*Both sexes*	*% to Total*	*Male*	*% to Total*	*Female*	*% to Total*	*% Distribution*		
							Both sexes	*Male*	*Female*
TOTAL	1,815,226	100.0	1,157,977	100.0	657,250	100.0	100.0	63.8	36.2
Own house	333,338	18.4	156,269	13.5	177,069	26.9	100.0	46.9	53.1
Employer's house	75,946	4.2	19,848	1.7	56,098	8.5	100.0	26.1	73.9
Other person's house	33,417	1.8	23,310	2.0	10,107	1.5	100.0	69.8	30.2
Office factory	15,089	0.8	6,332	0.5	8,758	1.3	100.0	42.0	58.0
Farm	1,069,215	58.9	755,289	65.2	313,926	47.8	100.0	70.6	29.4
Street	58,110	3.2	38,593	3.3	19,517	3.0	100.0	66.4	33.6
Market	54,002	3.0	22,744	2.0	31,258	4.8	100.0	42.1	57.9
Mines/quarry/ construction sites	13,959	0.8	12,850	1.1	1,110	0.2	100.0	92.1	7.9
Others	162,150	8.9	122,742	10.6	39,408	6.0	100.0	75.7	24.3

Source: NSO 1995 Child Labor Survey.

Table 3.5. Working children 5-14 years old by employment status

Status of employment	*Both sexes*	*% to Total*	*Male*	*% to Total*	*Female*	*% to Total*	*% Distribution*		
							Both sexes	*Male*	*Female*
TOTAL	1,815,226	100.0	1,157,977	100.0	657,250	100.0	100.0	63.8	36.2
Worker in private household	82,282	4.5	24,275	2.1	58,007	8.8	100.0	29.5	70.5
Worker in private establishment	246,334	13.6	168,438	14.5	77,896	11.9	100.0	68.4	31.6
Worker in government	1,767	0.1	1,767	0.2	0	0.0	100.0	100.0	0.0
Paid worker in own h.hold enterprise	21,331	1.2	11,641	1.0	9,690	1.5	100.0	54.6	45.4
Self-employed	95,647	5.3	68,321	5.9	27,327	4.2	100.0	71.4	28.6
Employer in own h.hold enterprise	10,643	0.6	8,335	0.7	2,308	0.4	100.0	78.3	21.7
Unpaid worker in own h.hold enterprise	1,344,522	74.1	866,285	74.8	478,237	72.8	100.0	64.4	35.6
Unpaid worker for other members who work for others	12,700	0.7	8,916	0.8	3,784	0.6	100.0	70.2	29.8

Source: NSO 1995 Child Labor Survey.

Table 3.6. Working children 5-14 years old by nature of employment

Nature of employment	*Both sexes*	*% to Total*	*Male*	*% to Total*	*Female*	*% to Total*	*% Distribution*		
							Both sexes	*Male*	*Female*
TOTAL	1,815,227	100.0	1,157,978	100.0	657,249	100.0	100.0	63.8	36.2
Permanent	385,136	21.2	259,776	22.4	125,360	19.1	100.0	67.5	32.5
Short-term/casual	536,303	29.5	331,624	28.6	204,679	31.1	100.0	61.8	38.2
Seasonal/school vacation	833,054	45.9	526,258	45.4	306,796	46.7	100.0	63.2	36.8
Worked for different employers	56,338	3.1	39,004	3.4	17,334	2.6	100.0	69.2	30.8
Others	4,396	0.2	1,316	0.1	3,080	0.5	100.0	29.9	70.1

Source: NSO 1995 Child Labor Survey.

3.2. Hours worked

Table 3.7 shows the average number of days in a week and the number of hours in a week children of various age groups work. The average number of days and hours in a week spent working increases with the age of the child. Working children in the youngest age group (5-6 years old) work almost three days and six hours a week. Older children (12-14 years old) work three and a half days or 16.2 hours a week. Children in the urban areas work slightly longer in a week than their rural counterparts.

There is considerable variation, however, in average number of hours worked per week by place of work. Children in mining and construction work the longest hours, averaging 31 hours per week. Children who work in other homes, in personal services, or as workers in home-based enterprises, also work relatively longer hours, averaging 27 hours a week. Children who work in their own homes, in family-operated small-scale enterprises, work relatively less hours, averaging 10.7 hours a week.

Recreation and leisure time are important for the total development of children. Working children, however, hardly have any free time at all. Their waking hours are spent studying, working, or doing household chores. Table 3.8 shows the average number of hours children of different age groups and gender spend in home production and market work. Boys spend more time in market work than girls, although the difference is quite small—an average of 14.2 hours per week for boys and 13.5 hours for girls. There is a much bigger difference, however, in the number of hours spent in home production between girls and boys. Working girls spend more time doing housework than boys, averaging 9.9 hours a week compared to 8.2 hours for the latter. At the same time, girls are more likely to be enrolled in school than boys.

3.3. Incomes of working children

Table 3.9 gives the average income earned by children in a week by place of work. It includes cash income and gross income, the latter consisting of both cash and non cash income. Average weekly gross incomes are highest for children working the streets, in markets, and in mining and construction. However, children in mining and construction also work long hours. Street hawking and market vending seems to be quite lucrative for children since they work relatively less hours but earn relatively higher gross incomes. Children who work in other people's homes also earn relatively higher incomes but, as we saw earlier, they also work longer hours. Children employed in family-operated enterprises work less hours but also earn less. Overall, earnings from child labor are considerably large, averaging Php 524 in cash or Php 749 gross a week per child. For poor households the contributions of child labor are indeed substantial.

Table 3.7. Hours worked, children 5-14 years old, by age group, area, place of work

Mean days/hours of work, past week, by age group

Age group	*Mean days of work*	*Mean hours of work*
5 to 6	2.7	5.7
7 to 9	3.3	8.3
10 to 11	3.1	10.7
12 to 14	3.5	16.2
Total	3.4	13.9

Mean hours of work by area, past week

Area	*Mean hours of work*
Urban	14.1
Rural	13.9
Total	13.9

Mean days/hours of work, past week, by place of work

Place of work	*Mean days of work*	*Mean hours of work*
Own house	4.1	10.7
Employer or other persons house	4.4	27.1
Office factory	3.4	9.9
Farm	3.0	13.0
Street	3.3	14.3
Market	3.7	15.6
Mines and construction site	4.4	30.9
Others	3.8	18.4
Total	3.4	13.9

Source: 1995 CLS (NSO).

Table 3.8. Hours spent working, doing household chores (past week) and enrollment rates

Age group	*Home production**	*Market production*	*% Enrolled*
MALE			
5 to 6	4.2	6.3	30.2
7 to 9	7.3	8.5	90.6
10 to 11	8.4	10.8	92.3
12 to 14	8.4	16.4	76.7
Total	8.2	14.2	81.6
FEMALE			
5 to 6	3.4	5.3	65.6
7 to 9	10.0	8.0	94.1
10 to 11	7.6	10.5	96.4
12 to 14	10.8	15.6	84.6
Total	9.9	13.5	88.3
ALL			
5 to 6	3.7	5.7	50.3
7 to 9	8.3	8.3	91.9
10 to 11	8.1	10.7	93.8
12 to 14	9.4	16.2	79.5
Total	8.9	13.9	84.0

Source: 1995 Child Labor Survey, NSO.

*Average hours per week.

Table 3.9. Mean income of working children by place of work (in pesos)

Place of work	*Cash income*	*Gross income*
Own house	335	451
Employer or other persons house	592	977
Office factory	784	719
Farm	476	606
Street	346	1,267
Market	871	1,080
Mines and construction site	645	1,051
Others	456	529
Total mean income	524	749

Source: 1995 CLS (NSO).

4. The determinants of child labor

As mentioned in our framework, a number of factors determine child labor. In the analysis below we look for empirical evidence that supports the various hypotheses regarding these determinants.

4.1. Household income and poverty

The 1995 NSO Survey suggests that child labor is associated with poverty and the income status of households. As indicated in Table 4.1, the incidence of child labor is highest among households with the lowest incomes. As household income increases, the incidence of child labor correspondingly declines. For the lowest-income households earning less than Php 2,000 a month, the incidence of child labor is 15.2 percent, a figure much higher than the national incidence of 10.6 percent in 1995. For households belonging to the next higher rung, earning a total income of Php 2,000 but less than Php 3,000 a month, the incidence of child labor decreases to 13.4 percent. The incidence of child labor falls to relatively low levels for households earning monthly incomes of Php 5,000 a month or more.

Table 4.1. Incidence of child labor by household-income group (children aged 5-14 years)

Household-income groups	*Total child workers*	*Total children*	*Incidence*
Less than P2,000	282,419	1,855,831	15.22
P2,000–P2,999	509,736	3,802,797	13.40
P3,000–P4,999	573,820	5,610,219	10.23
P5,000–P9,999	292,001	3,941,545	7.41
P10,000 and over	135,127	2,093,932	6.45
Not reported	3,954	52,372	7.55

Source: 1995 Child Labor Survey, NSO.

4.2. A household model of the demand and supply of child labor

In this section we test other hypothesis of the determinants of child labor by estimating a reduced-form model of household decision making. Following Grootaert [1998], the model estimates the probability that a child will (a) stay in school and not work, (b) combine schooling with work, or (c) stop schooling and work full time. The probability of these three alternatives is conditioned by variables that may have a bearing on decisions made by households.

The model assumes that households make decisions on the supply of child labor in a sequential manner. Hence, a sequential probit model is appropriate in this case. In particular, we analyze the decisions of households as a sequential process

using four binary probit models. We estimate the following hierarchy of choices and choice probabilities for each child:

P_1 = probability of going to school and not working
P_2 = probability of going to school and working
P_3 = probability of not going to school and working
P_4 = probability of not going to school and not working

These probabilities are determined as follows:

$$P_1 = F(b_1`X)$$
$$P_2 = \left[1 - F(b_1`X)\right]F(b_2`X)$$
$$P_3 = \left[1 - F(b_1`X)\right]\left[1 - F(b_2`X)\right]F(b_3`X)$$
$$P_4 = \left[1 - F(b_1`X)\right]\left[1 - F(b_2`X)\right]\left[1 - F(b_3`X)\right]$$

where F represents the standard normal distribution function and b_1, b_2, and b_3 are vectors of the parameters of the explanatory variables, X. The parameters of b_1 are estimated over the entire sample. The parameters of b_2 are estimated over the sample of children excluding those who go to school only. The parameters of b_3 are estimated over the sample of children who do not go to school.

The vector X contains the following variables described below:

		Expected signs		
Variables	*Description*	P1	P2	P3
Age	Age of the child	-	+	+
Female	Binary indicator of the gender of the child. Equals 1 if child is female and 0 if male	+	-	-
Male head of HH	Binary indicator of gender of head of household. Equals 1 if male and 0 if female	+	-	-
HH head has low education	Binary indicator of the educational attainment of the head of the household. Equals 1 if the household head did not finish elementary grade	-	+	+
HH head has low education x female	Binary interaction term which equals 1 if head of household did not finish elementary grade and the child is female	-	+	+
Age of the HH head	Age of the household head	+	-	-
Other children 0-4	Number of other children in the household aged 0-4	-	+	+
Other children 5-9	Number of other children in the household aged 5-9	-	+	+
Other children 10-14	Number of other children in the household aged 10-14	-	+	+
Other children 15-17	Number of other children in the household aged 15-17	+	-	-

Number of adults	Number of adults in the household aged 18-65	+	-	-
HH owns agricultural land	Binary variable that equals 1 if the household owns agricultural land and 0 otherwise	+	-	-
HH owns residential land	Binary variable that equals 1 if the household owns residential land and 0 otherwise	+	-	-+
HH owns other land	Binary variable that equals 1 if the household owns other land and 0 otherwise	+	-	-
HH engaged in own enterprise	Binary variable that equals 1 if the household is engaged in own-household-operated enterprise or business and 0 otherwise	-	+	+
Low income HH	Binary indicator of poverty that equals 1 if the household earns less than Php 3,000 per month on average	-	+	+
Urban	Binary variable equals 1 if household is located in urban area and 0 if in rural area	+	-	-
Urban x female	Binary variable that equals 1 if household is located in the urban area and the child is female	-	+	+

The probability that the child will stay in school and not work should decrease with the child's age. We expect the probability of combining school with work or working full time to increase with the child's age. Given the traditional gender division of labor, girls are less likely to engage in market work than boys.

We include the gender of the household head to take into account that households headed by females are more likely to be low-income households. Hence, the likelihood of child labor is likely to be greater. The low education of the household head should increase the probability of child labor for two reasons: first, the household is likely to be poor; and second, it would have little appreciation for the long-term benefits from education. Although female children are more likely to stay in school, the low educational attainment of the household head may increase the probability that they will also combine work with school or leave school to work. The age of the household head should capture life-cycle effects. Income tends to increase with a person's age and this should decrease the probability of children working or quitting school to work.

The demographics of the household should have a strong influence on child labor. Households with more children below working age are more likely to have children who work. On the other hand, the need for child labor diminishes in households with more adults or children of working age (15-17 years old).

The inclusion of ownership of various household assets is meant to capture the credit constraints of households. Households with more physical assets are likely to have better access to credit and are therefore less likely to use child labor to overcome liquidity constraints.

Households with their own enterprise (home-based small-scale manufacturing or own small farm) are more likely to involve their children in the enterprise.

The variable indicating if the household falls in the lowest income quintile seeks to capture the special constraints of the poorest segment of households in terms of access to credit and insurance. Higher-income risk increases the likelihood that households hedge against risk by diversifying income sources through child labor.

The urbanity variable represents locational differences in the demand for labor. Labor demand tends to be higher in rural areas because of the need for children in farm work. But it also represents the cost of hiring children. It tends to be lower in the rural areas where monitoring and enforcement of labor laws tend to be weak. On the other hand, the interaction variable of urban location and gender of child seeks to capture locational differences in the demand of female child labor. Compared to rural areas, urban areas provide more opportunities for the employment of young females, usually in the service sector.

We also include dummy variables for the regional location of the household where the child belongs to capture locational differences in the cost of education. The base region is Region 1 or the Ilocos region. The other regions consist of the following:

NCR	Western Visayas	Northern Mindanao
Cagayan Valley	Central Visayas	Southern Mindanao
Central Luzon	Eastern Visayas	Central Mindanao
Southern Tagalog	Bicol	Western Mindanao
CAR		

4.3. Empirical results of the household model

Annex A gives a full report of the regression results while Table 4.2 below gives the marginal probabilities that were estimated from the model. As expected, the probability that the child will combine work with schooling or will stop schooling in order to work increases with the age of the child. Girls are less likely to work than boys. The traditional gender division of labor, wherein females are often assigned to do the household chores such as cooking, cleaning, laundering, and taking care of infants, can explain this. For girls who work, however, the burden becomes heavier because, more often than not, they are not spared from domestic duties in the household.

Table 4.2. Marginal probabilities of sequential probit model of the determinants of child labor

	P1	P2	P3
Independent variables	*Probability of going to school and not working*	*Probability of going to school and working*	*Probability of not going to school and working*
Age of child	-0.80*	4.58*	5.91*
Child is female	10.15*	-6.13	-19.69*
Male household head	0.74	1.77	-0.37
Low education of household head	-0.19	-8.08*	5.34*
Low educ of female head	-0.25	4.33	3.72
Age of hh head	-0.04	-0.1	0.02
No. of children (0-4)	-2.52*	-1.45*	0.95**
No. of children (5-9)	-0.88*	1.51*	1.24*
No. of children (10-14)	-1.01*	-4.63*	-0.93**
No. of children (15-17)	2.74*	-0.79	-1.07
No. of adults	0.29	-2.89*	-1.05*
Owns agricultural land	2.51*	1.90**	-0.26
Owns residential land	-2.22*	1.69	2.88*
Owns other land	1.01	-4.11	-2.55
Owns an enterprise	-13.16*	24.93*	8.40*
Low-income household	-7.51*	-3.61*	4.77*
Urban area	6.34*	-0.89	-4.97*
Urban x female	-4.76*	2.98	4.39*
NCR	9.64*	-20.31*	-6.43*
Region 2	-10.34*	-0.23	8.27*
Region 3	0.97	-19.98*	3.54
Region 4	1.27	-10.31*	-0.58
Region 5	1.1	-9.81*	2.08
Region 6	-2.61*	-2.67	6.24*
Region 7	0.97	-22.16*	-2.22
Region 8	-0.21	-18.87*	7.41*
Region 9	-5.76*	-16.97*	-1.38
Region 10	-0.17	-13.23*	-1.19
Region 11	-7.74*	-12.62*	7.00*
Region 12	-7.43*	-7.83*	8.07*
ARMM	-3.76*	-28.38*	-1.88
CAR	-3.0	-0.95	-1.6

*Significant at the 95 percent level of confidence.

**Significant at the 90 percent level of confidence.

The estimated effect of the low educational level of the household head on child labor is quite disturbing. The low education of the household head reduces the probability that a child will study full-time by 0.19 percentage points, increases the probability that the child will combine work with schooling by 8 percentage points, and increases the probability that the child will stop studying to work by 5.34 percentage points. The education of the household head is highly correlated with household income. There is evidence that households headed by persons who have not completed at least an elementary education are likely to be poor or have low levels of income [World Bank 2000]. Moreover, the value that households with low educational attainment place on the education of their young is also expected to be low. These two factors should increase the probability of child labor in the household. The negative sign of the probability that the child will go to school and work and the positive sign of the probability that the child will not go to school and work strongly suggest that a child who belongs to a household where the head is poorly educated is likely to drop out of school to find work. This finding provides tangible evidence of how poverty is perpetuated through generations.

The next set of explanatory variables attempts to determine the impact of the number of children in a household on the probability of a child participating in market work. Households with more children below working age (i.e., 0-14 years old) are less likely to have children who are full-time students. Alternatively, households with more children of working age (15-17 years old at least) are more likely to have children who go to school and don't work. Households with more toddlers, children below five years old, are less likely to have siblings who combine work with school because they are likely to have children out of school and working. Households with more children of elementary school age (5-9 years old) are likely to have siblings who combine work and schooling or who work full time.[7] The presence of more children of working age and more adults in the household reduces the probability that a child will work either full time or part time. The view that a high youth dependency burden (defined as the proportion of children below working age to the population of individuals of working age) increases the likelihood of child labor is supported by the data. High dependency burdens are, in turn, the consequence of high fertility rates among Filipino households.[8]

Ownership by the household of physical assets is a variable that measures the effect of household wealth on child labor. Asset ownership allows a household to overcome credit constraints, making it possible for them to invest in the human capital of their children. Ownership of agricultural land, as expected, increases the probability that a child will stay in school and not work. However, it also increases the probability that a child will combine work with schooling. This second-stage result is understandable since ownership of agricultural land also increases the likelihood that children will be mobilized to help in the farming activities of the household.

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[7]The differential impact of a household having more children 10-14 years old cannot be ascertained because the signs of all three probabilities are negative.

[8]Fertility rates remain relatively high in the country due, to a large extent, to the strong resistance put up by the Catholic hierarchy against the government's population program.

The result for the dummy variable on household ownership of residential land is unexpected. The sign suggests that ownership by the household of residential land increases the probability that a child will quit school and work.

Ownership by the household of an enterprise has the strongest influence on child labor. Having a household enterprise reduces the probability that a child will stay in school and not work by 13 percentage points, increases the probability that a child will study and work at the same time by 25 percentage points, and increases the probability that a child will stop going to school and work by 8.4 percentage points. Households with their own enterprises, which include farming and home-based small-scale manufacturing, are likely to involve their children in production work. The results also reveal, however, that the children from these households are more likely to combine work with schooling.

The model includes a variable for households belonging to the lowest income quintile, that is, earning less than Php 3,000 a month on average. As suggested by Grootaert [1998] this should not be interpreted as an income variable.[9] Instead, this variable intends to take into account the special constraints that the poorest households face in terms of access to credit and insurance. Child labor can then be understood in light of the effort of these households to hedge against income risk by diversifying their sources of income through child labor. The econometric results suggest that belonging to a poor household decreases the probability that a child will go to school and not work by 7.5 percentage points. It increases the probability that a child will drop out of school to work by 4.8 percentage points.

The location of the household also has a strong influence on child labor. The estimates suggest that households located in an urban center are more likely to have children who go to school and don't work and are less likely to have children who work and don't go to school. This variable may represent differences in demand conditions in urban areas relative to rural areas. In the rural areas, children are employed in farming, fishing, and in mining and quarrying. Moreover, the enforcement of child labor laws tends to be much weaker in rural areas than in urban centers. This makes the cost (in terms of the risk of getting caught by enforcement agencies) of employing children in the rural areas lower than that in urban areas.

Although girls are less likely to engage in market work than boys, being a girl in an urban setting increases the probability that she will work. This variable captures locational differences in the demand for female child labor. Compared to a rural environment, the urban areas provide more opportunities for the employment of young girls who can easily find work in personal services (particularly domestic work), in sales (street hawking or vending), and most of all as unpaid laborers in small-scale family-owned manufacturing enterprises (home-based work).

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[9]The model includes variables that determine household income such as the age and education of the household head, ownership of physical assets, and the number of adults. Including income in the model would be statistically erroneous because this variable is endogenous.

The model includes regional dummies to serve as a proxy for the cost of education that, according to the literature, is a major determinant of the likelihood of child work. Being in the National Capital Region (NCR), where public schools are more numerous and more accessible, increases the probability that a child will attend school and not work by about 10 percentage points, decreases the probability that a child will study and work at the same time by 20 percentage points, and decreases the probability that a child will work and leave school by 6.4 percentage points.

The results we get for Regions 3, 4, 5, 7, and 10 are difficult to interpret. Being in these regions lessens the probability that a child will work and study at the same time. However, we cannot tell from the estimates if being in these regions increases the probability that a child will study and not work (P1) or will decrease the probability that a child will work and stop studying (P3). The results for these two probabilities are not statistically significant. Most of these regions are fairly developed and have relatively better educational and physical infrastructure facilities. However, they also have provinces where the population has inadequate access to good educational facilities.

On the other hand, being in Region 2 reduces the probability that a child will attend school and not work by 10 percentage points and increases the probability that a child will stop schooling and work by 8 percentage points. Being in Region 8 increases the probability that a child will work and stop schooling by 7.4 percentage points. These two regions are known to be relatively "backward" in terms of the availability of social and physical infrastructure.

The results for Mindanao (except for Region 10) may also reflect the poor state of infrastructure that tends to raise the cost of education in these regions. A child in Region 9 is less likely to be studying full time or combining work with schooling. Being in Region 11 reduces the likelihood that a child will be a full-time student or will at least work and study by 7.7 percentage points and 12.6 percentage points, respectively, and increases the probability that a child will leave school and work by 12.6 percentage points. Being in Region 12 reduces the probability of a child studying full time by 7.4 percentage points, reduces the probability of a child combining work and school by 7.8 percentage points, and increases the probability that the child will stop going to school to work by 8 percentage points. Being a child in the Autonomous Region in Muslim Mindanao (ARMM) reduces the probability that a child will engage in full-time study by 3.7 percentage points and reduces the probability that a child will at least combine work and schooling by 28 percentage points.[10]

4.4. The macroeconomy and child labor

What is the impact of economic growth on child labor? We first have to distinguish between child labor incidence and the labor force participation of children. The former refers to the actual number of children working over the

[10]The results imply that children in ARMM should have a high probability of leaving school to work, but the probability of P3 is statistically insignificant for the region.

total number of children. The latter refers to the number of children employed or unemployed and searching for work over the total number of children.

Theoretically, the effect of economic growth on both child labor incidence and participation rates is ambiguous. When economic growth leads to an increase in the incomes of low-income families, the need to employ children to augment household income may be reduced, and one should expect a decrease in both the incidence and participation of children in market work. An economic decline or slowdown that reduces household income should have an opposite effect on children. A household may try to cope with the fall in the earnings of the principal breadwinner or the other adults by encouraging or even forcing children to look for work. This is known as the "added worker" effect and it should lead to an increase in the labor force participation of children. If children succeed in finding employment, the incidence of child labor should also increase. On the one hand, an economic downturn may lead to the unemployment of both adults and children due to a decline in labor demand. This may also induce a "discouraged worker" effect, that is, children and adults will stop searching for work in the belief that it is futile to do so. The incidence of child labor and the labor force participation rates of children should decline as a result.

The Labor Force Survey of the NSO collected quarterly data on the labor force participation of children aged 14-17 from 1988 to the year 2000.[11] The time-series allows us to examine the relationship between the incidence of child labor and national income and output.

Annual data on employed children and the incidence of child labor consisting of the average for the four quarters of the year are shown in Table 4.3 together with data on gross domestic product (GDP) for the same period. One can observe from the table that the 12-year period was characterized by a declining trend in the incidence of child labor. The same period shows the economy expanding overall, although there were two periods of negative growth, one in 1991 and another in 1998. This observation suggests a negative relationship between levels of national income and the incidence of child labor. Table 4.4 shows data on labor participation of children covering the same period. It also suggests an inverse relation between labor participation rates of children and GDP. A simple regression of child labor incidence with GDP does show a negative and significant relationship between the two variables (Table 4.5). However, a regression of participation rates and GDP shows a negative and significant correlation of these two variables only for workers aged 15-17. Overall, statistical analysis of data at the aggregate level reinforces the conclusion one arrives at from household data—that a fall in income increases the magnitude of child labor, a finding that suggests that the "added-worker effect" tends to dominate in the decisions of low-income families.

[11]Processing and publication of the data are not done regularly, however, because the official working age is 15 years and above. The author is grateful to the NSO for the special runs of the survey for this study.

One observes that in 1991, when the economy experienced negative growth brought about by the energy crisis and the severe contractionary fiscal and monetary policies adopted by the government to alleviate a balance of payments crisis, the incidence of child labor increased substantially from that of the previous year (Tables 4.3 and 4.4). This can be explained by the "added worker" effect. On the other hand, the economy experienced another bout of negative growth in 1998 at the height of the Asian financial crisis. This time one sees a large decrease in the incidence of child labor and a lower fall in the labor force participation rates of children. However, this can be explained by the fact that, during the same period, the country experienced a severe drought brought about by the El Niño weather phenomenon. The drought could have brought about a substantial drop in the demand for agricultural labor including child labor, which, as we saw earlier, is concentrated in rural areas. Given the large fall in agricultural production during this period, a "discouraged worker" effect may have prevailed over the "added worker" effect of a fall in income as children also stopped looking for work.[12]

Table 4.3. Child labor incidence and national income, 1988-2000

	*No. of working children**			*Incidence of child labor*			*GDP* (*Php million*, 1985 *prices*)
Year	10-14	15-17	10-17	10-14	15-17	10-17	
1988	863,107	1,357,497	2,220,603	12.2	31.9	19.6	658581
1989	870,565	1,313,955	2,184,520	12.0	31.0	19.0	699448
1990	715,131	1,252,717	1,967,848	9.6	28.6	16.6	720690
1991	858,766	1,344,611	2,203,378	11.4	30.3	18.4	716522
1992	775,777	1,276,738	2,052,515	10.3	28.3	17.1	718941
1993	820,015	1,352,636	2,172,651	10.7	28.6	17.5	734156
1994	758,164	1,352,253	2,110,417	9.8	27.3	16.7	766368
1995	874,116	1,418,217	2,292,332	11.3	27.7	17.9	802866
1996	931,534	1,558,321	2,489,856	11.6	29.6	18.7	849121
1997	912,233	1,457,144	2,369,376	11.0	28.0	17.6	892860
1998	831,113	1,366,543	2,197,657	9.8	26.1	16.0	887905
1999	809,681	1,317,054	2,126,735	9.7	26.2	15.9	917382
2000	702,579	1,214,538	1,917,116	7.5	22.6	13.0	953582

*****Figures are averages for the four quarters of the year except for 1990 when there was no April survey, in which case the figures were averages for the other three quarters.

Sources: NSO and NEDA.

[12]The observed decline in participation rates during the El Niño drought can also be explained by the time frame used for comparison. Lim [1999] makes a quarter-on-quarter comparison of the participation rates of children aged 10-14 years from October 1997 to October 1998 using data from the Labor Force Survey. His findings reveal that participation rates of these children for both males and females increased substantially, although the unemployment rate of children in this age group also rose to relatively high levels. This suggests that the added worker dominated except that children could not find work.

Table 4.4. Child participation rates and national income, 1988-2000

Year	*No. of children either employed or unemployed**			*Child labor participation rate*			*GDP* (*Php million*, 1985 *prices*)
	10-14	15-17	10-17	10-14	15-17	10-17	
1988	911,189	1,525,639	2,436,827	12.9	35.8	21.5	658581
1989	929,645	1,463,797	2,393,442	12.8	34.5	20.8	699448
1990	742,354	1,352,598	2,094,952	9.9	30.9	17.7	720690
1991	962,245	1,564,104	2,526,349	12.8	35.2	21.1	716522
1992	832,574	1,448,456	2,281,030	11.1	32.1	19.0	718941
1993	869,740	1,517,436	2,387,177	11.3	32.0	19.2	734156
1994	811,817	1,530,360	2,342,177	10.5	30.9	18.5	766368
1995	943,376	1,597,083	2,540,460	12.2	31.2	19.8	802866
1996	1,015,229	1,778,705	2,793,934	12.7	33.8	21.0	849121
1997	1,120,678	1,800,241	2,920,919	13.5	34.6	21.7	892860
1998	1,119,901	1,738,617	2,858,518	13.2	33.2	20.9	887905
1999	855,826	1,496,526	2,352,353	10.2	29.8	17.5	917382
2000	758,695	1,409,533	2,168,228	8.0	26.2	14.7	953582

*Figures are averages for the four quarters of the year except for 1990 when there was no April survey, in which case the figures were averages for the other three quarters.

Sources: NSO and NEDA.

Table 4.5. Regression results, child labor and real GDP (1988-2000)

Dependent variable	*Independent variables*	*Coefficient*	*t-stat*	*Standard error*	R^2	*F-stat*
Incidence of child labor (10-17)	Constant	26.9	8.64	3.11	0.47	9.80
	real GDP	1.2 E-05	-3.13	3.89 E-06		
Incidence of child labor (10-14)	Constant	16.8	6.50	2.58	0.35	6.00
	real GDP	-7.9 E-06	-2.45	3.24 E-06		
Incidence of child labor (15-17)	Constant	44.1	12.60	3.5	0.66	21.00
	real GDP	-2.0 E-05	-4.59	4.38 E-06		
Child participation rates (10-14)	Constant	15.8	3.91	3.88	0.07	0.84
	real GDP	-4.5 E-06	-0.92	4.86 E-06		
Child participation rates (15-17)	Constant	43.99	7.97	5.52	0.29	4.53
	real GDP	-1.50E-05	-2.13	6.9 E-06		
Child participation rates (10-17)	Constant	25.8	5.50	4.69	0.14	1.82
	real GDP	-7.9 E-06	-1.35	5.87 E-06		

Another mechanism by which macroeconomic fluctuations affect child labor is via its impact on school participation and enrollment. For low-income households, the schooling of children is quite costly in terms of school materials, transportation, and meal allowances. When incomes fall from an economic downturn, children face the risk of being forced to stop schooling (at least temporarily) to look for work or to do the household chores as the female head of the household engages in a job search. Lim [1999] provides evidence supporting this view.

5. The consequences of child labor

As seen earlier, a great deal of child labor in the Philippines consists of unpaid family labor in farms and other small household enterprises under the supervision of parents. Moreover, most child laborers combine work with schooling. Hence, it is likely that the additional income contributed by children to the household enables it to finance investments in the human capital of children, that is, in terms of their education and nutrition. However, some forms of child labor, especially wage work done outside the home, often interfere with the children's ability to attend or do well in school. Others are extremely hazardous and place the health and safety of children at risk.

5.1. Education of working children

According to the 1995 CLS, around 69 percent of all working children 5-17 years old were attending school or at least attended school during the previous school year (Table 5.1).[13] A significant proportion of working children (about 30 percent) have dropped out of school. The NSO Survey revealed that only 61.5 percent of working children aged 5-14, attended school during school years 1994-1995 or 1995-1996 while only 38.5 percent of working children aged 15-17 were enrolled at any time during these years. Given elementary and secondary school participation rates in 1995 of 98.5 percent and 79.3 percent, respectively, this implies that working children are more likely to be out of school than their nonworking counterparts. Table 5.1 suggests that working males are more likely to leave school than females.

Working children from the rural areas had higher school attendance (69.6 percent) than those from the urban areas with only 32.7 percent of working children attending school. Since most of the labor done by children in the rural areas is farm work, which is seasonal and often done only during school vacations, it is unlikely that this kind of work would seriously interfere with schooling. The problem arises when children are engaged in more regular work, as is often the case in off-farm rural employment and urban employment.

[13]We include working children aged 15-17 years in the analysis because although they are legally of working age, most are also supposed to be enrolled in secondary schools.

Nevertheless, having to work has adverse consequences on school performance. When working children were asked about "problems encountered" 20.3 percent reported "experiencing difficulty in catching up with lessons" (Table 5.2). When regular work makes it difficult for children to catch up with school lessons and when low marks reduce the expected returns from schooling, then dropping out becomes a practicable option.

Table 5.1. Schooling of working children, 5-17 years old, by sex and location, 1995

Schooling status	*Both sexes*	*% to Total*	*Male*	*% to Total*	*Female*	*% to Total*
Total children working	3,669,903	100	2,401,964	100	1,267,139	100
Attending school or attended school last year	2,527,008	68.9	1,578,316	65.7	948,692	74.8
Not attending school/did not attend school last year	1,093,637	29.8	808,976	33.7	284,661	22.5
Not reported	49,258	1.3	14,672	0.6	34,586	2.7
Urban	1,177,840	100	740,328	100	437,511	100
Attending school or attended school last year	825,631	70.1	500,482	67.6	325,149	74.3
Not attending school/did not attend school last year	352,208	29.9	239,846	32.3	112,362	25.7
Not reported	29,590	2.5	6,032	0.8	23,558	5.3
Rural	2,442,806	100	1,646,964	100	795,842	100
Attending school or attended school last year	1,701,377	69.6	1,077,834	65.4	623,543	78.4
Not attending school/did not attend school last year	741,429	30.4	569,130	34.6	172,299	21.6
Not reported	19,667	0.8	8,640	0.5	11,027	1.4

*Figures are averages for the four quarters of the year except for 1990 when there was no April survey, in which case the figures were averages for the other three quarters.

Sources: NSO and NEDA.

Table 5.2. Schooling problems of working children, aged 5-17, by sex and location, 1995

Schooling problems (multiple responses)	*Both sexes*	*% to Total*	*Male*	*% to Total*	*Female*	*% to Total*
TOTAL RESPONSES	4,002,913	100.0	2,513,839	100.0	1,489,073	100.0
None	737,520	18.4	426,295	17.0	311,225	20.9
Difficulty catching up with lessons	812,720	20.3	549,808	21.9	262,912	17.7
Nonsupportive teachers	172,973	4.3	109,429	4.4	63,544	4.3
High cost of school supplies/books/ transportation	1,044,489	26.1	652,847	26.0	391,642	26.3
No time to study	240,815	6.0	153,016	6.1	87,799	5.9
School too far from residence	873,024	21.8	548,644	21.8	324,380	21.8
Other problems	121,372	3.0	73,800	2.9	47,571	3.2
URBAN	1,187,659	100	726,456	100	461,204	100.0
None	314,741	26.7	177,760	24.0	136,981	29.7
Difficulty catching up with lessons	228,275	19.4	152,767	20.6	75,507	16.4
Nonsupportive teachers	56,733	4.8	33,991	4.6	22,742	4.9
High cost of school supplies/books/ transportation	282,557	24.0	175,396	23.7	107,162	23.2
No time to study	69,449	5.9	39,282	5.3	30,168	6.5
School too far from residence	197,817	16.8	122,595	16.6	75,222	16.3
Other problems	38,087	3.2	24,665	3.3	13,422	2.9
RURAL	2,392,474	100	1,538,848	100.0	853,627	100.0
None	422,780	17.7	248,536	16.2	174,244	20.4
Difficulty catching up with lessons	584,446	24.4	397,041	25.8	187,405	22.0
Nonsupportive teachers	116,239	4.9	75,438	4.9	40,802	4.8
High cost of school supplies/books/ transportation	761,932	31.8	477,451	31.0	284,481	33.3
No time to study	171,365	7.2	113,734	7.4	57,631	6.8
School too far from residence	675,207	28.2	426,049	27.7	249,158	29.2
Other problems	83,285	3.5	49,135	3.2	34,150	4.0

Source: NSO, 1995 CLS.

The most dominant response of the children to this open question, however, had more to do with the high cost of schooling. About 26.1 percent of the children complained of the "high cost of school supplies, books, and transportation" while 21.8 percent said that their school was too far from their place of residence. Not surprisingly, these responses were more common among children living in the rural areas. This adds another dimension to the problem of low school participation rates among working children. It suggests that some children do not attend school or eventually drop out to look for work not necessarily because of the need for additional income but perhaps more so because of the high cost of education that makes it unaffordable to many low-income families.

5.2. Health of working children

Working children are generally more susceptible than adults to workplace hazards that endanger their health and physical and psychological development. For one thing, their small size and immature metabolic processes make them less capable of neutralizing dangerous chemicals, fumes, and other pollutants. Moreover, because of their youth, they are defenseless and therefore vulnerable to exploitation, maltreatment, and other forms of abuse. Also, many are found in the informal sector where they are beyond the protective reach of labor legislation, inspection, and enforcement.

Table 5.3 provides a summary of the kind of market work children do, the hazards they are exposed to, and the resulting injuries or diseases. In agriculture, most children are engaged in farming where they are exposed to toxic chemicals—particularly pesticides and herbicides—and harsh elements of nature. The most hazardous form of work in the fishing industry is deep-sea diving where children are in danger of drowning or suffering injuries (like ruptured eardrums and damage to the auditory nerves) associated with working under the extreme pressures of the ocean depth.

In the industry sector, employment in mining, quarrying, and construction poses the greatest risk to the health and safety of children. Children carrying heavy loads are prone to incapacitating spine injuries and other physical deformities. When working in high structures, they run the risk of falling or getting injured from falling objects. They are exposed to dust, noxious fumes, and lead and are in danger of getting injured from corrosive chemicals. Mercury poisoning is a common affliction among children engaged in gold panning.

Children in manufacturing are susceptible to cuts, abrasions, and consequent infection from sharp tools (saws, cutters, and needles) and raw materials (wires and metal sheets) and dangerous machinery. This is the case for most manufacturing activities such as woodwork, garments and clothing, metalwork, food processing, and leather and footwear. They are exposed to chemical fumes such as solvents and lead in the leather, tanning, and footwear industry, in ceramic-making, and

in the production of handicrafts; to dust in ceramics, stonework, and hollow-block production; and to heat stress in food processing and ceramics. Children in pyrotechnic production are susceptible to lung diseases, burns, and severe injury or even death from chemical explosions. Children working in slaughterhouses and other food processing industries often work in unsanitary conditions and are predisposed to various bacterial infections.

A good number of working children are employed in the service sector. Some are engaged in the cooking and preparation of food where they become susceptible to burn injuries. Others are street hawkers or vendors where they get exposed to high levels of pollutants and become victims of violence and vehicular accidents. Many are into scavenging and, because of the unsanitary working condition, become prone to acquiring various kinds of communicable diseases. Children in domestic work (cooking, cleaning, laundry, and child care), most of whom are girls, are at risk of suffering burn injuries, various maladies from overexposure to dangerous chemical cleansers, chronic fatigue, and social isolation. They are also susceptible to physical and sexual abuse. Others are into the sex trade where they often have to endure physical violence and rape and where they are likely to contract various sexually transmitted diseases.

The 1995 CLS reveals that of the total number of children 5-17 years old, more than 60 percent reported being exposed to various work hazards (Table 5.4). Most (85 percent of the total responses) complained of the hot and humid environment they had to work in.[14] Around 30 percent of the responses concerned exposure of the children to viral, bacterial, and fungal contaminants. Others reported exposure to dust (22 percent) and toxic liquids, vapors, and gases (28 percent).

Table 5.5, also from the 1995 CLS, summarizes the perceptions of children, aged 5- 14, regarding the dangers and risks they face in their place of work. About 70 percent of children working in mines and construction sites consider their work risky or dangerous. The danger arises from the high risk of falling, injuries from tools, machineries, and falling objects, and getting sick from excessive exposure to dust and noxious chemicals. Streets and markets, where vehicular accidents involving working children are common, were also considered relatively dangerous places. Farm work is also considered dangerous for some children. About 15 percent of the total number of children doing farm work considers it a risky occupation because of the likelihood of getting sick, falling, and getting injured from tools and equipment. Working in one's own house was considered the least dangerous among the various places of work.

The CLS also revealed that in 1995, about 30,000 children aged 5-17 (or one out of every 100 working children) reported suffering from work-related illnesses or injuries. About three of every 100 ill or injured children had to stop working permanently due to the injuries or illnesses they suffered from work.

[14]The large percentage can be attributed to the large number of children who are in farm work and therefore exposed to the sun.

Table 5.3. Health impacts of child labor by sector

Sector	*Activity*	*Hazard*	*Injury/Disease*
AGRICULTURE			
Farming	Farming, animal care, processing of agricultural products	Dangerous tools and machinery, exposure to the elements, pesticides, herbicides, heavy loads	Trauma, occupational lung diseases, chemical poisoning, skin diseases, deformities
Fishing	Land- and sea-based fishing, diving, processing of marine products	Dangerous machinery, unsafe vessels, unsanitary conditions, currents, pressure, drowning	Trauma, communicable diseases, damage to eardrums and auditory nerves

Table 5.3. Health impacts of child labor by sector (continued)

Sector	*Activity*	*Hazard*	*Injury/Disease*
INDUSTRY			
Mining and quarrying	Extracting mineral, precious metals and stone products, carrying heavy weights, diving	Dusts, fires, dangerous tools and equipment, dangerous chemicals, noise, falls, explosions, drowning	Trauma, occupational lung diseases, deformities, metal poisoning, burns, dermatitis
Construction	Carrying heavy loads, digging, mixing, working in high structures	Dusts, fires, dangerous tools and equipment, dangerous chemicals, noise, exposure to lead and asbestos, falls, falling objects	Trauma, occupational lung diseases, deformities, burns,
Clothing	Sewing, embroidery, cutting, smocking,	Poor lighting, dangerous tools and machines, chemicals, heat and humidity,	Fatigue, heat stress, chemical poisoning, eye strain
Textiles and weaving	Cutting, knitting, dyeing, washing, weaving	Noise, dust, dangerous machinery, chemicals, heat and humidity, poor lighting	Occupational lung diseases, trauma, chemical poisoning, eye strain, heat stress
Metalwork	Welding, soldering, plating, twisting and twining metal	Dangerous tools and machinery and sharp metals, exposure to lead and dangerous chemicals, heat	Trauma, metal and chemical poisoning, burns, heat stress
Glass and ceramics	Drawing and carrying molten glass, cutting, polishing, glazing and firing ceramics, polishing, painting	Dangerous machinery, hot kilns, dust, heat, fires, lead	Heat stress, burns, lead poisoning, occupational lung diseases
Leather and footwear	Cutting, hammering, stitching, glueing, dyeing, trimming	Dangerous tools and machinery, solvents, dangerous chemicals	Cuts and serious wounds, lung diseases, cancer, chemical burns
Chemicals	Match and fireworks, mixing chemicals, wrapping explosive powders, making fuses	Explosions, fires, hazardous chemicals	Burns, lung disease, chemical poisoning, neurological impairment
Food processing	Slaughtering, cutting carcasses, cleaning, separating animal parts, grinding meat, mixing, stuffing	Dangerous tools and machinery, unsanitary conditions	Cuts and serious wounds, infectious diseases

Table 5.3. Health impacts of child labor by sector (continued)

Sector	*Activity*	*Hazard*	*Injury/Disease*
SERVICES			
Food	Preparing, cooking and handling food, cleaning, selling	Fire, heat, exposure to dangerous cleaning materials, dangerous tools, stoves, and other cooking equipment, unsafe neighborhoods, exposure to the elements	Burns, heat stress, infections from exposure to the elements, trauma
Transport	Stevedoring work, carrying heavy loads	Falls, spinal injuries	Deformities, trauma
Domestic services	Cooking, cleaning, child care, laundry work	Dangerous cleaning chemicals and equipment, fires, sharp instruments, falls, fatigue. Physical and sexual abuse	Trauma, burns, chemical poisoning, respiratory diseases, psychological impacts
Street and dumpsite work	Scavenging, begging, street-hawking, selling drugs	Unsanitary conditions in garbage heaps, traffic accidents, prolonged exposure to pollutants	Trauma, malnutrition, elevated lead levels in blood, infectious diseases
Sex work	Bar and club work, prostitution	Dangerous environment, physical abuse, rape, long hours, drugs	Trauma, fatigue, HIVs and STDs, psychological impacts

Table 5.4. Exposure to hazards of working children, 5-17 years old, by sex, location, 1995

	Both sexes	*% to Total*	*Male*	*% to Total*	*Female*	*% to Total*
TOTAL CHILDREN WORKING	3,669,903	100.0	2,401,964	100.0	1,267,139	100.0
Exposed to hazards	2,207,563	60.2	1,538,048	64.0	669,515	52.8
Dust	486,118	22.0	337,066	21.9	149,052	22.3
Chemical hazards	618,939	28.0	465,846	30.3	153,096	22.9
Noise, heat, radiation, humidity	1,877,422	85.0	1,306,608	85.0	570,814	85.3
Viral, bacterial, fungal	712,593	32.3	496,890	32.3	215,703	32.2
Not exposed to hazards	1,462,340	39.8	863,196	36.0	598,424	47.2
URBAN	1,177,840	100.0	740,328	100.0	437,511	100.0
Exposed to hazards	709,737	58.8	481,361	64.5	228,376	49.5
Dust	223,070	31.4	152,421	31.7	70,649	30.9
Chemical hazards	186,564	26.3	132,005	27.4	54,539	23.9
Noise, heat, radiation, humidity	594,788	83.8	405,145	84.2	189642	83.0
Viral, bacterial, fungal	223,418	31.5	144,811	30.1	78,607	34.4
Not exposed to hazards	497,692	41.2	264,999	35.5	232,693	50.5
RURAL	2,442,806	100.0	1,646,964	100.0	795,842	100.0
Exposed to hazards	1,497,826	61.3	1,056,687	64.2	441,139	55.4
Dust	263,048	17.6	184,645	17.5	78,403	17.8
Chemical hazards	432,375	28.9	333840	31.6	98,536	22.3
Noise, heat, radiation, humidity	1,282,635	85.6	901,462	85.3	381,172	86.4
Viral, bacterial, fungal	489,174	32.7	352,079	33.3	137,096	31.1
Not exposed to hazards	964,648	38.7	598,917	35.8	365,731	44.6

Source: NSO, 1995 CLS.

Table 5.5. Perceived work risk of children, 5-14 years old by place of work

NUMBERS

	Is work risky or dangerous?			*Why risky?*								
Place of work	*No*	*Yes*	*Total*	*Possible vehicular accident*	*Might get burned*	*May fall*	*May impair hearing*	*May lose sight*	*May suffer physical injury*	*May catch disease/ get sick*	*Others*	*Total*
Own house	276,218	10,898	287,116		529	1,155			1,982	3,245	3,986	10,897
Employer/other persons house	63,006	7,250	70,256	562	408	1,781		444	1,348	720	1,987	7,250
Office factory	11,149	821	11,970								821	821
Farm	664,730	123,813	788,543		2,191	18,014	504	1,273	23,309	45,492	33,029	123,812
Street	19,813	17,711	37,524	13,949		493				1,740	1,528	17,710
Market	36,130	9,735	45,865	6,843	533					1,389	971	9,736
Mines and construction site	4,915	3,328	8,243			1,104			1,106	1,119		3,329
Others	77,735	49,741	127,476	2,814	437	6,482			6,441	9,890	23,676	49,740
Total	1,153,696	223,297	1,376,993	24,168	4,098	29,029	504	1,717	34,186	63,595	65,998	223,295

Source: NSO, 1995 CLS.

Table 5.5. Perceived work risk of children, 5-14 years old by place of work (continued)

PERCENTAGES

	Is work risky or dangerous?			*Why risky?*								
Place of work	*No*	*Yes*	*Total*	*Possible vehicular accident*	*Might get burned*	*May fall*	*May impair hearing*	*May lose sight*	*May suffer physical injury*	*May catch disease/ get sick*	*Others*	*Total*
Own house	96.2	3.8	100	0.0	4.9	10.6	0.0	0.0	18.2	29.8	36.6	100
Employer/other persons house	89.7	10.3	100	7.8	5.6	24.6	0.0	6.1	18.6	9.9	27.4	100
Office factory	93.1	6.9	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100
Farm	84.3	15.7	100	0.0	1.8	14.5	0.4	1.0	18.8	36.7	26.7	100
Street	52.8	47.2	100	78.8	0.0	2.8	0.0	0.0	0.0	9.8	8.6	100
Market	78.8	21.2	100	70.3	5.5	0.0	0.0	0.0	0.0	14.3	10.0	100
Mines and construction site	59.6	40.4	100	0.0	0.0	33.2	0.0	0.0	33.2	33.6	0.0	100
Others	61.0	39.0	100	5.7	0.9	13.0	0.0	0.0	12.9	19.9	47.6	100
Total	83.8	16.2	100	10.8	1.8	13.0	0.2	0.8	15.3	28.5	29.6	100

Source: NSO, 1995 CLS.

6. Conclusions

A nation that neglects the development of its human resources and squanders one of its most valuable resources—namely, the productive potentials of its children—cannot hope to achieve sustainable human development. Child labor impedes the development of the country's stock of human capital, reduces the lifetime earnings of individuals, lowers the level of labor productivity, and hampers the growth of an economy.

Poverty and the high cost of education drive children away from classrooms and into hazardous occupations. While poverty begets child labor, it in turn perpetuates it through generations as the low educational attainment of working children diminishes their prospects for upward mobility. Nevertheless, the evidence suggests that the contribution of working children to household income can be quite substantial and it is doubtful that poor families can cope without it.

Economic growth that is both equitable and sustainable—that is, labor absorbing—and that creates job opportunities for the adult members of poor households, is a necessary condition for the elimination of child labor. Programs to provide skills to adults from poor families will enable them to exploit the opportunities that come with robust economic growth. Sound macroeconomic policies, particularly fiscal, monetary, and exchange rate policies, are needed to ensure that economic growth and, consequently, the growth in incomes proceed on a sustainable basis.

It takes some time, however, for economic growth to raise the incomes of poor households to a level that eliminates the need to send children to work. Hence, policies and programs that directly alleviate poverty are essential to a meaningful reduction in the incidence of child labor.

The evidence also suggests a strong association between the number of children in a household and the incidence of child labor. Moreover, it is a stylized fact that poor households tend to have higher fertility rates. Any program to alleviate poverty, therefore, should have, as a major component, decisive efforts to help low-income families achieve their desired number of children.

Poverty alleviation programs tend to focus on credit provision for poor households. With regard to child labor, it is a two-edged sword. Loans are used to finance household enterprises and the direct effect is to increase the odds of children working. On the other hand, the increased income from the enterprise reduces the need for child labor. It does not necessarily follow that credit programs for the poor should be abandoned. Instead, it merely suggests that support measures to raise household income should come hand-in-hand with incentives to keep children in school. One possibility is to provide children of poor households with a generous "stipend" that will be tied to the school performance of the child. It can be withdrawn when the child leaves school and reduced when the child performs poorly.

The findings of the study suggest that efforts to make schools more accessible and less costly can significantly reduce the likelihood that children will leave school to work. Eliminating the obstacles that poor households face in sending children to school can effectively reduce child labor in the short run and poverty in the long run. Priority should be given to regions that have lagged behind in terms of the level of available educational infrastructure.

Child labor is a complex phenomenon and it will take some time for broad-based policies to have significant impact. Broad-based macro policies and programs must be complemented by policies and programs directed specifically against child labor. Any work performed by children that is detrimental to their physical, social, and psychological development should, in principle, be discouraged or totally eliminated. However, because resources are limited and the total elimination of child labor is a vast and long-term undertaking, clear priorities and realistic goals have to be established at the outset. Most of child labor in the country entails children working in family-owned enterprises under parental supervision. Over the short term, eliminating it need not be the focus of attention. Instead, efforts ought to concentrate on preventing children from engaging in the most intolerable or "worst forms" of child labor and withdrawing and rehabilitating those who are driven into it. By worst forms we mean work that, by nature of the circumstances in which it is carried out, is likely to harm the health, safety, or morals of children.

The study reveals one incontrovertible fact—that child labor can have an adverse impact on the physical, psychological, and intellectual development of children. Hence, from a humanitarian and economic standpoint, preventing and eliminating child labor, particularly its worst forms, is certainly worth the effort.

References

Anker, R. [2000] "The economics of child labor: a framework for measurement", *International Labor Review* **139**(3): 257-280.

DeGraff, D., R. Bilsborrow, and A. Herrin [1993] 'The implications of high fertility for children's time use in the Philippines" in: C. Lloyd, ed., *Fertility, family size and structure: consequences for families and children*. Proceedings of a Population Council Seminar, New York, June 9-10, 1992. New York: The Population Council.

Graitcer, P. and L. Lerer [1998] *Child labor and health: quantifying the global health impacts of child labor*. Washington, D.C.: The World Bank.

Grootaert, C. [1998] *Child labor in cote d'ivoire: incidence and determinants*. Washington, D.C.: The World Bank.

International Labour Organization (ILO) [1997] Strategies for eliminating child labor: prevention, removal and rehabilitation. Synthesis document of the International Conference on Child Labor, Oslo, October 27-30, 1997. Geneva.

Jacoby, H. and E. Scoufias [1994] "Risk, financial markets and human capital in a developing country", World Bank Policy Research Department. Washington, D.C.: The World Bank.

Lim, J. [1999] "The East Asian crisis and child labor in the Philippines." Draft manuscript.

Lim, J. [2001] Conceptual framework for the child labor component of the ILO/ ADB project: strengthening the role of international labor standards in selected DMCs. Manila: International Labour Organization.

Lloyd, C. [1994] "Investing in the next generation: the implication of high fertility at the level of the family", New York Population Council Research Division Working Paper No. 63. New York: Population Council.

Villamil, W. [2000] "Child labor: a preliminary inquiry", *Issues and Letters* **9**(1). Quezon City: Philippine Center for Policy Studies.

World Bank [2000] "Philippines poverty assessment." Draft manuscript. Washington, D.C.

Annex A

Statistical results of a sequential probit regression of child labor using data from the 1995 NSO Survey of child labor

Table A.1. Sequential probit results: first stage

First stage	P1=probability of going to school and not working
Sample size:	43,934
Log likelihood:	-23,509
Wald chi^2:	3,362
Pseudo R^2	0.0747
% Correct predictions	74.46

Table A.1. Sequential probit results: first stage (continued)

Variable	*Beta coefficients*	*z-stat*	*Marginal effect*
age	-0.0254	-11.8	-0.0080
female	0.3225	5.8	0.1015
hhmale	0.0232	1.0	0.0074
hhlowed	-0.0061	-0.2	-0.0019
lowedfem	-0.0078	-0.1	-0.0025
hhage	-0.0012	-1.6	-0.0004
age04	-0.0796	-9.5	-0.0252
age59	-0.0279	-3.4	-0.0088
age1014	-0.0319	-4.1	-0.0101
age1517	0.0867	7.9	0.0274
adults	0.0090	1.5	0.0029
agriland	0.0797	5.5	0.0251
resland	-0.0696	-4.4	-0.0222
othrland	0.0324	0.9	0.0101
ownenter	-0.4223	-28.4	-0.1316
lowinc	-0.2302	-15.3	-0.0751
urban	0.1986	10.4	0.0634
urbfem	-0.1472	-5.5	-0.0476
reg2	-0.3008	-7.0	-0.1034
reg3	0.0309	0.9	0.0097
reg4	0.0404	1.2	0.0127
reg5	0.0353	0.9	0.0110
reg6	-0.0807	-2.2	-0.0261
reg7	0.0308	0.8	0.0097
reg8	-0.0067	-0.2	-0.0021
reg9	-0.1730	-4.1	-0.0576
reg10	-0.0055	-0.1	-0.0017
reg11	-0.2304	-6.4	-0.0774
reg12	-0.2203	-5.0	-0.0743
ncr	0.3333	9.1	0.0964
car	-0.0920	-1.8	-0.0300
armm	-0.1148	-2.5	-0.0376
_cons	1.1088	16.3	

Table A.2. Sequential probit results: second stage

First stage	P2=probability of going to school and working
Sample size:	11,645
Log likelihood:	-6,151
Wald chi2:	2,822
Pseudo R2	0.1969
% Correct predictions	70.56

Table A.2. Sequential probit results: second stage (continued)

Variable	*Beta coefficients*	*z-stat*	*Marginal effect*
age	0.1280	40.3	0.0458
female	-0.1725	-1.5	-0.0613
hhmale	0.0498	1.1	0.0177
hhlowed	-0.2170	-2.8	-0.0808
lowedfem	0.1202	1.1	0.0433
hhage	-0.0027	-1.8	-0.0010
age04	-0.0406	-2.5	-0.0145
age59	0.0421	2.7	0.0151
age1014	-0.1293	-8.6	-0.0463
age1517	-0.0219	-1.0	-0.0079
adults	-0.0807	-6.1	-0.0289
agriland	0.0530	1.9	0.0190
resland	0.0470	1.6	0.0169
othrland	-0.1178	-1.7	-0.0411
ownenter	0.7698	22.8	0.2493
lowinc	-0.1014	-3.6	-0.0361
urban	-0.0249	-0.7	-0.0089
urbfem	0.0822	1.5	0.0298
reg2	-0.0063	-0.1	-0.0023
reg3	-0.6598	-9.4	-0.1998
reg4	-0.3067	-4.7	-0.1031
reg5	-0.2933	-4.1	-0.0981
reg6	-0.0757	-1.1	-0.0267
reg7	-0.7712	-10.0	-0.2216
reg8	-0.6291	-7.9	-0.1887
reg9	-0.5509	-7.0	-0.1697
reg10	-0.4090	-5.6	-0.1323
reg11	-0.3838	-5.8	-0.1262
reg12	-0.2311	-3.0	-0.0783
ncr	-0.6888	-8.2	-0.2031
car	-0.0266	-0.3	-0.0095
armm	-1.1869	-12.7	-0.2838
_cons	-1.5337	-12.0	

Table A.3. Sequential probit results: third stage

First stage	P3=probability of not going to school and working
Sample size:	7,362
Log likelihood:	-2,118
Wald chi2:	2,646
Pseudo R2	0.5200
% Correct predictions	85.74

Table A.3. Sequential probit results: third stage (continued)

Variable	*Beta coefficients*	*z-stat*	*Marginal effect*
age	0.3031	48.1	0.0591
female	-1.0813	-5.8	-0.1969
hhmale	-0.0188	-0.3	-0.0037
hhlowed	0.3316	2.7	0.0534
lowedfem	0.1869	1.0	0.0372
hhage	0.0009	0.3	0.0002
age04	0.0487	1.8	0.0095
age59	0.0634	2.4	0.0124
age1014	-0.0476	-1.9	-0.0093
age1517	-0.0549	-1.5	-0.0107
adults	-0.0536	-2.5	-0.0105
agriland	-0.0134	-0.3	-0.0026
resland	0.1437	2.8	0.0288
othrland	-0.1415	-1.3	-0.0255
ownenter	0.4573	8.6	0.0840
lowinc	0.2370	4.9	0.0477
urban	-0.2559	-4.5	-0.0497
urbfem	0.2094	2.2	0.0439
reg2	0.3533	2.3	0.0827
reg3	0.1680	1.3	0.0354
reg4	-0.0303	-0.2	-0.0058
reg5	0.1010	0.7	0.0208
reg6	0.2799	2.1	0.0624
reg7	-0.1211	-0.9	-0.0222
reg8	0.3232	2.3	0.0741
reg9	-0.0735	-0.5	-0.0138
reg10	-0.0628	-0.5	-0.0119
reg11	0.3117	2.5	0.0700
reg12	0.3462	2.3	0.0807
ncr	-0.4095	-2.8	-0.0643
car	-0.0863	-0.4	-0.0160
armm	-0.1018	-0.7	-0.0188
_cons	-4.5639	-19.9	

Table A.4. Sequential probit results: fourth stage

First stage	P4=probability of not going to school and not working
Sample size:	7,362
Log likelihood:	-2,118
Wald chi2:	2,646
Pseudo R2	0.5200
% Correct predictions	85.74

Table A.4. Sequential probit results: fourth stage (continued)

Variable	*Beta coefficients*	*z-stat*	*Marginal effect*
age	-0.3031	48.1	-0.0591
female	1.0813	-5.8	0.1969
hhmale	0.0188	-0.3	0.0037
hhlowed	-0.3316	2.7	-0.0534
lowedfem	-0.1869	1.0	-0.0372
hhage	-0.0009	0.3	-0.0002
age04	-0.0487	1.8	-0.0095
age59	-0.0634	2.4	-0.0124
age1014	0.0476	-1.9	0.0093
age1517	0.0549	-1.5	0.0107
adults	0.0536	-2.5	0.0105
agriland	0.0134	-0.3	0.0026
resland	-0.1437	2.8	-0.0288
othrland	0.1415	-1.3	0.0255
ownenter	-0.4573	8.6	-0.0840
lowinc	-0.2370	4.9	-0.0477
urban	0.2559	-4.5	0.0497
urbfem	-0.2094	2.2	-0.0439
reg2	-0.3533	2.3	-0.0827
reg3	-0.1680	1.3	-0.0354
reg4	0.0303	-0.2	0.0058
reg5	-0.1010	0.7	-0.0208
reg6	-0.2799	2.1	-0.0624
reg7	0.1211	-0.9	0.0222
reg8	-0.3232	2.3	-0.0741
reg9	0.0735	-0.5	0.0138
reg10	0.0628	-0.5	0.0119
reg11	-0.3117	2.5	-0.0700
reg12	-0.3462	2.3	-0.0807
ncr	0.4095	-2.8	0.0643
car	0.0863	-0.4	0.0160
armm	0.1018	-0.7	0.0188
_cons	4.5639	-19.9	