

**Centre de recherche sur l'emploi et les fluctuations économiques (CREFÉ)**  
**Center for Research on Economic Fluctuations and Employment (CREFE)**

**Université du Québec à Montréal**

**Cahier de recherche/Working Paper No. 135**

**Why Banning the Worst Forms of Child Labour Would Hurt Poor Countries \***

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June 2001

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\* This paper benefited from comments by Clément Lemelin and Michel Robe. The authors gratefully acknowledge financial support from the Social Sciences and Humanities Research Council of Canada.

**Abstract:**

Although it is intuitive and morally compelling that the worst forms of child labour should be eliminated, banning them in poor countries is unlikely to be welfare improving and can come at the expense of human capital accumulation. We show that the existence of harmful forms of child labour, in fact, has an economic role: it helps keep wages for child labour high enough to allow human capital accumulation. Therefore, unless appropriate mechanisms are designed to mitigate the decline in child labour wages caused by reduced employment options for children, a ban on harmful forms of child labour will likely prove undesirable in poor countries. We perform our analysis within a simple two-period model of parental investment in children's education and nutritional quality.

**Keywords:**

Child labour, human capital, nutrition, development

JEL classification: I00, J20, O01

# 1 Introduction

If we were to gather a large crowd of people from diverse origins in a football field around any European city, asking them to vote on a ban on harmful forms of child labour, no doubt they would unanimously vote in favour of the ban. In fact they have nothing to lose in this vote and they might even think that they are doing something good. It may come as a surprise to them, as it did to us, that poor countries might not gain from such convention. This paper provides a welfare evaluation of the new convention on the worst forms of child labour initiated by the International Labour Organisation (ILO).

The international consensus on the elimination of child labour is built around three main concerns: the protection of children, their mental and cognitive development, and the economic impact of child labour. Echoing this consensus, the International Labour Organisation put together, in 1973, a convention establishing at fifteen years the minimum age for admission to employment (Convention C138). Notwithstanding the need to protect children, there is now a widespread agreement that poverty is the main determinant of child labour, implying that this phenomenon should be tolerated in poor countries, at least in its non-hazardous forms (see, e.g., Anker, 2000).

Recently, therefore, the concern about child labour has shifted to its worst forms. In 1999, a new ILO convention was designed that aimed at banning only those forms of child labour. Two years after its birth, however, the new ILO Convention C182 is far from having drawn universal support. In particular, the vigorous ratification campaign launched by ILO has not yet generated much enthusiasm among poor countries, those with *per capita* income below \$1000.

While it is undeniable that hazardous work has a negative impact on children's well-being, to ban it requires an understanding of its determinants, including the role of poverty. For the ban to be successful, it must be that it does not make poor families worse off. If parents are altruistic, it is difficult to understand why they would even choose to enlist their children to perform hazardous work. Of course coercion, as in the case of child slavery and bonded labour, could be an explanation. But not all worst forms of child labour are the result of coercive forces. In fact, as we show in this paper, coercion is not necessary for altruistic parents to consent to their children engaging in hazardous and dangerous activities, such as prostitution, begging, and others.

In this paper therefore, we argue that, although it is intuitive that the worst forms of child labour should be eliminated, using legislation to ban it may not be welfare improving and can come at the expense of human capital accumulation in poor countries, unless appropriate mechanisms are designed to mitigate the decline in child labour wages caused by reduced employment options for children. This result is obtained within a simple two-period model of parental investment in human capital. A main feature of the model is the

complementarity between the quality of the nutrition received by a child and his scholastic achievement. While parents may in fact value their children's education, they would not be inclined to invest in this education if education and good health cannot be reconciled. Parents may know that the returns to education are high in the long run, but those returns can only be captured by a healthy child and well-educated adult, which makes the quality of the child's nutrition and schooling complementary. Allowing for part-time child labour may in fact enhance human capital in the economy. In our model economy, there is a supply of child labourers in both non-harmful and harmful forms of child labour. Although parents may prefer non-harmful work, in equilibrium, wages for both types of child labour will adjust to make them indifferent, causing both forms of child labour to coexist.

Our arguments rely on a series of empirical findings linking malnutrition and scholastic achievements. Positive correlations between nutrition and school performance are undisputed (see, e.g., Behrman, 1996, for a survey). Because of simultaneity problems, however, causality is not straightforward to establish. In fact, for parents to send their children to school and to provide them with adequate nutrition are simultaneous decisions. After accounting for this endogeneity of variables, Behrman & Lavy (1997) find little effect of health variables on schooling outcomes, unlike previous estimates ignoring endogeneity problems. Glewwe & Jacoby (1993) and Alderman, Behrman, Lavy, & Menon (2001) do find, however, that poor nutrition significantly delays school enrolment. In essence, health is not a factor determining children's success in school because children in schools are healthy, but malnutrition does affect the prospects of children in general, since a child in poor nutritional status will not be sent to school. This evidence therefore suggests that there exists a threshold nutritional level below which it is not worthwhile to enrol children in schools. This will have important implications in our modelling, Section 2. Notwithstanding the above, it is widely accepted that temporarily malnourished children lack concentration and learn less than children with better nutrition. The negative effects of short-term malnutrition on schooling outcomes are estimated by Harbison & Hanushek (1992).

That child labour is an important phenomenon makes no doubt. In many poor African countries, the proportion of children involved in labour activities ranges from 20 to 30%, depending on the age-bracket considered (see, for instance, ILO, 1996; Canagarajah & Coulombe, 1997; Grootaert, 1998). That it may come at the expense of education is intuitive, yet not necessarily true, as we argue in this paper. Child labour has been the focus of much reflection in recent years (see Basu, 1999, for a survey). Many explanations have been offered for a practice of which parents themselves often disapprove. In Basu & Van (1998), though parents are altruistic towards their children, they nevertheless send them to work to provide a necessary income supplement. In Baland & Robinson (2000), child labour arises because children cannot commit to transfer parts of their future income to their parents to compensate them for supporting their education. Dessy

& Pallage (2001) show that child labour may also find its origin in the lack of a coordination mechanism between firms' decisions to invest in skill-biased technologies and parents' decisions to send their children to school. Social norms have also been put forth to rationalise the practice (see, e.g., López-Calva, 1999). Market-oriented solutions to child labour are not straightforward to apply. As Basu (2000) points out, for instance, raising the minimum wage to relax the budget constraint of the poor, has ambiguous effects. It may in fact induce a larger share of child labourers. Hence the attractiveness of coercive measures such as those pushed forward by the International Labour Organisation. In most of the literature, including Dessy (2000), bans on child labour are indeed advocated as Pareto improvements. In fact, Basu & Van (1998) were probably the first to suggest that these bans are not necessarily socially desirable in that they may worsen the family condition. In the present paper, we show that even selective bans could be detrimental to poor countries welfare and economic prospects.

In the next section, we develop a model consistent with the empirical evidence on the role of nutrition in schooling decisions. In Section 3, we discuss our results and conclude.

## 2 A Two-Period Model

Consider the following two-period economy, with a single consumption good. In the first period, there is a continuum of identical adults of measure 1. Each adult is endowed with human capital  $h_p$  and bears one child who lives for two periods. Adults and children dispose of a unit endowment of time, which, for parents, is entirely allocated to work, but, in the case of children, can be divided between school and work. In the second period, the children are adult and their parents exit the labour force.

Three main features characterise parental allocation of children's time use in this model. First, child labour, depending upon its form, can be harmful to children in the sense that it can adversely affect their ability to accumulate human capital. Second, there exists a threshold nutrition quality below which schooling is not worthwhile, which is consistent with empirical evidence (see, e.g., Glewwe & Jacoby, 1993; or Alderman *et al.*, 2001). Third, the productivity of schooling as a human capital accumulation mechanism positively depends upon the quality of nutrition received by children, capturing the fact that malnourished students do not perform as well as the others (Harbison & Hanushek, 1992). More formally, if a child works in an environment characterised by a degree of hazard  $z$ , during a length of time  $1 - e$ , and receives nutrition of quality  $n$ , his human capital when adult, denoted by  $h_z$ , will be given by

$$h_z = \begin{cases} \theta (n - \bar{n}_z)^\gamma e^{1-\gamma} h_p^\lambda, & \text{if } n > \bar{n}_z \\ \nu, & \text{otherwise} \end{cases} \quad (1)$$

where  $e \in [0, 1]$  denotes child's time allocated to schooling and  $\bar{n}_z$ , the threshold nutritional quality above which schooling is human capital enhancing;  $\theta > 1$ ,  $0 < \gamma < 1$ ,  $\lambda \geq 0$ , and  $\nu$  is positive but arbitrarily small.

Because of its dependence on  $z$ , the threshold nutritional quality  $\bar{n}_z$  captures the effect on the child's ability to learn of the environment in which he works. It is assumed that the more harmful the working conditions of the child, the higher the threshold nutritional quality above which schooling for him is a productive human capital accumulation mechanism. To further simplify the analysis, it will be assumed that there are only two types of works available to children, a non-harmful form, referred to as type  $A$ , and a harmful form, referred to as type  $B$ . Therefore we have  $\bar{n}_A < \bar{n}_B$ , implying that type  $B$  child labour puts a higher demand on nutritional quality in order to correct or alleviate its harmful effects on the child's ability to learn. Since type  $A$  work is not dangerous, we assume that  $\bar{n}_A$  is also the nutritional threshold of a child not involved at all on the labour market.

#### *Parental preferences and budget constraint*

All parents have preferences defined over their level of consumption  $c$ , as well as over their child's human capital when adult. As is standard in the literature on parental investment in education (see, e.g., Glomm, 1997; Kremer and Chen, 1999), the parent's life-time utility is given by:

$$U = \ln c + \beta \ln h_z \tag{2}$$

where  $\beta \in (0, 1)$  denotes the time discount factor and  $c$  the parent's own consumption. We assume, without loss of generality, that an adult's wage is  $h_p$ . The budget constraint faced by a parent whose child performs type  $z$  child labour is thus:

$$c + \rho n \leq h_p + \mu_z (1 - e) \omega_z \tag{3}$$

where  $\rho$  is a positive, constant parameter which converts one unit of the unique consumption good into units of nutrition quality,  $\omega_z$ , the wage rewarding child labour performed in environment  $z$  and  $\mu_z$ , a binary variable which takes value 0 if children are prohibited by law from working in environment  $z$ , and value 1 otherwise. Since the utility function is strictly increasing, the budget constraint of Equation (3) will be binding in the optimum.

#### *Parental decision making*

Parents make the nutrition and schooling decisions on behalf of their child. More formally, they all face the

following problem:

$$V_1(h_p, \omega_z, z) = \max_{\langle e, n \rangle} \left\{ \ln[h_p - \rho n + \mu_z (1 - e) \omega_z] + \beta \ln \left[ \theta (n - \bar{n}_z)^\gamma e^{1-\gamma} h_p^\lambda \right] \right\} \quad (4)$$

To solve the parents' problem, we consider two different legal environments: (i) one in which  $\mu_z = 1$ , for all  $z$ , i.e., there are no restrictions on child labour; and (ii) one in which  $\mu_A = 1$  and  $\mu_B = 0$ , i.e., only the harmful form of child labour is banned, in the spirit of ILO Convention C182.

## 2.1 No legal restriction on child labour

When there are no legal restrictions on child labour, parents must first choose the form of child labour  $z$  they want their child to perform,<sup>1</sup> then decide on the pair  $(e, n)$ . To solve this two-stage problem, it is convenient to use backward induction. Given  $z$ , the first order conditions for an interior solution to problem (4) are:

$$n : \quad \frac{-\rho}{h_p + \omega_z - \rho n - e\omega_z} + \frac{\beta\gamma}{n - \bar{n}_z} = 0 \quad (5)$$

$$e : \quad \frac{-\omega_z}{h_p + \omega_z - \rho n - e\omega_z} + \frac{\beta(1-\gamma)}{e} = 0 \quad (6)$$

These first order conditions lead to the following decision rules and optimal human capital accumulation:

$$\hat{e}_z = (1 - \gamma) \phi \left[ \frac{h_p + \omega_z - \rho \bar{n}_z}{\omega_z} \right] \quad (7)$$

$$\hat{n}_z = \gamma \phi \left[ \frac{h_p + \omega_z}{\rho} + \delta \bar{n}_z \right] \quad (8)$$

$$h_z = \Theta \omega_z^{\gamma-1} [h_p + \omega_z - \rho \bar{n}_z] h_p^\lambda \quad (9)$$

where  $z = A, B$ ,  $\delta = \frac{1+\beta(1-\gamma)}{\beta\gamma}$ ,  $\phi = \frac{\beta}{1+\beta}$  and  $\Theta = \theta \phi (1 - \gamma)^{1-\gamma} \left( \frac{\gamma}{\rho} \right)^\gamma$ .

Note the dependence of both decisions rules ( $\hat{e}_z$  and  $\hat{n}_z$ ) on the threshold nutritional quality,  $\bar{n}_z$ , and on the child labour wage,  $\omega_z$ . To have a clear picture of the dynamics of child labour and nutrition, consider an environment where the representative parent is so poor that without child labour, he would not be able to send his child to school. Such an environment is characterised by:

$$h_p \leq \rho \bar{n}_A, \quad (10)$$

Condition (10) implies that the representative parent is unable to afford even the child's minimum nutritional quality above which it is worthwhile to educate him. Since nutrition is essential for schooling to be human

<sup>1</sup>We assume that both work forms are mutually exclusive.

capital enhancing, in such an environment, child labour may become a necessary condition for the child to be enrolled in school. Hence the following proposition:

**Proposition 1** *If Condition (10) holds, then child labour is always necessary in this environment, and the higher the child labour wage, the higher the level of parental investment in both the child's education and nutrition.*

**Proof.** To prove the first part of this proposition, it suffices to note that  $\hat{e}_z < 1$  whenever Condition (10) holds, given that  $\gamma$  and  $\beta$  are both between 0 and 1. Part two simply follows from the sign of the derivatives of both policy functions with respect to  $\omega_z$ . ■

A corollary to Proposition 1 is that the human capital achieved by a child working in a given environment  $z$  is a positive function of the wage in this environment.

Proposition 1 echoes growing concerns that banning child labour, regardless of its form may not necessarily enhance human capital accumulation. This idea is formalised in the present paper by the complementarity between nutrition and schooling time. Schooling, by the demand it puts on adequate nutrition imposes a liquidity constraint on parents. Observe that the higher  $\rho$ , the stronger this liquidity constraint, as implied by Condition (10). In this world of missing capital markets, the liquidity constraint, in turn forces parents wishing to invest in their child's education to resort to child labour. Hence the positive association, in a poor economy and in all work environments, between the child labour wage and both the child's nutritional quality,  $\hat{n}_z$ , and schooling time,  $\hat{e}_z$ .<sup>2</sup> In other words, Proposition 1 rationalises the lack of universal support for ILO Convention C138 banning *all* forms of child labour. In fact, poor economies in our model — those characterised by Condition (10) — always suffer from signing and enforcing Convention C138. Convention C182 may therefore appear as an improvement upon its ancestor in the sense that it tolerates non-harmful forms of child labour. To what extent this new convention actually represents an improvement is analysed below in the context of a poor economy — one in which child labour is necessary.<sup>3</sup>

Since we are mainly interested in countries in which child labour is driven primarily by poverty, it will be assumed henceforth that Condition (10) holds, which, by Proposition 1, also makes child labour a prerequisite to education. Hence the importance of the following question: what type of child labour will parents choose? Given that  $\bar{n}_A < \bar{n}_B$ , parents wishing to rely on child labour as a means to invest in their child's

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<sup>2</sup>Were Condition (10) not satisfied, however, we would find back the typical negative relation between child schooling and child labour wage.

<sup>3</sup>The assumption of identical parents should not be taken as restrictive. Our focus is on poor countries. If the average income in a country satisfies a condition like Condition 10, it means that more than 50% of the population is extremely poor. It also means that if they were to vote on ratifying the convention, the poor would hold the majority.



human capital face a trade-off between the harmful effect of the type of child labour they choose and its beneficial effect, measured by the wage it pays. In equilibrium, the assumption of identical parents implies that the wages for both types of child labour will adjust to make these parents indifferent. In fact, this is the necessary condition for both forms of child labour to coexist.<sup>4</sup> We prove the following proposition:

**Proposition 2** *Let  $\bar{n}_A < \bar{n}_B$ . Then in equilibrium, it must be that  $\omega_B > \omega_A$ . Furthermore,  $\omega_B - \omega_A > \rho(\bar{n}_B - \bar{n}_A)$ .*

**Proof.** To prove the first part of this proposition, suppose we have simultaneously  $\bar{n}_A < \bar{n}_B$  and  $\omega_A > \omega_B$ . Consider two allocations of consumption, child nutrition and work and schooling time,  $x_A^*$  and  $x_B^*$ , solving the problem of parents in work environments A and B respectively given the wages  $\omega_A$  and  $\omega_B$ , and leaving the parents indifferent. Consider next an alternative allocation  $\tilde{x}$  in which children work and attend school for the same number of hours as in  $x_B^*$ , receive the same nutrition as in  $x_B^*$ , but instead of working in environment B, they work in environment A. This allocation is feasible and yields a higher consumption level together with a higher future human capital for children. It must be that  $\tilde{x}$  is strictly preferred to  $x_B^*$  by parents in the type B environment. Since, by assumption, they are indifferent between  $x_A^*$  and  $x_B^*$ , by transitivity of preferences, it must also be that  $\tilde{x}$  is strictly preferred to  $x_A^*$ , which means that parents in the type A environment were not optimising when choosing  $x_A^*$ , which contradicts our premise. The same reasoning applies to the case where  $\omega_A = \omega_B$ . Hence it must be that  $\omega_B > \omega_A$ . For the second part of the proposition, it can be established that parental indifference between type A and type B forms of child labour implies:

$$\frac{\omega_A}{\omega_B} = \left[ \frac{h_p + \omega_A - \rho\bar{n}_A}{h_p + \omega_B - \rho\bar{n}_B} \right]^{\frac{1+\beta}{\beta(1-\gamma)}} \quad (11)$$

Using part 1 of this proposition, we know that the numerator of the fraction in the right-hand side of Equation (11) must be smaller than the denominator. Hence:  $\omega_B - \omega_A > \rho(\bar{n}_B - \bar{n}_A)$ . ■

The term  $\rho(\bar{n}_B - \bar{n}_A)$  denotes the minimum additional nutritional expenditure a parent must incur if he wishes to use the harmful form of child labour as a means to relax his liquidity constraint. The term  $\omega_B - \omega_A$  represents the wage premium for the harmful form of child labour. A corollary to Proposition 2 is that unless the wage premium for the worst form of child labour exceeds the minimum additional expenditure in nutritional quality necessary to alleviate its harmful effects on the child, the two forms of child labour will never coexist in equilibrium. In other words, in environments in which child labour occurs in both harmful and non-harmful forms, it must be that the harmful form pays a sufficiently high wage to compensate the

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<sup>4</sup>Our problem would be vacuous if type B child labour were not used in equilibrium.

parents for its deleterious effects on the child.<sup>5</sup>

Now, it might be important to understand which form of child labour will help children accumulate more human capital. As the next proposition makes it clear, children working in the non-harmful environment, *ceteris paribus*, have higher human capital prospects than children working in hazardous environments.

**Proposition 3** *In equilibrium, ceteris paribus,  $h_A > h_B$ .*

**Proof.** Using parental education and nutrition policies, it can be established that:

$$\frac{h_A}{h_B} = \left( \frac{\omega_B}{\omega_A} \right)^{\frac{1-\gamma}{1+\beta}} \quad (12)$$

Proposition 2 guarantees that the right-hand side of this equation is bigger than 1. Hence the result. ■

Taken literally, Proposition 3 might lead to the conclusion that a ban on type B child labour, in the spirit of ILO Convention C182, would be human capital enhancing in poor countries and likely welfare improving. The point we wish to make, however, is that such a conclusion should not be validated irrespective of the labour market consequences of reduced employment options for children. One should keep in mind that, in a poor economy, children have higher human capital prospects, the higher the child labour wage (Proposition 1). This is mainly due to the fact that the higher the wage, the fewer the number of hours a child needs to work in order to help finance his nutritional needs. To the extent that both types of child labour would have coexisted, absent the ratification of ILO Convention C182, a ban on type B child labour, and the sudden influx of child labourers it will generate in type A market, will likely drive down the wage on this market. How this decline in the child labour wage will affect welfare and human capital prospects therefore needs to be carefully assessed. In the coming lines, we first evaluate the welfare consequences for a poor country of adopting the ban on the worst forms of child labour. We then compare *per capita* human capital in an economy without legal restrictions on child labour with the one obtained in an environment determined by ILO Convention C182.

## 2.2 Convention C182

### *Welfare evaluation*

In absence of the ban on the worst forms of child labour, the household's welfare, from the point of view of

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<sup>5</sup>We would like to stress the fact that this does not apply to slavery or debt bondage, which our model is not equipped to analyse.

the altruistic parent whose child is involved in type  $z$  child labour can be written as follows:<sup>6</sup>

$$W(h_p, \omega_z, z) = (1 + \beta) \ln [h_p + \omega_z - \rho \bar{n}_z] - \beta (1 - \gamma) \ln \omega_z + D \quad (13)$$

for  $z = A, B$ , where the residual term  $D$  is given by

$$D = \beta \ln \theta h_p^\lambda + \beta \ln [(1 - \gamma) \phi] + \beta \ln \left( \frac{\gamma}{(1 - \gamma) \rho} \right)^\gamma - \ln (1 + \beta)$$

Likewise, under ILO Convention C182, household welfare is given by:

$$W^{C182}(h_p, \omega_A^{C182}) = (1 + \beta) \ln [h_p + \omega_A^{C182} - \rho \bar{n}_z] - \beta (1 - \gamma) \ln \omega_A^{C182} + D \quad (14)$$

where  $\omega_A^{C182}$  denotes the new child labour wage following enforcement of the convention.

In absence of legal restrictions on child labour, type  $A$  and type  $B$  households will have identical welfare levels. Therefore, to investigate the welfare implications of ILO Convention C182, it suffices to compare the welfare of a type  $A$  household in absence and in the presence of a ban on the worst forms of child labour. For expository convenience and without loss of generality, we restrict ourselves to the richest of the poor countries satisfying Condition (10), those for which the condition is satisfied with equality:

$$h_p = \rho \bar{n}_A \quad (15)$$

In that case, the expressions for household welfare with and without the ban respectively reduce to:

$$\begin{aligned} W^{C182}(h_p, \omega_A^{C182}) &= (1 + \beta\gamma) \ln (\omega_A^{C182}) + D \\ W(h_p, \omega_A) &= (1 + \beta\gamma) \ln (\omega_A) + D \end{aligned}$$

Observe that if  $\omega_A > \omega_A^{C182}$ ,  $W(h_p, \omega_A) > W^{C182}(h_p, \omega_A^{C182})$ . Hence the following proposition:

**Proposition 4** *Let condition (15) hold. If  $\omega_A > \omega_A^{C182}$ , then parents will be worse off under ILO Convention C182.*

The condition  $\omega_A > \omega_A^{C182}$  is likely to obtain in a poor country, one in which child labour is necessary. In that context, following a ban on the worst forms of child labour, children who would have been found

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<sup>6</sup>The preferences of children are implicit in this welfare formulation, since parents are altruistic and care about their children's future human capital.

working in harmful jobs will now all apply for non-harmful ones. This in turn, *ceteris paribus*, will put downward pressures on the child labour wage,  $\omega_A^{C182}$ . Proposition 4 therefore implies that poor countries do not benefit from ratifying Convention C182, because it fails to enhance household welfare.

Although it is intuitive that the harmful forms of child labour should be abolished, their existence in a poor economy helps maintain the wage for other forms of child labour sufficiently high that children may need to work less to help finance adequate nutrition quality.

We have assumed that adult wages are not affected by the adoption of Convention C182. One might think that our results crucially depend on this assumption. We want to argue that, if adult wages respond to the new legal environment, they will likely be decrease. In fact, the evidence on the substitutability of adult and child labours is at best mitigated (see, e.g. Galbi, 1997; Anker, 2000). If substitutable in non-hazardous environments, those two forms of labour will face higher competition, following the ban on the worst forms of child labour, with negative consequences on both adult and child wages on these markets. Since non-hazardous activities often take place in the formal sector (e.g., newspaper delivery), substitutability between child and adult workers is most likely in those activities. Whether substitutability may also hold in harmful activities, however, we do not know. But, as Anker (2000) puts it, one way (possibly the best way) to enforce a ban on hazardous child labour is to ban hazardous activities, which would imply that no adult would gain from the ban.<sup>7</sup> For all these reasons, we believe that our results are not sensitive to the assumption that adult wages are unaffected by the ban.

### *Human capital accumulation*

Our results imply that Convention C182 should be rejected by poor countries on the basis of welfare. Policies, however, are often adopted on the basis of simpler indicators, such as *per capita* gross domestic product or (equivalently in this paper) human capital accumulation. Could Convention C182 also be rejected on the basis of such indicator? We turn to this question.

Let  $\alpha > 0$  denote the equilibrium proportion of children involved in the harmful form of child labour. The *per capita* human capital accumulated by children in this economy, absent any legal restriction on children's time use is given by:

$$\bar{h} = \alpha h_B + (1 - \alpha) h_A \tag{16}$$

$$= G(\alpha) \Theta (\omega_A)^{\gamma-1} [h_p + \omega_A - \rho \bar{n}_A] h_p^\lambda \tag{17}$$

where  $G(\alpha) = \alpha \left( \frac{\omega_A}{\omega_B} \right)^{\frac{1-\gamma}{1+\beta}} + 1 - \alpha$ . As long as  $\alpha > 0$ , clearly,  $G(\alpha) < 1$ . The second line of the above equation is obtained after substituting in the optimal human capital accumulation rules.

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<sup>7</sup>In any case, the wage effects of replacing children by adults, if positive, are extremely small (see Anker, 2000).

Again, without loss of generality, we focus on the richest of the poor countries satisfying Condition (10). Suppose that the government of a country whose economy is characterised by Condition (15) is willing to ratify the new ILO Convention C182 only if this convention can enhance human capital accumulation. Assuming that enforcement of this ban on the harmful form of child labour is effective, and that Condition (15) holds, per capita human capital in this economy would be:

$$\bar{h}_A^{C182} = \Theta \left( \omega_A^{C182} \right)^\gamma h_p^\lambda.$$

If instead the country's government declines to ratify this convention, under Condition (15), per capita human capital would be:

$$\bar{h} = G(\alpha) \Theta \left( \omega_A \right)^\gamma h_p^\lambda.$$

*Ceteris paribus*, ratification of the convention is human capital enhancing if and only if:

$$\frac{\omega_A^{C182}}{\omega_A} \geq [G(\alpha)]^{1/\gamma} \tag{18}$$

A simple inspection of the above inequality suggests that unless the new wage  $w_A^{C182}$  is sufficiently high, it is unlikely that Convention C182 will outperform the status quo in terms of *per capita* human capital. The following proposition is clear:

**Proposition 5** *In countries in which Condition (15) holds, but Condition (18) is violated, ratifying the new ILO Convention C182 will not enhance human capital accumulation.*

Note that both sides of Inequality (18) are dependent on  $\alpha$ , which makes it quite impossible to draw clear-cut answers as to the circumstances under which a country's human capital may be boosted by Convention C182. We do want to highlight the fact, however, that banning the worst forms of child labour has ambiguous effects on the average human capital in poor countries. Whether a ban on harmful forms of child labour can be human capital enhancing or not, is far from trivial. In fact, it depends on the effect of the selective ban on the wage paid for the remaining type of child labour.

### 3 Discussion and conclusion

Without appropriate accompanying policies, Convention C182 on the worst forms of child labour should be rejected by poor countries. We show that this convention worsens the condition of poor families. Blindly banning harmful forms of child labour would be ignoring that such activities have an economic role, that

of keeping the wage for other forms of child labour sufficiently high to help poor families provide adequate nutrition to their children attending school. We further show that this convention may in fact reduce the average human capital prospects of a poor country, which makes the adoption of such convention on the basis of development highly questionable.

Convention C182, combined with an appropriate food-for-education program, may in fact boost support for a ban on harmful forms of child labour. Because it relaxes the liquidity constraint of the very poor, this food-for-education program may induce more time spent at school, which may be sufficient to offset the negative effects of the sudden increase in the supply of child labourers on type A job market, following the ban.

Of course food-for-education programs cannot be evaluated in a partial equilibrium setting. The question of their financing needs to be addressed, which may temper our conclusion. One could argue that such programs might be financed by international aid. Pallage & Zimmermann (2000) have studied the possibility to use international transfers to buy out child labour. They find, however, that the required transfers significantly exceed the willingness to pay of rich countries. Furthermore, our model is not equipped to take into account the adverse effects food-for-education programs may have on fertility decisions, for instance, or the stigma that may be attached to them, often leading parents to disregard the option to subscribe to them.

We worked throughout with the assumption of identical parents. One might argue that this lack of heterogeneity in the distribution of human capital across parents weighs heavily on our results. Such is not the case, however. If a country satisfies a condition resembling Condition (10), it implies that more than half its population would suffer from the ban on worst forms of child labour. The ban, in such country, would never be part of a voting equilibrium.

Our results should not be interpreted as suggesting that child prostitution or dangerous work are good and should be encouraged. They suggest that these activities have an economic role in poor countries which cannot be ignored. Banning them without taking appropriate steps may have adverse effects on the well-being of families and possibly on human capital accumulation in the poorest countries.

Rich or middle income countries should not have problems ratifying ILO Convention C182 because, for them, education is negatively related to child labour wages. The ban is therefore likely to stimulate human capital accumulation. However, for those interested in rallying poor countries around this new convention, a lot needs to be done in order to compensate parents for the welfare loss implied by the convention.

## References

- Alderman, H., Behrman, J. R., Lavy, V., & Menon, R. (2001). Child health and school enrollment: a longitudinal analysis. *Journal of Human Resources*, 36(1), 185–205.
- Anker, R. (2000). Conceptual and research frameworks for the economics of child labor and its elimination. ILO/IPEC Working Paper: International Labour Organization.
- Baland, J.-M. & Robinson, J. A. (2000). Is child labor inefficient?. *Journal of Political Economy*, 108(4), 663–679.
- Basu, K. (1999). Child labor: cause, consequence, and cure, with remarks on international labor standards. *Journal of Economic Literature*, 37(3), 1083–1119.
- Basu, K. (2000). The intriguing relation between adult minimum wage and child labour. *The Economic Journal*, 110(March), C50–C61.
- Basu, K. & Van, P. H. (1998). The economics of child labor. *American Economic Review*, 88(3), 412–427.
- Behrman, J. R. (1996). The impact of health and nutrition on education. *World Bank Research Observer*, 11(1), 23–37.
- Behrman, J. R. & Lavy, V. (1997). Child health and schooling achievement: association, causality and household allocations. Working Paper 97-023: Penn Institute for Economic Research, University of Pennsylvania.
- Canagarajah, S. & Coulombe, H. (1997). Child labor and schooling in Ghana. The World Bank, Working Paper 1844.
- Dessy, S. E. (2000). A defense of compulsory measures against child labor. *Journal of Development Economics*, 62(1), 261–275.
- Dessy, S. E. & Pallage, S. (2001). Child labor and coordination failures. *Journal of Development Economics*, 65(2), 469–476.
- Glewwe, P. & Jacoby, H. (1993). Delayed primary school enrollment and childhood malnutrition in Ghana. LSMS Working Paper 98: The World Bank, Washington D.C.
- Glomm, G. (1997). Parental choice of human capital investment. *Journal of Development Economics*, 53(1), 99–114.
- Grootaert, C. (1998). Child labor in Côte d'Ivoire: incidence and determinants. The World Bank, Working Paper 1905.
- Harbison, R. W. & Hanushek, E. A. (1992). *Educational Performance of the Poor: Lessons from Rural Northeast Brazil*. Oxford University Press, Oxford, New York, Toronto and Melbourne.
- ILO (1996). *Economically Active Populations: Estimates and Projections, 1950-2010*. International Labor Organization, Geneva.
- Kremer, M. & Chen, D. (1999). Income distribution dynamics with endogenous fertility. *American Economic Review*, 89(2), 155–160.
- López-Calva, L. F. (1999). A social stigma model of child labor. Working Paper 99-13: Cornell University.
- Pallage, S. & Zimmermann, C. (2000). Buying out child labor. CREFE Working Paper Nr 123: University of Quebec at Montreal.