

CHILD LABOUR, HUMAN CAPITAL ACCUMULATION AND FOREIGN AID

RAHUL A. SIROHI*

University of Illinois at Urbana Champaign, USA

In a three period overlapping generations model with child labour, exogenous increases in child health endowments increase child labour and fertility. On the other hand, cash transfer and compulsory education funded through foreign aid have a negative effect on child labour. Foreign aid has a positive effects on fertility if cash transfers for child support are unconditional, and no effect if transfers are conditional on time spent in school. This result supports conditional cash transfer programs like the Bolsa Familia.

Keywords: Child Labour, Human Capital, Poverty Traps, Foreign Aid

JEL classification: I12, I25, J1, O1

1. INTRODUCTION

Child labour today is a global phenomenon. The importance and pervasiveness of child labour in our world today can be judged by the fact that 12.6 percent of children between the ages of 5 and 14 are employed as child labourers. At a disaggregated level the trends are less than comforting. Between 2004 and 2008 child labourers in the 5-14 year category declined from over 170 million to around 152 million. The number of child labourers in the 15-17 year category, however, have increased from 52 million in 2004 to 62 million in 2008 (Diallo *et al.*, 2010). Facts regarding children employed in hazardous occupations reveals that in 2008 a large portion of child labourers continue to be employed in hazardous industries.

It is clear that substantial progress has been made in reducing child labour, but the dimensions of the problem continue to be daunting. Given the enormity of the issue, a large literature on child labour has emerged. This paper is closely related to a particular strand of this literature that concentrates on the interrelationship between fertility, mortality and child labour. Chakraborty and Das (2005) analyze child labour in an old

* I would like to thank the anonymous referee for valuable comments. All remaining errors are my own. This paper draws on my PhD thesis submitted to UIUC in 2014.

age security model where adults face mortality risks. Mortality risks translate into a lower discount on future consumption, making poorer parents less likely to invest in child quality. Strulik (2004) analyzes a model with endogenous fertility and educational decisions, where high levels of child mortality may lead to stagnation of the economy. Eswaran (2000) and Baland and Estevan (2007) analyze an old age security set up with young adult mortality to model child labour under imperfect markets.¹

Historically, most mortality reductions have occurred at early stages of life (Kalemli-Ozcan, 2008). Given this fact, the relationship between infant mortality (as opposed to young adult mortality or adult mortality) and child labour becomes all the more relevant. This paper introduces infant mortality into an old age security model similar to Chakraborty and Das (2005). Following Doepke (2005) and Azarnert (2006) we assume decisions regarding schooling and child labour are made *ex-post* i.e., after mortality risks have occurred. In that sense infant mortality may be interpreted as a health endowment. The crucial feature of an old age security model is that children are a source of future income. Parents must then decide whether to invest in child quality by increasing schooling which leads to greater human capital in the future, or to invest in child quantity by increasing fertility. Poor parents have large families and send their children to work rather than to school. At very low levels of parental human capital, child labour traps might emerge.

If child labour is a detriment to economic progress, then its elimination has to become an integral aspect of economic policy. On the one hand, market forces themselves have proven to be potent forces in reducing the demand for child labour. Technological progress and increased competition, in 19th century Britain and United States, forced employers to re-place the labour of children with the more skilled and more productive labour of adults. In the British textile industries for instance, the introduction of steam power in the early 19th century led to a decrease in the recruitment of children (Nardinelli, 1980). In the United States too, the use of mechanical pickers in coal mines led to substantial reductions in child employment (Hindman, 2002). On the other hand, active state intervention and regulation has also helped in controlling child labour. Examples of such intervention include abolition of child labour, minimum age restrictions, compulsory education supported by cash transfer schemes etc. British Factory acts of 1833, the National Recovery Act of 1933 in the United States are important examples of successful anti-child labour legislations (Humphries, 2003). What was true in the nineteenth century is also true for modern developing countries. Brazil's Bolsa Escola programme, Mexico's Progresá or South Korea's compulsory education drives have played a significant role in getting children into schools (Weiner, 1991; Schultz, 2004).

In addition to the factors described above, growing international activism against child labour has begun to play a significant role in modern day policy making. In this

¹ Baland and Estevan (2007) do not endogenize fertility decisions.

context there is a growing debate about the role of international agencies and developed countries in reducing child employment (Jafarey and Lahiri, 2002; Neumayer and de Soysa, 2005; Kitaura, 2009; ILO, 2010). Since a large share of development spending in LDC's is being financed by foreign sources, the link between child labour and foreign aid needs to be carefully analysed. In this paper we analyse the effectiveness of foreign aid in tackling child employment. We find that cash transfers and compulsory education systems funded via foreign aid, can play an important role in the elimination of child labour.

Broadly speaking, this paper points to some important implications for policies that are designed to eliminate child labour. Previous literature has supported the hypothesis that improvements in health are sufficient to reduce child labour. In contrast, this paper shows that the causality between health and child labour is far more complex. Similar results have been obtained by Azarnert (2006) and Acemoglu and Johnson (2007) though in a different context. These findings point to the substantial role that can be played by direct and concerted policies like conditional cash transfers and compulsory education laws, especially when they are funded by foreign aid. These findings are in stark contrast with studies (like Azarnert, 2008) which have found foreign aid funded cash transfers to be detrimental to human capital accumulation. Azarnert (2008) constructs a model in which agents allocate scarce resources between fertility (quantity) and education (quality). An increase in child specific cash transfers, distorts decisions by increasing returns to fertility thereby incentivizing quantity investments over quality investments. In contrast, in our model we explicitly introduce the possibility of child labour. Parents send children to work due to shortage of income i.e. demand for child labour decreases as incomes increase. In this case cash transfers, even in the form of child support, increase household incomes thereby reducing demand for child labour income.

2. PREVIOUS LITERATURE

The relation between life expectancy and human capital has been analyzed by a number of scholars. Traditionally, studies have shown that life expectancy improvements are important factors driving human capital accumulation and schooling. Improvements in life expectancy are said to increase the life horizon of individuals making them more likely to invest in human capital in the long run. Studies that posit a positive causal relationship between life expectancy and human capital include Kalemli-Ozcan (2003, 2008), Boucekkine *et al.* (2003), Gallup and Sachs (2001), Zhang *et al.* (2001). Within the literature on child labour, Eswaran (2000), Chakraborty and Das (2005) and Strulik (2004) provide theoretical models supporting the claim that improvements in mortality conditions can drive down the incidence of child labour. Though the logic of these theories is compelling empirical studies suggest that the link between human capital and life expectancy can be far more complex than envisaged by traditional models. Acemoglu and Johnson (2007) conduct an empirical investigation

into the relationship between life expectancy and GDP growth. They conclude that “There is no evidence that the increase in life expectancy led to faster growth of income per capita or output per worker. This evidence casts doubt on the view that health has a first order impact on economic growth.” (p. 975) This anomaly is explained in terms of the impact of life expectancy on population: As life expectancy increases so does the population size and this reduces growth at least in the short run. Similarly results are obtained by Ashraf *et al.* (2008). Theoretically, Azarnert (2006), Hazan and Zoabi (2006) suggest that improvements in life expectancy need not always improve human capital. Though the literature concentrates on human capital, the results have direct implications for child labour as well. To take a historical example, if we look at England which was at the epicenter of the child labour problem in the 19th century, it appears that the incidence of child labour began to decline only after 1860’s (Cunningham, 1996). On the other hand life expectancy had shown slow but steady improvement from the end of the 18th century itself (Cutler *et al.*, 2006). Such historical examples suggest that improvements in mortality conditions may be insufficient for alleviating child labour. Here the implementation of anti-child labour laws, compulsory education provisions, and investments in education may have been equally important ingredients in eradicating the child labour problem. For contemporary economies there is substantial literature that suggests cash transfers and subsidies of various sorts can play an important role in getting children into schools and away from the labour market. Analysing enrolment and fertility data, Schultz (2004) observes that conditional cash transfers increase schooling without affecting fertility. Similarly Skoufias *et al.* (2001) show a significant effect of cash transfers on child labour. In a theoretical model Zhang (1997) analyses the impact of tax financed school subsidies and finds that these policies reduce fertility and increase human capital. Edmonds (2006) finds that cash transfers to families through old age pension schemes in South Africa can lead to reductions in child labour.

3. THE ENVIRONMENT

Consider a three period OLG model. During the first period, agents spend their time endowments on schooling (e_t) and on child labour (l_t). During the second period, adult agents spend their time endowments on child-care and on labour market participation. In this model fertility is endogenously determined by the adult. Let n_t refer to the number of children in a family i.e., the fertility rate of a family. z_1 denotes the cost per birth. Note that a child plays a passive role in this model. Schooling and child labour decisions are taken entirely by adults. Moreover, as we have mentioned earlier, schooling and child labour decisions are taken ex-post i.e., after mortality has occurred (Azarnert, 2006; Doepke, 2005). In the third period, old agents receive a share of their children’s human capital as old age security.

We denote the probability of survival by a function $P(\cdot)$. To simplify analysis we

assume that the survival rate is exogenously given.² Human capital of an adult depends on the schooling he received as a child. The human capital production function is given by a simple linear function (Chakraborty and Das, 2005):

$$H_{t+1} = H(e_t) = \gamma(1 + e_t), \quad \gamma > 0. \quad (1)$$

Note that this production function assumes that each individual is endowed with at least one unit of human capital at birth, irrespective of the amount of schooling received. The old-age security structure in Chakraborty and Das (2005) implies that surviving children donate α of their adult incomes to the elders in the family.

Fertility and Schooling Choice

Each adult solves the following utility maximization problem:

$$\text{Max}_{e_t, n_t} U(c_t) + \beta U(c_{t+1}),$$

subject to:

$$c_t = w(1 - e_t)n_tP + (1 - \alpha)(1 - z_1n_t)H_t, \quad (2)$$

$$c_{t+1} = \alpha P n_t H_{t+1}, \quad (3)$$

$$0 \leq e_t \leq 1, \quad n_t \geq 1, \quad e_t + l_t = 1, \quad w > 0. \quad (4)$$

The period 1 budget constraint consists of two components: child labour income and adult income. Adult and child wage rates are given by γ and w respectively. Old-age consumption depends on the transfers made by adults to the elderly, which implies that $n_t \geq 1$. In addition we make the following assumption:

$$w < \gamma. \quad (A1)$$

(A1) ensures adult labour is more productive than child labour, thus ensuring that returns to education are high enough. Maximizing the objective function with respect to the constraints set out above we obtain the following F.O.C's:

² Like in Azarnert (2006), we could endogenize infant survival, by making it a function of parental human capital and child cost z_1 , but this would not change the results of this paper.

$$n_t : [w(1 - e_t)P - (1 - \alpha)z_1H_t]U'(c_t) + \beta\alpha PH_{t+1}U'(c_{t+1}) \leq 0, \quad (5)$$

$$e_t : -wPn_tU'(c_t) + \beta\alpha n_tP \frac{dH_{t+1}}{de_t}U'(c_{t+1}) \leq 0. \quad (6)$$

From this it follows:

$$\frac{U'(c_t)}{\beta U'(c_{t+1})} \geq \frac{\alpha PH_{t+1}}{(1 - \alpha)z_1H_t - wP(1 - e_t)} \equiv R_t^n, \quad (7)$$

$$\frac{U'(c_t)}{\beta U'(c_{t+1})} \geq \frac{\alpha\gamma}{w} \equiv R_t^e. \quad (8)$$

The R.H.S of (7) and (8) are the returns to fertility (R^n) and schooling (R^e) respectively. In Chakrabarti and Das (2005, p. 275) increases in adult survival rates imply that “Healthier parents who expect to live longer behave more patiently and are more willing to substitute toward old-age consumption. The way they do so is by investing in their children’s future productivity.” As soon as we introduce infant mortality into the model things change dramatically. An exogenous increase in P , reduces the fertility costs incurred by adults and increase future utility derived from children i.e. returns to fertility are increasing in P .

Assuming $U(\cdot) = \ln(\cdot)$, the optimal schooling and fertility decisions are given by:

$$e_t = \begin{cases} \frac{\beta - 1}{\beta + 1} + \frac{\beta}{\beta + 1} \frac{1 - \alpha}{wP} (1 - z_1)H_t & \text{if } e_{t-1} \geq \tilde{e}, \\ 0 & \text{if } e_{t-1} < \tilde{e}, \end{cases} \quad (9)$$

$$n_t = \begin{cases} 1 & \text{if } e_{t-1} \geq \tilde{e}, \\ \frac{\beta}{\beta + 1} \frac{(1 - \alpha)H_t}{(1 - \alpha)H_t z_1 - wP} & \text{if } e_{t-1} < \tilde{e}, \end{cases} \quad (10)$$

where \tilde{e} is determined by setting $R_t^e < R_t^n$ and $e_t = 0$. Simplifying we get $\tilde{e} = (2wP/(1 - \alpha)\gamma z_1) - 1$.

The optimal schooling and fertility decisions imply that when parental schooling is below \tilde{e} , children are not schooled at all and fertility rates are greater than 1. Above \tilde{e} , fertility is at its lowest value. Notice that in this case demand for increases in the income of parents increase its demand.

There are two additional facts that are worth noting. First, schooling in (9) is positively related to γ (adult wage) and negatively related to w (child wage). Increases in relative child wages (w/γ) increase the opportunity cost of studying, in terms of foregone child labour income and thus discourage schooling.³ Second, like Azarnert (2006) our model predicts that an exogenous increase in P might reduce the time spent in school and increase fertility rates. Since child survival is already observed by parents before they make schooling decisions, one possible interpretation of P is that it is a child health endowment. Thus the above results suggest that parental investments in children vary inversely with child health endowments i.e., parents compensate children who are worse off in terms of their health, with more schooling. This could be interpreted as a “preference for equality”.⁴ This relationship can be summarized by the following proposition:

Proposition 1: *Under the assumption (A1) and given Equations (9) and (10), an exogenous increase in the health endowment of a child:*

1. *Increases the incidence of child labour (decreases schooling time) and leaves fertility unchanged if parental schooling is greater than \tilde{e} .*
2. *Leaves child labour unchanged but increases the fertility rate if parental schooling is below \tilde{e} .*

Proof : The proof follows from Equations (9) and (10).

Notice that the proposition does not rule out the possibility that improvements in P -through some endogenous mechanism- could alleviate the child labour problem. The results only suggest that exogenous increases in P are insufficient to generate such changes. To understand the point, let us assume that P is actually endogenous. Following Azarnert (2006), let us endogenize the mortality risk function as follows:

$$P(H_t) = \begin{cases} 1 & \text{if } H_t \geq \tilde{H}, \\ (H_t)^\delta & \text{if } H_t < \tilde{H}, \end{cases} \quad (11)$$

where $P(H_t)$ is an increasing function of H_t . Substituting this function into (9) we see, that as each generation becomes more educated, infant mortality declines until the economy reaches a point where it becomes zero (P becomes unity).

In recent times there has been a proliferation of philanthropic initiatives aimed at child welfare (The Gates Foundation is one such example). In light of the above findings these policy makers and activists need to contend with intricate behavioral responses of

³ Basu and Van (1998) refer to the substitutability between adult and child labour as the substitutability axiom.

⁴ See Behrman *et al.* (1982) for a discussion.

poor families while designing and executing welfare policies. Improving health is an important end in itself and ought to be a crucial component of development policies. However the results suggest that these policies in themselves cannot replace direct and concerted efforts at reducing child employment. Two important insights can be drawn from the results presented above. First, since schooling and income are positively associated, an exogenous increase in family income (funded by foreign aid for instance) should increase schooling and thus decrease child labour. However, the implications of such measures on schooling and fertility decisions will depend largely on the incentives-mediated via complex income and substitution effects- that it generates. Second, the results suggest that increases in human capital constitute the primary driving force behind reductions in child labour. This implies that human capital augmenting policies like compulsory schooling laws could be extremely effective in tackling the problem of child labour. These insights form a background to our subsequent analysis of policy interventions.

4. CHILD LABOUR AND COMPULSORY EDUCATION: THE ROLE OF FOREIGN AID

The elimination of child labour has a long and complex history. In the 19th and 20th centuries, the problem of child labour in Britain and United States was so severe that its elimination became a priority amongst legislators, abolitionists and trade unions alike. Anti-child labour legislations - from outright bans on child labour to minimum age restrictions - became an integral part of child labour eradication strategies across these countries. A popular and effective anti-child labour legislation was compulsory schooling. The experiences of both Britain and the United States confirm the success that these policies have had in reducing child labour (Stambler, 1968; Weiner, 1991; Hindman, 2002).

Compulsory schooling, though directed at improving a nation's human capital, has an indirect effect on child labour by effectively reducing its supply. In countries with large informal sectors harsher restrictions like bans or international sanctions tend to in-formalize child labour, making children more rather than less vulnerable in the long run (Humphries, 2003). Examples are numerous. In the early 20th century, the child labour abolition movement in America had reached a fever pitch. Shifting industrial production directly to the homes of poor families provided a convenient way for employers to make use of child labour without facing any liabilities associated with it (Hindman, 2002). More recently, in 1996, Bangladeshi child labourers were forced into hazardous occupations (including prostitution) after the garments industry fired a number of them under the threat of international boycotts (UNICEF, 1997).

The success of compulsory education however, depends on a host of factors, including a sound legal system that is capable of enforcing laws, public awareness about the importance of education, effective educational infrastructure, etc. Additionally, in

countries where education is unaffordable or returns to private education are too low, an effective policy would require additional subsidies to augment household incomes making schooling more attractive. Resources for such a massive effort can come from a variety of sources. In recent years foreign aid has become an important source of funding development projects. Foreign aid directed towards education is now an important part of foreign aid flows. DAC countries for instance have increased annual aid flows by 1332 percent between 1993-1996 and 2002-2004 (Asiedu and Nandwa, 2007). Foreign aid has been particularly effective in reducing child labour and increasing schooling in Africa (ILO, 2010).

This section analyses the role of foreign aid and cash transfers in tackling child labour. Similar to Azarnert (2008), we assume that total foreign aid F_t can be spent in two forms: a cash transfer conditional on the number of children i.e., a child support scheme (T_t) or as an investment in the public education system (G_t) that guarantees a certain mandatory level of education μ_t . This implies:

$$F_t = T_t n_t P + G_t. \quad (12)$$

Compulsory education effectively reduces child labour participation rates by an amount $0 \leq \mu_t \leq 1$. Even though it is not entirely realistic, we assume laws are enforced without any transaction costs. The human capital technology is given by a simple linear function:

$$H_{t+1} = H(e_t) = \gamma(1 + \mu_t + e_t), \quad \gamma > 0. \quad (13)$$

The technology is linear in private education e_t and the compulsory education level μ_t . This is similar to the human capital production function adopted by Azarnert (2010) in the sense that this technology treats private education and compulsory education as substitutes. The optimization problem for an adult agent becomes:

$$\text{Max}_{e_t, n_t} U(c_t) + \beta U(c_{t+1}),$$

subject to:

$$c_t = w(1 - \mu_t - e_t)n_t P + (1 - \alpha)(1 - z_1 n_t)H_t + T_t n_t P,$$

$$c_{t+1} = \alpha P n_t H_{t+1},$$

$$0 \leq e_t + \mu_t \leq 1, \quad n_t \geq 1, \quad e_t + l_t + \mu_t = 1, \quad w > 0.$$

Assuming $U(\cdot) = \ln(\cdot)$, the optimal schooling and fertility decisions are:⁵

$$e_t = \begin{cases} \frac{\beta}{\beta+1} \left(\frac{T_t}{w} + \frac{1-\alpha}{wP} (1-z_1) H_t \right) + \frac{\beta-1}{\beta+1} - \mu_t, & \text{if } e_{t-1} \geq e^{**} \\ 0, & \text{if } e_{t-1} < e^{**} \end{cases} \quad (14)$$

$$n_t = \begin{cases} 1, & \text{if } e_{t-1} \geq e^{**} \\ \frac{\beta}{\beta+1} \left(\frac{(1-\alpha)H_t}{(1-\alpha)H_t z_1 - T_t P - wP(1-\mu_t)} \right), & \text{if } e_{t-1} < e^{**} \end{cases} \quad (15)$$

where $e^{**} = \frac{2wP + PT_t}{(1-\alpha)\gamma z_1} - 1 - \mu_{t-1}$. The optimal solutions lead us to the following proposition:

Proposition 2:

1. Above e^{**} and for a given μ_t , an increase in child support transfers (T_t) reduces the incidence of child labour. These transfers do not affect fertility which is at its lower bound.
2. Below e^{**} and for a given μ_t , an increase in child support transfers (T_t) increases fertility.
3. Below e^{**} foreign aid funded compulsory education (μ_t) decreases fertility.

Proof: Follows from the optimal schooling and fertility decisions.

The positive relation between education aid and schooling is supported by a number of studies (Dreher *et al.*, 2008; ILO, 2010). Interestingly, unlike the model of foreign aid funded schooling in Azarnert (2008), here cash transfers to households in the form of child support, increases human capital by increasing schooling at least for those households where parental education is above e^{**} , even while increasing fertility for the lower income classes. This makes it difficult to judge the efficacy of such policies since fertility increases are often associated with higher dependency ratios. Fertility increasing effects of foreign aid, however, need not necessarily be interpreted as a failure of foreign aid policies as long as educational attainment is increasing. Nag (1980), for instance argues that:

“In making predictions about fertility and in evaluating the fertility impact of any development or family-planning program, the fertility-increasing effects of

⁵ Subject also, to the time constraint $1 - z_t n_t \geq 0$.

modernization are often overlooked. The tendency of the fertility level to remain the same or even to rise should not necessarily be interpreted as a failure of a development program to generate any demand for birth control or of a family-planning program to provide any effective service.”

Note that, child subsidies distort the income distribution: e^{**} increases with T_t . In contrast compulsory education (μ_t) leaves e^{**} unchanged. It is also worth noting that an increase in P lowers human capital by reducing private schooling e_t , but has no effect on μ_t . This implies that if health interventions are supplemented by compulsory education, then the negative relation between human capital and P disappears. Having said this, it must be noted that the impact of aid on child labour and fertility crucially depends on the way aid policies are designed. In the example above the impact of cash transfers can be very different if they are made conditional on child schooling, i.e., $F_t = G_t + T_t e_t n_t P$. Here cash transfers to families depend on the time spent by children in school. In this case the optimal solutions for schooling and fertility are (under the assumption $w > T_t$):

$$e_t = \begin{cases} \frac{\beta}{\beta+1} \left(\frac{w(1-\mu_t)}{w-T_t} + \frac{1-\alpha}{(w-T_t)P} (1-z_1)H_t \right) - \frac{(1+\mu_t)}{\beta+1}, & \text{if } e_{t-1} \geq \hat{e} \\ 0, & \text{if } e_{t-1} < \hat{e} \end{cases} \quad (16)$$

$$n_t = \begin{cases} 1, & \text{if } e_{t-1} \geq \hat{e} \\ \frac{\beta}{\beta+1} \left(\frac{(1-\alpha)H_t}{(1-\alpha)H_t z_1 - wP(1-\mu_t)} \right), & \text{if } e_{t-1} < \hat{e} \end{cases} \quad (17)$$

where $\hat{e} = \frac{2wP - T_t P(1+\mu_t)}{(1-\alpha)z_1 \gamma} - 1 - \mu_{t-1}$. Notice that though cash transfers no longer

effect fertility they continue to have a positive impact on schooling. Our results suggest that the effect of foreign aid on schooling and fertility finally depends on the economic incentives that it generates. Once cash transfers are made conditional on schooling adult agents have a greater incentive to increase schooling without distorting their fertility decisions. Moreover, \hat{e} is decreasing in both the cash transfer, T_t and compulsory education, μ_t . Previous empirical studies have shown that conditional cash transfer schemes are effective in reducing child employment (Schultz, 2004; Miller and Tsoka, 2012). The results presented above support this claim.

From Equations (14) and (16) it is clear that de_t/dT is positive for both types of transfers. At first glance, it is not entirely clear which type of cash transfer scheme elicits higher returns. By comparing the derivatives we can observe that the conditional cash

transfer scheme is more effective only under certain conditions. More precisely, there is a threshold level of human capital above which the derivative with respect to conditional cash transfers is higher:

$$\frac{de_t}{dT^C} > \frac{de_t}{dT^{UC}}, \text{ iff } H_t > \frac{P(w-T_t)^2 - w^2P(1-\mu_t)}{(1-\alpha)w(1-z_1)},$$

where the superscripts C and UC refer to conditional and unconditional transfers, respectively.

5. CONCLUSION

This paper has investigated the relationship between child labour and foreign aid in a model with infant mortality and endogenous fertility. The results show that exogenous increases in health endowments alone, cannot increase child schooling. These results suggest that the goal of eradicating child labour can be better served through policies that directly confront barriers to human capital accumulation and schooling. Foreign aid could have an important role to play in this regard. In particular, cash transfers and compulsory education funded through foreign aid have a negative effect on child labour. The impact of foreign aid on fertility however, depends on the way the welfare program is structured. Cash transfers that are conditional on the time spent in school, do not affect fertility while unconditional cash transfers in the form of child support have a positive effect on fertility.

REFERENCES

- Acemoglu, D., and S. Johnson (2007), "Disease and Development: The Effect of Life Expectancy on Economic Growth," *Journal of Political Economy*, 115(6), 925-985.
- Ashraf, Q.H., A. Lester, and D.N. Weil (2008), "When Does Improving Health Raise GDP?" NBER Working Paper, 14449, National Bureau of Economic Research.
- Asiedu, E., and B. Nandwa (2007), "On the Impact of Foreign Aid in Education on Growth: How Relevant Is the Heterogeneity of Aid Flows and the Heterogeneity of Aid Recipients?" *Review of World Economics (Weltwirtschaftliches Archiv)*, 143(4), 631-649.
- Azarnert, L.V. (2006), "Child Mortality, Fertility and Human Capital Accumulation," *Journal of Population Economics*, 19(2), 285-297.
- _____ (2008), "Foreign Aid, Fertility and Human Capital Accumulation," *Economica*,

- 75(300), 766-781.
- _____. (2010). "Free Education, Fertility and Human Capital Accumulation," *Journal of Population Economics*, 23(2), 449-468
- Baland, J.M., and F. Estevan (2007), "Mortality Risks, Education and Child Labor," *Journal of Development Economics*, 84(1), 118-137.
- Basu, K., and P.H. Van (1998), "The Economics of Child Labour," *American Economic Review*, 90(5), 1160-1183.
- Behrman, J.R., R.A. Pollak, and P. Taubman (1982), "Parental Preferences and Provision for Progeny," *Journal of Political Economy*, 90(1), 52-73.
- Boucekkine, R., D. de la Croix, and O. Licandro (2003), "Early Mortality Declines at the Dawn of Modern Growth," *The Scandinavian Journal of Economics*, 105(3), 401-418.
- Chakraborty, S., and M. Das (2005), "Mortality, Fertility and Child Labour," *Economics Letters*, 86(2), 273-278.
- Cunningham, H. (1996), "Combating Child Labour: The British Experience," in Cunningham, H., and Viazso, P.P., Eds., *Child Labor in Historical Perspective, 1800-1985: Case Studies from Europe, Japan and Colombia*, Florence: UNICEF.
- Cutler, D., A. Deaton, and A. Lleras-Muney (2006), "The Determinants of Mortality," NBER Working Paper, 11963.
- Diallo, Y., F. Hagemann, A. Etienne, Y. Gurbuzer, and F. Mehran (2010), "Global Child Labour Developments: Measuring Trends from 2004 to 2008," International Labour Office, International Programme on the Elimination of Child Labour (IPEC) Geneva: ILO.
- Doepke, M. (2005), "Child Mortality and Fertility Decline: Does the Barro-Becker Model Fit the Facts?" *Journal of Population Economics*, 18(2), 337-366.
- Dreher, A., P. Nunnenkamp, and R. Thiele (2008), "Does Aid for Education Educate Children? Evidence from Panel Data," *World Bank Economic Review*, 22(2), 291-314.
- Edmonds, E.V. (2006), "Child Labor and Schooling Responses to Anticipated Income in South Africa," *Journal of Development Economics*, 81(2), 386-414.
- Eswaran, M. (2000), "Fertility Literacy and the Institution of Child Labour," in Kähkönen, S., and A. Lanyi, eds., *Institutions, Incentives and Economic Reforms in India*, Sage, 267-296.
- Gallup, J.L., and J.D. Sachs (2001), "The Economic Burden of Malaria," *American Journal of Tropical Medicine and Hygiene*, 64(1-2)S, 85-96.
- Hazan, M., and H. Zoabi (2006), "Does Longevity Cause Growth? A Theoretical Critique," *Journal of Economic Growth*, 11(4), 363-376.
- Hindman, H.G. (2002), *Child Labor: An American History*, Armonk Sharpe.
- Humphries, J. (2003), "Child Labor: Lessons from the Historical Experience of Today's Industrial Economies," *The World Bank Economic Review*, 17(2), 176-196.
- ILO (2010), *Accelerating Action Against Child Labour, Report of the Director-General, International Labour Conference, 99th session*, International Labour Organization.

- Jafarey, S., and S. Lahiri (2002), "Will Trade Sanctions Reduce Child Labour? The Role of Credit Markets," *Journal of Development Economics*, 68(1), 137-156.
- Kalemli-Ozcan, S. (2003), "A Stochastic Model of Mortality, Fertility, and Human Capital Investment," *Journal of Development Economics*, 70 (1), 103-118.
- _____ (2008), "The Uncertain Lifetime and the Timing of Human Capital Investment," *Journal of Population Economics*, 21(3), 557-572.
- Kitaura, K. (2009), "Child Labor, Education Aid, and Economic Growth," *Journal of Macroeconomics*, 31(4), 614-620.
- Miller, C., and M. Tsoka (2012), "Cash Transfers and Children's Education and Labour among Malawi's Poor," *Development Policy Review*, 30(4), 499-522.
- Nag, M. (1980), "How Modernization Can Also Increase Fertility," *Current Anthropology*, 21(5), 571-580.
- Nardinelli, C. (1980), "Child Labor and the Factory Acts," *Journal of Economic History*, 40(4), 739-755.
- Neumayer, E., and I. de Soysa (2005), "Trade Openness, Foreign Direct Investment and Child Labor," *World Development*, 33(1), 43-63.
- Schultz, P.T. (2004), "School Subsidies for the Poor: Evaluating the Mexican Progresa Poverty Program," *Journal of Development Economics*, 74(1), 199-250.
- Skoufias, E., S.W. Parker, J.R. Behrman, and C. Pessino (2001), "Conditional Cash Transfers and Their Impact on Child Work and Schooling: Evidence from the Progresa Program in Mexico [with Comments]," *Economia*, 2(1), 45-96.
- Stambler, M. (1968), "The Effect of Compulsory Education and Child Labor Laws on High School Attendance in New York City, 1898-1917," *History of Education Quarterly*, 8(2), 189-214.
- Strulik, H. (2004), "Child Mortality, Child Labour and Economic Development," *Economic Journal*, 114(497), 547-568.
- UNICEF (1997), *State of the World's Children*, Oxford University Press, United Nations
- Weiner, M. (1991), *The Child and the State in India: Child Labor and Education Policy in Comparative Perspective*, Princeton: Princeton University Press.
- Zhang, J. (1997), "Fertility, Growth, and Public Investments in Children," *The Canadian Journal of Economics (Revue Canadienne d'Economique)*, 30(4a), 835-843.
- Zhang J, J. Zhang, and R. Lee (2001), "Mortality Decline and Long-Run Economic Growth," *Journal of Public Economics*, 80, 485-507.

Mailing Address: Rahul A. Sirohi, Sullivan Hall, 1 Cunningham Square, Providence, Rhode Island 02908, U.S.A. E-mail: sirohi1@illinois.edu.

Received July 30, 2013, Revised January 9, 2014, Accepted May 16, 2014.