# Explaining the demand and supply of child labour: A review of the underlying theories

---

ILO/IPEC-SIMPOC, Geneva, dated 18 Jan '07

# Contents

*Page*

# 1. Introduction

1.1 There is little argument that child labour is a serious issue. At the global level, the International Labour Organisation (ILO, 2002) has estimated that there were some 245 million child labourers in 2000, and that in 2004 although their numbers had reduced, the worldwide child labour population was still at the level of over 217 million (ILO, 2006). While a global figure provides a stark view of the magnitude of the problem, an examination of country level data is not similarly enlightening. A major reason is that there is at present no internationally agreed statistical definition of child labour. This makes the task of preparing comparable and accurate estimates of child labour difficult in countries where it is known that children are at work; it also reduces the credibility of the published numbers. It is in this context that ILO/ IPEC (International Labour Organisation/International Programme on the Elimination of Child Labour) has been entrusted with the responsibility of preparing a draft resolution on child labour statistics and to present it at the 18th International Conference of Labour Statisticians. Towards that objective, this paper provides an overview of the existing research on the underlying theoretical issues dealing with child labour.

1.2 Although child labour has been the norm throughout history, the fact of children working and under difficult conditions became more evident and troubling during the 19th century British industrial revolution. More recently, over the past decade and a half, the spectre of children toiling long hours under, at times, dehumanizing conditions, has precipitated an intensive debate concerning appropriate conditions and the permissible thresholds to work by children. This paper does not attempt to provide a definitive diagnosis of the causes and consequences of child labour, but rather to review the existing theoretical and empirical research as to why children work. The review consists of four sections. Following the introduction, supply side influences on child labour and the theoretical research are presented in the Section 2. Household decision making, itself, is considered along with market characteristics that constrain the choices families make concerning their children. In Section 3, a similar approach is followed with regard to the demand side influences on child labour. Here the role that technological change, or lack thereof, can play in creating employment opportunities for children is reviewed. In Section 4, an overview of both micro and macro level theories on the dynamics of child labour is provided.

1.3 Before examining the theoretical issues it would be helpful to give a brief explanation of how the existing literature models child labour. In this regard, Basu (1999) provides a synopsis of the evolution of ideas on modelling child labour, and notes that more than a century ago Marx and Marshall, and later Pigou, had provided significant insights for both the theory and policy implications of child labour. While Marx noted the impact of low wages for labour forcing entire families to work in order to make ends meet, Marshall extended the argument to incorporate the inter-generational effects that child labour could have on the accumulation of human capital in the economy. Basu (op. cit.) notes that these early arguments can be related to the results derived in the existing literature on child labour. More recently, the externalities argument has been paid a great deal of attention by economists such as Grootaert and Kanbur (1995), and Gupta (2000). These ideas are elaborated later.

1.4 With regard to the modelling methodologies for child labour, it is noted that the pioneering works in this area (for instance, Rosenzweig and Evenson 1977; Goldin 1979; Nardinelli 1990) included unitary models of household decision-making. These early models characterized the household as a single unit of decision-making, on the lines of Becker (1981). This is a valid approach if one person in the household happens to be pre-eminent, or all members of the household have the same utility function. Recent empirical evidence has, however, shown that the unitary household model may not provide significant insights into the behaviour of the household. There is increasing empirical evidence that a household's consumption pattern tends to change as the intra-household composition of who earns how much changes, even when the total earnings of the household are unchanged. A general representation of this approach is the collective model (Bourguignon and Chiappori, 1994). Moehling (1995) has adapted this approach to take account of the child. Gupta (op. cit.) uses a Nash-bargaining approach to model child labour. While Moehling (op. cit.) models the bargain as occurring within the family (between the parent and the child), Gupta (op. cit.) models the bargain as occurring between the employer and the parents of the child. Therefore, the agents in the bargain are different in the two approaches. Basu (2001) provides an interesting new perspective for the issue. He notes that the literature on collective models of household decision-making fails to account for the opposite effect, and finds that taking account of the two-way relationship between power issues and choices in the household generates interesting insights for household equilibrium and for child labour. The author shows that the structure of household power has a decisive effect on child labour but the precise relationship is non-monotonic and sensitive to the parameters of the model. This discussion is detailed further in the section on altruism.

1.5 As is clear from the above, in the theoretical modelling exercises, the child has seldom been given the status of an autonomous decision-maker. Andvig (2000) makes a plausible case for viewing the child as an independent decision-maker. There is also an increasing consensus among children's rights activists that children's own voices, opinions and experiences should be taken into account (Myers, 1988). Another component of child labour models is the labour market where children are potential workers. The Basu and Van (1998) model make a case for multiple equilibria. Alaka Basu's (1993) study of slums outside New Delhi suggests an inverted–U relationship between the adult female wage and child labour, especially the labour of a female child. When the multiple equilibria argument is taken into account, a parental decision to send the child to work may be seen, partly at least, as a social norm (Hirschman, as cited in Basu, 1999). The dynamics of child labour have also been modelled, and 'virtuous spirals', in the case of a child labour trap, have been shown to be plausible (Chaudhri, 1997). This line of causation is elaborated in a separate section.

## 2. Supply of child labour

## A. Poverty

2.1 Poverty is well recognized as an important supply side factor on the child labour issue, and may be viewed as an influential supply side factor at both the micro and macro level. At the macro level, it is seen that economically active children

represent a decreasing proportion of the total labour force as gross domestic product (GDP) per capita increases. A World Bank report (1998) notes that the higher the share of agriculture in an economy's GDP, the higher the incidence of child labour. These macro level observations do not however help us form a precise view of the dynamics influencing child labour. The micro level dynamics operate at the level of the household. The existing literature discussed below, makes two crucial assumptions, namely, the 'luxury' and 'substitution' axioms. These assumptions are made for the labour market in which children are workers. As an extension, the effects of adult labour supply and wages on those of children are examined. For the above line of argument, poverty is analysed in relation to the structure of the labour market. In another line of argument, poverty is analysed in relation to cultural and gender factors. Last, but not the least, some of the literature analyses poverty and risk factors together to conclude that child labour is a buffer mechanism for poor households.

2.2 The Basu and Van (op. cit.) model is first considered. The authors assume that parents are altruistic. They then proceed to model the supply of child labour under the two crucial assumptions mentioned above – the 'luxury' and the 'substitution' axioms. The luxury axiom asserts that households send their children to work only when driven to do so by poverty. The substitution axiom asserts that adult and child labour are substitutes, that is that adults can do what children can, subject to an adult equivalency correction. Based on these assumptions, a hybrid supply curve is derived; with three distinct regions (only adult labour, increasing child labour and total labour supply). The authors prove the existence of multiple equilibria in the labour market, with equilibrium where the adult wage rate is low and children work, and the other in which the adult wage rate is high and children do not work.

2.3 The multiple equilibrium result in Basu and Van (op. cit.) is established in a partial equilibrium framework. Basu (2002) establishes the multiple equilibrium result in a general equilibrium model. The model developed considers the possibility of multiple equilibria when a single decision-making unit (household) decides on the labour supply of more than one agent. The general equilibrium analysis shows that in an economy in which child labour is prevalent, there is a need to think of social welfare functions, which attach a special weight to worker's welfare or a negative weight to child work. This has important implications for the policy conclusions that one can derive from the model.[1] However, the Basu and Van model is silent on the questions of income distribution and unemployment. Swinnerton and Rogers (1999), thus, extend the Basu and Van model to allow for distributional considerations in the economy, an issue that is considered later.

2.4 A substantial part of the literature notes that a lack of alternative opportunities for adults will tend to increase child labour supply in low-income households (Galli 2001, Rialp 1993). Andvig (op. cit.) argues that if the production possibilities in the economy are too poor, the Basu and Van model will predict a high child participation rate equilibrium. He argues that while the Basu and Van model is interesting and important for economies with a high rate of child labour supplied to private firms in the market, the low incidence of such child labour makes the possibility of the non-Pareto child labour trap less likely. Thus, the practical policy implications of the Basu

[1] The role of social factors is elaborated on in a separate section.

and Van model for influencing child labour seem to be limited. Grimsrud (2001) agrees with Andvig (op. cit.) in noting this aspect to the Basu and Van model, but argues that the model seems to be relevant in a crucial aspect. He notes that in the model developed by Basu and Van the 'added worker effect' is crucial in explaining the existence of a low wage-high child labour trap. If the household is too poor, it will send both the adult and the child members to work in the labour market and since adult and child labour are substitutes, this will push down the level of wages in the economy therefore leading the economy to be stuck in a low wage-high child labour trap. Grimsrud (op. cit.) argues that an 'added worker effect' is also created when children have to take on work in the household family plot or business, so as to enable adult household members to enter the wage labour market. Thus, he argues that even in economies with a low rate of child labour supplied to private firms, the existence of child labour in the household may lead to a low wage-high child labour equilibrium. Significantly, Basu (op. cit.) notes that in a very poor economy it is entirely possible that the demand for labour is so low that there is only one equilibrium and that is a 'bad' equilibrium, in which case a ban on child labour can backfire, leaving the children and their parents impoverished and at the risk of starvation.

2.5 A more comprehensive argument that takes into account the above aspects is offered by Basu, Genicot and Stiglitz (2000). The authors bring together the issues of poverty and unemployment and analyze how these may be influencing children's participation in the labour market. An 'added worker effect' is possible when an increase in unemployment causes an increase in labour supply and thereby exacerbates the unemployment problem. Basu, Genicot, and Stiglitz (op. cit.) show how this added worker effect is stronger than the 'discouragement effect' for low-income households. They show that, if the primary breadwinner in a low-income household has little possibility of finding work (income), the household will send its other members of the household to seek work as well. These other members may be children, or adults for whom the children must assume some of the domestic duties. Furthermore, bringing the children along with themselves to the labour market may also increase the adult's opportunities for work. Several studies seem to confirm this connection between adult and child work.

2.6 Basu (2000) shows that minimum wage legislation that tends to increase adult wages can potentially increase child labour instead of decreasing it in economies where the amount of effective labour that the children of a single household can supply is large. He notes that the implementation of minimum wage legislation can cause some adults to be unemployed and send their children to work, which in turn displaces more adult labour and sends more children to work. The author notes that the effect of such a multiplier process can be large and, for appropriate parametric configurations, child labour may fall or rise as the adult minimum wage is raised. The author argues that there is some theoretical reason for believing that improvement in the condition of adult workers results in the decline of child labour, since parents can then afford to take their children out of the labour force. But much depends on how any intervention in the adult labour market is carried out. The author also notes that if policies raising the marginal productivity of adult workers, which also raise their wages and employment, are adopted then desirable results may be obtained.

2.7 The need for appropriate and considered policy interventions is also brought out in a paper by Dessy and Pallage (2005). The authors model the phenomenon of

the worst forms of child labour. They show that that the harmful forms of child labour have an economic role – they maintain wages for child labour high enough to allow households to send the children to school. In this way, the worst forms of child labour foster human capital accumulation in poor countries. In light of the above, the authors argue that a ban on the worst forms of child labour is unlikely to be welfare improving. But instead, by reducing the employment options for children, it may make their acquisition of schooling an unfeasible option.

2.8 Most of the existing literature has concentrated on modelling child labour as a result of household poverty. An interesting extension of this notion is provided by Blunch, Canagarajah and Goyal (2002) who observe that there are asymmetries in the child labour-poverty link, as well as quite complex dynamics in the evolution of child labour and schooling and their determinants over time. They find that child labour is responsive to poverty in the short run, but not in the long run, while child schooling is unaffected by poverty in the short run but responds in the medium- to long-run. The use of child labour by households as a buffer or survival strategy has also been noted by Galli (op. cit.).

2.9 Arguments have also highlighted the link between poverty and culture. Blunch and Verner (2000) find evidence of a gender gap in child labour linked to poverty. They suggest that the gender gap need not necessarily reflect discrimination but rather reflect cultural norms. The relationship between gender and poverty is explored in detail later in the section on the non-economic work of children, where it is noted that child labour and child poverty estimates may be systematically biased against the girl child in developing countries, as girls are more likely to engage in household work which is not counted as GDP-related work. Lieten (2002) notes that the cultural explanation for child labour is not necessarily distinct from the poverty explanation and that it is necessary to review the place of children in society and to look into the culturally conceived obligations towards, and expectations from, them. There is also the argument that child labour is not an economic compulsion of all poor families; it is instead the result of extreme social and economic exploitation (Burra, 2005; Isvan Hayat, 1988).

## B. Altruism and issues of imperfect information

2.10 Parental altruism is a simplifying assumption often made by models of child labour. Broadly speaking, it implies that parents act in the best interest of their children. This would imply that given favourable circumstances children would be sent to school rather than work. Vice versa, the existence of child labour must imply a constraint on household resources. It must then be the poverty of the household that is the responsible factor behind children being at work. This is a very easy generalization of the assumption of parental altruism and its implications for household decisions to send children to work or to school. The important point, however, lies in exploring to what extent the assumption is valid – what if parents are not altruistic?

2.11 An extreme assumption made by some of the existing literature is that parents act only in their self-interest. The theoretical literature by Becker and Lewis (1973) and Becker and Barro (1991) treats children as consumption goods only. Gupta (op.

cit.) assumes total bifurcation between agency and welfare, since parents and employers take the child employment decision entirely in their self-interest. Basu (1999) and Udry (2004) present the contrary argument that parents are altruistic towards their children, and it is poverty that restricts their capacity to invest in them.

2.12 Anker (2000) notes that it is important to realize that there are limits to parental altruism, especially for many poor families in poor countries. The author identifies six reasons for making such a remark. First, family survival for poor households may require income from child labour. Second, poor families benefit from having several different income sources as this helps ensure an income flow at all times. Third, some parents irrespective of income level are not completely altruistic towards their children. Fourth, family crises can cause children to drop out of school in order to work and help ensure family survival. Fifth, an important economic benefit that parents might receive from educated children – old age support – is highly uncertain (also expounded in Rosati and Tzannatos, 2003). Sixth, work and school are often combined.

2.13 The above illustrates that even when parents are altruistic, child labour may arise as a result of household poverty (Humphries, 2003). This intuition has been modelled in an important model of child labour discussed earlier, namely, the Basu and Van model. Basu (op. cit.) notes that while interesting analyses of the link between the status of children and the structure of household decision-making can be found in the theory, relatively little analysis has been done on the link between the structure of power in the household and its effect on the status of children. Important work in this regard includes that by Moehling (op. cit.), who shows that if one of the agents in the household happens to be a child, a greater income contributed by the child enhances the child's power, which in turn leads to a greater consumption by the child. Browning, Bourguignon, Chiappori and Lechene (1994), however, argue that children are unlikely to have much say in household decisions. Gupta (op. cit.) develops a wage determination model of a child labourer using the consumption efficiency hypothesis and Nash bargaining technique whereby the employer and the guardian of the child determine the child's wage. The model developed reveals surprising correlations regarding the split of the wage between the consumption of the child and the income of the guardian. Basu (op. cit) shows that a household equilibrium can be inefficient and that (for a certain class of parameters) children will be least likely to work in a household where power is evenly balanced. As mentioned earlier, he concludes that the precise relationship between the structure of power in the household and child labour is non-monotonic and is very sensitive to the parameters of the model.

2.14 The above discussion has significance for determining how the degree of parental altruism (Bhalotra, 2001) enters the mechanics of household decision-making. The status of a child in the household not only influences whether the child has a say in the decisions that are made with regard to work or school but also whether the child is viewed as an asset or a liability by his/her parents. Satz (2003) notes that children have two kinds of interests, what Sen (1985) calls welfare interests and agency interests. Welfare interests concern a person's overall good; agency interests concern the ability to participate in deciding matters that bear on that good. Both children and adults have these interests but in different ways and to different degrees.

2.15 Additionally, Humphries (1999) points out that there is no *infans economicus* responding to market signals; most children are put to work by their parents. In ideal labour markets, workers and employers are fully rational agents who transact on their own behalf with perfect information. In child labour, however, parents make the market decisions concerning their children's time. This gap between the chooser and the chosen in the market for child labour opens up the possibility that children's interests will be discounted.

2.16 Baland and Robinson (2000) investigate the conditions under which decisions by parents about their own children's work are inefficient. Using a simple two-period model with altruistically linked family members, they show that child labour decisions are efficient when credit markets are perfect and intergenerational altruistic transfers are non-zero. Moreover, they show that when the level of child labour is inefficient, because of liquidity constraints or because altruistic transfers are at a corner, a ban on child labour can be Pareto improving.

2.17 In contrast to the results of Baland and Robinson (op. cit.), Bommier and Dubois (2004) show that the inefficiency of child time allocation does not necessarily rely on capital market imperfections, but may result only from the inability of family ties driven by altruism to reach efficient outcomes. The authors set up a non-cooperative game between parents and children, where the first action is decided by the parents and the transfers are chosen by the children. The disutility of child labour is central since it generates a breakdown of the transferable utility condition. It is shown that two-sided altruism allows the disutility of child labour to be taken into account by reducing its level, but not enough to reach the efficient level. It is also shown that labour disutility reduces the likelihood that a marginal ban on child labour will be Pareto improving. To sum up, the authors show that when parents are not altruistic enough, there is a 'rotten parents' effect in which parents rationally sacrifice some childhood utility and choose a level of child labour that is inefficiently high. This result holds even if parents expect to receive transfers in the later period of their life. In fact, as soon as preferences include child labour disutility, parents and children's utilities are not transferable and the existence of altruistic family transfers does not guarantee that the family will choose an efficient level of child labour.

2.18 The theoretical research into the collective decision-making process involving household members (for example, Browning and Chiappori op. cit.) offers an interesting insight. Cooperation between spouses has been intensively discussed in this regard; however, very few have focused on cooperation between generations. Bommier and Dubois (2004) note that cooperation across generations within the family is even less able to be taken for granted and is at least as important when human capital investments are considered. An interesting paper by Rogers and Swinnerton (2003) sheds light on the issue. The authors note that in the presence of two-sided altruism, that is, when parents and children care about each other's utility, increases in parental income need not always lead to increases in schooling and to decreases in child labour. This surprising result derives from the systematic way credit market constraints bind as parental income rises: child labour increases as soon as parental income rises by enough to eliminate transfers from children to parents.

2.19 To summarize the above, one may model parents' behaviour towards their children as selfish or altruistic or one may introduce two-sided altruism by accounting for the differing welfare and agency interests between parents and children. Another aspect of the issue could, however, be imperfect information. Parents may have imperfect information about the kind of hazards faced by their children at work (Aksit *et al*, 2001) or they may not perceive the value of education sufficiently to allow their children to attend school. In such circumstances, parents might act in the best interest of their children and yet appear to be acting non-altruistically.

2.20 Rogers and Swinnerton (2002) develop a model of exploitative child labour, where parents have imperfect information as to whether the employment opportunities available to their children are exploitative or not and firms choose whether or not to exploit their child workers. The authors show that a ban on exploitative child labour is desirable, because it resolves the problem of imperfect information faced by parents, and therefore leads to Pareto efficiency. Moreover, as Dreze and Gazdar (1996) point out, "the ability of parents to assess the personal and social value of education depends, among other things, on the information they have at their disposal. If their entire reference group is largely untouched by the experience of being educated, that information might be quite limited." It is thus noteworthy that children in bonded labour tend to have parents who were bonded labourers themselves (Burra 1995). On a different note, children's behaviour itself may greatly influence their parents decisions (Anker, op. cit.). For example, when a child does not like school and/or does poorly in school, parents are less likely to view further schooling to be in the best interest of the child or the family.

## C. Social norms and cultural and community factors

2.21 Social norms and cultural and community factors play an important role in influencing both the supply and demand side of child labour. Broadly speaking, they influence the institutional context in which child labour occurs, by making child labour either acceptable or non-acceptable. As Leiten (op. cit.) recommends, the cultural and poverty contexts of the existence of child labour are not necessarily distinct. At a subjective level, the relationship between poverty and the breakdown of social systems finds particular mention in the context of the worst forms of child labour. For instance, a rapid assessment ILO conducted in Tanzania identified poverty, the laxity of families and of community members at large (in the sense of loose moral ethics, lack of hope, marital separation and domestic violence) as being responsible for driving children out of their homes and into the streets, leading to child exploitation by local and international private social entertainers and for child prostitution as a means for survival. Invernizzi (2000) in an analysis of the daily life of child street workers, shows that cultural elements and gender are important in explaining daily survival practices.

2.22 Majumdar (2001) diverges from the family strategy approach of contemporary economists and demographers that identifies child labour as a resultant of the cost-benefit calculus of the family head, and makes a case for considering child well-being as a separate problem of its own. The author argues that non-schooling and work by children reflect not only parental income constraints but also, more importantly, the paucity of publicly provided educational opportunities. Thus child labour is the

product of not just a parental utilitarian calculus but of deficiencies in public policy and social institutions.

2.23 Anker (op. cit.) brings out a case for communities (such as villages and neighbourhoods, religious groups, ethnic and tribal groups; castes and extended kin networks) playing an important role in determining the level and extent of child labour, and, in particular, the level and extent of hazardous and other worse forms of child labour. He specifies four factors as being important. First, communities establish, shape and determine values and traditions. Second, work opportunities for children and their hazardousness, are mainly determined by local labour market working conditions and traditions. Children are generally unable to migrate in search of work and so tend to be almost totally dependent on local labour market opportunities and working conditions. Third, some of the most important child labour policies are implemented at the community level. Fourth, community level data are very important for researchers.

2.24 At the theoretical level, there are important analyses, notably by Zelizer (1985), that point to the changing social conception of childhood, and relate it to the value of the child. Social norms matter and sometimes in very concrete ways, as has been discussed by Lopez-Calva (2003), following the models of Lindbeck and others (1999). Lopez-Calva (op. cit.) develops a simple model of cultural and behavioural rules at the community level and their impact on household decisions, including child labour. The argument follows that social norms are compatible with multiple equilibria. Thus, two innately identical societies can socially engineer themselves into different levels of child labour which, once in place, tend to persist. The social stigma may vary depending on the type of labour (whether a child works in a factory, farm or at home, for example), and may cause the extent of different kinds of child labour in urban and rural areas and between factories and homes, to vary as well.

2.25 Finally, on the demand side of child labour, Grimsrud (op. cit.) notes that in addition to the economic reasons, an explanation of child labour must include attitudes, values and norms surrounding the phenomenon. The author cites Bolin-Hort, who notes that entrepreneurs in different cultures (Lancashire, Scotland, Massachusetts and the American south) historically used the same technology and yet pursued significantly different employment strategies, resulting in quite different levels of child labour.

## D. Economies in transition

2.26 Transition economies present an interesting case study of the kind of circumstances that can lead children to the worst forms of child labour. It is important to review the rapid assessments (ILO/IPEC, 2005) in this regard, essentially because the case of economies and societies in transition is one that requires attention. Briefly, the rapid assessments note that a combination of social and economic factors make children vulnerable to exploitation and trafficking. These are: poverty and unemployment, lack of social safety nets, social anomie including crime and corruption, threatened family structures including absent parents, single parent households, large families, remarriage, concomitant lifestyle hazards such as alcohol, violence and drugs, school dropout and low enrolment, early entry into child labour;

lack of hope, unmet aspirations, desperation to earn enough to survive; life and work on the streets, unbalanced or lack of information and defective socialization; institutionalization; marginalization on the basis of ethnicity (Roma, Gypsies) or disability; migration for work and particularly irregular migration; existence of established routes for drug trafficking and contraband; newly opened or still poorly controlled borders; a climate of social tolerance of exploitation and trafficking and expansion of organized crime.

2.27 Poverty has been identified as an especially influential factor. The rapid assessment studies clearly identify most of the children as being from socially vulnerable families with high demands on disposable income. Where families are poor or where family size or structure puts strains on disposable income, there are often tensions between adult family members and between parents and children. The family relationships may include specific problems such as domestic violence, parental alcoholism or substance abuse, and sexual violence. Cultural factors such as traditional involvement of children as labourers in rural areas and a low value put on education were also noted as being influential. Moreover, child labour itself contributes to an increased vulnerability to trafficking, for the reason that working children tend to look upon moving abroad to work, as progress to better living standards.

## E. Risk theory

2.28 In a research paper supported by World Bank, Holzmann and Jorgensen (2000) note that "All individuals, households and communities are vulnerable to multiple risks from different sources, whether they are natural (such as earthquakes, flooding and illness) or man-made (such as unemployment, environmental degradation and war). These shocks hit individuals, communities and regions mostly in an unpredictable manner or cannot be prevented, and therefore, they cause and deepen poverty. Poverty relates to vulnerability since the poor are typically more exposed to risk while they have limited access to appropriate risk management instruments." This succinctly sums up the possibility of child labour applied as a risk management instrument by the poor. In fact, in his study, Grimsrud (op. cit.) has noted that an additional element in the household's supply of child labour might be different types of risk-mitigating strategies. Child labour might occur because poor households cannot insure themselves adequately against income fluctuations (Grootaert and Patrinos, 1999; Grootaert and Kanbur, op. cit.). In the most extreme cases they may sell the value of the future work of the child as a substitute for credit; this is at times termed as 'bonded labour'.

2.29 An interesting piece of theoretical work by Levhari and Weiss (1974) deals with determining the effect of risk on a household's decision to invest in human capital vis-à-vis physical capital. The authors consider a Fisherian two-period model where future labour earnings are randomly dependent on current investment in human capital. They make the assumption that human capital is more risky than physical capital and base their results on the case in which returns to non-human capital are known with certainty. The reason for human capital being more risky, as given by Levhari and Weiss (op. cit.), is the non-saleability of embodied human capital and also the limited possibility for diversification. However, this reasoning for greater

risk element in human capital is more relevant at the individual than at the social level. At the societal level greater flexibility of use of human capital under various economic circumstances may be an advantage.

2.30 Levhari and Weiss (op. cit.) show that though human capital is risky, investment in it will not be discouraged. The relationship between the expected marginal rate of return on human capital and on other assets depends on the correlation between the marginal and average rates of return to human capital. If this correlation is positive, or if the variance in earnings is increasing with the level of schooling, then, and only then, will the expected return on human capital be higher than on the same non-human asset. Under the assumptions of decreasing absolute risk aversion and increasing risk, it is shown that an increase in initial wealth will encourage the investment in human capital. The authors show that an increase in the rate of interest will induce a decrease in the investment in human capital when the individual is a net borrower during the investment period. When the individual is a net saver, an increase in the interest rate will lead to opposing income and substitution effects and the result is ambiguous.

## F. Credit and insurance markets

2.31 One would intuitively believe that should the poor households have access to well functioning credit and insurance markets, they would send their children to school and not to work. In such a scenario, the household resource constraint would be relaxed and altruistic parents would send their children to school. This is the scenario that Baland and Robinson (op. cit.) capture in their model of child labour, discussed in the section on altruism. The authors show that when capital markets are imperfect or when the bequests are zero, child labour may arise in equilibrium even though it is socially inefficient and parents are altruistic. Grote, Basu and Weinhold (1998) address the interrelationship between the market for schooling and that for child labour using a model which shows that under certain circumstances the major causes for the emergence and existence of child labour may be credit market imperfections and the high costs of education.

2.32 Other important literature in this area tries to model the interaction between poverty and credit market imperfections (Ranjan, 1999), between credit markets, trade sanctions and incidence of child labour (Jafarey and Lahiri, 2002), between the development of financial markets, old-age security and fertility (Rammohan, 2001), incidence of child labour in debt bondage and financial sector development in the economy (Basu and Chau, 2003). These issues are discussed in greater detail below.

2.33 Ranjan (op. cit.) shows how poverty in combination with credit constraints can give rise to the phenomenon of child labour in developing countries. The author develops a theoretical model of a developing economy to show that child labour arises due to imperfections in the credit market. The model is developed in respect of an education/ child-labour trade-off, as a child at work is most likely to be out of school. The author offers an interesting discussion on whether the emergence of informal credit markets in developing countries may be seen as a substitute for the missing formal credit markets. It is argued that informal credit markets work mainly for short-term loans to meet unforeseen contingencies, whereas poor households need long-

term credit to be able to substitute for the foregone earnings of their children, which are unlikely to be compensated through the informal credit markets prevailing in many developing countries. This, the author argues, creates a role for government intervention to improve welfare. Ranjan (2001) develops an overlapping generations general equilibrium model where inefficient child labour arises due to credit constraints. Furthermore, a positive relationship between inequality in the distribution of income and the incidence of child labour is derived.

2.34 Jafarey and Lahiri (op. cit.) examine the interaction between credit markets, trade sanctions and the incidence of child labour in a two-goods, two-period model with unequally wealthy households. Both poverty and poor education quality, *inter alia*, are important determinants of child labour. The incidence of child labour decreases as one moves from a situation of borrowing constraints to circumstances in which poor households can borrow freely from rich ones, and then to the scenario of perfect international credit markets. Trade sanctions can increase child labour, especially among poor households, a possibility that decreases as their access to credit improves.

2.35 Rammohan (op. cit.) examines the link between the development of financial markets, old-age security and fertility, when child labour is prevalent. The model demonstrates that when returns from financial capital markets increase, fertility levels and investment in children's schooling are reduced, but child labour levels increase. However, the return to child labour is also an important determinant of fertility decisions. In particular, if there is a child labour market, fertility decisions are determined mainly by the child wage rate and child rearing costs. Finally, the model shows that the development of financial capital markets implies a reduction in borrowing rates, which, in turn, leads to an increase in schooling investments and a rise in adult labour.

2.36 Basu and Chau (op. cit.) conduct a cross-national study and subsequently construct a theoretical model, which identifies poverty and the absence of reliable legal and financial systems through which the poor can secure loans to safeguard against hunger or unexpected consumption needs, as root causes of child labour in debt bondage. Consequently, child labour in debt bondage grows out of an institutional arrangement in which labour and credit contracts are interlinked and outstanding household debts are paid at least in part through the labour services of children. Genicot (2002) identifies the lack of suitable alternatives as the causative factor behind workers opting for a life in servitude.

2.37 An interesting perspective on modelling child labour in a framework of credit market imperfections is provided by Udry (op. cit.). The author notes that two issues are very important in trying to account for a household's decision to send its child to school or to work. These are: first, an inability to seize advantageous long-run investments in children's human capital because of credit market constraints; and second, problems of agency within households. Agency problems arise because decisions regarding child labour and schooling are generally made by parents – who do not necessarily themselves experience the full implications of these decisions. He goes on to note that agency problems within a household become even more salient when they occur in the typical environment of imperfect financial markets. If the household cannot borrow (and does not plan to save) then decisions regarding child

labour and educational investments cannot be made by balancing the current financial gain and the discounted future financial cost of child labour. Instead, decisions are made by balancing subjective welfare costs and benefits. Parents balance the benefit in terms of current welfare of increasing child labour against the current subjective cost of the child's reduced welfare. The immediate question that arises in this case is whose subjective welfare determines the child's education and labour force participation? Parents may well have divergent preferences regarding such investments, so that shifts in bargaining power within the household could have important effects on child labour.

2.38 An interesting approach is provided by Purkayastha (1998), who uses a modified neoclassical household model that incorporates parental power. The author demonstrates that under certain conditions, anti-child labour laws that effectively reduce the child's wage may be instrumental in improving the child's welfare. In an alternative two-period model it is shown that if the household borrowing constraint is stringent, sanctions may conditionally improve human capital of the child.

## G. Income distribution

2.39 A branch of the theoretical literature on child labour models the effect of income distribution in the economy on the incidence of child labour. In this regard, it is notable that Swinnerton and Rogers (1999a, 1999b) and Rogers and Swinnerton (2001) extend the Basu and Van model by introducing the 'distribution' axiom. Ranjan (op. cit.) develops a model of child labour and shows explicitly the positive relationship between the incidence of child labour and the inequality in the distribution of income. Also interesting is the political economy model by Tanaka (2003). The importance of the effect of income distribution in the economy for the determination of child labour has been recognized (Grimsrud, op. cit; OECD, 1996) and theoretically established in a number of studies. Grootaert and Kanbur (op. cit.) note that as household level poverty is well known to be the major cause of child labour, "general economic development, equitably distributed, is the best and most sustainable way of reducing child labour."

2.40 The work by Swinnerton and Rogers (1999a) is very interesting as it shows that an essential assumption for the results from the Basu and Van model to hold is the distribution axiom. The authors show that in addition to the assumptions of luxury and substitution axioms about the micro level behaviour of households and firms, there is also an essential macro level assumption that may be termed the distribution axiom: income or wealth from non-labour sources must be sufficiently concentrated in the hands of a few agents. In other words, the authors show that if non-labour income is distributed with sufficient equality, market equilibrium with child labour cannot exist in the Basu and Van model. Basu and Van focus exclusively on labour incomes as a determinant of child labour, and justify this focus by assuming that non-labour incomes (returns to capital) are consumed by either a capitalist class that owns all the capital, or foreign owners of capital. Swinnerton and Rogers (1999a) depart from these assumptions by supposing that some of the working households own capital.

2.41 Further, Swinnerton and Rogers (1999b) extend their discussion to an interpretation of the results obtained by Fallon and Tzannatos (1998), who note that there is a negative association between income and the level of child labour for low-income countries, but that this association becomes less marked in the more affluent developing countries. Swinnerton and Rogers (1999b) suggest that this weakening of the negative relationship may be interpreted as: child labour observed in the more affluent countries may be the result of an inequality in income distribution.

2.42 Basu and Van (1999) note that the kind of redistribution that Swinnerton and Rogers (1999a) write about concerns the ownership of firms - workers own shares, so profits may accrue to the workers. They, like the Basu and Van model, focus on the equilibrium in which all children work or no children work. Basu and Van (op. cit.) present the argument that their model and that of Swinnerton and Rogers (op. cit.) present polar extremes of a general model. In reality, there may not exist either of these two kinds of equlibria. However, whenever such equlibria do not exist, there must exist another equilibrium in which some children work and some do not – a 'hybrid equilibrium'.

2.43 Rogers and Swinnerton (2001) extend the general model in Basu and Van (1998) to allow for different types of households, and the model in Swinnerton and Rogers (1999b) to allow for a more general utility function. They suggest that in higher-productivity countries with child labour, a more equal income distribution can reduce or eliminate child labour, while in low-productivity countries a more equal distribution of income can exacerbate child labour. Rogers and Swinnerton (op. cit) show that the impact of economy-wide inequality on child labour is generally ambiguous. This is because while redistributing income will tend to reduce child labour participation among working households, it can also increase child labour among households paying taxes. They also show that policy measures designed to reduce inequality in the economy will have the most favourable impact upon child labour in high productivity economies. The notion that productivity matters in this context is that high productivity implies high wage rates and, therefore, levels of parental income are sufficiently high so that children need not work. As a result, the supply of child labour falls. High productivity also goes hand in hand with high skill and, as skill levels in an economy improve, children become less substitutable for adults. Thus, the demand for child labour falls.

2.44 Interestingly, Ranjan (op. cit.) derives a positive relationship between inequality in the distribution of income and the incidence of child labour, contrary to the relationship being ambiguous (Rogers and Swinnerton, op. cit.). The author develops an overlapping generations general equilibrium model where inefficient child labour arises due to credit constraints. It is shown in a model where individuals have differing abilities that if borrowing against the future earnings of children is not possible, greater inequality is associated with greater incidence of child labour.

2.45 Tanaka (2003) develops a political economy model of child labour in which a rise in the tax rate results in a decline in child labour, but the tax rate itself is deterministic and influenced by the level of inequality in the economy. In this model, the government does not legislate against child labour. Instead, it collects taxes and runs schools and, by providing good schools, tries to wean children away from labour to education. Thus, as long as a household does not send its children to school, rising

tax rates make it worse off. But once the schools are good enough for households to decide to take children out of the labour market and send them to school, its welfare responds to the tax rate like an inverted-U, because an increase in the tax rate improves the quality of schools. Preferences are of the kind that satisfy the conditions for use of the median voter theorem. Tanaka then imposes the necessary technical restrictions and uses the median voter theorem to predict the tax rate (and therefore, the quality of schooling) that the government will choose. This in turn determines the incidence of child labour in the economy – a rise in the tax rate results in a decline in child labour. However, if inequality is high, in the sense of the median income being much lower than the average income, then the tax rate will be low and child labour will be high. Like the model of Swinnerton and Rogers (1999b), inequality is closely related to the incidence of child labour, though the causation is very different.

## H. Quality of schooling and enrolment

2.46 Research has also revealed that a direct trade-off also exists between child labour and child schooling. This is quite clear if children's time is viewed as a variable divisible between children's work and school. While children who work full-time are likely to be out of school as well, children who work part-time are sacrificing learning time to go to work. It therefore appears that for a household to be sending its child to work than to school, the relative returns from schooling must be low or the relative cost of schooling must be high. The relationship between child labour and schooling has been formally modelled in the theoretical literature. Examined below is the political economy model by Doepke and Zilibotti (2005), the model by Lopez-Calva (2003), the intergenerational model by Anker and Melkas (1996), and the model by Rammohan (2000). While the former two deal with improving the quality or productivity of schooling, the latter two deal with increasing the school enrolment rates to decrease the incidence of child labour.

2.47 Child labour inhibits the acquisition of human capital through loss of education and through other channels, for instance, by damaging health or affecting attitudes (Rosati and Rossi, op. cit; Grimsrud, op. cit.). Education itself is a multi-linked variable in a country's statistical profile (UNICEF, 1999). Doepke and Zilibotti (op. cit.) develop a political economy model in which the act of restricting child labour is endogenous. In their model, households with many children and less wealth tend to oppose legal restrictions on child labour. The number of children and the amount of human capital in a household depend, in turn, on whether there are legal restrictions on child labour. They show that there can be multiple steady state equilibria in the economy. There can be an economy in which fertility is high, per capita wealth is low and poorly distributed and opposition to legal restrictions is so high that government does not legislate against child labour, so these conditions persist through time. Alternatively, the same economy could be caught in a steady state equilibrium in which household size is low, equality is high and public opinion strongly favours legal restrictions. The authors contend that one exogenous change that can shift the economy from the first equilibrium to the second is a rise in the productivity of education.

2.48 Lopez-Calva (2003) develops a simple model of cultural and behavioural rules at the community level and their impact on household decisions, including child

labour. In terms of the policy perspective, the author emphasizes that reducing child labour is not the objective *per se*. The main objective is to relax some important constraints on household decision-making to improve household welfare and, more important, to increase income generation capabilities of the individuals in the future. That leads to the incorporation of other variables in the analysis that should not be neglected, namely, economic growth, regional development and quality of schooling. In an earlier model, Lopez Calva *et al* (2002) analysed the effect of compulsory schooling on the incidence of child labour, within a dynamic, overlapping-generations general equilibrium setting. Both human and physical capital is accumulated, and altruistic parents care about their own consumption and the human capital they bequeath to their children. It is suggested that, under a certain class of parametric conditions, household welfare would be higher if compulsory schooling laws were eliminated and children could work more hours. The reason for this is that the restriction on household income reduces the accumulation of physical capital without compensating the family with a high enough accumulation of human capital, thus preventing the economy from reaching the threshold beyond which child labour is eliminated endogenously.

2.49 Udry (op. cit.) argues that the most effective way to draw children out of damaging work is to encourage school attendance by improving school quality. He argues that from a social point of view it may be efficient to increase child labour and reduce schooling up to the point at which the present discounted value of future costs of additional child labour is just balanced by the current benefit to the household of that additional labour. It need not, however, be the case that the socially efficient level of child labour is zero; this will depend upon the productivity of child labour, the degree to which schooling improves future productivity and the interest rate at which future earnings are discounted. For example, if a child has already sufficient schooling so that further years of education have a relatively small impact on his/her future income, if he/she could generate a lot of income by working and if interest rates are relatively high, then the immediate benefit of having the child work may be sufficiently large to offset the present discounted value of the child's future earnings as a less well-educated adult; and vice versa. Furthermore, it is argued that the most promising tool yet developed for reducing child labour is a targeted subsidy to families sending their children to school. It overcomes the problems associated with imperfect or non-existent financial markets by balancing the current cost of moving a child out of the labour force and into school with a current grant. It addresses also the main agency problem by providing current resources, thus reducing the importance of intergenerational transfers.

2.50 Grootaert and Kanbur (op. cit.) present the externalities argument to make a case for bolstering the returns to education in an attempt to draw children away from work and into school. They note that significant positive externalities may exist where the social returns to education are higher than private returns. Basu and Tzannatos (2003), too, note the need for going beyond poverty and social stigma and looking for causes of child labour, such as may be dependent on the quality and the availability of schools and the transaction costs involved. Grimsrud (op. cit.) notes that the decision on how much time a child should spend at school or work is influenced by both the assessed cost and the benefits from schooling and job opportunities. It is evident that the supply of child labour will increase as costs of education increase. The total cost to a household of enrolling a child in school is even

higher, including not only the sum of the direct money costs but also the opportunity costs. Opportunity costs are the implicit costs of the time that children devote to schooling, including the time they spend in the classroom, travelling to school and doing schoolwork at home. These factors affect the possibility of combining schooling and work activities. Thus, inflexible schooling schedules may unnecessarily increase the opportunity costs of going to school.

2.51 Anker and Melkas (op. cit.) describe the intergenerational vicious circle comprising poverty, fertility, child work, school enrolment and economic development. Couples in poor households have more children, partly because the possibility that the children can work reduces the cost of having children. High fertility in turn increases the need for the income provided by child labour. It also reduces the education levels of future generations, thereby helping to ensure that future generations will have high fertility, since parents education is one of the most important determinants of fertility. Breaking this circle may impose an extra burden on the generation that does so. On the demand side, producers might assume that with an increased labour supply as a result of child labour, their return on capital would increase. But a reduction in the child labour supply would result in higher wages for both children and adults. At the macro level it could be the case that if children were withdrawn from the work force, certain activities within specific industries and some industries in their entirety would shrink or face closure. In the long run, however, an increased education level could pave the way for increased labour productivity.

2.52 Rammohan (2000) develops a theoretical framework where fertility and schooling decisions are made in an environment where children contribute through child labour when young and provide old-age security as adults. The model demonstrates that the child wage rate, which is also the opportunity cost of schooling, is a crucial determinant of total fertility. An increase in the child wage rate leads to lower schooling investments and higher fertility levels. However, changes in schooling costs have no impact on fertility decisions. They only affect the allocation of children's time between schooling and child labour. A similar analysis on the fertility and child labour dynamics has also been done Dessy (2000). The environment considered is one where children's time has an economic value and schooling and child labour are the main competing claims on a child's time. Using a one-parent family overlapping-generations model, it is demonstrated that compulsive measures against child labour are justifiable as an integral part of an intervention that combines incentives and regulations in order to eliminate child labour.

2.53 Anker *et al* (1998) note the importance of taking parental perception into account in accounting for the household's decision to send a child to school or to work. They note that many poor parents feel that sending their children to school (especially after they have completed lower primary and attained literacy) will not improve their children's employment chances in life. Grimsrud (op. cit.) similarly presents the argument that to explain the observed level of child labour it may be argued that risk-averse households systematically underestimate the value of education, and that there may be inter-temporal distribution problems (Baland and Robinson, op. cit.) between those who have to invest in education and those who will receive the return of this investment.

2.54 Bhalotra (2001) offers a new approach to analyzing a household's motivation behind sending a child to school or to work. The author suggests studying the wage elasticity of child labour supply. Incorporating subsistence constraints into a model of labour supply, it is demonstrated that negative wage elasticity favours the hypothesis that poverty compels children to work, whereas positive wage elasticity would favour the alternative view that children work because the relative returns to school are low.

2.55 Also interesting is the analysis put forward by Basu and Tzannatos (op. cit.) in respect of child labour and education across siblings. The authors argue that although a particular child working cuts into education, work and education often seem to go together across siblings in poor families: one child's labour makes it possible for the other child to go to school. Though this phenomenon of sibling complementarities seems obvious, it has not received much attention in the literature. The case for giving importance to studying the impact of such an effect, in context of its policy as well as gender implications, has been made by Grimsrud (op. cit.) and also by Satz (op. cit.).

# 3. Demand for child labour

## A. Nimble fingers hypothesis

3.1 The nimble fingers theory claims that children have a comparative advantage in some kinds of occupation, that is, children are more suitable labourers than adults for some occupations. This theory can then plausibly explain the existence of a large proportion of child labourers, and was the held view for a long time. More recently, however, important studies have refuted the theory and exposed new directions of causality explaining the demand for child labour.

3.2 An important work on the demand side of child labour is the collection of research studies in Anker *et al* (op. cit.). This study gives an understanding of the economics of replacement of child labour with adult labour in the carpet, gems and diamond industries. The papers in this volume refute the nimble fingers theory, and note that non-pecuniary and non-economic factors are often very important reasons why employers hire children. Among the non-pecuniary reasons given for hiring child labour are (i) awareness, subservience and innocence (that is, child workers are more docile and less troublesome, children show greater willingness to do repetitive monotonous work, have greater innocence, do less absenteeism, do not join trade unions or agitate for their rights, etc.); (ii) prevailing traditions in scoiety (tradition of hiring child labour by employers, traditional occupations encourage the children to work alongside parent(s), the social and community status of the employer gets enhanced by providing jobs to children in the community, employers need workers and this assures availability of skilled labour in the future); and (iii) the physical characteristics of children.

3.3 Edmonds (2003) refutes the nimble fingers theory and finds that a majority of child labourers are involved in agriculture while the focus of much of the research has been on the employment of children in the industrial sector. In this regard, Isvan (op. cit.) proposes a framework for studying the production process and peasant

households in which this process is seen as comprising two conceptually distinct but highly interdependent sub-processes: production for household consumption (including the production and reproduction of household labour power) and production for the market. The distribution of the labour pool between the two household production processes outside wage employment is determined by: the household production characteristics, the agrarian structure within which the household is located and the gender system within which the household is located. Application of the framework to the Chayanov concept of self-exploitation in peasant production reveals the possible existence of separate exploiter and exploited groups in what has generally been assumed to be a reflexive phenomenon. It is argued that under many gender systems, self-exploitation takes the form of the exploitation of female and child labour by elder members.

3.4 Grimsrud (op. cit.) cites a number of studies refuting the nimble fingers theory (United States Department of Labor, 2000; Burra, 1995). He mentions that employed children are generally paid less than adults in the same job, which indicates that children are more willing to accept lower wages, or other measures that are cost-saving for the employer. There are two possible reasons for this: first, children's productivity and quality of work are lower than that of adults and second, children are easier to exploit. Studies have indicated that both may be the case (Burra, op. cit.). Grimsrud (op. cit.) remarks that the more the latter is the case, the more child labour can be spoken of as demand-driven and hence the greater the scope for interventions.

3.5 Grimsrud (op. cit.) notes that another possible demand-side explanation for child labour is that child labour is caused by a shortage of labour in general, leading to more marginal groups entering the labour market. If this is indeed the case, one should find a corresponding upward pressure on adult wages. But, on the contrary, downward pressure on adult wages is more commonly observed. This helps us reach the conclusion that the direct labour market demand for children is closely linked to the price of children's labour. The more opportunities for the employer to hire children at a lower price than adults, the greater is the demand for child labour. These differences in opportunities could be caused by lack of legislation, lack of control, or acceptance through social norms. The more important indirect demand (the supply in conjunction with the parents work) for child labour is linked to the range of income opportunities for adults.

3.6 Furthermore, Grimsrud (op. cit.) argues that one may also look at the total labour demand and supply in the economy. By so doing, it is noted that child labour supply is a result of decisions within the household influenced initially by the wealth of the household. Working children's relationship to the labour market is generally closely linked to their parents' labour market relations. With reduced income the household will respond by sending its children out into the labour market or will let them take over tasks in the household or on the family land that, in turn, will release adults for the labour market. Such increased child labour could be stimulated by an external crisis that the household was not able to resolve through the credit market. These various issues are discussed in detail in later sections.

3.7 With regard to the hazardous and worst forms of child labour, Anker (op. cit.) notes that the same is determined to a large extent by employers and traditions, since they establish working conditions as well as their acceptability. A report on child

trafficking (ILO/IPEC, 2005) notes that younger children are the usual victims. It notes that there is a differentiated market for younger children often trafficked into begging either alongside their parents or as part of a group of children put to beg on the streets with a handler. The young age of these children is precisely why they are exploited in begging. Thus, diverse factors influence the employment of children as labourers. While the nimble fingers theory has been refuted in most studies, the existence of a differentiated market for children involved in trafficking points to exceptions that need better analysis.

## B. Technological progress

3.8 The impact of technology on child labour has been analysed in diverse ways. Humphries (2003) offers an historical overview of the pattern of child labour in the early industrializers and offers a comparison with the present developing countries. A theoretical perspective on the issue is provided in the models developed by Hazan and Berdugo (2002), Dessy and Pallage (2001) and Gupta (2001). The model by Hazan and Berdugo (op. cit.) is particularly interesting as it analyses the dynamics of child labour in a model where fertility is endogenous.

3.9 Considering Humphries (op. cit.), the author notes that child labour was more prevalent in the 19$^{th}$ century industrializers than it is in developing countries today. It was particularly extensive in the earliest industrializers. Humphries (op. cit.) suggests that this pattern may be a source of optimism signalling the spread of technologies that have little use for child labour and of values that endorse the preservation and protection of children. The author offers four types of explanation for the observed trends. The first focuses on developments within capitalist labour markets. It examines the effects of technology as well as managerial and trade union strategies on children's work. The second focuses on the parental decision to send the child to work. The third relates to the legal and political stance of the state. The fourth focuses on social norms and beliefs about appropriate behaviour. The author finds that the organization of the labour process generated both direct and indirect implications for the demand for child labour through its influence over technology, employment strategies and labour relations. It is noted that children's work was often the consequence of failed or incomplete mechanization. It was a necessary evil essential to the competitive success of the key industries of the Industrial Revolution. But with the development of the capitalist labour market the demand for child labour faded as more advanced industrial technologies replaced the need for the unskilled labour of children (Goldin and Parsons 1989; Nardinelli op. cit.). As Cunningham (cited in Humphries, op. cit.) observes, "it is assumed that technology has its own in-built rationale and that it always acts in favour of adult and in opposition to child labour".

3.10 Next, Hazan and Berdugo (op. cit.) explore the evolution of child labour, fertility and human capital in the process of development. In the early stages of development the economy is in a development trap where child labour is abundant, fertility is high and output per capita is low. Technological progress, however, gradually increases the wage differential between parental and child labour, thereby inducing parents to substitute child education for child labour and reduce fertility. The economy takes off to more sustained growth, steady state equilibrium where child

labour is effectively abolished and fertility declines. Here, prohibition of child labour would expedite the transition process and generate a Pareto dominating outcome.

3.11 Dessy and Pallage (2001) show that a technology-based coordination failure may explain the emergence of child labour. Child labour may arise because of the lack of a coordination mechanism between parental decisions to invest in the human capital of their children and firms' decisions to invest in skill-biased technologies. This coordination failure and a vicious circle of beliefs may be the source of a poverty trap. This result is established on the basis of three facts: first, in an environment in which children's time has an economic value, educating children presents parents with an opportunity cost; second, the reward from children's education will arise in the long term provided firms have invested in technology that requires high skill workers in the meantime; and third, investing in an economy with low human capital is a risky venture. Legislative intervention in such a case helps coordinate expectations towards a Pareto-superior outcome with investments both in human capital and in skill-biased technologies.

3.12 D'Mello (2002) develops a micro socio-economic model of a technologically backward small industrial capitalist enterprise that, in a particular context, has a propensity to employ child labour. It is noted that an analysis of capitalist competition at the industry level, wherein the backward capitalist enterprise has less space to accommodate rising wage rates, is found to be illuminating in understanding the propensity to employ and exploit child labour. The analysis is undertaken to understand the circumstances in which a technologically backward industrial capitalist enterprise, situated within the institutions and structures of under-developed capitalism, may change the incidence of employment and the exploitation of child labour.

3.13 The related research also includes Gupta (2002) develops a two sector dynamic model of a small open economy with a child labour market. This model analyses the simultaneous accumulation of human and physical capital, and shows the possibility of multiple long-run equilibria with a low level equilibrium trap (child labour trap).

## C. Structure of the labour market

3.14 Lieten (op. cit.) presents the paradox that in areas where one can expect more push forces because of poverty and illiteracy, the incidence of child labour is lower than in areas where levels of poverty and illiteracy are considerably lower. The author suggests that an explanation for the above can be provided by specific labour market segmentation, a low reward for labour power and high levels of employment under conditions of social, economic and political submissiveness. Moreover, since the vast majority of the poor are cut off from higher-status, higher-wage jobs, in competing for the jobs for which there are no credential barriers, they further drive down relatively low wages. So the pattern of supply of workers to different types of jobs can be expected to strengthen labour market segmentation.

3.15 A rapid assessment study on child trafficking (IPEC, 2005) notes that in this case the demand paradoxically comes from a supply side actor. In many obvious sectors, there is no consumer demand but only an opportunity for an exploiter to

profit. In the absence of consumer demand, it is the exploiter who therefore generates the pull equated with demand in the form of a desire to profit by exploiting an opportunity. This is what economists call derived demand and it can operate where there is no obvious consumer. The study cites Schloenhardt, "in these cases, the 'demand' comes in fact from the 'supply' side actor, to the extent that the would be migrant may 'demand' help to migrate and may in this way end up 'acquiring the services' of a trafficker".

## D. Efficiency wages

3.16 An efficiency wage is a wage paid that exceeds the market wage. It stimulates worker productivity and can result in higher employer revenues that offset the higher wage cost. Genicot (2001) argues that if some part of adult wages is used to purchase child nutrition and if efficiency wages are being paid, child labour may tend to increase. This is because parental altruism, as evidenced by higher incomes for parents and better nutrition for children, implies a leakage of the efficiency wage paid to adults, which can create an incentive for the employer to employ the adult along with his or her children. He concludes that this analysis is consistent with the fact that entire families are often employed together on farms and in factories and workshops.

## E. Composition of household asset portfolios

3.17 The composition of household asset portfolios is usually an important factor on the demand side of child labour. Cockburn (2000) shows that an explicit integration of the role of household asset profiles provides a fuller and more nuanced explanation of child labour and schooling decisions. The author uses a simple agricultural household model with a missing labour market to show how the extent and composition of household asset portfolios simultaneously determine household income and the shadow wage of, and demand for child labour. Child labour-increasing (-decreasing) assets are characterized by a dominant wage (income) effect. An empirical analysis of data on rural Ethiopian households shows that both poverty constraints and income opportunities play important roles in the decision to send children to school or to work. It is also shown that both work and school conflict substantially but not entirely.

3.18 Another critique of poverty-based explanations of child labour comes from Bhalotra and Heady (2003). Using data for Ghana and Pakistan the authors have attempted to show that households that own (or operate) larger amounts of land tend to make their children work more. Because a larger landholding would typically mean greater wealth, this seems to suggest that greater poverty does not lead to greater child labour. The main reason that greater land ownership may contribute to higher child labour is, as Bhalotra and Heady recognize, that labour market imperfections mean that owning or controlling land amounts to having the opportunity for more productive use of the household's labour, including child labour. If this is the case, Grimsrud (op. cit.) remarks, then children of the poorest households will not appear in global child labour estimates.

## F. Trade and comparative advantage

3.19 Galli (2001) notes that for many developed countries seeking trade sanctions (United States Child Labor Deterrence Act of 1997) against developing country imports, the worry arises from the fact that the exploitation of children in many developing countries can artificially depress the cost of labour, leading to unfair competitive advantage in world markets and to a wider downward pressure on unskilled workers' wages and employment in rich countries. A paper by Rodrik (1996) explores the relationship between labour standards (including child labour) on one side, and, comparative advantage and foreign investment on the other, and finds evidence validating the expectation of child labour reducing overall costs.

3.20 The above argument for an economic case of trade sanctions should be seen in light of the fact that just about 5 per cent of the world's child labourers are estimated to work in formal economy export-related jobs (Bachman, 2000). Arat (2002) condemns trade-related bans and other consumer oriented measures intended to combat child labour, and advocates instead a strengthened role for labour unions and consideration for the views of children themselves in espousing their rights.

3.21 Ranjan (2001) discusses that trade sanctions against countries using child labour may fail to reduce its incidence. Since most countries having a high incidence of child labour are exporters of unskilled labour intensive goods, the author discusses the impact of trade sanctions on the economy having a comparative advantage in the unskilled labour intensive good. A trade sanction for this economy will lower the relative price of the unskilled labour intensive good. This will translate into a lower unskilled wage and a higher skilled wage from the familiar Stopler-Samuelson relationship between product prices and factor prices. This would increase the returns to schooling and hence induce the altruistic parents to send their children to school. However, a decline in the unskilled wage would reduce the income of parents who are unskilled. Taking both these effects into account, trade sanctions may fail to reduce the incidence of child labour. An argument against trade-related bans is also made in Bhalotra (op. cit.).

3.22 Shelburne (2001) shows that trade openness reduces the benefits of child labour for other members of society. In view of this an open economy would thereby reduce society's incentive to allow child labour. A public choice model is hypothesised whereby societies create institutions that benefit those that control the political process. Using this framework, it is argued that child labour will exist where the other factors of production gain from its practice. It is demonstrated theoretically that the non-child-labour factors are harmed by child labour in capital abundant nations; therefore, child labour is unlikely to exist in these countries. In labour abundant countries, the non-child-labour factors gain from child labour when the economy is closed. As a labour abundant economy becomes more open to international trade, those gains diminish and even turn negative as the size of the economy increases. It is shown empirically that the cross-country prevalence of child labour falls with increases in a nation's per capita income, its openness to trade and its economic size. Therefore, the author argues that trade sanctions, as a remedy for child labour, may be counter-productive. However, since the model shows that the non-child-labour factors are sensitive to how economic policy affects their incomes, trade policy sanctions, which sufficiently target the non-child-labour factors, could possibly

be effective. The model also shows that as societies become more democratic, the process sets in motion economic changes that will undermine the practice of child labour.

3.33 While the model developed by Shelburne (op. cit.) shows that trade openness by itself sets in motion a process whereby child labour in the economy decreases, an alternative argument is sketched in Grimsrud (op. cit.) which explains the standard effect of trade argument in the context of child labour, and shows that it is in the interest of the developing countries to eliminate child labour in order to reap the gains from trade. It is noted that child labour differs in countries, over time but seems to have a more constant presence in some industries where labour-intensive technologies cannot be replaced by capital-intensive technology. The existence of child labour, thus, may slow down or obstruct structural changes needed for growth as explained by endogenous growth theory.

3.34 When knowledge accumulation is located largely in the rich countries and the poor country is also smaller in (economic) size, particularly in the size of already accumulated knowledge capital (which determines research effectiveness), the rich countries capture a growing market share in the total number of differentiated varieties and entrepreneurs in the poor country, foreseeing capital losses, may innovate less rapidly in long run equilibrium with international trade than under autarky. Trade reduces the profitability of education and research and development in the poor country as it places local entrepreneurs in competition with a rapidly expanding set of imported, differentiated products. It may drive the country to specialize in production rather than research and within production to shy away from high-tech products, favouring instead traditional, possibly stagnant, industries, which use the relatively plentiful supply of unskilled workers, thus slowing innovation and growth. Another important effect of trade is that eliminating child labour may actually alter the terms of trade between producing and consuming countries in favour of the producing countries, since payments to the labour force will increase and some of this increase will be transferred to the world market price. Grimsrud observes that in light of the above arguments, developing country governments should be more eager to legislate against child labour. That such a desire only exists on a limited scale, or has been translated into practical policies to only a small degree, may be due to the fear that an individual nation that unilaterally abolished child labour might easily lose out if other countries failed to follow suit. It is a collective action problem.

## G. Non-economic activities of children and gender issues

3.35 Non-economic activities by children constitutes an important demand on the child's time. As Grimsrud (op. cit.) notes, the majority of the world's child labourers are girls and most economically active children are boys. This difference in number and gender composition is a result of children's work in the household, activities defined as non- economic. As Knual (1998) notes, the standard definition of employment leaves out the effort undertaken in a child's own home that does not directly lead to the production of commercial goods. Including housework in the definition of child labour would substantially increase "the rates of work activity rates among female children and youth …". Furthermore, Galli (op. cit.) notes that unpaid family workers contribute to their household's income and survival by helping their

parents in both paid and self- employment activities. It is common for families to engage in sub-contracting where the family is paid at piece rates so that the help of children is crucial to increase household productivity and daily income. Children (especially girls) are often engaged in unpaid family activities in order to free their parents (especially their mothers) from housework and allow them to undertake paid work.

3.36 Burra (2005) argues that the distinction at the conceptual level between child labour and child work is essentially flawed and be abandoned both at the level of theory and practice. The ILO defines child labour 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." Child work, on the other hand, includes all paid and unpaid work for the household or for the market, whether it is full-time or part-time. Burra notes that the largest numbers of children are in fact to be found working in agriculture and allied activities. Moreover, a large number of children are involved in the informal economy, which in itself is very extensive. Informal enterprises run by adults depend hugely on family labour (Bhalotra and Tzannatos, op. cit.), particularly the labour of children. And, if children are not directly working on production-related work, they are engaged in supporting the care economy so that their mothers can be freed up for wage employment. The author goes on to note that it is being increasingly realized that a large number of children are out of school largely because they are involved in some kind of work within the household. In light of the above arguments, the author advocates that the distinction between child labour and child work be abolished and all children be targeted for compulsory primary education.

3.37 Grimsrud analyses the private return on child labour and notes that it has several elements, namely, the child's money income; the value of the child's work in the family enterprise, at the family plot, or in the household; the increased income opportunities for adult members of the household; and the skills or increased labour market opportunities the child acquires while working. He notes that the more important of the stated factors is the value of the work and the increased income opportunities for adult household members. Children working in their own household increase the adult labour supply. The money earned and the learning effects from child labour are generally not of great economic importance for the household, but the value of the work done and the increased income opportunities for adult members of the household may be of more importance. There will, of course, be differences among households.

3.38 The above review helps shed some light on the nature, extent and importance of children's non-economic work. In the following paragraphs an important theoretical work by Rende that models children's non-GDP-related work in the household framework and suggests interesting propositions is considered. The author notes that the literature on the economics of child labour often starts with the presumption that market work is a competitor of school time. In the author's view, this is, however, a curious approach since the international convention that delineates the guidelines for children's well-being, the United Nations Convention on the Rights of the Child, does not single out labour market attachment as the only source of violation of child rights. The guiding principle is rather to determine whether work

hampers the child's health, education and well-being now and in the future, while paying attention to the relations and environment within which work is performed.

3.39 The author develops a unitary household model in which children's time is allocated between school, market and non-market work. The author assumes one parent and two children who live and pool resources in two periods. The parent is concerned with consumption and the education of her children in the first period and with household consumption in the second period. The author also assumes that there exists a probability of being attached to the labour market, and denotes this by p and s for the first and second child, respectively, in light of the fact that in the literature several studies argue that children's market-related work will be easier to supply in households with complementary assets, or with parents who have access to land and labour markets.

3.40 On analysing the model, interesting implications are presented. First, in households with a link to labour or land markets, children's GDP-related work is expected to increase, independent of the level of income. Second, parents will choose a diversification strategy in choosing the optimal level of education for children. And this will depend on wages offered in the market, socially dictated productivity at non-market work and productivity at market work. Increase in one child's productivity will lead to an increase in the other child's optimal level of education. Third, if the parent is concerned over the total future income of her offspring, increases in the probability of finding a job during her daughter's adult life will negatively affect the optimal level of her son's education in the first period. But if the parent is concerned over the distribution of future income among her children, then improvements in the returns to women's education do not affect boy's education in the first period. After a threshold level of income, neither child's productivity matters and the optimal level of education rises for siblings.

3.41 The author concludes by noting that the literature on the economics of child labour needs to reconsider the definition of child labour. If the main concern is whether or not work interferes with a child's education, then the assumption that a child's time is allocated only between market work and school deserves serious consideration. If the main concern is that price and income changes are the incentives for parents to reallocate their child's time, then it is important to remember that GDP-related work is not the only option available to parents for allocating a child's time.

3.42 Finally, Grimsrud (op. cit.) presents an argument in extension of Andvig's, by taking account of children working in households. Andvig (2000) suggests an inverse U-shape for children's participation rate in the labour market in regard to poverty as a possibility to explore. Grimsrud (op. cit.) observes that the inverse U-shape may be a possibility in the case of economically active children but the same is not necessarily true of child labour; in poorer households children may still be working in their own household. He also notes that a related analytical problem deriving from the use of statistics for economically active children as a proxy for child labourers is that access to the labour market is an important determinant of poverty. Since children in the labour market are mainly sent by their families, economically active children tend to be from households with economically active parents. Analysis thus tends to exclude those households where both adults and the children are permanently or temporarily out of the labour market and households with the weakest connection to the labour

market. Further, both children and adults working in the illegal informal sector might be systematically less represented in the statistics. These conceptual and statistical issues point to the importance of accounting for children's non-economic work in order to derive a more accurate representation of the factors operating at the household level in favour of continued work by children.

## 4. Theories of the persistence of child labour

4.1 The persistence of child labour can be seen as the result of the equilibrium reached between both the demand and supply side factors. Thus, much of the discussion from the previous sections would be able to explain why child labour persists. Alternatively, a new perspective for analysing the issue can be introduced. One may differentiate the factors at the household level from those at the level of the economy as a whole. Thus, there exist in the literature theories of dynastic traps and the literature on economic growth, both in the framework of child labour.

4.2 Basu and Tzannatos (op. cit.) note that there is a small body of literature that analyses the dynamics of child labour. The studies assume that a person who receives more education as a child should grow up to have higher human capital. Under normal conditions in capital and labour markets, higher human capital will mean a higher labour income. Hence, a person who supplies more labour and gets less education as a child will grow up to be poorer as an adult. Following the logic of the basic model, this person's child will also be sent to work, thereby perpetuating child labour across generations. Child labour can thus be thought of as a dynastic trap. Here again there is the possibility of multiple equilibriums. Of two otherwise identical dynasties, one can be caught in the dynastic child labour trap, whereas the other is not. Furthermore, if an economy is caught in a child labour trap, one would suggest a large effort at educating one generation and this can get the economy moving towards a virtuous equilibrium without need for further action.

4.3 Grimsrud (op. cit.) analyses the persistence of child labour by application of the growth theories and notes that the endogenous growth theory offers a new analytical framework for studying child labour. First, the question of how child labour may be placed in the context of a neoclassical growth model is addressed. The neoclassical growth model normally does not differentiate between different types of labour; child labour is the same as other types of labour. Intra-household pooling of labour and discriminating among different labour markets are also not normally reflected in a neoclassic growth model. If children are hired, it is because their work at the wage paid has a positive marginal return to the enterprise output and hence to growth.

4.4 In the neoclassical model of growth, a sustained increase in investment raises the economic growth rate only temporarily, the ratio of capital to labour goes up, the marginal product of capital declines and the economy moves back to a long term path, with output growing at the same rate as the work force (quality adjusted, in more recent versions) plus a factor to reflect improving productivity. Because the last term is exogenous – determined outside the model – critics say that the neoclassical model ignores the very engine of growth. In a neoclassical growth model, the existence of

child labour does not therefore seem to pose any particular development problem. Working children represent both themselves and, by the corresponding growth in adult labour supply, a source of economic growth (depending on how one defines productivity and the quality of growth in the labour force).

4.5 Next, in Grimsrud (op. cit.) the endogenous growth theory and how its treatment of child labour differs from that of the neoclassical growth model are examined. The endogenous growth approach brings improvements in productivity, notably due to innovation and investment in human capital, fully inside the model, so that outputs grow faster than exogenous factors alone would make them grow. Human capital, for example, is not just another input into the production process with diminishing marginal returns, but one with the characteristics of a non-rival public good and one whose accumulation can make marginal returns to other inputs, particularly physical capital, increase, rather than diminish (Srinivasan, 1998). It may be assumed that the economy's representative agent maximizes its utility function over time, and a decision in the household to let the children spend less time working and more time in school could be an example of this. Production in the second period will hence depend not only on the number of workers, but also on their productivity and the quality of their works.

4.6 Lucas (….) adds to this a term representing an external effect associated with the accumulated human capital. In other words, the more human capital society as a whole has accumulated, the more productive each single member will be. In this way endogenous growth theory makes human capital development essential for economic growth. It also foresees externalities associated with this human capital development. If child labour should be a phenomenon in an early stage of industrialization, the lost opportunities that one generation has to forgo in order for future generations to prosper not only must be an optimal deployment of resources in period one, but must also offset the reduced return to human capital in later periods. In neoclassical theory this was not the case. Endogenous growth theory therefore seems to offer a useful analytical tool that casts new light over the connections between child labour and macroeconomic performance.

4.7 Brown, Deardorff and Stern (2003) in analysing the theory and evidence on child labour, note that the supply of child labour is largely a household decision pertaining to work and educational attainment for children, and is influenced by factors such as family size, parental work and income status, and investment in child's education. Compulsory school laws, as also programs designed to improve school quality and raise the return to education, have an impact too on child labour supply. Achieving the optimal decision is, however, constrained by a variety of market dysfunctions, such as, inadequate availability of credit and insurance, the inability of families to engage in efficient intra-generational bargaining, inefficiency in information gathering, coordination failure between firms that invest in upgrading technology and parents who invest in human capital, among others. The authors note that demand-side forces have only a limited role only, and in that context, since later stages of industrialization tends to be skill-biased it often appears that demand for child labour occurs when labour saving or other technological innovations have not been adopted.

4.8. Brown, Deardorff and Stern (op.cit.) suggest from their findings that child labour is a consequence of both the supply of, and the demand for, child workers. Their analysis does not support the conventional wisdom that child labour is essentially the outcome of a single cause such as poverty, greed, or 'nimble fingers'. While research supports the view that poverty increases the incidence of child labour, there is evidence that child labour surges when employment opportunities are created. Again, child labour may decline as incomes in developing countries rise, but there is nothing in theory or evidence that indicates that such an outcome is inevitable. The authors highlight, moreover, that parents are the single largest employer of children, in household economic activity, family enterprise, or farm, and the reason partly is that hiring non-family members is more expensive and incurs incentive problems. At times, parents take along children to work as a 'parent-child' team for increased productivity (and higher 'efficiency' wages), or engage the child for work allotted to themselves under 'sub-contracting' terms for maximising income. Thus, a policy that targets a single dimension of child labour is unlikely to be efficient or effective. Nonetheless, the authors conclude that evidence of precipitous decline in the hours that children work and the improvement in the conditions under which they worked in the West between the middle of the 19$^{th}$ and 20$^{th}$ centuries suggest that in the correct, policy, and cultural environment, eliminating child labour is an obtainable social objective.

## References


Aksit, Bahattin, Nuray Karanci and Ayse Gunduz-Hosgor (2001). *Turkey: Working street children in three metropolitan cities – A rapid assessment*, ILO/ IPEC Rapid Assessment Reports No.7 (ILO, Geneva).

Andvig, Jens Cristopher (2000). *An essay on child labour in sub-Saharan Africa: a bargaining approach*, Norwegian Institute of International Affairs (NUPI, Oslo).

Anker, Richard (2000). "The economics of child labour: a framework for measurement", *International Labour Review*, Vol. 139 (2000), No.3, (ILO, Geneva).

Anker, R.; S.Barge, S. Rajagopal and M.P. Joseph (eds.), (1998). *Economics of Child Labour in Hazardous Industries of India*, Centre for Operations Research and Training, (Baroda, India).

Anker, R. and H. Melkas (1996). *Economic incentives for children and families to eliminate or reduce child labour*, May (ILO, Geneva).

Arat, Zehra F. (2002). "Analyzing child labour as a human rights issue: its causes, aggravating policies, and alternative proposals", *Human Rights Quarterly*, Vol. 24, No.1 (2002), pp. 177-204 (John Hopkins University Press, Baltimore).

Bachman, S.L. (2000). "New economics of child labour: searching for answers behind the headlines", *Journal of International Affairs*, Vol.53, No.2, Spring, pp. 545-572 (Columbia University, New York).

Baland, Jean-Marie and James A.Robinson (2000). "Is child labour inefficient", *Journal of Political Economy*, 108.4, August, pp. 663-79 (University of Chicago Press, Chicago).

Basu, Alaka Malwade (1993). "Family size and child welfare in an urban slum: some disadvantages of being poor but modern", in *Fertility, Family Size and Structure*, Cynthia B. Lloyd (ed.) (Population Council, New York).

Basu, Arnab K. and Nancy H. Chau (2003). "Targeting child labour in debt bondage: evidence, theory and policy implications", *The World Bank Economic Review*, Vol.17, No.2 (2003), pp. 255-281 (World Bank, Washington DC).

Basu, Kaushik and Pham Hoang Van (1998). "The economics of child labor", *American Economic Review*, 88.3, June, pp. 412-27 (Pittsburgh).

Basu, Kaushik and Pham Hoang Van (1999). "The economics of child labor: reply", *The American Economic Review*, 89.5, December, pg. 1386 (Pittsburgh).

Basu, Kaushik (1999). "Child labour: causes, consequence, and cure, with remarks on international labour standards", *Journal of Economic Literature*, Vol.37, pp. 1083-1119 (Pittsburgh).

Basu, Kaushik (2000). "The intriguing relation between adult minimum wage and child labour", *Economic Journal*, Vol.110, March, pp. C50-C61 (Blackwell Publishing, Boston).

Basu, Kaushik (2002). "A note on multiple general equilibria with child labour", *Economics Letters*, Vol. 74 (2002), pp. 301-308 (Elsevier).

Basu, Kaushik and Zafiris Tzannatos (2003). "The global child labor problem: what do we know and what can we do?" *The World Bank Economic Review*, Vol. 17, No.2, pp. 147-173 (World Bank, Washington DC).

Basu, Kaushik (2001). *GENDER AND SAY – A model of household behavior with endogenously-determined balance of power*, (Mimeo.), (Department of Economics, Cornell University).

Basu, Kaushik, Garance Genicot and Joseph Stiglitz (2000). *Unemployment and Wage Rigidity when Labour Supply is a Household Decision*, (Mimeo.), (Department of Economics, Cornell University).

Becker, Gary S. (1974). "A Theory of Social Interaction", *Journal of Political Economy*, Vol. 82.

Becker, Gary S. (1981). *A Treatise on the Family*, (Harvard University Press, Cambridge).

Becker, G.S. and H.G. Lewis (1973). "On the interaction between the quantity and quality of children" *Journal of Political Economy*, Vol.8, pp. 279-288 (University of Chicago Press, Chicago).

Becker, G.S. and R.J. Barro (1991). "A reformulation of the economic theory of fertility", *Quarterly Journal of Economics*, Vol. 103, pp.1-25 (MIT Press, Cambridge).

Bhalotra, S. (2001). *Is child work necessary?* STICERD Discussion Paper No. 26, August (London School of Economics, London).

Bhalotra, S. (2001). *Parent altruism*, (Mimeo.), (University of Bristol, Bristol).

Bhalotra, S and C. Heady (2003). "Child farm labour: the wealth paradox", *The World Bank Economic Review*, Vol. 17, No. 2, pp. 197-227 (World Bank, Washington DC).

Blunch, Niels-Hugo, Sudharshan Canagarajah and Sangeeta Goyal (2002). *Short and long-term impacts of economic policies on child labor and schooling in Ghana*, Social Protection Discussion Paper No. 0212, May (World Bank, Washington DC)

Blunch, Niels-Hugo and Dorte Verner (2000). *Revisiting the link between poverty and child labor: the Ghanaian experience*, Policy Research Working Paper WPS-2488 (World Bank, Washington DC).

Bommier, Antoine and Dubois, Pierre: Comments (2004). "Rotten parents and child labor", *The Journal of Political Economy*, 112.1 (University of Chicago Press, Chicago).

Bourguignon, Francois and Pierre-Andre Chiappori (1994). "The collective approach to household behaviour", in *The Measurement of Household Welfare*, Richard Blundell, Ian Preston, and Ian Walker (eds.) (Cambridge University Press, Cambridge).

Brown, D.K., A. V. Deardorff and R. M. Stern (2003). *The Determinants of Child Labour: Theory and Evidence*, OECD Social Employment and Migration Working Papers No.2, Paris, April (OECD, Paris)

Browning, Martin, Francois Bourguignon, Pierre-Andre Chiappori and Valerie Lechene (1994). "Income and outcomes: a structural model of intrahousehold allocation", *Journal of Political Economy*, Vol.102, pp.1067-96 (University of Chicago Press, Chicago).

Burra, Neera (1995). *Born to Work: Child Labour in India,* (Oxford University Press, New Delhi).

Burra, Neera (2005) "Crusading for children in India's informal economy", *Economic and Political Weekly*, Special Article, December.

Cockburn, John (2000). *Child labour versus education: poverty constraints or income opportunities?* 22 March (Mimeo.), (Centre for the Study of African Economies, Oxford).

Chaudhri, D.P. (1997). "A policy perspective on child labour in India with pervasive gender and urban bias in school education", *Indian Journal of Labour Economics*, 40.4, pp.789-808 (Indian Society of Labour Economics, India).

Dessy, Sylvain E. (2000). "A defence of compulsive measures against child labour", *Journal of Development Economics*, 62.1, June, pp. 261-75 (Elsevier).

Dessy, Sylvain E. and Stéphane Pallage (2001). "Child labour and coordination failures", *Journal of Development Economics*, 65.2, August, pp. 469-76 (Elsevier).

Dessy, Sylvain E. and Stéphane Pallage (2005). "A theory of the worst forms of child labour", *Economic Journal*, 115, January, pp. 68-87 (Blackwell Publishing).

D'Mello, Bernard (2002). "Child labour in technologically backward small industrial capitalist enterprises: towards a micro socio-economics"**,** *Indian Journal of Labour Economics*, Vol. 45, Issue 3, pp. 517-35 (Indian Society of Labour Economics, India).

Doepke, M and Zilibotti, F. (2005). *The Macroeconomics of Child Labor Regulation*, Federal Reserve Bank of Minneapolis Staff Report No. 354, February (FRBM, Minneapolis).

Dorman, P. (2001). *Child labour in the developed economies*, ILO/ IPEC Working Paper, January (ILO, Geneva).

Dreze, J. and H.Gazdar (1996). "Uttar Pradesh: the burden of inertia", in J. Dreze and A.Sen, (eds.), *Indian Development: Selected Regional Perspectives*, (Oxford University Press, New Delhi).

Edmonds, E.V. (2003). *Child labour in South Asia*, OECD Social, Employment and Migration Working Papers No. 5, May (OECD, Paris).

Fallon, P. and Z. Tzannatos (1998). *Child labour: issues and directions for the World Bank* (World Bank, Washington DC).

Galli, R. (2001). *The Economic Impact of Child Labour*, Decent Work Research Programme Discussion Paper DP/128/2001, International Institute for Labour Studies, (ILO, Geneva).

Genicot, G. (2001). *Malnutrition and child labour* (Mimeo.), Department of Economics, University of California, 45 pgs (University of California, Irvine).

Genicot, G. (2002). "Bonded labour and serfdom: a paradox of voluntary choice", *Journal of development economics*, Vol. 67, pg. 101-127 (Elsevier).

Goldin, Claudia D. (1979). "Household and market production of families in a late nineteenth century American town", *Explorations in Economic History*, Vol. 16.2, pp.111-31 (Elsevier).

Goldin, C. D. and Parsons D. O. (1981), *Economic Well-Being and Child Labor: The Inter action of Family and Industry*, NBER Working Paper No. W0707, July (NBER, Cambridge).

Grimsrud, B. (2001). *What can be done about child labor? An overview of recent research and its implications for designing programs to reduce child labor*, Social Protection Discussion Paper Series No.0124 (World Bank, Washington DC).

Grote, U., A. Basu and D. Weinhold (1998). *Child Labour and the International Policy Debate: The Education/Child Labour Trade-Off and the Consequences of Trade Sanctions*, ZEF – Discussion Paper on Development Policy No. 1, Zentrum für Entwicklungsforschung, September (Center for Development Research, Universität Bonn, Bonn).

Grootaert, C. and R. Kanbur (1995). "Child labor: an economic perspective", *International Labour Review*, Vol. 2, No.134, pp. 187-203 (ILO, Geneva).

Grootaert, C. and H. Patrinos (1999). *The Policy Analysis of Child Labour: A Comparative Study* (St. Martin's Press, New York).

Gupta, M. R. (2000). "Wage determination of a child worker: a theoretical analysis", *Review of Development Economics*, Vol. 4, No. 2, pp. 219-228 (Blackwell Publishing).

Gupta, M. R (2002). "Child labour, skill formation and capital accumulation: a theoretical analysis"**,** *Keio Economic Studies*, Volume 38, Issue 2, pp. 23-40 (Keio University, Tokyo).

Hazan M. and B. Berdugo (2002). "Child labour, fertility and economic growth", *The Economic Journal*, Vol. 112, No. 482, pp.810-828 (Blackwell Publishing).

Hemmer, H., T. Steger and R. Wilhelm (1997). *Child labour in the light of recent economic development trends*, (Mimeo.) ILO/IPEC Working paper, May (ILO, Geneva).

Holzmann, R. and Steen J. (2000). *Social risk management: a new conceptual framework for social protection and beyond*, Social Protection Discussion Paper No.0006, The World Bank, Human Development Network, Social Protection Unit, February (World Bank, Washington DC).

Humphries, J. (1999). "Cliometrics, child labour and the industrial revolution". *Critical Review*, Vol. 13, Nos. 3-4, pp. 269-83 (Critical Review Foundation, Texas).

Humphries, J. (2003). "Child labour: lessons from the historical experience of today's industrial economies", *The World Bank Economic Review*, Vol. 17, No. 2, pp. 175-96 (World Bank, Washington DC).

International Labour Organization (2002), *A Future Without Child Labour*, Global Report under the Follow-up to the ILO Declaration on Fundamental Principles and Rights at Work (ILO, Geneva).

International Labour Organization (2006), *The End of Child Labour: Within Reach*, Global Report under the Follow-up to the ILO Declaration on Fundamental Principles and Rights at Work (ILO, Geneva).

International Labour Organization /International Programme on the Elimination of Child Labour (2001). *Tanzania - children in prostitution: a rapid assessment*, Investigating the Worst Forms of Child Labour No.12, November (ILO, Geneva).

International Labour Organization /International Programme on the Elimination of Child Labour (2002). *Annotated Bibliography on Child Labour*, Geneva, December (ILO, Geneva).

International Labour Organization /International Programme on the Elimination of Child Labour (2005). *Child Trafficking – The People Involved, A Synthesis of Findings from Albania, Moldova, Romania and Ukraine* (ILO, Geneva).

Invernizzi, A. (2000). *Child workers on the streets of Lima: between strategies for survival and socialization*, Faculty of Economic and Social Sciences, University of Fribourg (Fribourg).

Isvan Hayat, Nilufer (1988). "*Self-exploitation reconsidered: gender asymmetry in rural household production*" accessed from <http://www.ucw-project.org/cgi-bin/ucw/Publications/Main.sql?come=Lunga_include.sql&ProductID=10970&Title=CLP_Authors_Res.sql>

Jafarey, S. and S. Lahiri (2002). "Will trade sanctions reduce child labour? The role of credit markets", *Journal of Development Economics*, 68.1, June, pp.137-56 (Elsevier).

Knaul, F.M. (1998). *Incorporating Home-Based Domestic Work into Estimates of Child and Youth Labour: the Mexican Case*, Manuscript, World Bank LCSPR Project on Human Capital Decisions, Labor Force Participation and Gender (World Bank, Washington DC).

Levhari, D. and Yoram W. "The effect of risk on the investment in human capital", *The American Economic Review*, Vol.64, No.6 (1974), pp.950-963 (American Economic Association, Pittsburg).

Lieten, G.K. (2002). "Child labour and poverty: the poverty of analysis", *The Indian Journal of Labour Economics*, Special issue on Child Labour: Dimensions and Policy Options, Vol. 45, No. 3, July-September 2002 (Indian Society of Labour Economics, India).

Lindbeck, A., S. Nyberg, and J. Weibull (1999). "Social norms and economic incentives in the welfare state", *Quarterly Journal of Economics*, 114.1, pp.1-35 (MIT Press, Cambridge).

Lopez-Calva, L.F. (2003). "Social norms, coordination and policy issues in the fight against child labour", in Basu, K., H. Horn, L. Roman and J. Shapiro (eds.), *International Labour Standards: History, Theories and Policy*, (Blackwell publishing).

Lopez Calva, L. F and L.A. Rivas (2002). 'Acumulacion de capital, trabajo infantile y educacio obligatoria', English Summary, *El Trimestre Economico*, Vol. 69, Issue 1, pp. 3-36 (Fondo de Cultura Economic, Mexico).

Majumdar, M. (2001). "Child labour as a human security problem: evidence from India", *Oxford Development Studies*, 29.3, pp. 279-304 (Routledge, London).

Moehling, C.M. (1995). *The Intrahousehold Allocation of Resources and the Participation of Children in Household Decision-Making: Evidence from Early Twentieth Century America* (Mimeo.), (Northwestern University, Evanston).

Myers, W. (1988). *Alternative services for street children: the Brazilian approach* in Assefa Bequele and Jo Boyden (eds.) *Combating Child Labour* (ILO, Geneva).

Nardinelli, C. (1990). *Child Labour and the Industrial Revolution*, (Indiana University Press, Bloomington).

Organization for Economic Cooperation and Development (1996). *Trade, employment and labour standards: a study of core workers rights and international trade* (OECD, Paris).

Purkayastha, D. (1998). "Child labour, human capital and the role of parental power in poor households", *Journal of Economic Development*, Vol.23, Issue 2, pp.43-55 (Elsevier).

Rammohan, A. (2000). "The interaction of child labour and schooling in developing countries: a theoretical perspective", *Journal of Economic Development*, 25.2, December, pp. 85-99 (Elsevier).

Rammohan, A. (2001). "Development of financial capital markets and the role of children in economic assets", *Journal of International Development*, 13.1, January, pp. 45-58 (John Wiley & Sons).

Ranjan, P. (1999). "An economic analysis of child labour", *Economics Letters*, 64.1 July, pp. 99-105 (Elsevier).

Ranjan, P. (2001). "Credit constraints and the phenomenon of child labor", *Journal of Development Economics*, Vol. 64, pp. 81-102, (Elsevier).

Rende, S. *When 'enemy with spoon' becomes 'idle': non-market work and children* (Mimeo.), Department of Economics, University of Massachusetts (University of Massachusetts, Amherst).

Rialp, V. (1993). *Children and hazardous work in the Philippines*, (ILO, Geneva).

Ritualo, A.R., *Measuring Child Labor*, (2002). paper prepared for the National Academy of Sciences, September (Mimeo., Washington DC).

Rodrik, D. (1996). "Labor standards in international trade: do they matter and what can we do about them?" in Lawrence R.Z., D. Rodrik and J. Whalley (eds.) *Emerging agenda for global trade: high stakes for developing countries*, Overseas Development Council, (Washington DC).

Rogers, C.A. and K.A. Swinnerton (2001). "Inequality, productivity, and child labour: theory and evidence", December**,** <**http://www.georgetown.edu/faculty/rogersc/Papers/Ineq.pdf**>.

Rogers, C.A. and K.A. Swinnerton (2002). "A theory of exploitative child labour", October, <**http://www.georgetown.edu/faculty/rogersc/Papers/Exploit.pdf** >.

Rogers, C.A. and K.A. Swinnerton (2003). "Does child labour decrease when parental incomes rise?", March, <**http://www.georgetown.edu/faculty/rogersc/Papers/Altruism.pdf**>.

Rosati, F.C. and M. Rossi (2003). "Children's working hours and school enrolment: evidence from Pakistan and Nicargua". *The World Bank Economic Review*, Vol. 17, No.2 (World Bank, Washington DC).

Rosati, F.C. and Z. Tzannatos (2003). *Child work: an expository framework of altruistic and non-altruistic models*, Social Protection Discussion Paper No. 0305, (World Bank, Washington DC).

Rosenzweig, M.R. and R. Evenson (1977). "Fertility, schooling and the economic contribution of children in rural India: an econometric analysis", *Econometrica*, 45.5, pp. 1065-79 (Econometric Society).

Satz, D. (2003). "Child labor: a normative perspective", *The World Bank Economic Review*, Volume 17, No.2, pp. 297-309 (World Bank, Washington DC).

Sen, A. (1985). "Well-being, agency and freedom: the Dewey lectures 1984", *Journal of Philosophy*, 82(4), pp.169-221 (Journal of Philosophy, New York).

Shelburne, R.C. (2001). "An explanation of the international variation in the prevalence of child labour", *World Economy*, 24.3, March, pp. 359-78 (Blackwell, Publishing).

Srinivasan, T.N. (1998). *Developing countries and the multilateral trading system: From the GATT to the Uruguay Round and the future* (Boulder, Westview).

Swinnerton, K. and A. Rogers (1999a). "The economics of child labour: comment", *The American Economic Review*, December, 89.5 (1999), pg. 1382 (American Economic Review, Pittsburg).

Swinnerton, K. and A. Rogers (1999b). *Inequality, productivity and child labor: theory and evidence*, Working paper, Georgetown University, (Georgetown University, Washington DC).

Tanaka, R. (2003). "Inequality as a determinant of child labour", *Economic Letters*, 80(1), pp. 93-97 (Elsevier).

Udry, C. (2004). *Child Labour*, Yale University, August (New Haven).

UNICEF (1999). *The state of the world's children*, (UNICEF, New York).

World Bank (1998), *World Development Report* (World Bank, Washington DC).

Zelizer, V.A. (1985). *Pricing the priceless child: the changing social value of children* (Basic Books, New York).

***Annex***

## Statistical measurement practices with regard to activities by children

This report dealt primarily with an overview of the underlying research expanding the determinants of the supply, demand and persistence of child labour (CL). The review of the literature in the report included some econometric studies on which the theoretical discussion of child labour determinants was based. In this annex, these studies are presented with an emphasis on the variables and indicators applied in analysing the CL phenomenon, along with a selection of additional empirical studies on CL measurement. The purpose of surveying this aspect of the research is to identify possible guidelines on improvising suitable statistical measurement practices in respect of activities by children.

The following studies (most have been reviewed in the report, those marked * are additional) are examined in this annex.

1.* Ahmed, Iftikhar: "Getting rid of child labour", *Economic and Political Weekly* Special Articles, Vol.33 No.27 (July 1999), pp. 1815-22.
2. Basu, Arnab K. and Nancy H. Chau : "Targeting child labour in debt bondage: evidence, theory and policy implications", *The World Bank Economic Review*, Vol.17, No.2 (2003), pp. 255-281.
3. Bhalotra, S. and C. Heady: "Child farm labour: the wealth paradox", *The World Bank Economic Review*, Vol. 17, No. 2 (2003), pp. 197-227.
4. Bhalotra, S: *Is child work necessary?* STICERD Discussion Paper No. 26, London School of Economics, August 2001.
5. Blunch, Niels-Hugo, Sudharshan Canagarajah, Sangeeta Goyal: *Short and long-term impacts of economic policies on child labour and schooling in Ghana*, Social Protection Discussion Paper No. 0212, World Bank, Washington DC, May 2002.
6. Blunch, Niels-Hugo and Dorte Verner: *Revisiting the link between poverty and child labour: the Ghanaian experience*, Policy Research Working Paper WPS-2488, World Bank, Washington DC, 2000.
7. Burra, Neera: "Crusading for children in India's informal economy", *Economic and Political Weekly* Special Articles, December 2005.
8. Grootaert, C. and H. Patrinos: *The policy analysis of child labour: a comparative study*, St. Martin's Press, NY, 1999.
9.* Hussain, Mahmood: *Child labour standards and economic growth: an econometric analysis*, Working Paper # 99-21, Department of Economics, University of Colorado at Boulder, USA, October 1999.
10.* Jayaraj, D and S. Subramanian: "Child labour in Tamil Nadu in the 1980s: a preliminary account of its nature, extent and distribution", *Economic and Political Weekly*, March 2002.
11. Lieten, G.K, "Child labour and poverty: the poverty of analysis", *The Indian Journal of Labour Economics*, Special issue on Child Labour: Dimensions and Policy Options, Vol. 45, No. 3 (July-September 2002).
12.* Ray, Ranjan, "Simultaneous analysis of child labour and child schooling – comparative evidence from Nepal and Pakistan", *Economic and Political Weekly*, Review of Labour, Vol.37 No.52 (December 2002), pp. 5215-24.

Each study is reviewed and brief descriptions of (i) objective and findings, (ii) data used, and (iii) variables formulated, are provided.

**1. Ahmed (1999)**

The study is an empirical analysis seeking a response to the policy question of whether and to what extent changes in GNP per capita, poverty, inequality, the structure of the economy, demographic factors and basic education could effectively reduce child labour. It is anticipated that child labour should be positively associated with poverty, income inequality, the percentage of population below 15 years of age and the share of agriculture in GDP. Furthermore, child labour is expected to be negatively associated with GNP per capita, school enrolment and adult and female literacy rates. This hypothesis is tested using cross-section data from a sample of developing countries.

Scope: Cross-country analysis

Data sources:
- International Labour Organization (ILO)
- World Development Report
- ILO survey of estimates

Data source application/ econometric estimation:
- Data from the first source gives estimates for child labour (10-14 years of age)
- Data from the second source gives information on GNP per capita, adult literacy rates, primary age group enrolled in education, percentage of population below 15 years of age and percentage contribution of agriculture to GDP
- Data from the third source provides information on poverty and Gini coefficient

Table of variables:

| *Dependent variable* | *Description/ notes* |
|---|---|
| Child labour | ♦ measured by the percentage of economically active children in the age group 10-14 years |
| *Independent variables* | *Description/ notes* |
| GNP per capita | - |
| Poverty | ♦ the percentage of population or households with income (or expenditure) below poverty line or the standard in the year closest to 1995 for which data is available for the country concerned |
| Gini coefficient | ♦ measures inequality in the distribution of income or expenditure at the personal or household level for the year closest to 1995 for which data are available either at the national or the rural level |
| Primary age group enrolment in education | - |
| Percentage adult literacy | - |
| Percentage adult female literacy | - |

| | |
|---|---|
| Percentage contribution of agriculture to GDP | - |
| Percentage of population below 15 years of age | - |

## 2. Basu and Chau (2003)

The study contains an econometric analysis of the factors influencing the existence of bonded child labour. In light of the findings from the econometric model a theoretical model evaluating the effectiveness of policy responses to bonded child labour is developed. The econometric findings suggest systematic correlations between the incidence of child labour in debt bondage and the enforcement of core labour rights and the stage of development of an economy. Child labour in debt bondage is less likely in countries where per capita real income is relatively high, the rights of workers to freely negotiate wages and form unions are respected and financial markets are better developed.

Scope: 163 countries (cross-national study)

Data sources:

- Country report on Human Rights Practices for 1998, United States Department of State 1999
- Worldwide Report on the Worst Forms of Child Labour, Global March against Child Labour 2000
- World Development Indicators, World Bank
- International Labour Office
- International Trade and Core Labour Standards (Monograph), Organization for Economic Cooperation and Development (OECD) 2000

Data source application/ econometric estimation:

- Data from the first three sources are used to construct the dependent variable, bonded child
- Data from the last three sources are used to construct the labour rights indicators
- Data from the World Bank provides information on household consumption per capita and GDP, and is used to construct indicators for financial market development

Table of variables:

| *Dependent variable* | *Description/ notes* |
|---|---|
| Bondchild (Bonded child) | ♦ constructed to take the value of one whenever incidences of child labour in debt bondage have been reported and a value of zero otherwise |
| ***Independent variables*** | ***Description/notes*** |
| Average real GDP per capita, 1994-98 | ♦ is a stage of economic development variable |
| Legexag (labour rights indicator) | ♦ constructed for each country and assigned a value of one whenever child agricultural labour is exempt from national minimum age legislations |

| | |
|---|---|
| Enforcement (labour rights indicator) | ♦ deals with the enforcement of core labour rights, based on information (four point scores) in the OECD report<br>♦ takes a value of 0 for the two groups of countries in which enforcement of freedom of association and the right to organize is deemed adequate and a value of 1 for the two groups of countries in which more severe violations have been reported |
| Share of economically active population (age 10-14) | ♦ 'outcome' indicator for the observance of core labour rights |
| Intspread (financial development indicator) | ♦ captures the average gap between official lending rate and the deposit rate during 1994-98 |
| Priv (financial development indicator) | ♦ denotes the share of private credit (by deposit money banks and other financial institutions) to GDP |
| Riskshare (financial development indicator) | ♦ attempts to measure the development of insurance markets by estimating the extent to which variability in gross domestic product per capita translates into variability in household consumption per capita (1970-98, constant 1995 prices). The estimated least square regression coefficient in the regression of the latter on the former gives the variable 'riskshare'<br>♦ when the coefficient takes a value of 0, household consumption is fully insulated (insured) from per capita income shocks in the country. When the coefficient takes a value of 1, there is perfect pass-through of income variability to household consumption variability |

### 3. Bhalotra and Heady (2003)

The paper suggests that land and labour market failures can explain the apparent paradox that children of land-rich households are often more likely to be in work than the children of land-poor households. Additionally, it suggests that credit market failure will tend to weaken the force of this paradox. The effects from land, labour and credit market failures are modelled and estimates obtained from the data. It is found that even after conditioning for covariates, the wealth paradox persists for girls in both countries, whereas it disappears for boys.

Countries: Pakistan and Ghana

Data sources:
- Rural samples of the Ghana Living Standards Survey for 1991/92
- Rural samples of the Pakistan Integrated Household Survey for 1991

Data source application/ econometric estimation:
- Data used to construct the right and left hand side variables. Data structure and definition of work as used in the referred data sets are sufficiently similar to allow comparability across the two countries

Table of variables:

| *Dependent variable* | *Description/ notes* |
|---|---|
| Child work | ♦ hours of child work on the family farm |

| *Independent variables* | *Description/ notes* |
|---|---|
| Child characteristics | ♦ age, age squared<br>♦ child of household head |
| Household resources | ♦ log per capita food expenditure (this includes imputed value of home produced consumption, and proxies for household consumption)<br>♦ acres multiply 10 square, acres (square) multiply 10 to the power 4 (land size, defined as the acres of farm land owned or operated by the household, is the key regressor in the equation. A quadratic term is included to allow the sizes of the wealth and substitution effects to vary with land size)<br>♦ dummy variables are introduced to distinguish the land owned from rented land. A further distinction is between sharecropping land, use of free or village land and number of plots of land (*see farm organization, which is the next independent variable)*<br>♦ land owned is a valid instrument for total land operated if it is assumed to be exogenous – this takes care of the possible endogenity of land operated by virtue of including the land rented or sharecropped. An index of inequality in land distribution within the community is used as another instrument – communities in which there is greater inequality in land ownership are expected to have more rental arrangements over land<br>♦ unemployment rate at the community level together with indicators of the level of infrastructural development of the community are used to instrument household consumption, to account for a possible endogenity of the consumption variable if decisions about consumption and labour supply are made simultaneously. The within community variation in income is captured by including interactions of these variables with the education of the household head |
| Farm organization | ♦ number of farms<br>♦ rent, sharecrop, free farm or village farm? |
| Household structure | ♦ household size<br>♦ female head<br>♦ males <5-7 years, males 5-9 years, males 15-19 years, males 20-59 years, males >60 years<br>♦ females <5-7 years, females 5-9 years, females 15-19 years, females 20-59 years, females >60 years<br>♦ household size and composition appear as regressors, as the incentive to put a child to work on the farm depends on the size of the farm relative to the size of the available pool of family labour<br>♦ an indicator for whether the household has a female head serves as a measure of household insecurity |
| Parents education | ♦ mother - middle/secondary, father – secondary<br>♦ to the extent that women's education reflects their bargaining power, inclusion of mother's education as distinct from father's education goes some way towards relaxing the common preference assumption |
| Community variables | ♦ primary school (girls), primary school (boys), middle school, secondary school<br>♦ public transport |

| | |
|---|---|
| | ♦ log of male wage<br>♦ wage of hired labour is proxied by the going agricultural wage rate for men in the community (a statistic provided by village leaders identified as respondents in the community questionnaires of both surveys)<br>♦ an indicator for public transportation in the community is included as it may affect access to school<br>♦ dummy variables for whether primary, middle and secondary schools are present in the community in which the child lives serve as a proxy for school costs |
| A set of province dummies | ♦ introduced in all the equations to capture any effects of inter-province differences in wages and prices |

## 4. Bhalotra (2001)

This paper investigates the hypothesis that children work because their income contribution is necessary for the household to meet subsistence expenditures. A testable implication of this hypothesis, which is used in the paper, is that the wage elasticity of child labour supply is negative. Labour supply models for boys and girls in wage work are estimated. On conditioning for full income, a forward falling labour supply curve for boys is identified. This is consistent with the view that boys work on account of the compulsions of poverty. It is also shown that this finding is much less clear for the case of girls.

Scope: Pakistan

Data source:
- Rural observations from the Pakistan Integrated Household Survey, 1991

Data source application/econometric estimation:
- Data used to construct the right and left hand side variables

Table of variables:

| *Dependent variable* | *Description/ notes* |
|---|---|
| Child wage work | ♦ hours of child wage work<br>♦ two definitions of hours of child wage work are constructed from the survey. One refers to the week before the survey, and the other to the annual average of weekly hours of work |
| ***Independent variables*** | ***Description/ notes*** |
| Child wage rate | ♦ measured as earnings divided by hours of work<br>♦ wage rate is specific to the individual child and not constrained to be the local market wage. The local market wage is instead used as an instrument<br>♦ measurement of earnings is complicated by some payments being made in kind and by earnings being reported for different payment frequencies. It is reduced to a common denominator and payments in kind are incorporated using cluster level grain prices and information on the quantities of grain received |

| | |
|---|---|
| Wage rates of other household members | ♦ calculated in the same manner as for children<br>♦ a interesting problem arises as the wage rate data records many missing values – it is not uncommon to find that a child is in wage work but one or both of her parents are not. The authors mention two ways of dealing with this problem – first, predicting the wage rate using the sample of adults for whom the wage data are available and second, replacing the wage rate of the person with the age and educational level of the person. The latter is adopted and parent's education and age is replaced by the average education and age of all adults in the household |
| A life cycle consistent measure of non-labour income | ♦ constructed using the cross sectional data on household consumption and labour income of all household members |
| Acres of land owned by the household[1] | ♦ at a given household size, this reflects the marginal productivity of farm/enterprise work |
| Dummy variables for the presence of primary, middle and secondary school in the village[1] | ♦ to proxy for the cost of school attendance |
| Other variables | ♦ a quadratic in child age, a dummy indicating whether the child was ill in the month preceding the survey, dummies for female headship, religion, a cluster level unemployment rate, province dummies, household size, indicators of the age-gender composition of the household, birth order dummies and dummies describing the relation of the child to household head<br>♦ a cluster level unemployment rate allows for disequilibrium in the labour market<br>♦ province dummies pick up more aggregate regional effects including demand effects |

## 5. Blunch, Canagarajah and Goyal (2002)

This paper proposes that most of the empirical analysis of child labour has been based on one-time cross-sectional samples and though this may give an idea of the incidence and determinants of child labour at one point in time, it is silent about the dynamics. The econometric findings suggest that child labour is responsive to poverty in the short run, but not in the long run, while child schooling is unaffected by poverty in the short run but responds in the medium- to long run.

Scope: Ghana

Data source:
Ghana Living Standards Survey 1987/88, 1991/92, 1998/99

Data source application/econometric estimation:
- Data used to construct the right and left hand side variables

Tables of variables:

| *Dependent variable* | *Description/ notes* |
|---|---|
| Activity of the child (y) | ♦ y =1 if child i neither attends school nor works; y = 2 if child i |

only attends school; y = 3 if child i both attends school and works; y = 4 if child i only works

| *Independent variables* | *Description/ notes* |
|---|---|
| Individual characteristics | ♦ age, age squared<br>♦ female<br>♦ child of the household |
| Parent characteristics | ♦ mother lives in household, father lives in household<br>♦ education - mother: primary/middle secondary/post middle secondary, father: primary/middle secondary/post middle secondary |
| Household characteristics | ♦ children 0-6 years, brothers 7-14 years, sisters 7-14 years, males 15-59 years, females 15-59 years, older than 60<br>♦ Muslim, catholic, protestant, other Christian<br>♦ (log) per capita expenditure<br>♦ male head of household<br>♦ age of head of household, square of the age of head of household<br>♦ household owns livestock, household owns land |
| Cost of schooling | ♦ schooling expenditure<br>♦ distance (in minutes) |
| Location | ♦ Accra, urban areas outside Accra, rural coastal, rural forest |

## 6. Blunch and Verner (2000)

This paper is based on the premise that child labour is not necessarily harmful and goes on to analyse the determinants of harmful child labour viewed as child labour that directly conflicts with the human capital accumulation of the child. The authors' findings reinstate the positive relation between poverty and child labour.

Scope: Ghana

Data source:
Core Welfare Indicators Questionnaire 1997

Data source application/econometric estimation:
- Data used to construct the right and left hand side variables

Tables of variables:

| *Dependent variable* | *Description/ notes* |
|---|---|
| Child work | ♦ this is defined as: work=1 if main occupation is work, =0 otherwise<br>♦ the indicator variable is based on the question "What was NAME's main work status during the past 4 weeks". If the main work status was labour related activities rather than school, this is interpreted as indicating that the child is engaged in harmful child labour activities – those that directly conflict with the accumulation of human capital |

| *Independent variables* | *Description/ notes* |
|---|---|
| Individual characteristics | ♦ female:1 if yes, 0 otherwise<br>♦ age, age squared<br>♦ child of household head: 1 if yes, 0 otherwise |

| | |
|---|---|
| | ♦ disabled: 1 if yes, 0 otherwise |
| Household characteristics | ♦ 'socio economic group of household head' dummies:1 if as stated below, 0 otherwise (public or semi-public sector employee is reference group) – private sector employee (formal), private sector employees (informal), own account worker (agriculture), own account worker (non agriculture), unemployed or non active, other or unknown |
| | ♦ owns land: 1 if household operates land, 0 otherwise |
| | ♦ owns cattle:1 if household owns cattle, 0 otherwise; owns sheep: 1 if household owns sheep, 0 otherwise |
| Quintile | ♦ household wealth quintile: households are weighted according to various poverty predictors, for instance, how frequently they get meat to eat, whether the household uses toothpaste etc. |
| Community characteristics | ♦ urban location - 1 if urban community, 0 if rural community |
| | ♦ nearest primary school (minutes), nearest secondary school (minutes) |

## 7. Burra (2005)

The paper's arguments have a few implication for statistical measurement practices, namely:

i) The distinction between 'child labour' and 'child work' should be abolished for all practical policy purposes.

ii) In light of the increasing recognition that a large proportion of out of school children are involved in some kind of work within the household, an attempt should be made to capture children's involvement in non-economic work.

## 8. Grootaert and Patrinos (1999)

The case studies in this study analyse the supply of child labour as a sequential decision making process, using binary probit models. The case studies for Cote d'Ivoire, Colombia and Bolivia also present for comparative purposes the results of the multinomial logit model. The illustration below is made of the case study for Cote d'Ivoire.

Scope: Cote d'Ivoire

Data source:
Cote d'Ivoire Living Standards Survey, 1988

Data source application/ econometric estimation:
- Data used to construct the right and left hand side variables

Table of variables:

| *Dependent variable* | *Description/ notes* |
|---|---|
| Household's time allocation decisions regarding their children | ♦ sequential probit model – first stage (probability of going to school and not working), second stage (probability of combining work and school), third stage (probability of only working). In addition to |

| | |
|---|---|
| | three stage sequential probability model, the author also runs an OLS regression with weekly hours worked as the dependent variable<br>♦ multinomial logit model (probability derivates at the mean, in percentage points): schooling only, work and school, work only, home care or no work<br>♦ difference between the sequential probit and multinomial logit model arises from the fact that the former models the household decision making process sequentially whereas the latter models the same as occurring simultaneously |
| *Independent variables* | *Description/ notes* |
| Child characteristics | ♦ age of child, age of child squared<br>♦ gender (female=1) |
| Parent characteristics | ♦ years of education of father, years of education of father multiply gender of child<br>♦ years of education of mother, years of education of mother multiply gender of child<br>♦ father employed, father employed multiply gender of child<br>♦ mother employed, mother employed multiply gender of child |
| Household characteristics | ♦ age of head, age of head squared<br>♦ gender of head (female=1)<br>♦ number of other boys in household (0-5 years), number of other boys in household (6-9 years), number of other boys in household (10-15 years), number of other boys in household (16-17 years)<br>♦ number of other girls in household (0-5 years), number of other girls in household (6-9 years), number of other girls in household (10-15 years), number of other girls in household (16-17 years)<br>♦ household owns farm, household owns non-farm enterprise<br>♦ household in poorest quintile |
| Cost of schooling | ♦ cluster average of household education expenditure per pupil (‘000 CFAF)<br>♦ school less than 1 km away (omitted), school 1-5 km away, school more than 5 km away |
| Location (urban) | ♦ Abidjan (omitted), other cities |
| Location (rural) | ♦ East Forest (omitted), West Forest, Savannah |

## 9. Hussain (1999)

This paper considers a simple dynamic theory of child labour, human capital formation and economic growth that is consistent with some of the main features of child labour and economic development. The empirical analysis is based on panel data from 64 countries for the period 1960-1980 and uses different estimation techniques (OLS and SUR). Estimations are obtained under different model specifications – linear and nonlinear, and using different dependent and independent variables. The findings suggest that the incidence of child labour is negatively correlated to parental human capital, negatively correlated with education quality and positively correlated with education cost.

Scope: 64 countries (*cross -country analysis)*

Data sources:

- International Labour Organization's Economically Active Population, 1950-2010
- Barro and Lee (1993) dataset, in "International comparisons of educational attainment," Journal of Monetary Economics, 32, pp. 363-394
- UNESCO Statistical Yearbooks

Data source application/econometric estimation:

- Data from the first source is used for get estimates for child labour
- Data from the second source is used for estimates on all other variables, except for the cost of education
- Data from the third source is used for estimates for the number of schools per square mile, which is used as a proxy for the cost of education variable

Table of variables

| *Dependent variable* | *Description/ notes* |
|---|---|
| CLABOR (Child labour) | ♦ ILO estimates of participation rates for children (10-14 years)<br>♦ required data is available at 10 year intervals for time period 1960-80 |
| *Independent variables* | *Description/ notes* |
| GDPCAP (GDP per capita) | ♦ from the Barro and Lee data set |
| HUMAN (stock of human capital) | ♦ proxied by average schooling years in the total population over age 25 |
| NHUMAN (level of future human capital) | ♦ from the Barro and Lee dataset for the years 1965, 1975 and 1985 |
| NGDPCAP (level of future GDP per capita) | ♦ from the Barro and Lee dataset for the years 1965, 1975 and 1985 |
| GRHUMAN (growth rate of human capital) | ♦ calculated for the years 1960-65, 1970-75 and 1980-85 |
| GRGDPCAP (growth rate of GDP per capita) | ♦ calculated for the years 1960-65, 1970-75 and 1980-85 |
| INVQLTY (quality of schooling) | ♦ pupil-teacher ratio is used as the inverse of the quality of education: a higher ratio will imply lower quality |
| INVCOST (cost of education) | ♦ proxied by number of schools per square mile<br>♦ the idea is that the proximity of schools signals a lower cost of schooling |
| Dummies to account for unobservable temporal and spatial effects | ♦ cross-sectional dummies – AFRICA, ASIA, CENTAM (Central America), LATAM (Latin America), EUROPE, and OCENIA. The country with all zeros for these dummies is the United States. Only 6 regional dummies based on the continents of the countries in the data are included to strike a balance between the inclusion of spatial effects and the loss of degrees of freedom<br>♦ time dummies - YR70 (1970) and YR80 (1980). These are included to reflect the fact that many unobservable and qualitative factors evolve within a country and lead to different amounts of child labour over the years |

## 10. Jayaraj and Subramanian (2002)

This paper looks at secondary data sources with a view towards presenting certain broad descriptive features of the phenomenon of child labour in Tamil Nadu, its distribution across well-defined socio-economic groups (classified by gender, sector of origin, caste), and its dispersal across space. An attempt is made to circumvent the definitional inadequacy of the existing child labour estimates by estimating the numbers of children who constitute the (statistically) 'invisible' workers. This is done by counting the numbers of children in the school-going age group who are listed as neither workers nor attending school.

Scope: India (Tamil Nadu state)

Data sources:

- Various rounds of the survey on 'Employment and Unemployment' concluded by the National Sample Survey Organization (NSSO), pertaining to the years 1972-73, 1977-78, 1983,1987-88
- The population census data for the year 1981

Data source application:

- The census and the NSS data are helpful in obtaining estimates for the number of total workers, defined as the workers who are gainfully employed. To obtain estimates for the number of invisible workers, a specific assumption is made – '*invisible workers*' are defined as all those children in the considered age group (5-14) who are neither in school nor are listed as workers.
- These data sources are also employed to study the different categories of the invisible workers, the relative disadvantage of population sub-groups under different grouping systems and spatial dispersion in the incidence of child labour.

Statistical methodology:

1. Definition of children – as persons who have completed 5 years of age but are below the age of 15.

2. Definition of workers – all children aged 5-14 who are neither in school nor listed as workers as 'invisible workers'. This is termed as the 'liberal' definition, as opposed to the 'restrictive' definition that classifies only those as workers who are employed gainfully.

3. Workforce Participation Rate (WPR) – is defined as the ratio of the number of workers in the age group 5-14 to the total population in this age group. The WPR is a decomposable index and can be written as a population weighted sum of the group specific WPRs. The group specific WPR is the work participation rate of the group i. The grouping of the population can be along the lines of caste, gender, sector of origin, religion, occupation etc. Furthermore, a simple normalized index of relative disadvantage can be constructed from the data on the population share of a group and its contribution to the overall WPR. This can be constructed in two steps. First, a simple index of deviation from the norm of representation in the working population is obtained by the difference between the group's relative contribution to the overall WPR and the group's population share relative to the group's population share. Second, a normalized value can be obtained by dividing the above by its maximized

value. A given group is deemed to be relatively disadvantaged when the normalized index is positive and relatively advantaged when the same is negative.

4. A simple binary classification of the population is made by gender (boys and girls), by sector of origin (rural and urban), and by caste (scheduled castes and tribes and others), and an index of relative disadvantage is computed for the disadvantaged sub group in each pair of groups into which the population is partitioned. Also, a simple measure of the extent of inequality in the distribution of WPRs across the sub-groups of a population is calculated in an analogous manner to the Gini coefficient of inequality.

5. A measure of the spatial dispersion of the incidence of child labour across districts is calculated. The inter-district variability of work participation rates is measured in terms of the squared coefficient of variation.

6. Finally, a generalized aggregate headcount measure of deprivation is constructed making use of the district level data on various dimensions of basic capabilities. This allows examination of the existence of any systematic relationship between the incidence of child labour and capability failure in the dimensions of literacy, health, adequate shelter, mobility and access to potable water.

Findings:
1. The estimate of the WPR under the restrictive definition understates the incidence of child labour under the liberal definition by around 60 per cent. Moreover, the categories of invisible workers and the distribution of children by sex across the categories provide a harsh commentary on gender discrimination. These various categories are: children perceived to be too young to work or to attend school, children reporting disability and children involved in domestic duties and free collection of goods.

2. On calculating the index of relative disadvantage for sub-groups within groups, the authors find that girls are more disadvantaged than boys, rural children are more disadvantaged than their urban counterparts, and children from Scheduled Castes and Schedules Tribes (SCST) are more disadvantaged than the non-SCST children.

## 11. Lieten (2002)

In this paper the author raises some questions on the causes of child labour as well as inquires why children participate in the labour process. The author argues:

i) it is imperative to define clearly what child labour exactly means.
ii) there is a need for separating the various categories (in different languages different words exist for activities in which products, services, artifacts and mental constructs are produced) before meaningful statistics and a multivariate analysis based on those statistics can be produced.
iii) it is necessary to review the place of children in society and to look at the culturally conceived obligations towards and expectations from them - value judgments and evaluative standards rooted in and deriving from developed country experience cannot always be meaningfully superimposed on the social realities of the developing countries.

## 12. Ray (2002)

The study investigates the key determinants of child labour hours and child schooling experience, paying special attention to the interaction between the two. The analysis recognizes the joint endogenity of child labour, child schooling and child poverty. A three stage least squares estimation methodology is employed. The findings suggest a sharp trade-off between child labour and child schooling. A gender bias in favour of boys' schooling is observed in both the country data sets.

Scope: Nepal, Pakistan

Data sources:
- Nepal Living Standards Survey (NLSS) conducted in 1995 by the Central Bureau of Statistics (CBS)
- Pakistan Integrated Household Survey (PIHS)

Data source application:
- Data is used to construct the right and left hand side variables.

The empirical exercise is based on a simultaneous equations system, using three stage least squares (3SLS), of a set of three equations, namely, the annual labour hours of the child, the years of schooling experience of that child, and the poverty status (1=poor, 0=non-poor) of the household that the child belongs to. This is complemented with a multinomial logit estimation that analyses child labour and child schooling participation.

Tables of variables:

| *Dependent variables* | *Description/ notes* |
|---|---|
| Labour hours | ♦ annual labour hours of the child |
| Schooling years | ♦ years of schooling experience of the child |
| Poverty status | ♦ defined as equal to 1 if the child comes from a poor household, and 0 otherwise<br>♦ for examining the impact of poverty on child labour and child schooling, the study distinguishes between household poverty and cluster poverty. The former is a household attribute based on the household's income shortfall from the poverty line, and the latter is a community level variable which uses the headcount poverty rate to measure economic affluence or the lack of it, of the cluster of residence of the household |
| Choice outcomes for the dependent variable in the multinomial logit estimation | ♦ 1 if the child attends school only, 2 if the child combines both school and work, 3 if the child is neither in school nor at work; and 4 if the child only works |
| *Independent variables* | *Description/ notes* |
| Child characteristics | ♦ currently attending school – 0 if no, 1 if yes<br>♦ age of child, age of child squared<br>♦ gender of the child – 0 if boy, 1 if girl<br>♦ child wage |