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EXTENT AND DETERMINANTS OF CHILD LABOUR IN UGANDA

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Abstract

Despite the prevalence and the many dangers associated with child labour, the phenomenon has received the attention of researchers, academicians and policy makers only recently, and not until International Labour Organization (ILO) estimates showed a large and increasing number of working children worldwide. It is now recognized that in order to combat child labour effectively, policies should be grounded in an informed understanding of its causes, roles and implications. This study uses data from the 1992, 1999 and 2002 Uganda National Household Surveys to explore the extent, determinants and forms of child labour in a poor but growing economy. Of note here is that over this period Uganda introduced universal and compulsory primary education.

The study highlights the extent, characteristics and determinants of child labour in Uganda and their evolution over the decade. The theoretical framework is a standard household production model that analyses the allocation of time within the household. Using probit and tobit models, we estimate the determinants of child labour for the individual child worker. The results indicate that child labour is still common, widespread and starts at an early age in Uganda, although it has reduced significantly over the years. Education and formal employment of the household head significantly decrease the probability that a child will work. Household welfare is another indicator of child labour, as poor households are more likely to have working children. A comparison of the three data sets reveals an increase in the percentage of children combining work and study over time. Nevertheless, the likelihood of child labour increases with the age of the child. The findings provide important results for informing policies to reduce, and possibly eliminate, child labour in the country.

Acknowledgements

1. Introduction

While widespread child labour has existed in developing countries for a long time, it has received the attention of researchers, academicians and policy makers only recently, and not until International Labour Organization (ILO) studies showed a large number of working children worldwide. ILO estimates for 1996 indicate that the number of child workers stood at over 250 million, about half of whom worked full time (Ashagarie, 1988).[1] Child labour is extensive and a severe problem in most African countries. This can be explained by the fact that from a development perspective, the problem of child labour in Africa is not one of enforcement of international labour standards, but of poverty and household survival. The large majority of child labour takes place in what can be called "informal child labour", that is to say children working in small businesses, including family farms and housework. Relatively few working children appear to be wage employed, although children do work in formal agricultural sectors in many countries, including Benin, Kenya, Uganda, Malawi, Tanzania, South Africa, Ethiopia and Sudan. Child labour also takes place in formal manufacturing and business sectors.

Current estimates show the number of working children (aged 5–18 years) to be increasing. In 2000, there were over 350 million working children worldwide, of whom about 211 million were aged 5–14 years (IPEC and SIMPOC, 2002). Demands to include labour clauses, including child labour clauses, in recent international trade negotiations and agreements under the World Trade Organization (WHO), various European Union (EU) accords and the North Atlantic Free Trade Area (NAFTA) have also brought the issue of child labour and children's rights to the fore. The renewed interest initially led to demands for immediate and total ban on the worst forms of child labour.

A more pragmatic view about child labour now seems to prevail, however. Indeed, in the face of limited knowledge of the causes of child labour, weak local enforcement capabilities, the predominantly rural nature of the population in most developing countries and a perceived need for poor families to let their children work to earn some extra income, the effectiveness and even desirability of national and international bans on child labour have been called into question (Cockburn, 1999). As Basu (1999) theorizes, sending their children into the labour force is a family's last income-earning resort. As soon as income increases, the children are withdrawn from the labour force.

The difficulty of regulating the informal sector where most children work is also acknowledged. The fact is that a total, and effective, ban on child labour would not be in the best interests of poor families that are reliant on their children's productive contribution to maintain a subsistence level. Combined, these mean that some forms of

child labour are tolerated and in some cases the worst forms of the practice take place unnoticed/unreported.

As the global movement against child labour grows, the need for more precise and detailed estimates on child labour has become apparent. It is increasingly recognized that in order to be effective and avoid hurting further the poorest of the poor, child labour policies should be founded on a better understanding of the causes, role and implications of child labour. While many studies on child labour have been conducted, few concern themselves with the consequences or have strong policy implications for child labour in sub-Saharan Africa (SSA). Yet according to ILO estimates, child labour participation rates are highest in the region, currently estimated at 29%,[2] compared with 19% in Asia and the Pacific, 16% in Latin America, 15% in the Middle East and North Africa, 4% in the Transition Economies, and only 2 in the developed economies (IPEC and SIMPOC, 2002).

Considering the magnitudes of child labour and the social and economic strain it imposes on the young and society in general, an understanding of the extent, causes and characteristics of child labour becomes imperative, so as to choose the right policies and avoid unexpected counter-effects.[3] This need is clearly emphasized by Frans Roselaers, the director of the International Programme on the Elimination of Child Labour (IPEC), in his preface to a report on child labour in the drugs trade in Thailand (Sunthornkajit et al., 2002). Roselaers observes, "Although there is a body of knowledge, data and literature on child labour, there are also considerable gaps in understanding the variety of forms and conditions in which children work".

Research problem

For Uganda, analysis of the extent, causes and characteristics of child labour is very important, not least because the country is young – children below the age of 14 years make up more than half of the total population (UBOS, 2003).[4] As a result of this, and as a consequence of low family incomes, limited opportunities to study, broken homes and other social problems, rates of child labour in the country are reportedly high, and there is a risk that if not controlled, they could degenerate to unbearable proportions. The majority of working children are employed in the agriculture and service sectors. They also perform household chores such as fetching water, collecting firewood, cooking and taking care of young ones. Although many of these children are working under family supervision, full time work can be harmful (ILO, 1998). Government efforts to enact a policy to protect children against the dangers of inappropriate labour are under way (*The Monitor*, 2003),[5] but this is in a context of imprecise knowledge of the exact dimensions of child labour in the country. In addition, more than two decades into the AIDS epidemic, civil conflict and high adult mortality rates have resulted in large numbers of orphans – about 15% of children aged below 18 years (UBOS, 2003) – many of whom must work to fend for themselves and their siblings. Using the Uganda National Household Surveys (UNHSs), representative data sets gathered by the Uganda Bureau of Statistics, this study examines the extent, causes and characteristics of child labour in Uganda.

Study objectives

The basic objective of the study is to describe the characteristics, examine the determinants and assess the extent of child labour in Uganda. To accomplish this the study addresses the following questions:

- What are the key determinants of child labour in Uganda?
- What determines labour supply decisions in a household?
- To what extent is child labour a problem in Uganda?
- What are the determinants of time allocation of boys and girls to income-generating activities?

2. Literature review

Child labour is a phenomenon that predates and seems to have contributed to modern industrialization. It has been a characteristic of almost all economic systems at some stage of their life. What occurred in Europe during the industrial revolution and in the United States in the mid-nineteenth century where children were employed in large numbers in industries and commercial establishments (Basu, 1999), is similar to what is currently happening in the developing countries. In his article on the history of child labour in the US, Hindman (2002) examines the existence of child work prior to industrialization, before it was condemned as child labour. Hindman reports that child labour thrived in a number of industries, including coal mining, manufacturing (particularly glass making, the textile industry, sweatshops and industrial homework), street trades, agriculture and food processing. Even now, in both developed and developing countries, child labour is still quite common and takes various forms (Scoville, 2002). Smith and Wilson (2002) found that over half of Australian schoolchildren aged ten years and above are engaged in paid formal work. Except for minority groups, most children who wish to work are able to find employment with relative ease. In India, Singh (2001) reports the predominance of female child labour in seed and vegetable production. In Ghana, Peru, Bolivia, Central African Republic and El Salvador, child labour participation rates reach 91%, 90%, 89%, 81% and 74%, respectively (O'Donnell et al., 2002). In spite of these historical considerations, the dynamics of child labour are far from being deterministic and have been regarded as significantly related to several factors clearly identified in the literature. For Uganda, a study by SODECO (2002) conducted in tobacco growing areas shows that 64% of households employ children on their farms to perform various activities including ploughing or land preparation, planting, weeding, and harvesting. About 48% of the farmers employ their own children; another 26% employ children from the neighbourhood and about 23% employ relatives.

Reynolds (1991) observed that while women spent 20% of their working hours caring for infants and small children, girls in the 4–8 age group spent 56% of their time this way. Time allocation data from Ghana and Côte d'Ivoire show significant differences between rural and urban children. The results from Benin are even more conclusive (Kielland et al., 2000). Rural schoolchildren tend to combine school and work, but the patterns vary. In Tanzania, the sum of schooling and work appears constant (Mason and Khandker, 1998), while in Benin, rural schoolchildren work as many hours as children not in school. Lots of children are idle, that is neither in school or working. Among urban children, there is a much stronger division between those who work and those

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who study. Schoolchildren work much less than other children. Working children in urban households are often poor.

It seems, therefore, that the phenomenon of child labour is rooted in the level of economic development – or rather, under-development. Countries in which large numbers of children are working are, on average, poor countries (Andvig et al., 2001). With child labour rates of 2% or less, the developed countries appear to have overcome the problem. Hazan et al. (2002) argue that 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. As technological progress takes place, gradual increases in the wage differential between parental and child labour appear, which eventually induces parents to substitute child education for child labour. In addition, as economic growth and transition take root, urbanization, improved education and increased female participation in the labour market result, leading to a decline in fertility rates. Slow changes in norms, the education system and in technology, together with changes in the economic structure, will influence both the nature of work performed by children and the participation rates (Andvig et al., 2001). In the long run, the economy takes off to a sustained steady-state growth equilibrium where child labour is finally virtually abolished and fertility is low. This implies that developing countries should not worry quite so much about child labour as it should eventually "take care of itself" as the economies grow. In the meantime, however, children do need protection from the worst labour practices and exploitation, and this requires specific policy action. While the bulk of literature on the determinants of child labour focuses on East Asian and Latin American countries, little exists for African countries and it is therefore important to carry out studies that address this gap. Literature on the economic consequences of child labour is equally very small and scattered (Galli, 2001).

Impact of child labour

Child labour can have a number of negative implications, not only for the child but also for society as a whole. Child labour can be an infringement of the basic rights of children and is potentially damaging to children's educational, physiological and psychological development (O'Donell et al., 2002). Moreover, child labour can have harmful effects at both macro and micro levels. At the macro level, the economic impact of child labour – effects on long-run growth, human capital accumulation, investment (domestic and foreign), technological progress, and income and gender inequality – are discussed in detail by Galli (2001). Child labour may also have a negative impact on fertility rates, health, education and the adult labour market. For example, it is argued that since children's work can be undertaken by adults and yet children are paid much lower wages, employers prefer to hire children. Child labour may thus increase adult unemployment, which in turn forces adults to send their children to work, generating a vicious circle. Here, we mainly focus on the impact of child labour on the health of the children.

Most African societies do not consider most child labour as delinquent activity. Child labour is often seen as teaching the child survival skills and is a means of social integration

(Grootaert, 1998). On the other hand, childhood is probably the best time for acquiring knowledge from the formal education system, since schooling is an investment in human capital that yields a return in the labour market. In that sense, schooling is the preferred alternative to child labour (Grootaert, 1998).

Grootaert (1998) showed that in 1998 children in Cóte d'Ivoire spent an average of 30.7 hours per week working and 12.1 hours in home care – that is, almost 43 hours of work per week, on average. Canagarajah and Coulombe (1997) indicate a much lower burden for children in Ghana. Average working hours for these children is about one-half that of the children in Cóte d'Ivoire – 26.8 hours for boys and 32.2 for girls. In Tanzania (Mason and Khandker, 1998), average working time for children not in school was 30.2 hours for boys and 38.9 for girls in 1993. According to Mason and Khandker, schoolchildren spend approximately the same amount of time on school and work together as the working children spend on labour. This indicates that from the household's point of view, schooling represents a considerable investment of unused child labour.

A child engaged in work receives less education, which points to lower earnings in future. The human capital accumulation of children is the increasing function of school. A child can go to school full time or work full time, or can combine work and school, or can do neither work nor study.

Concern about the health implications of child labour derives primarily from the belief that work increases the child's exposure to health hazards that threaten to subject the child to illness or injury. The hazards may be obvious and threaten immediate damage to health, such as risks arising from construction, manufacturing and mining from the use of heavy and dangerous tools and machinery, and exposure to high temperatures and falling objects (O'Donnell et al., 2002). The risk of injury from such activities is much higher for children because of their physiological and psychological immaturity. The impact of the hazards may be immediately realized, and can also hold longer-term health consequences such as risks from contact with dust, toxins, chemicals and pesticides, lifting of heavy equipment, and forced adoption of poor posture. Engagement in child labour and the associated hazards may threaten the child's psychological health through exposure to abusive relationships with employees, employers, supervisors or clients (ILO, 1998). Because of data limitations for Uganda, we are unable to quantify the impact of child labour on health outcomes.

Determinants of child labour supply

We begin by looking at the role of individual characteristics in child time use and children's decision to participate in the labour market. At the individual level, the wage rate should in principle be the major determinant of child labour supply. Holding other things constant, the higher the wage rate, the greater would be the probability that a child is willing to find work. However, the Uganda national household survey (UNHS) data do not capture the wage rates received by most child workers. This is probably because these children do not collect them, reflecting that most child labour is unpaid work in the family farm or non-farm family enterprise. Where children do not participate in wage work but are engaged as unpaid family labour, their shadow wage (marginal productivity in household production and other time use) could potentially play the

same role. The shadow wage is endogenous, however, and is not directly observable (Cockburn, 1999). For these reasons, we do not include the shadow wage in our estimations as it is not captured in the survey; rather, we use the wage rate for the few working children in one of our estimations.

Other individual characteristics that are likely to be important in the decision to participate in child labour are age, gender and level of education. Because they can be employed easily, older children are more likely to participate in the labour market than young ones. Empirical evidence suggests that the relationship between age and the decision to participate in child labour is positive and quadratic, usually peaking in early childhood (Cockburn, 1999). Sex may affect the decision to participate in child labour and productivity, perhaps differently according to specific tasks considered. For example, boys as opposed to girls may be more likely to participate in activities that require physical strength and endurance. This is especially true with respect to manual jobs, such as brick laying, metal work fabrication, construction and street vending. On the other hand, girls may engage more in agriculture and household work such as collecting water/firewood, cooking, or working as maids and food vending. Empirical evidence from ILO shows that there are no specific gender differences in the global incidence of child labour for the age category 5–14 years. Gender differences are only observed as boys and girls grow older: the work ratio is noticeably higher among boys (44%) than among girls (41%) in the age category 15–17 years (IPEC and IMPOC, 2002). Therefore, for the age category 5–14 years that we consider here, the sign of the dummy for gender cannot be determined a priori.

Higher levels of education and the likelihood of continuing in school would reduce the probability of a child joining the labour market. Several studies find that in developing countries many children who attend school also work (Galli, 2001). Part-time child labour can be seriously harmful to the child's education, however, and in fact may lead to the child eventually dropping out of school, with negative implications for human capital development. Non-fostered children, as opposed to foster children and orphans, are more likely not to participate in child labour, but rather to be engaged in school. Parental preferences and desire for their own children to be better off in the future would dictate that, other things equal, own children would not be sent to work.

Characteristics of the household are generally the richest determinants of child labour supply, and when modelling the determinants of child labour, we take the household as the unit of analysis. A number of studies conclude that household income, which is by far the most studied, is the major factor in the decision to supply child labour supply (Cockburn, 1999; Cartright and Patrinos, 1999; Swaminathan, 1998; Basu and Van, 1998; Usha and Devi, 1997). Sunthornkajit et al. (2002) find the economic factor to be the strongest push for the use of child labour in drug cartels in Thailand. Economic theory suggests that the lower the level of household income, the greater the incentive for children to find employment in order to supplement parental income. As income increases, child labour supply should fall as long as leisure is a normal good, as has generally been the case in the developed countries (Hazan, et al., 2002). Given that child labour is a direct source of household income, income could be endogenous with respect to child labour participation, which would be a major problem in time series models that track household income over time.

Basu and Van (1998) observe that child labour is a result of poverty and occurs when the household is below subsistence level. Basu (1999) postulates that children work as the family's last income-earning resort: that is, children are sent to work if household income does not reach a given subsistence threshold. The contribution of child labour to total household income can be substantial, ranging anywhere between 10% and 20%. For example, Cartright and Patrinos (1999) report that children in Bolivia contribute, on average, around 21% of family income; Usha and Devi (1997) find similar results for Tamil Nadu, India, and Swaminathan (1998) reports that children in Gujarat, India, contributed between 10% and 20% of total household income. This contribution is quite critical since children are sent to work when parents' earnings are insufficient to guarantee the survival of the family or are insecure so that child labour is used as a means of minimizing the impact of possible job loss, failed harvest and other shocks to the family's income stream (Galli, 2001).

Children from low-income households may also be tempted to find work in order to fend for themselves and their siblings. It is a very common practice in Uganda for older children to take care of and fend for their younger siblings, particularly where the parents are very poor or absent (for example as a result of the many deaths due to HIV/AIDS). Using a sample of about 1,600 tobacco farmers in four districts of Uganda, SODECO (2002) found that poverty is one of the major causes of child labour in the country. Other causes are the low cost of child labour, ignorance of the law, HIV/AIDS and insecurity.

Family size is another important factor that may force children to go to work at an early age. The larger the household size, the lower the per capita income and, therefore, the need for extra income, which may create an incentive for parents to send their children to work. With fixed productive assets (land, tools, animals, etc.), the marginal productivity of labour in household production diminishes and this may force children to find work outside home. Child labour is expected to have a negative long-run impact on the well-being of the family, however, through continued high fertility (Galli, 2001) as parents desire more children as insurance against poverty now and in their old age. This implies that households whose children work, have more children, which makes them worse off. To the extent that child labour may lower the perceived cost of raising children, it may increase fertility, giving rise to larger families. A large family size in turn fuels the need for the income the children provide, generates a larger labour force and impedes the education of the future generation of parents. A smaller family size for a given present income translates into more resources for human capital formation. Thus, educated parents may have fewer, but better educated children because of a reduced need to insure against future poverty.

Studies also show that the level of parents' educational attainment is an important factor in the determination of the likelihood of children going to work at an early age. In particular, the level of education of the father is found to have a stronger impact on the sons' participation, while that of the mother will have more effect on the daughters' participation. Parents with higher level of human capital have a better potential income than that of the less educated parents, and thus the higher income of parents increases the chance of the children being in school rather than working. In addition, the nature of parents' employment affects a child's decision to join the labour market (Canagarajah

and Coulombe, 1997). Wahba (2000) finds that having a father who works in the public sector decreases the probability of a child going to work and increases the probability of attending school.

Gender of the household head is another potentially important determinant of child labour. On the one hand, and as is generally expected, female-headed households usually have lower incomes, lower education and higher dependency ratios, which may increase the likelihood of sending children to work. However, female-headed households are found to be more likely to invest in the education of their children, particularly the girls (Wahba, 2000; Canagarajah and Coulombe, 1997). We therefore cannot predetermine the sign of the dummy for gender of the household.

Location and availability of jobs could be another factor that affects child labour supply. For example, child labour may be higher in rural areas where children work on the farm or participate in some other activities (fetching firewood, hauling water, cooking, etc.) for their families in comparison with urban areas. In the rural areas, poverty rates tend to be much higher and the levels of education much lower than in the urban areas. In addition, children are not as mobile as adults and thus may tend to work near where they live; considering that the biggest proportion of the population in Uganda is rural based, child labour rates are expected to be higher in the rural areas. Some children are hired in the urban areas to work on the streets, selling small items to passers-by. The main driving force behind the recruiting of street children is, again, rural and urban poverty, war, disaster, and family disintegration. In addition to the lack of skills, an early development of seemingly emotional independence and a boyish lack of risk aversion are important reasons for boys going to the street rather than competing with girls for domestic work.

Compared with other continents, African countries are more rural and still dominated by household (subsistence) production, which is labour intensive, rather than large landholdings combined with labour markets that would lead to large-scale commercialized production and demand for highly skilled labour. There are also cultural factors and norms that pull children toward the labour force. Of these, Bradley (1993) found that children of both sexes did more of women's than men's tasks. Traditionally, children in most African tribes for which ethnographic evidence exists tend to do a larger share of the work in African homesteads than children elsewhere because women shoulder a larger share of the economic tasks in African agriculture. Reynolds (1991), in her study on Zimbabwe, found that during the farming season, women were working eight hours and twenty-seven minutes each day, while the men were working three hours and thirty-two minutes. As the children grow older, they tend to do more of the tasks of the adults of the same sex.

Using a two-period, two-good model with unequally wealthy households, Jafarey et al. (2002) examine the interaction among credit markets, trade sanctions and the incidence of child labour. Their findings show that both poverty and poor education quality are important determinants of child labour. The incidence of child labour tends to decrease for households with fewer borrowing constraints. Trade sanctions can increase child labour, especially among poor households, a possibility that decreases as their access to credit improves. In their analysis for Ghana, Peru and Pakistan, Maitra et al. (2002) also conclude that household poverty discourages a child from achieving superior outcomes, i.e., they are more likely not to be in school and instead engage in work at an early age.

3. Methodology

In the analysis, we model the decision of a child or children to participate in work (participation) and the hours worked (level of participation) as the dependent variables. The determinants of time allocation by individuals in a household have attracted a lot of attention in empirical literature. Some obvious examples include investigations of the determinants of female labour supply and the allocation of children's time to school and labour (Ilahi, 2000). There is a fundamental difference between the decision to work and the hours worked, but almost all child labour studies consider only the former, mainly because of data constraints concerning hours supplied. Some studies have looked at the relationship between child labour supply and other household decisions concerning, for example, schooling (Wahba, 2000), fertility and adult labour markets (Galli, 2001).

Modelling the determinants of child labour

To develop our model for the analysis of child labour, we start from the theory of household time allocation, which is rooted in the fact that households are both producers and consumers. Each household is seen as seeking to maximize its utility, based on the consumption of various commodities (Z_j), which are themselves produced by the household by combining inputs of market goods (X_j) and time (H_j) expressed as hours of work. It also depends on a vector of household characteristics (μ) that are assumed to be exogenous. These commodities, e.g., a good meal, are not simply market goods – they are produced with various inputs of market goods and inputs of time. The household seeks to maximize the following utility function:

$$Max. \ U = U (Z_1, Z_2, ..., Z_{m;} \ \mu) \tag{1}$$

Subject to

$$Z_j = f (X_j, H_{j; \ Qj, \ \alpha^i}) \tag{2}$$

Equation 2 represents the household production function, where X_j and H_j are vectors of goods and time, respectively. Qj are publicly provided goods and α^i are personal characteristics of a household that are assumed to be exogenous. Utility maximization is not only subject to household production functions, but also to constraints on expenditures for market goods (Equation 3) and "expenditures" of time (Equation 4).

$$\Sigma P_j X_j = Y = V + H_w * W \tag{3}$$

$$\Sigma H_j = H_h = H - H_w \tag{4}$$

The market goods constraint (Equation 3) indicates that expenditures on market goods $\Sigma P_j X_j$, where P_j is a vector of unit prices of X_j cannot exceed the household money income (Y), which is equal to the sum of non-labour income (V) and earnings from wage labour, H_w, multiplied by the hourly wage, W. The time constraint (Equation 4) indicates that the sum of all time inputs to the production of commodities ΣH_j or total home production time (H_h) is simply that proportion of the total time available (H) that is not spent at work in the market. The reservation wage, W^*, is the shadow price of leisure and is therefore equal to the marginal rate of substitution when H=0; that is, $W^* = W^*(Pj, Y; Zj)$. If the market wage, W, exceeds the reservation wage, then the individual will work. The optimal hours of work must satisfy the condition that the real wage equals the marginal rate of substitution.

Solving the first-order conditions from utility maximization gives the following individual supply equation for labour:

$$H^i = H^i (P, W, V; \mu, Qj, \alpha) \tag{5}$$

Clearly, participation and hours of work are inter linked and depend on the same exogenous variables.

The existence of differences across households and children means that prices $(P1...Ps)$ of various commodities will differ across households. Thus, given a child's characteristics, the household's characteristics and the relative efficiency of the labour market, a child in a household will work depending on the total income and total time available to it. Therefore, to explore the determinants of child labour participation in Uganda, we consider child characteristics and household level characteristics: age, gender, education of head, and household size and wealth (using the value of household assets and dwelling characteristics as proxy). Income is not included directly because in most surveys income tends to be under-reported. In addition, we include locational variables – rural dummy and dummies for the regions – to establish the impact of these variables on child labour participation.

Implementing the model

As implied by the theoretical discussion, in our regression framework we estimate the dependent variable child labour (if a child works or the hours worked), applying both the probit and tobit models, respectively. We first estimate a child labour supply model for the child decision to work (participation) and hours worked based on the child and household characteristics. Then we estimate the general model with locational/regional variables. In the first case, we specify and estimate two separate child labour supply models for child labour participation and hours supplied as the left-hand variables

and the determinants of child labour on the right hand. The model estimated is specified thus:

$$C_i^j = \alpha_0 + \alpha_1 X_{1i}^j + \alpha_2 X_{2i}^j + \alpha_3 X_{3i}^j + \alpha_4 X_{4i}^j + \alpha_5 X_{5i}^j + \alpha_6 X_{6i} + \alpha_7 X_{7i}$$
$$+ \alpha_8 X_{8i} + \alpha_9 X_{9i} + \alpha_{10} X_{10i} + \varepsilon_i \tag{6}$$

where, C_i^j is a 1,0 variable if a child j in household i is participating in the labour market, X_{1i} is the age of the child j in years, X_{2i} is the level of education of the child, X_{3i} is a 1,0 dummy for the biological child of the household head, X_{4i} is the completed years of education of the child and X_{5i} is the child's occupation. X_{6i} is the household size, X_{7i} is the education level of the household head and X_{8i} is the occupation of the household head. Finally, X_{9i} is a vector of household dwelling characteristics (roofing and floor materials), X_{10i} is consumption expenditure (in logs) and ε_i is an error term assumed to be normally distributed with constant variance. For the hours supplied, we estimate a tobit model of the form:

$$H_i^j = \alpha_0 + \alpha_1 X_{1i}^j + \alpha_2 X_{2i}^j + \alpha_3 X_{3i}^j + \alpha_4 X_{4i}^j + \alpha_5 X_{5i}^j + \alpha_6 X_{6i} + \alpha_7 X_{7i}$$
$$+ \alpha_8 X_{8i} + \alpha_9 X_{9i} + \alpha_{10} X_{10i} + \delta_i \tag{7}$$

where, H_i^j are the average number of work hours supplied by child labourer j in household i. The other variables, $X_{1i} - X_{10i}$, are as defined before in Equation 5.

Next, we estimate the full models with the household and locational variables (rural/urban and regions) as the explanatory variables. The child labour participation model is specified thus:

$$C_i^j = \alpha_0 + \alpha_1 X_{1i}^j + \alpha_2 X_{2i}^j + \alpha_3 X_{3i}^j + \alpha_4 X_{4i}^j + \alpha_5 X_{5i}^j + \alpha_6 X_{6i} + \alpha_7 X_{7i}$$
$$+ \alpha_8 X_{8i} + \alpha_9 X_{9i} + \alpha_{10} X_{10i} + \alpha_{11} X_{11i} + \alpha_{12} X_{12i} + \phi_i \tag{8}$$

where C_i^j is a 1,0 variable if child j is working, $X_{1i} - X_{10i}$ are the child and household characteristics as defined before, X_{11i} is a dummy for rural household, X_{12i} is a vector of the regional dummies, and ϕ_i is the error term.

The tobit model for child labour hours supplied is specified along similar lines:

$$H_i^j = \alpha_0 + \alpha_1 X_{1i}^j + \alpha_2 X_{2i}^j + \alpha_3 X_{3i}^j + \alpha_4 X_{4i}^j + \alpha_5 X_{5i}^j + \alpha_6 X_{6i} + \alpha_7 X_{7i}$$
$$+ \alpha_8 X_{8i} + \alpha_9 X_{9i} + \alpha_{10} X_{10i} + \alpha_{11} X_{11i} + \alpha_{12} X_{12i} + \gamma_i \tag{9}$$

where H_i^j is the average number of daily hours worked by child j in household i. The rest of the variables are as defined in Equation 8.

Description of the data and definition of major variables

This study uses individual level data obtained from the Uganda National Household Surveys (UNHS) conducted in 1992/93, 1999/00 and 2002/03. These surveys cover about 10,000 households with about 50,000 individuals in each round. The surveys are nationally representative samples of households and cover a number of important household and individual characteristics, including activities engaged in, sources of income, expenditure, assets, etc. The socioeconomic module provides information on individual and household characteristics including sex, age and education. In addition, information on assets owned, consumption expenditure and dwelling characteristics is available. The 2002/03 survey has a more detailed module on the labour force.

The ILO defines children at work (economically active) in a broad sense to include most productive activities: unpaid, casual informal sector work and illegal activities undertaken by children. "Economic activity" here is defined in the sense that it is the only internationally agreed standard to measure work and employment. In the absence of other child-specific measurement tools, it is often used as a proxy quantifier for child labour (IPEC and SIMPOC, 2002). It is noted that not every economically active or working child contravenes the ILO Minimum Age Convention No. 173 of 1973 and the ILO Worst Forms of Child Labour Convention No. 182 of 1999.

Here we adopt the same definition and consider children to be economically active or participating in child labour if they engage in paid or unpaid economic activity either at home or in the market, industry, street or elsewhere. Children can combine different economic activities with schooling. ILO Convention No. 138 specifies 15 years as the age above which, in normal circumstances, a person may participate in economic activity. It is also commonly accepted that a child under five years of age is too young to be engaged in economic activity or to start schooling (IPEC and SIMPOC, 2002). We also follow the ILO benchmark minimum age of a child to work and employment of six years. By Uganda's constitution, a child is defined as any person who is below 18 years. We therefore carry out the quantitative analysis of child labour participation and hours supplied for children aged between 6 and 14 years following the ILO convention. A child involved in activities at home was not considered as child labour in this study as such activity is regarded as helpful to the child's growth.

Sample characteristics

For the 1992 household survey, there were 12,711 children aged 6–14 years out of the 48,489 individuals surveyed in the 9,927 households. Of these children, 2,464 were involved in child labour. The 1999 household survey had 57,387 individuals in the 10,696 households, with 17,838 children of whom 3,222 were found to be working as their main (current) activity. The 2002 household survey covered a total of 52,111 individuals, with 18,507 children; 2,353 of the children reported working as their main activity.

The surveys contain a limited range of questions about children's participation in the labour force. Children were asked the main activity in the last 12 months and the reasons

for the activity The 1992 and 2002 surveys provide information on the hours worked, but the 1999 survey does not. The data allow for information on household consumption per adult equivalent. Being household based, these surveys don't provide information on street children; we therefore use weights (provided in the surveys) in our estimations to take care of those children not recorded. It should also be noted that street children are a major problem in Uganda and may contribute to the problem of child labour, as some of them are exploited by businesses since they provide cheap labour. Some measures have been taken in Uganda to reduce the number of street children, such as collecting them and taking them to different centres to undergo rehabilitation and training in different fields.

Variables

Two dependent variables – "working child" and "hours worked" – are used in this study. The working child variable indicates whether the child is engaged in work or not. Hours worked indicates the number of hours the child works per day.

The explanatory variables describe the child characteristics such as age and relationship to the household head, household characteristics such as education and occupation of the household head, and then community characteristics such as location of the household and the distance from the child's household to the nearest school. Where it was indicated in some cases that the father was absent at the time of the survey, we tried to asses if the absence was temporary or permanent by looking at the marital status.

The wealth status of the household is proxied by asset value (*log assets*), if the household has iron roofing sheets (*dwelling ironsheet*) and if the floor is cemented (*dwelling floor*). The explanatory variables include residence in urban or rural areas and the region.

4. Results from the survey data

The figures presented in the tables below were generated taking into account the weights [fw=mult], as indicated in each of the surveys. Results in Table 1, for example, indicate that close to 17% of children in the 6–8 age group were working in Uganda according to the 1992 survey, 15% in 1999 and only 4.6% in 2002 – a drop of more than 70%. For the children in the age group 9–11, about 22% were working in 1992, nearly 19% in 1999 and 11% in 2002, indicating a 42% decrease. The highest labour participation rates were in the 12–14 age group; all the surveys indicate that more than 20% of children in that age group were working. Nevertheless, the proportion of working children aged 12–14 fell from 27.1% in 1992 to 22.6% in 2002, a 16% decrease in the ten years.

It is important to note here that Uganda introduced compulsory universal primary education (UPE) in 1997. Education is free of charge for up to four children from each household, of whom two must be girls if present.

Table 1: Working children by age (percentage)

Age bracket (years)	1992	1999	2002
6–8	17.3	15.3	4.6
9–11	21.7	18.9	11.2
12–14	27.1	24.0	22.6
All	21.6	18.1	12.7
No. of observations	2,464	3,222	2,353

Source: Author's calculation based on 1992, 1999 and 2002 UNHS data sets.

Child labour is found to be widespread in Uganda and starts at an early age. Data from all three surveys reveal that children's work participation increases with age. Particularly between 9 and 14 years old, work participation rates increase sharply, even though this is shown to have decreased across the surveys. A very big decrease is observed for the 6–8 and 9–11 age groups for the 2002 survey. Overall, it is estimated that in 1992, around 22% of Ugandan children aged 6–14 years were involved in child labour. By 2002 this had dropped significantly to 12.7%. Clearly, the phenomenon of child labour is still high in Uganda but is declining significantly, especially for the lower age groups.

The results in Table 2 show that close to 19% of girls and 16% of boys in the 6–8 age group were working in 1992. There is a sharp increase in the incidence of child labour with respect to age and gender. For the 12–14 age group, the incidence of child labour

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for girls (32.2%) was much higher than that for boys (22.2%) in 1992. Thus, girls aged 12–14 suffer a relative disadvantage. Overall, more girls than boys participated in child labour in 1992 (24.1% for girls and 19.3% for boys), but the difference was not so big according to the 1999 survey (19.5% for girls and 18.9% for boys, a difference of 0.6%). This changed over time, according to the 2002 survey, which reveals that the incidence of boys in child labour was now higher than that of girls in all age groups (14.3% for boys and 11.1% for girls).

Table 2: Percentage of working children by age group and gender

Age bracket	1992		1999		2002	
	Male	Female	Male	Female	Male	Female
6–8	16.1	18.7	14.7	16.3	5.4	3.9
9–11	20.5	23.0	18.9	19.1	13.1	9.4
12–14	22.2	32.2	24.4	23.6	25.0	20.2
All	19.3	24.1	18.9	19.5	14.3	11.1
No. of observations	1,091	1,373	1,605	1,617	1,301	1,052

Source: Author's calculation based on 1992, 1999 and 2002 UNHS data sets.

There is an increasing trend of child labour participation rates for both boys and girls as they get older (Table 2). However, a decreasing trend can be observed across the surveys – over time – by both gender and age group. The largest decrease was for girls in the 6–8 age group, from 18.7% in 1992 to 3.9% in 2002. The 1992 data also show a big difference in the incidence of child labour in terms of sexes, which has declined over the decade, according to the 1999 and 2002 data sets. Work participation rates for both sexes dropped substantially over time, especially for those aged 5–12 years. The larger drops are for the 6–8 age bracket. Overall, a significant decline in girls' participation can be observed across the decade.

Table 3 summarizes results by gender and residence (urban or rural). The table shows that 25% of girls and 20% of boys in the rural area were working in 1992. At the same time, only 12% of urban boys and 20% of urban girls were working. Thus, for both rural and urban sectors, the proportion of working girls was a bit higher than that of boys according to the 1992 survey. The patterns are similar for 1999, while the proportion of working children is higher in rural areas than in urban areas for all three surveys. Data indicate that the incidence of child labour declined from 19.8% in 1992 to 8.1% in 2002 for girls and from 12.1% in 1992 to 9.6% in 2002 for boys. For the 2002 survey, the proportion of boys working in both rural and urban areas was more than that of girls. In general, rural areas have the highest percentage of working children. Thus, as in most African countries, in Uganda, child labour appears to be primarily a rural phenomenon.

According to the 1992 survey, Western Region had the highest proportion of children working, at around 29% (Table 4). Central Region had the lowest, with 17% of the children in the region found to be working. The situation had changed by the 1999 and 2002 surveys, however. The 2002 data show the Central Region having the highest proportion of working children (15.6%), while the Eastern Region had the lowest (9.9%). For both the 1992 and 1999 data sets, the incidence of female working children was higher in each of the four regions in Uganda. By the 2002 survey, male child labour

participation rates were found to be higher than those for females in all the four regions. The Northern Region was found to have the highest child labour participation rate in 1999; this could be the effects of the war, which has left so many people homeless in the north. The overall results show a decreasing trend in child labour participation rates in all the regions, with the biggest decrease in Western Region, where it fell from 29% in 1992 to 10% in 2002. The next biggest drop was in Eastern Region, from 20.5% to nearly 10%.

Table 3: Proportion of working children by gender and residence (rural/urban)

	1992			1999			2002		
	Male	Female	All	Male	Female	All	Male	Female	All
Rural	20.3	24.9	22.5	21.6	22.2	21.9	17.1	12.6	14.8
Urban	12.1	19.8	16.2	14.9	19.8	17.7	9.6	8.1	8.8
No. observations	1,091	1,373	2,464	1,605	1,617	3,222	1,301	1,052	2,353

Source: Author's calculation based on 1992, 1999 and 2002 UNHS data sets.

Table 4: Working children by gender and region

Region	1992			1999			2002		
	Male	Female	All	Male	Female	All	Male	Female	All
Central Region (1)	15.8	18.4	17.1	19.6	20.0	19.8	17.1	14.2	15.6
Eastern Region (2)	17.5	23.6	20.5	21.7	19.9	20.8	10.8	9.1	9.9
Northern Region (3)	20.9	22.0	21.4	22.7	25.5	24.1	19.4	11.8	15.5
Western Region (4)	23.7	33.9	28.7	12.6	14.2	13.4	11.8	8.9	10.3
No. of observations	1,091	1,373	2,464	1,605	1,617	3,222	1,301	1,052	2,353

Source: Author's calculation based on 1992, 1999 and 2002 UNHS data sets.

Table 5 shows the proportion of working children with the level of education attained with respect to what they would have attained at a certain age. We assume that a child is expected to be in lower primary at least at the age of six years. The findings of 1992 survey indicate that 34% of the working children had no formal education. The percentage of working children with no education had fallen to 22.6% in the 1999 survey, but then rose again to 31.3% in 2002. Working children with lower primary education increased from 10.4%, according to the 1992 data set, to 17.3% for 1999, and then to 35% for 2002. With upper primary we find an increase from 10.6% for 1992 to 20% for 1999 and then to 23% for 2002. The fluctuations could be due to the impact of the UPE programme started in 1997. Education is compulsory, but is free for only four children per family. "Free" applies to the absence of school fees, but children or their parents have to meet the cost of other necessities and some children/families find it hard to meet these costs, hence the children drop out. Nevertheless, results indicate that the percentage of working children who have attained some level of education has increased over time. This also explains the increased school dropout rate to join the labour force.

Table 5: Working children by the highest level of education attained

	1992	1999	2002
No education	33.6	22.6	31.3
Lower primary (P.1-P.4)	10.4	17.3	34.6
Upper primary (P.5-P.7)	10.6	20.3	23.3
Secondary	16.6	15.7	8.2

Source: Author's calculation based on 1992, 1999 and 2002 UNHS data sets.

The 1992 household survey found the highest number of children who indicated they were working only, with more girls (22.8%) than boys (13%) engaged in work only. Another 1.5% of boys and 2% of girls combined work and studying, while a big number of children were neither working nor studying (24.3% for boys and 18.9% for girls). This group reduced according to the 1999 survey, but rose sharply in the 2002 survey. The reduction in 1999 could have been the increased school enrolment under UPE, while the increase in 2002 could have been due to the high rate of school dropout. More boys than girls were combining work and study in the 1999 and 2002 surveys compared with 1992. We thus find a very small percentage of children combining work and studying. In 1992, the percentage of boys who indicated that they study only was 61%, which was higher than that for girls (56%). In 2002, however, the situation had changed, with more girls indicating studying only. The results support the argument that poor households in developing countries seldom find it viable to send their children to school as the children's wage income is needed for family survival. The results for girls may also point to the traditional view that education is not as important for girls as it is for boys, and if parents have to choose they will educate their sons rather than their daughters. Only when Ugandan parents were required to send their girls to school did many of them do so.

Table 6: Child participation in work, work + study, and by gender, in percentages

	1992		1999		2002	
	Male	Female	Male	Female	Male	Female
Work only	12.9	22.8	7.0	9.0	7.4	6.4
Work +study	1.5	1.9	12.4	11.9	9.5	7.7
Study only	61.3	56.4	69.0	67.1	64.1	66.6
Nothing	24.3	18.9	11.6	12.0	19.0	19.3
Total	100	100	100	100	100	100

Source: Author's calculation based on 1992, 1999 and 2002 UNHS data sets.

Since education is not necessarily free, if school schedules could allow for children to work as well as study, then more children could be enrolled and the high dropout rate could be significantly reduced. Children could attend classes in the mornings and then be involved in light work, say, in the afternoon or on Saturdays.

Table 7 shows the relationship between the level of education of the household head and their children's labour participation rates. The results indicate that households headed by a person with no education had the highest child labour participation rates for 1992 and 1999. In 1992, 31% of the children from households headed by a person with no

education were found to be working. This declined to 13% in 2002, a 57% decrease. The results clearly show that child labour participation rates diminish with higher levels of education of the household head for the 1992 and 1999 data sets. This implies that households headed by persons with higher levels of education are less likely to send their children to work than those whose heads have less education. This can be explained by two factors. First, better educated household heads are more likely to generate higher income for their families, hence less need to send their children to work. Second, these parents have a better understanding of the importance and benefits of education from their own personal experience. By 2002, the different levels of education of the household head do not show significant differences in children's labour force participation, which is likely due to UPE.

Table 7: Working children by level of education of household head

	1992	1999	2002
No education	30.6	26.0	12.9
Lower primary (P.1–P.4)	23.1	17.9	12.3
Upper primary (P.5–P.7)	18.8	16.7	12.6
Secondary	11.0	17.9	13.4
Post secondary	10.7	14.1	12.6

Source: Author's calculation based on 1992, 1999 and 2002 UNHS data sets.

As suggested by the data in Table 8, child labour participation rates are highest for those children in households headed by farmers. This was consistent across all three surveys. For 1992 and 1999, the incidence of child labour is lowest for household heads with "professional" as their occupation. In the 2002 survey, however, the incidence of child labour increased for households whose heads are professionals and declined for farmer-headed households. This trend is expected to increase further as the business sector expands in Uganda. The data also show an initial increase in labour participation rates (1992 to 1999) for children from households with unskilled heads and then a significant fall between 1999 and 2002.

Table 8: Working children by occupation of household head

	1992	1999	2002
Professional	8.9	8.4	12.8
Clerk	10.7	16.6	13.8
Sales	16.9	20.6	9.0
Service worker	10.6	20.7	10.7
Farmer	24.4	18.3	15.3
Transport	18.9	17.3	5.9
Unskilled	13.5	16.2	12.3

Source: Author's calculation based on 1992, 1999 and 2002 UNHS data sets.

The 1992 survey data indicated an average of six hours worked per day for children aged six years and above, but this seems to be very high. There was no major difference in either the hours worked by gender or across the different age groups. The 2002 data show a substantial decrease in hours worked – on average two hours per day. Results do

not show a big change in hours worked with respect to age. The 2002 dataset shows that female children worked for more hours on average than males for all the age groups.

Table 9: Average hours of work per day among children working by age group and gender

Age group	1992		2002	
	Male	Female	Male	Female
6-8	6.8	6.7	2.1	2.2
9-11	6.7	6.8	2.2	2.3
12-14	6.6	6.5	2.6	2.7

Source: Author's calculation based on 1992 and 2002 UNHS data sets.

Table 10 reveals the following, among others: About 20% of children were working in 1992, 18% in 1999 and 13% in 2002. More than 70% of the children in all three surveys are sons/daughters of the household head. In the rural areas, 65% of the children were working in 1992 and 80% in 1999; this had declined to 62% in 2002. For about 58% of household heads the occupation was farming in 1992, 65% in 1999 and 44 % in 2002. More than 20% of the children belong to female-headed households.

Table 10: Variable names, definitions and means

Variable names	Description	Mean		
		1992	1999	2002
Child-level				
Working kid	Working child (1, 0 otherwise)	0.20	0.18	0.13
Kid age	Age of child	9.7	9.8	9.3
Biological kid	1 if son/daughter, 0 otherwise	0.73	0.75	0.77
Share of young kids	Share of kids below 5 years	0.22	0.20	0.20
Household-level				
Head age	Age of the household head (years)	41.2	44.4	39.8
Head female	Household head is female (1,0)	0.25	0.24	0.28
Head educ non	Education of household head – none	0.25	0.21	0.37
Head educ lower prim	Education of hh head – P1–P4)	0.20	0.21	0.24
Head educ upper prim	Education of hh head – P5–P7	0.28	0.30	0.21
Head educ sec	Education hh of head – secondary	0.20	0.16	0.11
Head educ post sec	Education of hh head – post secondary	0.06	0.10	0.06
Head professional	Occupation of hh head – professional	0.08	0.07	0.07
Head clerk	Occupation of hh head – clerk	0.03	0.01	0.07
Head sales	Occupation of hh head – sales	0.11	0.08	0.16
Head service	Occupation of head – service wker	0.03	0.04	0.03
Head farmer	Occupation of the head – farmer	0.58	0.70	0.40
Head transport	Occupation of the head – transport	0.03	0.05	0.03
Head unskilled	Occupation of the head – unskilled	0.09	0.04	0.13
Head married	Household head married	0.79	0.82	0.77
Head widow	Household head widow	0.10	0.11	0.10
Head divorced	Household head divorced	0.05	0.05	0.07
Log cons per cap	Consumption expenditure (logs)	9.97	10.30	10.40

Table 10, continued

Variable names	Description	Mean		
		1992	1999	2002
Log asset		11.98	14.38	–
Dwelling floor		0.08	0.25	–
Dwelling ironsheet		0.49	0.64	–
Location(working kid)				
Rural location	1 if rural and 0 if urban	0.65	0.80	0.62
Distance to school		5.18	2.20	1.66
Central	Central Region	0.27	0.27	0.29
Eastern	Eastern Region	0.26	0.27	0.28
Northern	Northern Region	0.24	0.17	0.17
Western	Western Region	0.23	0.29	0.26

Model estimations

Here we summarize our model estimation results. We first present the results from the probit model estimation on 1992, 1999 and 2002 data sets (Appendix tables A1, A2 and A3). These data sets were estimated separately. The dependent variable is whether the child works ($working\ kid$ = 1, or 0 otherwise), while the explanatory variables are the child and household characteristics as indicated in the theoretical model. We use consumption per adult equivalent in logs ($lcons$) as a proxy for household income. We consider the notion of a household's purchasing power as a central explanatory variable and want to explain how direct changes of this affect the probability of child labour.

We then present the results from the tobit model estimation on the 1992 and 2002 data sets (Appendix tables A4 and A5, respectively). We also estimate a probit model on male and female children separately for the three data sets. We estimate the sample, separating by gender, to see if there are gender specific impacts on child labour decision. The results are presented in Appendix tables A6, A7 and A8, respectively. We also present the results for the probit model for the 6–9 and 10–14 age groups separately for each of the surveys (Appendix tables A9 to A14). For Appendix tables A1–A5, the first estimation has only child characteristics as explanatory variables. The second estimation includes household characteristics. For 1999 and 2002, we exclude biological child in the second estimation and instead include orphan (child without a father or mother or both). The third estimation takes care of the household head's occupation and education and the fourth incorporates the location (rural) and regional dummies.

Empirical findings

Child characteristics, such as age, biological child (son/daughter of the head), share of children below five years and whether children are orphans, appear to be important determinants of child labour in Uganda. With the probit model, the age coefficient is found to be positive and significant for all three surveys. The coefficient for age squared is negative, indicating that child work increases with age, at a decreasing rate. Thus, as

would be expected, older children have a higher probability of being engaged in work, which could be because employers are looking for an energetic but easily manageable workforce. As we note later, this is likely to have implications for children's schooling in the sense that it could lead to absenteeism, poor performance and dropout. For both 1992 and 1999 data, the status of a child as the son or daughter of the head of household (*biokid*) has a significantly negative effect on the probability that a child will work. These results are confirmed in Appendix tables A1–A3: a child who is the son or daughter of the head of household is less likely to work. For the 2002 data set, however, we find that *biological child* is positively related to the probability of the child to work.

For both the 1992 and 1999 data sets, the proportion of children below five years is found to have a positive and significant effect on the probability on child labour. As mentioned in the literature, the child may work in order to fend for the young ones.

The level of education and the occupation of the household head have very big impacts on child labour. Empirical findings reveal that higher levels of education of the household head decrease the likelihood that the child will work. This is consistent with the theoretical assumptions. For the 1992 and 1999 data sets we find a negative effect for the education level of the household. In the 2002 data, the coefficients of education are all insignificant and that for lower primary is even positive.

The results for 1999 show that a child whose household head is a female is more likely to work. The coefficient for female head is positive and significant. The 1992 data set shows the reverse. Household marital status as divorced and widowed surprisingly gives a stronger negative effect on the probability of a child's working.

We get a strong positive correlation between a household head who is "sales person" and *child working*. This may be because parents in this occupation need their children's help, which would have a negative effect on schooling – and a presumed positive effect on child labour.

We also find a strong positive association between child labour and the household's involvement in farming. Thus households engaged in farming are likely to have a greater demand for labour and have a higher probability of obtaining it within the household as it is cheaper. This leads to higher child labour participation rates in rural farming and the urban informal sector.

The results for the dwelling (*dwiron*), which is an indicator of welfare, also show an expected direction. The estimations are robustly negative, implying that children from households with better dwellings are less likely to work. We derive a highly significant negative effect of household expenditure per adult equivalent (*cons*) in the work equation of the probit models for the 1992 and 1999 data sets. The coefficient is small considering the substantial literature on poverty as the main determinant of child labour. We also use the value of assets (*lnasset*) as a measure of wealth and find that it is also negatively related to child labour.

In all the three data sets, the coefficient for *rural* is positive and highly significant with the probit model. Thus the probability of working is higher for the children in rural areas than in urban areas. Regional dummies for 1992 and 1999 data indicate that children in the Eastern, Northern and Western regions are less likely to work compared with those in the Central region. For the 2002 data, the coefficient for the Northern region is insignificant.

For the hours worked (Appendix tables A4 and A5), 2002 data show a positive and strong relationship between hours worked and the child's age, and a negative relationship for the biological child. This means older children work for more hours than young ones. But the 1992 data show the reverse. A positive and strong relationship is found between the hours worked and biological child for the 1992 data. For 1992, the coefficient for *rural* is negative and highly significant, indicating that the children in the rural areas were working for fewer hours than those in urban areas in 1992. This is changed in 2002, where the coefficient for *rural* is found to be positive and highly significant in relation to hours of work. Education level of the household head was found to be negatively related with hours of work. This indicates that the higher the education level of the household head, the fewer the number of hours worked by the child. Western Region is found to be significant and negatively related to hours worked compared with Central Region. Distance to school positive and highly significant with hours worked by the child.

Turning to gender specific results (Appendix tables A6–A8), age was found to be significant and positively related to the probability of working for both boys and girls for all the three data sets. Biological child and distance to the nearest school were also found to be negative and highly significant for both males and females. Share of the children below five years was found to be positive and highly significant for girls according to 1992 dataset, meaning that girls in a family with many young ones are more likely to work.

Using a Hausman test, we check for difference in coefficients with respect to gender. The results for all the three surveys shows that biological female children (daughter to the household head) are less likely to work than males. According to the 1992 and 2002 data sets, however, girls in the rural area are more likely to work than boys. All in all, the pattern observed in the three data sets also prevails for the gender specific sample.

The results for the two age groups (6–9 and 10–14) are presented in Appendix tables A9 to A14. For 1992, female household head is more significant for the 6–9 age group than for the 10–14 age group. Children in the 6–9 age group with a widowed house head are more likely to work than those in 10–14 age group. The coefficient for rural is more significant for the 6–9 age group than for the 10–14 age group.

For the 2002 data set, the coefficient for female-headed household was found to be highly significant for the 6–9 age group but not for the 10–14 age group. Farmer household head was found to be insignificant for the 6–9 age group but highly significant for the 10–14 age group. This implies that the impact of occupation of the household head varies with the age of the working child.

5. Conclusions and policy implications

This paper analysed the extent and determinants of child labour in Uganda applying 1992, 1999 and 2002 Uganda National Household Survey (UNHS) data sets collected by Uganda Bureau of Statistics (UBOS).

Our results show that child labour participation rates are still high, although the problem has reduced over time. The results suggest that child characteristics and household head characteristics are important determinants of child labour in Uganda. Empirical findings provide evidence that the occupation and education of the household head has a significant impact on the probability that a child will work. The probability of child labour in rural areas is higher, while the welfare of the household has a significant impact on child labour. A child whose parent is a farmer is more likely to work.

The findings of this study provide important directions for policy makers in Uganda. As we can see, working is common among the older children and more children are now combining work with studying. Policy makers should now target those children who are working and studying. More attention should also be given to children of less educated parents, children who are poor and children in rural areas.

We find that UPE has greatly contributed to a reduction in child labour because of increased school enrolment. Given the observed increase in those combining work and study, however, changes at the work place by way of reduced hours and work loads may be a necessary step. If children work for long hours or are engaged in fatiguing work, they will certainly be unable to follow or to derive the full benefits from education and training activities. The cooperation of those for whom the children work and the introduction of improvements at the work site are therefore crucial. In short, efforts in the educational area alone are unlikely to be effective in the long run.

Expansion of educational training facilities should be an integral part of anti-poverty development policies and programmes. Progressive extension of economic and social measures would help ensure family living standards and income that are high enough to make it unnecessary to require recourse to the economic activity of children.

Greater emancipation of women and their increased participation in non-domestic economic activities could be also be a positive means of reducing the need for children to engage in such activities. More attention should be paid to children from households with female heads, while the needs of orphans and other vulnerable children who must fend for themselves and their siblings require significant emphasis.

In conclusion, many alternative specifications and explanatory variables have been included in the analysis. The findings and recommendations of this study are expected to contribute in reducing the problem of child labour in Uganda.

Notes

1. The preface to IPEC and SIMPOC (2002) notes that the 1996 ILO estimates of child workers drew international attention to the magnitude of the world's child labour problem. The number not only had a forceful impact on public opinion but it also helped to mobilize many governments and civil society groups into action.

2. The ratio has declined from Ashagarie's (1998) estimate of about 41% for 1996.

3. The ILO estimates that about 246 million working children in 2000 were in engagements that should be eliminated, with nearly 171 million of them working in hazardous situations or conditions. Some of the implications of child labour cannot be easily estimated, however, since data on the worst and often hidden and sometimes illegal and criminal forms of child labour such as trafficking, forced and bonded labour, armed conflict, or child prostitution and pornography are difficult to obtain. Boys are mainly trafficked for forced labour in commercial farming, petty crime and the drugs trade, while girls are trafficked for commercial sexual exploitation and domestic service (IPEC and SIMPOC, 2002).

4. The high fertility rate of about 6.9 children per adult female could be one of the major reasons for the large proportion of children in the total population. The scourge of HIV/AIDS could also explain the rather low proportion of adults in total the population.

5. *The Monitor* newspaper, quoting Mr. Henry Obbo, Minister of State for Labour, reported that with the support of the United States Department of Labour, government aims to abolish some of the worst forms of child labour and exploitative jobs and to put the children in school.

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Appendixes

Table A1: Probit model estimates for 1992 data set
Dependent variable: working kid

Variable	(1)	(2)	(3)	(4)	(5)
Log kid age	11.388***	10.980***	12.445***	11.051***	11.264***
	(9.42)	(9.03)	(8.96)	(8.99)	(9.09)
Log kid age sq.	-2.246***	-2.151**	-2.450***	-2.159***	-2.199**
	(8.71)	*(8.30)	(8.27)	(8.24)	*(8.32)
Biological kid	-0.146**	-0.290**	-0.123**	-0.240***	-0.265***
	*(4.95)	*(9.74)	*(3.49)	(7.80)	(8.52)
Distance to school	-0.086**		-0.074**	-0.084***	-0.077***
	*(14.73)		*(11.27)	(14.32)	(12.97)
Share of young kids	0.242**	0.449***	-0.096	0.215**	0.215**
	*(2.57)	(4.70)	(0.87)	(2.21)	(2.18)
Head female	-0.151***	-0.110***	-0.012		
	(4.77)	(3.13)	(0.34)		
Rural location		0.207***		0.302***	0.149***
		(6.10)		(8.96)	(3.99)
Head educ lower prim		-0.209**			
		*(5.43)			
Head educ upper prim		-0.338***			-0.223**
		(8.97)			*(6.63)
Head educ sec		-0.536***		-0.321***	
		(11.58)		(7.13)	
Head educ post sec		-0.367**			-0.067
		*(5.15)			(0.92)
Log cons per cap		-0.191**		-0.249**	-0.156***
		*(9.13)		*(11.68)	(6.65)
Log asset				-0.154***	
				(17.37)	
Head divorced				-0.110*	-0.148**
				(1.67)	(2.35)
Head widow				-0.068	-0.140***
				(1.34)	(3.17)
Eastern region				-0.025	-0.055
				(0.64)	(1.38)
Western region				-0.034)	-0.095**
				(0.87	(2.36)
Northern region				0.025	-0.091**
				(0.63)	(2.09)
Head farmer					0.106***
					(2.78)
Head sales					0.149***
					(2.70)
Dwelling ironsheet					-0.332***
					(9.75)
Dwelling floor				0.101	
				(0.66)	
Constant	-14.896***	-12.515***	-14.326***	-12.264***	-13.095***
	(10.59)	(8.75)	(8.85)	(8.47)	(8.96)
Observations	12,541	12541	12,541	12,541	12,541

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

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Table A2: Probit model estimates for 1999 data set
Dependent variable: working kid

Variable	(1)	(2)	(3)	(4)	(5)
Log kid age	0.376***	2.061**	2.021**	1.777	1.277
	(6.93)	(2.13)	(2.08)	(1.54)	(0.51)
Log kid age sq.		-0.308	-0.297	-0.302	-0.222
		(1.48)	(1.43)	(1.23)	(0.42)
Biological kid	-0.007		-0065**	0.043	0.042
	(0.23)		(2.48)	(1.40)	(0.65)
Distance to school	0.004		0.002	-0.016	
	(1.06)		(0.51)	(1.43)	
Share of young kids	0.355***	0.488***	0.440***		0.891***
	(3.80)	(6.02)	(5.37)		(4.25)
Orphan1		0.119***			
		(3.70)			
Head female		0.093***	0.064**	0.029	
		(3.46)	(2.39)	(0.95)	
Head educ lower prim					-0.107**
					*(3.23)
Head farmer			-0.090***	-0.028	-0.150**
			(3.32)	(0.85)	(2.10)
Head sales			0.059	0.142***	-0.030
			(1.29)	(2.74)	(0.25)
Rural location				0.216***	0.665***
				(5.67)	(7.39)
Dwelling ironsheet					-0.118
					(1.35)
Head widow					0.117
					(1.35)
Head divorced					0.235**
					(2.20)
Head clerk				-0.023	-0.092
				(0.16)	(0.51)
Injury shock					-0.114*
					(1.86)
Job shock					-0.375
					(1.53)
Eastern region					-0.078**
					(2.24)
Western region					-0.352***
					(8.05)
Northern region					-0.317**
					(9.06)
Head educ upper prim					-0.140***
					(4.48)
Head educ sec					-0.176***
					(4.58)
Head educ post sec					-0.276***
					(5.82)
Log cons per cap					-0.116***
					(6.57)
Observations	14,850	14,850	14,850	14,850	8,986

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

Table A3: Probit model estimates for 2002 data set
Dependent variable: working kid

Variable	(1)	(2)	(3)	(4)	(5)
Log kid age	1.578***	0.015*	0.119		1.104
	(30.25)	(1.78)	(0.13)		(0.11)
Log kid age sq.	-0.346*	-0.382*		0.353***	-0.334
	(1.69)	(1.85)		(30.58)	(1.61)
Biological kid	0.072**		0.072**	0.075**	0.094***
	(2.45)		(2.40)	(2.48)	(3.07)
Share of young kids	-0.044	-0.154*		-0.015	
	(0.49)	(1.68)		(0.16)	
Head female	-0.016	0.000	0.018	0.040	
	(0.58)	(0.01)	(0.63)	(1.38)	
Rural location		0.371***	0.384***	0.337***	0.391***
		(13.42)	(12.36)	(10.56)	(12.01)
Head educ lower prim		0.006			
		(0.18)			
Head educ upper prim		-0.048			
		(1.32)			
Head educ sec		-0.049			
		(0.99)			
Head educ post sec		0.029			
		(0.41)			
Head farmer			0.126***	0.100***	0.123***
			(4.18)	(3.33)	(4.01)
Head professional			-0.053	-0.001	-0.056
			(0.99)	(0.031)	(1.03)
Head sales			-0.106**	-0.064	-0.075*
			(2.57)	(1.53)	(1.77)
Dwelling floor				-0.001	0.012
				(0.02)	(0.35)
Eastern region				-0.189***	-0.191***
				(5.56)	(5.47)
Western region				0.078**	0.016
				(2.03)	(0.38)
Northern region				-0.242***	-0.203***
				(6.99)	(5.83)
Log cons per cap			0.156***		0.186***
			(8.09)		(8.80)
Head married					-0.092**
					(2.54)
Head divorced					-0.108*
					(1.87)
Head clerk					0.143
					(0.99)
Head transport					-0.204**
					(2.04)
Dwelling ironsheet					-0.139***
					(3.82)
Log asset			0.073***		
			(7.15)		
Constant	-4.850***	-3.297**	-4.908***	-4.471***	-5.234***
	(37.12)	*(3.16)	(4.59)	(20.91)	(4.84)
Observations	18,537	18,537	18,537	18,537	18,537

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

Table A4: Tobit model estimates for 1992 data set
Dependent variable: hours worked per day (hrs worked)

Variable	(1)	(2)	(3)	(4)	(5)
Log kid age	0.047	0.561*	1.600**	1.704**	1.834**
	(1.33)	(1.85)	(2.45)	(2.54)	(2.58)
Log kid age sq.		0.282	0.282	0.345	0.369
		(0.18)	(0.37)	(0.52)	(0.55)
Biological kid	0.042	0.205***	0.116	0.142**	0.168**
	(0.59)	(2.90)	(1.40)	(1.99)	(2.35)
Distance to school	0.024***		0.009	0.017**	0.018**
	(2.94)		(0.98)	(2.06)	(2.16)
Share of young kids	-0.259	-0.166	0.097	-0.197	-0.113
	(1.14)	(0.74)	(0.38)	(0.87)	(0.50)
Head female		-0.030	0.243***	0.029	
		(0.41)	(2.98)	(0.34)	
Rural location		-.341***		-0.425***	-0.344***
		(4.53)		(5.72)	(4.21)
Head educ lower prim		-0.120			
		(1.25)			
Head educ upper prim		-0.113		-0.039	
		(1.24)		(0.50)	
Head educ sec		-0.326***		-0.264***	
		(3.15)		(2.79)	
Head educ post sec		-0.096		-0.128	
		(0.63)		(0.85)	
Log cons per cap		0.620**		0.490**	0.466***
		*(12.90)		*(10.28)	(8.90)
Log asset			0.160***		
			(7.90)		
Head divorced				-0.143	-0.152
				(0.94)	(1.09)
Head widow				0.084	0.071
				(0.72)	(0.70)
Eastern region			0.081	0.107	0.168*
			(0.75)	(1.22)	(1.88)
Western region			0.560***	0.695***	0.726***
			(5.77)	(7.72)	(8.03)
Northern region			-0.544***	-0.470***	0.327***
			(5.39)	(5.04)	(3.31)
Head farmer					-0.190**
					(2.27)
Head sales					-0.190*
					(1.68)
Dwelling ironsheet					0.290***
					(3.76)
Dwelling floor					0.099
					(0.30)
Constant	6.766***	1.430	6.705	4.007	4.339
	(18.99)	(0.39)	(1.59)	(1.07)	(1.16)
Observations	10,468	10,468	10,468	10,468	10,468

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

Table A5: Tobit model estimates for 2002 data set
Dependent variable: hours worked per day

Variable	(1)	(2)	(3)	(4)	(5)
Log kid age	0.904**	-2.460***	-2.487***	-2.529***	-2.226***
	*(20.15)	(3.88)	(3.95)	(4.02)	(3.51)
Log kid age sq.		0.764*****	0.774	0.782***	0.721***
		(5.28)	(5.39)	(5.45)	(5.85)
Biological kid	-0.177***			-0.190***	-0.172***
	(6.14)			(6.56)	(5.85)
Share of young kids	0.275				0.318***
	(3.17)				(3.26)
Head female		-0.076***	-0.090***	-0.153***	
		(2.65)	(3.25)	(4.28)	
Rural location		0.274***	0.286***	0.257***	0.293***
		(9.93)	(9.92)	(8.53)	(10.08)
Head educ lower prim		-0.067**	-0.066**		-0.049
		(2.26)	(2.23)		(1.61)
Head educ upper prim		-0.095***	-0.083**		-0.060*
		(2.70)	(2.39)		(1.7)
Head educ sec		-0.093*	-0.096**		-0.070
		(1.93)	(2.00)		(1.43)
Head educ post sec		-0.075	-0.019		-0.005
		(1.06)	(0.27)		(0.07)
Head farmer		-0.039	-0.046	-0.053*	
		(1.33)	(1.55)	(1.95)	
Head professional		-0.361***	-0.331***	-0.352***	
		(6.78)	(6.21)	(6.81)	
Log head age		0.028			0.046
		(0.63)			(0.98)
Log cons per cap		0.117***	0.130***	0.173***	0.146***
		(9.93)	(6.17)	(7.88)	(6.70)
Eastern region		-0.224***	-0.244***	-0.225***	
		(7.01)	(7.39)	(6.86)	
Western region		0.056	0.040	0.038	
		(1.46)	(0.91)	(0.89)	
Northern region		0.214***	0.181***	0.226***	
		(6.43)	(5.41)	(6.81)	
Head divorced					-0.164*
					(1.66)
Head married				-0.297***	-0.071
				(3.30)	(1.64)
Head widow				-0.143	-0.036
				(1.51)	(0.67)
Dwelling ironsheet				-0.002	-0.038
				(0.06)	(1.13)
Head sales				0.032	0.035
				(0.85)	(0.92)
Dwelling floor					-0.161***
					(4.92)
Constant	0.357***	2.472***	2.649***	2.439***	1.987***
	(3.23)	(3.34)	(3.68)	(3.36)	(2.60)
Observations	13,916	13,916	13,916	13,916	13,916

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

Table A6: Probit model estimates, gender specific, for 1992 data set
Dependent variables: working male kid (1-3)/working female kid (4-6)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Log kid age	13.425***	13.066***	12.790***	10.297***	9.769***	10.370***
	(7.67)	(7.42)	(7.16)	(6.15)	(5.78)	(6.01)
Log kid age sq.	-2.738***	-2.662***	-2.592***	-1.977***	-1.846***	-1.959***
	(7.33)	(7.08)	(6.80)	(5.53)	(5.12)	(5.33)
Biological kid	-0.051	-0.131***	-0.094**	-0.206***	-0.399***	-0.407***
	(1.13)	(2.94)	(2.03)	(5.14)	(9.76)	(9.50)
Distance to school	-0.072***		-0.066***	-0.092**		-0.088***
	(9.79)		(8.93)	(10.65)		(9.91)
Share of young kids	-0.219	-0.062	-0.380***	0.530***	0.784***	0.482***
	(1.57)	(0.44)	(2.63)	(4.10)	(5.98)	(3.56)
Head female	-0.106**	-0.187***		0.016	-0.103**	
	(2.42)	(4.01)		(0.40)	(2.37)	
Rural location	0.263***	0.219***		0.168***	0.138***	
	(5.23)	(4.02)		(3.63)	(2.70)	
Head educ lower prim		-0.162***			-0.241***	
		(3.00)			(4.37)	
Head educ upper prim		-0.368***			-0.325***	
		(6.72)			(6.18)	
Head educ sec		-0.532***			-0.535***	
		(7.86)			(8.38)	
Head educ post sec		-0.444***			-0.336***	
		(4.00)			(3.53)	
Log cons per cap		-0.143***	-0.165***		-0.270***	-0.249***
		(4.71)	(5.10)		(9.09)	(7.82)
Head farmer			0.161***			0.157***
			(3.05)			(3.12)
Head divorced				-0.110*		-0.148**
				(1.67)		(2.35)
Head sales			0.172**			0.146**
			(2.08)			(2.04)
Head divorced			-0.043			-0.181**
			(0.49)			(2.04)
Head widow			-0.084			-0.069
			(1.35)			(1.15)
Eastern region				-0.190***		0.059
				(3.30)		(1.08)
Western region				-0.105*		-0.027
				(1.87)		(0.48)
Northern region				-0.250***		0.010
				(3.98)		(0.48)
Head farmer						0.106***
						(2.78)
Head sales						0.149***
						(2.70)
Dwelling ironsheet			-0.346***			-0.339***
			(7.08)			(7.19)
Constant	-17.003***	-15.200***	-14.666***	-13.781***	-10.488***	-11.488***
	(8.36)	(7.35)	(6.99)	(7.07)	(5.26)	(5.64)
Observations	6,345	6,345	6,345	6,258	6,258	6,258

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

Table A8: Probit model estimates, gender specific, for 2002 data set
Dependent variables: working male kid (1-3)/working female kid (4-6)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Log kid age	1.545***	0.469	0.520	1.637***	0.231	0.523
	(21.42)	(0.40)	(0.40)	(21.46)	(0.17)	(0.38)
Log kid age sq.		0.443	0.462	0.320		0.253
		(1.56)	(1.62)	(1.04)		(0.83)
Biological kid	-0.020	-0.019	0.004	0.157***	0.176***	0.186***
	(0.47)	(0.45)	(0.08)	(3.70)	(4.03)	(4.28)
Share of young kids	0.125		0.193	-0.155		-0.029
	(0.98)		(1.37)	(1.19)		(0.20)
Head female	-0.113	-0.076*		0.092**		0.136***
	(2.90)	(1.91)		(2.32)		(3.35)
Log head age		0.070	0.123*		0.142**	0.074
		(1.13)	(1.81)		(2.11)	(1.03)
Head educ lower prim		-0.034			0.029	
		(0.80)			(0.66)	
Head educ upper prim		0.038			-0.175***	
		(0.77)			(3.24)	
Head educ sec		-0.021			-0.104	
		(0.30)			(1.45)	
Head educ post sec		-0.022			0.064	
		(0.21)			(0.69)	
Head farmer		0.105**	0.118***		0.137***	0.138***
		(2.53)	(2.81)		(3.13)	(3.25)
Head professional		-0.123	-0.133*		0.028	
		(1.54)	(1.67)		(0.39)	
Head sales		-0.084	-0.037		-0.116*	-0.103*
		(1.45)	(0.64)		(1.94)	(1.76)
Rural location		0.416***	0.429***		0.353***	0.368***
		(9.61)	(9.85)		(7.83)	(8.11)
Eastern region			-0.223***			-0.100**
			(4.64)			(2.08)
Western region			0.178***			-0.004
			(3.40)			(0.08)
Northern region			-0.203***			-0.209***
			(4.19)			(4.19)
Log cons per cap		0.156***	0.188***		0.168***	0.368***
		(5.94)	(7.02)		(5.84)	(8.11)
Head married			-0.045			-0.179***
			(0.37)			(2.81)
Head widow			-0.088			0.037
			(0.69)			(0.48)
Constant	-4.632***	-4.544***	-5.014***	-5.138***	-6.195***	-6.001***
	(25.78)	(3.08)	(4.59)	(20.91)	(4.84)	(3.70)
Observations	9,014	9,014	9,014	9,523	9,523	9,523

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

Table A9: Probit model estimates for 1992 data set
Dependent variable: working kid 6 to 9 years old

Variable	(1)	(2)	(3)	(4)	(5)
Log kid age	131.289***	130.819***	143.130***	135.083***	136.752***
	(25.11)	(25.19)	(22.99)	(25.15)	(25.21)
Log kid age sq.	-30.301***	-30.212***	-32.991***	-31.188***	-31.579***
	(25.05)	(25.13)	(22.92)	(25.08)	(25.13)
Biological kid	-0.033	-0.141***	-0.023	-0.123**	-0.142***
	(0.71)	(2.98)	(0.40)	(2.46)	(2.83)
Distance to school		-0.110***	-0.096***	-0.115***	-0.106***
		(9.67)	(7.48)	(9.80)	(8.98)
Share of young kids	0.224	0.462***	0.008		
	(1.60)	(3.43)	(0.14)		
Head female	-0.155***	-0.190***	0.008		
	(3.14)	(3.43)	(0.14)		
Rural location	0.316***			0.435***	0.290***
	(6.02)			(8.23)	(5.00)
Head educ lower prim		-0.208***			
		(3.00)			
Head educ upper prim		-0.293***			-0.183***
		(5.16)			(3..63)
Head educ sec		-0.442***			-0.237***
		(6.32)			(3.47)
Head educ post sec		-0.459***			-0.166
		(3.73)			(1.31)
Log cons per cap		-0.258***		-0.313***	-0.224***
		(7.90)		(9.44)	(6.17)
Log asset			-0.190***		
			(13.52)		
Head divorced				-0.149	-0.183*
				(1.44)	(1.83)
Head widow				-0.204**	-0.249***
				(2.42)	(3.34)
Eastern region				-0.042	-0.062
				(0.69)	(1.01)
Western region				-0.090	-0.138**
				(1.46)	(2.21)
Northern region				0.093	0.008
				(1.54)	(0.13)
Head farmer					0.172***
					(2.91)
Head sales					0.133
					(1.49)
Dwelling ironsheet			-0.346***		-0.231***
			(7.08)		(4.42)
Constant	-142.593***	-139.578	153.235	-143.793***	-146.212***
	(25.30)	(24.95)	(22.86)	(24.88)	(25.03)
Observations	12,603	12,603	12,603	12,603	12,603

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

Table A10: Probit model estimates for 1992 data set
Dependent variable: working kid 10 to 14 years old

Variable	(1)	(2)	(3)	(4)	(5)
Log kid age	70.454***	72.540***	70.222***	71.049***	73.230***
	(12.90)	(13.28)	(11.17)	(12.88)	(13.06)
Log kid age sq.	-13.454***	-13.850***	-13.356***	-13.553***	13.967***
	(12.42)	(12.79)	(10.72)	(12.39)	(12.57)
Biological kid	-0.221***	-0.372***	-0.193***	-0.314	-0.329
	(5.87)	(9.74)	(4.28)	(8.01)	(8.21)
Distance to school		-0.073***	-0.085***	-0.071***	-0.063***
		(11.32)	(10.09)	(10.95)	(9.64)
Share of young kids	0.123	0.325**	-0.254*	0.093	0.011
	(0.97)	(2.54)	(1.70)	(0.71)	(0.08)
Head female	-0.108***	-0.067	0.023		
	(2.65)	(1.46)	(0.48)		
Rural location		0.123***		0210***	0.073
		(2.77)		(4.75)	(1.48)
Head educ lower prim		-0.204***			
		(4.00)			
Head educ upper prim		-0.379***			-0.302***
		(7.57)			(6.47)
Head educ sec		-0.595***			-0.418***
		(9.70)			(6.79)
Head educ post sec		-0.379***			-0.132
		(4.23)			(1.41)
Log cons per cap		-0.148***		-0.221***	-0.133***
		(5.40)		(7.89)	(4.28)
Log asset		-0.137***			
		(11.82)			
Head divorced				-0.079	-0.106
				(0.94)	(1.30)
Head widow				-0.027	-0.060
				(0.42)	(1.09)
Eastern region				0.029	-0.009
				(0.57)	(0.17)
Western region				0.041	-0.034
				(0.79)	(0.64)
Northern region				0.033	-0.173***
				(0.61)	(2.93)
Log Head age					-0.209***
					(2.96)
Head farmer					0.028
					(0.56)
Head sales					0.194***
					(2.76)
Dwelling ironsheet					-0.369***
					(8.04)
Constant	-92.566***	-93.689***	-90.880***	-91.355***	-93.818***
	(13.46)	(13.63)	(11.50)	(13.16)	(13.29)
Observations	12,603	12,603	12,603	12,603	12,603

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

Table A11: Probit model estimates for 1999 data set
Dependent variable: working kid 6 to 9 years old

Variable	(1)	(2)	(3)	(4)	(5)
Log kid age	-2.044***	73.521***	73.704***	65.097***	61.794**
	(28.31)	(21.06)	(21.04)	(16.28)	(3.56)
Log kid age sq.		-17.262***	-17.301***	-15.349***	14.670**
		(21.28)	(21.26)	(16.58)	(3.64)
Biological kid	-0.029		-0.024	0.040	-0.422*
	(0.78)		(0.58)	(0.84)	(2.11)
Share of young kids	0.440***	0.391***	0.305***		-0.300
	(3.99)	(3.33)	(2.54)		(0.41)
Orphan1		0.129**			
		(2.52)			
Head female		0.078*	0.056	0.028	
		(1.92)	(1.36)	(0.59)	
Head educ lower prim			-0.122**		
			(2.44)		
Head educ upper prim			-0.040		
			(0.85)		
Head educ sec			-0.164***		
			(2.79)		
Head educ post sec			-0.443***		
			(5.71)		
Rural location				0.271***	1.200**
				(4.69)	(4.01)
Log head age					-0.638*
					(1.95)
Head married					0.543
					(0.75)
Head widow					-0.015
					(0.02)
Log wage					-0.013
					(0.021)
Dwelling ironsheet					0.057
					(0.19)
Injury shock				0.014	
				(0.15)	
Head farmer			-0.130***	-0.086*	
			(3.23)	(1.77)	
Distance to school				-0.002	
				(0.34)	
Head sales			-0.015	0.106	
			(0.23)	(1.40)	
Head clerk			-0.105	-0.046	
			(0.46)	(0.17)	
Job shock				-0.219***	
				(4.24)	
Eastern region				-0.219***	
				(4.24)	
Western region				-0.464***	
				(6.87)	
Northern region				-0.303***	
				(5.84)	
Log cons per cap			-0.069***(	-0.241***	
			2.77)	(2.64)	
Constant	3.079***	-79.177***	-78.447***	-69.937***	-62.073***
	(18.70)	(21.14)	(20.82)	(16.26)	(3.36)
Observations	17,839	17,839	17,839	17,839	885

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

Table A12: Probit model estimates for 1999 data set
Dependent variable: working kid 10 to 14 years old

Variable	(1)	(2)	(3)	(4)	(5)
Log kid age	3.054***	70.564***	71.416***	79.288***	48.634'*
	(36.79)	(15.83)	(15.94)	(14.79)	(2.42)
Log kid age sq.	-13.552***	-13.718***	-15.375***	-9.033**	
	(15.33)	(15.44)	(14.46)	(2.26)	
Biological kid	-0.078**		-0.082**	0.028	-0.020
	(2.50)		(2.50)	(0.73)	(0.13)
Share of young kids	0.425***	0.499***	0.472***		0.955'**
	(4.11)	(4.63)	(4.36)		(2.17)
Orphan1		0.108***			
		(2.71)			
Head female		0.102***	0.068**	0.050	
		(2.95)	(2.00)	(1.28)	
Head educ lower prim		-0.098**			
		(2.29)			
Head educ upper prim				-0.197***	
				(4.83)	
Head educ sec				-0.183***	
				(3.72)	
Head educ post sec				-0.224***	
				(3.76)	
Rural location				0.188***	1.090'**
				(3.80)	(5.15)
Log head age					-0.593'*
					(2.38)
Head married					-0.360
					(0.74)
Head widow					0.116
					(0.23)
Head divorced					-0.061
					(0.12)
Log wage					-0.076
					(1.61)
Dwelling ironsheet					-.156
					(0.73)
Injury shock				0.093	
				(1.12)	
Head farmer			-0.053	0.036	
			(1.51)	(0.85)	
Distance to school				0.000	
				(0.03)	
Head sales			0.101*	0.179***	
			(1.70)	(2.61)	
Head clerk			0.051	-0.069	
			(0.29)	(0.30)	
Job shock				-0.390	
				(1.27)	
Eastern region				0.022	
				(0.49)	
Western region				-0.258***	
				(4.64)	
Northern region				-0.316***	
				(6.94)	
Log cons per cap				-0.116***	-0.108
				(5.14)	(1.35)
Constant	-8.729***	-92.625***	-92.297***	-103.152***	-62.447'*
	(40.74)	(16.51)	(16.38)	(15.29)	(2.46)
Observations	17,839	17,839	17,839	17,839	967

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

Table A13: Probit model estimates for 2002 data set
Dependent variable: working kid 6 to 9 years old

Variable	(1)	(2)	(3)	(4)	(5)
Log kid age	0.666***	44.227***	45.271***	45.963***	46.480***
	(9.47)	(14.50)	(14.58)	(14.63)	(14.64)
Log kid age sq.		-10.910***	-11.168***	-11.351***	11.457***
		(14.58)	(14.66)	(14.72)	(14.71)
Biological kid	0.173***		0.171***	0.244***	0.226***
	(3.24)		(2.86)	(3.79)	(3.61)
Share of young kids	-0.421***	-0.137			0.067
	(3.04)	(0.89)			(0.42)
Head female	0.110**	0.117**	0.172***	0.252***	
	(2.47)	(2.23)	(3.38)	(4.74)	
Orphan1		0.008			
		(0.11)			
Rural location		0.214***	0.325***	0.212***	0.291***
		(4.32)	(5.70)	(3.61)	(4.82)
Head farmer			0.003	-0.081	-0.052
			(0.05)	(1.51)	(0.96)
Head professional			-0.096	0.028	-0.080
			(0.97)	(0.29)	(0.80)
Head sales			-0.312***	-0.261***	-0.305***
			(3.99)	(3.28)	(3.81)
Dwelling floor				-0.142**	-0.095
				(2.29)	(1.48)
Eastern region				-0.420***	-0.380***
				(6.67)	(5.88)
Western region				-0.256***	-0.264***
				(3.68)	(3.40)
Northern region				-0.345***	-0.275***
				(5.61)	(4.46)
Log cons per cap			0.224***		0.255***
			(6.22)		(6.44)
Head married					-0.283***
					(4.20)
Head divorced					-0.178*
					(1.72)
Head clerk					-0.568
					(1.40)
Head transport					-0.480**
					(2.26)
Dwelling ironsheet					-0.074
					(1.15)
Log head age				0.132	
				(1.46)	
Log asset				0.129***	
				(6.73)	
Head educ lower prim				0.006	
				(0.11)	
Head educ upper prim				0.029	
				(0.44)	
Head educ sec				0.134	
				(1.54)	
Head educ post sec				0.178	
				(1.45)	
Constant	-0.707***	-46.425***	-50.017***	-50.417***	-6.195***
	(4.29)	(14.99)	(15.62)	(15.61)	(15.58)
Observations	20,682	20,682	20,682	20,682	20,682

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

Table A14: Probit model estimates for 2002 data set
Dependent variable: working kid 10 to 14 years old

Variable	(1)	(2)	(3)	(4)	(5)
Log kid age	3.123***	47.320***	47.044***	47.587***	47.789***
	(36.60)	(12.34)	(12.21)	(12.31)	(12.33)
Log kid age sq.		-9.147***	-9.076***	-9.190***	-9.231***
		(11.65)	(11.51)	(11.61)	(11.64)
Biological kid	0.052		0.048	0.045	0.063*
	(1.58)		(1.40)	(1.31)	(1.83)
Share of young kids	-0.065	-0.162	-0.059		
	(0.61)	(1.46)	(0.51)		
Head female	-0.071**	-0.046	-0.041	-0.032	
	(2.23)	(1.36)	(1.24)	(0.96)	
Orphan1		0.022			
		(0.59)			
Rural location		0.419***	0.396***	0.385***	0.429***
		(13.01)	(10.92)	(10.33)	(11.31)
Head farmer		0.179***	0.169***	0.190***	
		(5.04)	(4.74)	(5.21)	
Head professional			-0.043	-0.017	-0.048
			(0.69)	(0.28)	(0.76)
Head sales			-0.017	0.019	0.020
			(0.34)	(0.39)	(0.41)
Dwelling floor				0.061	0.062
				(1.61)	(1.54)
Eastern region				-0.090**	-0.102**
				(2.25)	(2.51)
Western region				0.212***	0.136***
				(4.69)	(2.70)
Northern region				-0.190***	-0.158***
				(4.66)	(4.46)
Log cons per cap			0.128***		0.156***
			(5.74)		(6.34)
Head married					-0.022
					(0.52)
Head divorced					-0.090
					(1.33)
Head clerk					0.310*
					(1.92)
Head transport					-0.112
					(0.98)
Dwelling ironsheet					-0.166***
					(3.85)
Log head age				0.023	
				(0.43)	
Log asset				0.050***	
				(4.25)	
Head educ lower prim			-0.010		
			(0.29)		
Head educ upper prim			-0.083**		
			(1.99)		
Head educ sec			-0.118**		
			(2.05)		
Head educ post sec			-0.052		
			(0.64)		
Constant	-8.720***	-62.141***	-63.297***	-63.470***	-64.393***
	(40.42)	(13.29)	(13.46)	(13.44)	(13.60)
Observations	20,682	20,682	20,682	20,682	20,682

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5% ; *** significant at 1%

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