Child Labour and Child Schooling in Rural Ethiopia: Nature and Trade-off*

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Abstract

This paper examines work participation and school attendance for children aged 7-15 using survey data from rural Ethiopia. To this effect, a bivariate probit model that addresses the interrelatedness of the two decisions is employed. Given the agrarian nature of the economy, special focus is given to child labour on family farms and within the household. The trade-off between child labour and educational attainment is also analysed by estimating an equation for age-adjusted educational attainment of children. Male children are found to be more likely to attend school than their female counterparts, pointing towards gender bias in school attendance. There is also some 'specialization' in child labour with females having a higher likelihood of participation in domestic chores while males having a higher likelihood of participation in market work. Large family size and ownership of livestock are also found to increase the probability of combining schooling with work. More importantly, long hour of work is found to reduce educational attainment of working children. Reducing family size and increasing educational opportunities, among others, may hold the key for raising educational attainment of working children.

Key words: *Child labour, Child education, rural Ethiopia*
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1. Introduction

Child labour is one of the most pervasive development problems of poor countries. Apart from its impact on the physical, mental, and psychological development of the labouring child, it hinders human capital formation by leaving the working child with little time or stamina to focus on education, thereby perpetuating poverty into future generations (Ravallion and Wodon 2000). From a macroeconomic point of view too, child labour interferes with proper schooling and will negatively affect the pace of economic growth by preventing full realization of positive externalities associated with human capital formation (Bhalotra 2003).

Notwithstanding universal agreements on the negative impact of child labour, there are millions of child labourers 'employed' both in the visible and invisible sectors. Included in the former category are child labourers in agriculture, manufacturing, construction, and mining while the latter category includes child labourers in the domestic economy obscured from the public eye. According to the International Labour Organization (ILO), for example, 218 million children aged 4-15 were trapped in child labour in 2004 of which 126 million were in what ILO refers to as 'hazardous' work (ILO 2006a).[1] Of these children, 69% were engaged in agriculture, 22% were in services, and 9% were employed in industry. While Asia and the Pacific region harbours the largest population of child labourers, Sub Saharan Africa (SSA) is top in terms of the activity rate with 26.4% of the children aged 5-14 engaged in economic activities followed by Asia and the Pacific region (18.8%)[2].

A number of factors are responsible for the high incidence of child labour in developing countries, many attributing this to poverty and poverty-related factors. It is argued that households that do not have enough resources to sustain the family have no choice but make their children engage in various activities to make ends meet. In such cases, not having the children work puts the very existence of the family at risk. Limited access to (quality) schooling is also among the factors identified as encouraging child labour. In areas where there is little or no access to (quality) schooling, parents may consider child work as an opportunity to help their children develop a future "career". Those in favour of this line of argument call for expansion of primary schooling as a deterrent to child labour. According to a report by the ILO, for example, "education is pivotal to eliminating and preventing child labour…" (ILO 2006b: 5). Of course, school expansion may not lead to a significant reduction in work participation. Imperfection in the labour and capital market, family expectations, and culture are other factors responsible for the high incidence of child labour worldwide.

Ethiopia is the second most populous nation in SSA, with a population of over 70 million, and one of the most impoverished (UNDP 2005). It is a country that heavily relies on agriculture, with over 80 percent of the population depending upon agriculture for its livelihood, yet there is recurrent drought and occasional famine. It has one of the highest incidences of child labour in the world, one of the lowest school enrolment rates in the world and one of the highest fertility rates, with 7 children per woman on average.[3] It is a

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[1] Figures from different sources about the number of child labourers seem to contradict each other due to lack of uniform definition on who is a child and what activities are considered as child labour ILO's "hazardous" work refers to any activity with adverse impact on the safety, health (physical or mental), and moral development of the labouring child (ILO 2006a).

[2] According to ILO's definition, economic activity refers only to productive activities undertaken by children, whether marketable or not, paid or not, part time or full time, on a casual or regular basis, legal or illegal, and excludes chores undertaken in the child's own household and schooling (ILO 2006b).

[3] A recent UN-FAO report indicates that agriculture accounts for 70 per cent of child labour worldwide (http://www.fao.org/newsroom/en/news/2006/1000394/index.html). Ethiopia's reliance on subsistence and labour intensive agriculture is one of the main reasons why it has one of the highest incidences of child labour in the world.

country of the young with children under 15 years accounting for 44% of the population. According to the country's recent survey on child labour, some 85% of children in Ethiopia were found to be engaged in some kind of labour activity during the survey week and only 38% were attending school (CSA 2001). It is also found that more than 40% of the children aged 13-17 years never went to school while 33% combined work and schooling. The country's heavy reliance on subsistence agriculture means that child work on family farms and within households are abundantly prevalent (Basu 1999; Bigsten *et al.* 2003; Cockburn and Dostie 2007, Dercon 2004; Edmonds and Pavcnik 2005; UNDP 2005; CSA 2001). Given this, a better understanding of the nature and trade-off between child labour and schooling in rural Ethiopia is essential to be able to inform policy aimed at curbing the high incidence of child labour.

The paper investigates the determinants of child domestic and market work participation and school attendance as well as the trade-off, if any, among the three activities. Although child labour is often defined as work that impairs the normal development of working children, this study defines child labour broadly as any non-leisure activity other than schooling. Specifically, the study looks into the participation of children aged 7-15 in such activities as farming, fetching of firewood and water, caretaking, herding, and other domestic chores. We index child schooling by two variables - a dummy for school attendance and age-adjusted school outcome variable - Grade-for-Age (GAGE). When the target sample is young, as is the case in this study, there is a need for using a measure of educational attainment relative to the child's age (Orazem and Gunnarsson 2004). The remainder of the paper is organized as follows. After briefly reviewing related studies in Section 2, Section 3 describes the survey data on which this paper is based along with descriptive statistics on the allocation of children's time. Section 4 outlines the empirical methodology employed to identify factors that explain parents' decision in the allocation of children's time. Section 5 discusses the estimation results obtained while the final section concludes the paper.

2. Review of Related literature

The issue of child labour is motivated by its detrimental impact on the normal development of labouring children in general and on their educational performance in particular (Bhalotra, 2003). Using micro level data, a number of studies have investigated the causes and consequences of child labour, with particular emphasis on the link between child labour and schooling. If the cost (direct as well as indirect) of sending children to school is high, then poor households will be forced not to send their children to school or to take their children out of school which in turn creates a fertile ground for the use of child labour. To the extent that this is true, policy reforms targeted at affecting the cost (direct or indirect) of schooling will affect the allocation of children's time. Ravallion and Wodon (2000), Skoufias and Parker (2001), and Edmonds (2005) are some of the recent studies that used policy reforms targeted at affecting the cost of school attendance to establish the trade-off between schooling and child labour.

Ravallion and Wodon (2000) used the food-for-education (FFE) programme in rural Bangladesh to measure the extent to which child labour displaces schooling. They compared the allocation of children's time in beneficiary households with that in non-beneficiary households using separate probit functions for school and work participation both as a function of FFE stipend and other child, household, and community level covariates. A strong positive (negative) association is found between FFE stipend and the probability of school attendance (labour force participation). However, their study does not look into the impact of the programme on hours of work and educational attainment which

is of immense policy relevance. In a similar study, Skoufias and Parker (2001) assessed the impact of conditional cash and in-kind transfer on the time allocation of Mexican children using the difference-in-differences (DiD) estimator.[4] A significant increase (reduction) in school attendance (work participation) is found for children in beneficiary households. The authors conclude by questioning if there are 'better' ways of increasing school attendance or reducing work participation in the form of, say, construction of more primary schools as opposed to transferring resources to households. Edmonds (2006) assessed the impact on the time use of black South African children of a policy reform that made black South African elders eligible for an Old Age Pension (OAP) programme initially restricted to white South Africans. Using regression discontinuity design, a significant increase (reduction) in child school attendance (work hours) is found after the realization of the anticipated income. The author concludes that to the extent that borrowing from future income is difficult; an increase in expected income will have an insignificant impact on the allocation of children's time, implying the role of credit markets.

In contrast to the studies reviewed in the preceding paragraphs, which rely on policy reform to establish the trade-off between child labour and child schooling, the bulk of the empirical work in the area relied on survey data and employed various econometric techniques and identifying assumptions to assess the trade-off between child labour and child schooling (Ray 2001a; Cockburn 2001; Assefa 2002; Rosati and Rossie 2003; Ray and Lancaster 2004; Phoumin and Fukui 2006). Employing the three stages least squares (3SLS) technique, Ray (2001a) simultaneously modelled child labour hours, educational attainment, and household poverty using Nepalese and Pakistani data. He found an inverse association between schooling experience and hours of work, and a positive association between poverty and hours of work. Phoumin and Fukui (2006) estimated work hours and the likelihood of school attendance for Cambodian children using simultaneous tobit and probit, respectively. They found a positive (negative) association between household income and the likelihood of school attendance (work hours). Employing a similar methodology to that of Phoumin and Fukui (2006), Rosati and Rossie (2003) examined the determinants of school attendance and hours of work for Pakistani and Nicaraguan children. Their findings show that higher income and large family size reduce hours of work, and Pakistani female children are less likely to attend school than their male counterparts.

Many empirical studies of chid labour and schooling have relied on survey data from Latin America and Asia. In recent years, however, improved availability of survey data has allowed researchers to look into the economics of child labour in Africa, where child labour on family farms and within the household is rampant. Previous studies have found an insignificant impact on child time allocation of household welfare (Canagarajah *et al.*1997; Ray 2000; Akabayashi *et al.* 1999; Bhalotra *et al.* 2001), of household composition with the exception of the number of infants (Cockburn1999, 2000), of birth order, land size, and a child's relation to the head (Bhalotra *et al.* 2001). On the other hand, a lower likelihood of school attendance is found for female children (Jensen *et al.* 1997; Canagarajah *et al.* 1997; Cockburn 1999), an inverse association is reported between land ownership and the likelihood of school attendance (Jensen *et al.* 1997; Cockburn 1999; Assefa 2002), and a positive (negative) association is found between parental education and school participation (hours of work) (Phoumin and Fukui 2006).

With the exception of Akabayashi *et al.* (1999) and Cockburn (1999), these studies analyse the determinants of child work participation and school attendance with no explicit

[4]The resource transfer is made possible through a government sponsored programme called Progressa. The transfer of money and other in-kind benefits for mothers is conditional on school-aged children's school enrolment and regular school attendance as well as regular attendance at clinic (Skoufias and Parker 2001).

focus on the trade-off between the two. Also, the studies lumped different types of work activities together and do not address the concern that different types of child activities affect child schooling differently. This paper adds to the existing literature on child labour in Africa by assessing the determinants of different types of child labour. Unlike previous studies on Ethiopia (Cockburn 2000; Assefa 2002, for example) that investigate determinants of school attendance and child work participation, this paper attempts to assess the trade-off between work hours and educational attainment.

3. Data

To analyse the determinants of children's school attendance and work participation as well as the trade-off between schooling and child labour, we use the 5th round of the Ethiopian Rural Household Survey (ERHS).[5] The sampling design is such that regions were selected to represent the main agro-ecological zones in the country. On the other hand, the selection of districts as well as households within each district is based on stratified sampling (Dercon *et al.* 2005). The survey includes 1681 households and 12,000 individuals residing in 21 districts located in four main regions of the country.[6] Socio-economic and demographic characteristics of households is gathered by interviewing household heads, where a household is defined as a group of people living and eating together. The main focus of this study is on children aged 7-15 (inclusive). The choice of this age group is influenced by availability of information on hours of work and 7 years being the official (though not compulsory) school starting age in Ethiopia, which enables us to model the trade-off between child labour and schooling. For the purpose of the descriptive analysis, however, we also look at children outside of this age range to get a general perspective on the extent of child labour.

One factor that determines the impact of child labour on the normal development of labouring children is the work starting age. The younger the child is, ceteris paribus, the riskier work participation will be. As presented in Table 2 in the Appendix, however, around 77% of children aged 4-15 in our sample have already started undertaking work activities before celebrating their 8th birthday and at the official school starting age. Apart from its impact on human capital formation, the fact that more than three-fourth of the children start participating in work activities at such an early age increases vulnerability to physical and psychological health hazard.

Another indicator of the intensity of child labour is the length of time spent on work activities. The longer the work hours, ceteris paribus, the shorter the time available for other activities will be. On the other hand, undertaking light work activities may not significantly interfere with schooling and may improve the acquisition of important skills for the child.[7] The survey contains information on hours of work spent on different activities by children aged 4-15 in the week preceding the survey. Table 3 in the Appendix gives summary of information on hours. Three points are worth noting. First, defining work as the sum of domestic and market work, child labourers spend 38 hours a week, on average, with no substantial difference between males and females. Second, there is a high variation in work hours between male and female children in market and domestic activities. This implies that analysis of mere participation of children in work activities may not allow a full

[5] The ERHS was conducted in 1999 by the Department of Economics of the Addis Ababa University in collaboration with the Centre for the Study of African Economies (CSAE), Oxford University.

[6] Ethiopia is a federal state composed of 9 regional states and 2 administrative regions. Each region is divided into *Zones* which in turn are subdivided into *Woredas*. Peasant Associations (PAs) (in rural areas) and *Kebeles* (in urban areas) are the lowest administrative units in the hierarchy.

[7] This may particularly be the case in traditional communities with insufficient schooling and/or post-school labour market opportunities where children may have to depend on skills passed on from their parents.

understanding of the nature of child labour. While male children spend, on average, longer hours (34.7 hours a week) on market activities than their female counterparts (25.3 hours a week), female child workers spend more hours on domestic work (28.2 hours a week) than male child labourers (17.2 hours a week).

Assessing the trade-off between child labour and human capital formation is necessary since long work hours leave working children with little time to spend elsewhere, including school attendance and studying, adversely affecting their educational attainment.[8] Apart from long work hours adversely affecting educational attainment (the common line of argument), it could be the case that lower (perceived or actual) expected returns on education discourages regular school attendance, thereby creating a fertile ground for intensive use of child labour. As shown in Table 4 in the Appendix, of the 2850 individuals aged 8-18 and for whom information on school attendance during the 12 months preceding the survey is available, 1218 (42.7%) attended school regularly while 1196 (42%) did not attend school at all. It is worth stating that proportionately more boys attended school regularly than girls, while more girls did not attend school over the reference period implying gender bias. Assessing the trade-off between schooling and child labour is appealing especially in situations where combining work and school is prevalent as shown in Table 5 in the Appendix. 26% of the children aged 8-15 combined school and work over the reference period, with marginally higher figure for male children. On the other hand, schooling and work were the only responsibility for 17% and 37% of the children in the reference age group, respectively. Disaggregation by work type reveals that the practice of combining school and domestic work is 36 percentage points higher for female children while that of combining school and market work is 24 percentage points higher for male children, implying specialization in the use of child labour.

Understanding the reasons for not attending school could give some idea as to the factors encouraging child labour. Table 6 in the Appendix reports reasons that prevent school attendance as reported by the head (in order of decreasing importance). While 'young age' is identified as the most important factor for non-attendance, responsibilities on family farms and in the household are the 2nd and 3rd most important factors preventing school aged children from attending school. Other factors reported include high direct cost of school attendance, health problems, and absence of primary schools in the vicinity. It is interesting to note that some heads do not believe in the income enhancing role of education in general and female education in particular.

4. Empirical Models

Parental decisions on the allocation of children's time are likely to consider more than one activity, necessitating simultaneous modelling of the alternative uses of children's time. This paper employs a bivariate probit model to simultaneously analyse the determinants of school attendance and work participation for children aged 7-15[9]. On the other hand and as shown in Section 3, the considerable variation in hours of work means that analysis of children's work participation may not be enough. This is particularly so since what matters most from a policy perspective is not whether children participate in work activities but the extent of participation measured in hours of work. To estimate the effect of hours of work on educational performance, a single equation for age adjusted educational attainment is estimated using Tobit.

[8] Establishing causal effect between the two may not be straightforward however.

[9] Allowing correlation between the errors is appropriate if, for example, it is the case that higher ability children are more likely to go to school and less likely to participate in work activities resulting in a negative correlation between the errors (Rosati and Rossi 2003).

4.1 Bivariate Probit (Model I)

The specification for the bivariate probit model is as follows (Cameron and Trivedi 2005).

1.1 $$y_1^* = \mathbf{X}_1'\boldsymbol{\beta}_1 + \varepsilon_1$$

1.2 $$y_2^* = \mathbf{X}_2'\boldsymbol{\beta}_2 + \varepsilon_2$$

where the observability criteria for the two binary outcomes is given as

1.3 $$y_1 = \begin{cases} 1 \ if \ y_1^* > 0 \\ 0, \ otherwise \end{cases}$$

1.4 $$y_2 = \begin{cases} 1 \ if \ y_2^* > 0 \\ 0, \ otherwise \end{cases}$$

where $\mathbf{X}_1$ and $\mathbf{X}_2$ are vectors of covariates while ε_1 and ε_2 are error terms assumed to have a bivariate normal distribution with $Cov[\varepsilon_1, \varepsilon_2 \mid \mathbf{X}_1, \mathbf{X}_2] = \rho$

In the bivariate model with $\rho \neq 0$, there are four combinations of observed outcomes. Using the relationships in equations 1.3 and 1.4, probabilities for the joint outcomes are computed for a given value of covariates($\mathbf{X}$). The joint probabilities that enter into the likelihood function could be given as follows (for i, j=1, 0)

$$p_{ij} = \Pr(y_1 = i, y_2 = j \mid \mathbf{x}_1, \mathbf{x}_2)$$
$$= \boldsymbol{\Phi}(p\mathbf{X}_1'\boldsymbol{\beta}_1, q\mathbf{X}_2'\boldsymbol{\beta}_2; p, q, \rho)$$

where $$p = \begin{cases} 1 \ if \ y_1 = 1 \\ -1 \ if \ y_1 = 0 \end{cases}$$

and $$q = \begin{cases} 1 \ if \ y_2 = 1 \\ -1 \ if \ y_2 = 0 \end{cases}$$

The log-likelihood for the bivariate probit is then given by,

$$l(\boldsymbol{\theta}) = \sum_{y_1=1, y_2=0} \ln \Phi_{10}(\boldsymbol{\theta}) + \sum_{y_1=1, y_2=1} \ln \Phi_{11}(\boldsymbol{\theta}) + \sum_{y_1=0, y_2=1} \ln \Phi_{01}(\boldsymbol{\theta}) + \sum_{y_1=0, y_2=0} \ln \Phi_{00}(\boldsymbol{\theta})$$

where, $\Phi_{ij}(.)$ is the joint probability that y_1 takes a value of i and y_2 takes a value of j, for i, j = 0,1 and $\boldsymbol{\theta}$ is the parameter vector consisting of $\boldsymbol{\beta}_1, \boldsymbol{\beta}_2, \text{and } \rho$. Maximum likelihood estimates are obtained by simultaneously setting to zero the derivative of the log likelihood function with respect to the parameters of interest. The bivariate probit model allows the computation of marginal effects necessary to arrive at the relative magnitudes of particular effects (Christofides *et al.* 1997). In this paper, marginal effects on the joint probabilities are computed at the mean value of continuous explanatory variables[10]. The same vector of covariates is included in the two equations and hence the system is just identified.

[10] For dummy explanatory variables, marginal effects on the four (joint) outcomes are computed by taking the difference in the joint probabilities evaluated at the two values of the dummy variable.

4.2 Tobit Model with Censored Regressor (Model II)

An important determinant of the educational performance of working children is the length of time spent working. Ceteris paribus, child labourers who spend longer hours on work activities will have little time for school attendance and studying. Exhaustion from long hours of work could also prevent the children from being attentive inside and outside classrooms with implications for their educational performance.[11] To assess the trade-off between educational attainment and hours of work, a Tobit model is specified, with the latent equation for the variable of interest given as,[12]

$$1.5 \quad S^{*} = \alpha H^{*} + \mathbf{X}' \beta + \eta$$

where a is the parameter of interest, η is the error term assumed to be normally distributed with mean zero and homoscedastic variance σ^2 and with the following observability criteria,

$$1.6 \quad S = \begin{cases} 0 \text{ if } S^{*} = 0 \\ GAGE \text{ if } S^{*} > 0 \end{cases}$$

$$1.7 \quad H = \begin{cases} H \text{ if } H^{*} > 0 \\ 0, \text{ otherwise} \end{cases}$$

Following Psacharopoulos and Yang (1991), the age-adjusted measure of educational attainment (GAGE) is defined as follows.

$$1.8 \quad GAGE = [G/(A-E)]*100$$

where G is highest grade of formal schooling attained by the child, A is child age, E is the official school entry age, so that

$$GAGE \begin{cases} = 0, \text{ if child is illiterate} \\ 0 < GAGE < 100, \text{ if below normal educational attainment} \\ = 100, \text{ if normal educational attainment} \\ > 100, \text{ if above normal educational attainment} \end{cases}$$

In our study more than 92.5% of the children aged 7-15 have non-zero hours of work (domestic and market work combined). This means that bias due to sample selection may not be a serious problem if use is made only of observations with non-zero hours. On the contrary, GAGE is zero for more than 52% of the children aged 7-15 necessitating a technique that controls for sample selection in estimating equation 1.5. We employ Maximium Likelihood technique to estimate the parameters of interest.[13]

More often than not, children in developing countries engage in work activities since they and/or their families could not survive without the income, goods, services or other benefits generated by the working children either directly or indirectly. As such, not having the children work may put the family at risk. In an attempt to identify the role of household poverty on the allocation of children's time, two types of physical assets - livestock and land size - are used. Both indicators are a good measure of household poverty in rural Ethiopia where agriculture (farming and animal rearing) is the main, if not the only, source of livelihood. If household poverty is what causes child labour, then intensity of child

[11] Of course, a number of other school related factors may also have a role to play though the survey data used in this study does not have such information.

[12] It is important to note that the hour variable (H) is censored at zero necessitating accounting for sample selection bias.

[13] It is worth noting that parameter estimates of equation 1.5 could be biased if hours of work is endogenous. As such interpretation of the results must be cautious.

labour should decline with an increase in land size and livestock population. The labour intensity of the farming technology in use as well as the size of livestock and land may encourage the use of child labour on family farms and/or within the household, especially since there is a high degree of imperfection in the adult labour market. Thus, the impact of the wealth proxies on child labour and school participation is indeterminate a priori.

Family size and household demographic characteristics are also among the factors identified in the literature as affecting the allocation of children's time with indeterminate impact a priori. Ceteris paribus, large family size reduces wealth per capita and makes the competition over scarce resources stiffer, which may in turn increase child labour to generate resources to sustain family members. On the other hand, it may also be the case that large family size provides children (at least some of them) with greater opportunity for school attendance and/or fewer work hours, especially if there is specialization among family members.

In connection with household composition, it is often argued that the larger the number of young children and the elderly, for example, the higher the demand for caretaking will become, which is usually undertaken by older children. Also, the number and composition of adult household members affects the intensity of child labour depending on the relationship between adult and child labour (Chernichovsky, 1985). To account for this, we use a range of covariates on household demographic composition. A covariate of particular importance we use in this paper is birth order. It is often argued that earlier-born children may have more intra-household resources directed to them as a result of which they tend to have better education and earnings at a later stage. However, in the presence of child labour, the effects of birth order can be confounded by the fact that earlier born children are able to command higher wages than their younger siblings. Also, with capital market imperfection, poor families cannot afford to send their earlier born children to school, but may be able to send their later-born children due to the income earned by their older siblings (Emerson and Souza 2002).

To the extent higher education enhances earnings potential, children of educated parents may not be as resource constrained as their counterparts from illiterate parents. On the other hand, in the absence of a perfect labour market, higher parental education that increases outside employment opportunities may increase the intensity of work participation by children, especially within the household. Unemployed parents and parents involved in economic activities that do not generate enough resources are more likely to let their children engage in various activities both within and outside the household to make ends meet. To capture these, a dummy variable for education level of the head as well as dummies for parental occupation are used.

Not all factors that affect the allocation of children's time are economic or demographic. Child- and parent- specific sociological factors may have an important impact, especially in a developing country like Ethiopia. In this regard, the role of child gender and the child's relationship to the household head may affect participation. Depending on how work is defined, gender may have a significant impact on child participation. Child sex and a dummy for the relation of the child to the household head are used in this study. The nature of headship is also another potential determinant of child labour. To the extent female headship signifies aspects of ill-being or insecurity, for example, children in female-headed households may tend to have greater work burden to generate resources to sustain the family. There may also be the opposite effect. Canagarajah *et al.* (1977), for example, reported a positive (negative) association between female headship and probability of school attendance (work participation), with stronger effect for girls. To account for this, a dummy variable is used for the type of headship.

In rural Ethiopia, it is not uncommon for families to engage in off-farm employment activities to supplement farm income, which is characterized by high degree of seasonal variation. Ceteris paribus, households with off-farm employment activities may not be as resource constrained as those without off-farm employment opportunities. On the other hand, it could be the case that involvement in off-farm activities by adult members increases the demand for child labour in activities where child and adult labour are substitutes. A dummy variable is therefore included for whether at least one household member is involved in off-farm activities in the year preceding the survey.

5. Empirical Results and Discussion

5.1 Market Work vs. School Attendance

As can be seen from Table 1, the coefficient of correlation between the errors in the two equations is statistically significant, justifying the use of the bivariate probit model to jointly estimate the two binary outcomes. As would be expected, male children are more likely to engage in market activities. They are also more likely to attend school than female children indicating the existence of gender bias in children's time allocation. A similar result is obtained by Jensen *et al.* (1997), Canagarajah *et al.* (1997), and Cockburn (1999). On the other hand, the nature of the relationship to the head has an insignificant impact on the likelihood of school attendance as well as market work participation, a result similar to that of Bhalotra *et al.* (2001) for Ghanaian children.

Table 1: Bivariate probit, market work & shool attendance, children aged 7-15.

	Market work		Schooling	
	Coeff.	Std. err	Coeff.	Std. err
Male	0.895	(0.070)**	0.16	(0.064)*
Age (9-12)	0.134	(0.086)	0.78	(0.083)**
Age (12-15)	0.113	(0.104)	0.67	(0.098)**
Biological child	-0.009	(0.126)	-0.03	(0.118)
Male household head	0.208	(0.171)	-0.24	(0.166)
Age of household head	0.000	(0.003)	-0.004	(0.003)
Household head domestic worker	-0.135	(0.184)	-0.14	(0.180)
Household head unemployed	-0.503	(0.157)**	0.08	(0.154)
Highest education of head	-0.034	(0.098)	0.39	(0.090)**
Household size	0.122	(0.059)*	0.20	(0.055)**
Birth order	-0.016	(0.038)	-0.12	(0.035)**
No. of dependants (<6 or 60+ years)	-0.169	(0.064)**	-0.22	(0.061)**
No. of children (6-15 years)	-0.212	(0.056)**	-0.15	(0.052)**
Young adults 15 to 25 years	-0.083	(0.068)	-0.15	(0.064)*
No. adults 25 or more	-0.147	(0.070)*	-0.14	(0.068)*
Off-farm activity	-0.096	(0.100)	-0.11	(0.090)
Livestock (no.)	0.049	(0.011)**	0.03	(0.010)**
Land size (ha.)	-0.067	(0.038)	0.04	(0.035)
Constant	-0.289	(0.328)	-1.15	(0.323)**
Region dummies	yes			
District dummies	yes			
Rho	-.137	(0.043)		
Wald test, rho=0: chi2(1) (Prob)	9.627	(0.002)		
Log pseudo likelihook	-20004.5			
Observations	1780			

Significant at 5%; ** significant at 1%.

With respect to household head characteristics, gender as well as age of the head has an insignificant impact on both binary outcomes, a finding also reported in Cockburn (1999). On the other hand, children from households headed by a person with at least primary education are more likely to attend school. Phoumin and Fukui (2006) also found inverse association between child work participation and head's education. It is interesting to note that compared with children from households with a farmer head, children from households with an unemployed head are less likely to participate in market activities. This is to be expected since unemployed heads are less likely to own land and hence their children are less likely to be involved in farm activities.

Children from large households are more likely both to attend school and to participate in market activities. This is not surprising since combining work and schooling is a common phenomenon in rural Ethiopia. The birth order coefficient is significant only in the school attendance equation, implying that there is less likelihood of school attendance by late births. Bhalotra *et al.* (2001) found birth order to have an insignificant impact on child farm hours in Ghana. It is often argued that what matters for the parents' decision on the allocation of children's time is not only household resource and family size but household composition. Benjamin (1992), for example, argued that if labour markets are imperfect, then farm labour usage will be a function of household composition. The impact of household composition of course depends on the type of work activity and the ease of substitutability between child and adult labour.

The results reported in Table 1 imply an inverse relationship between the number of dependents and children on the one hand and the likelihood of school attendance and market work participation on the other. While having a large number of young children increases the demand for caretaking, large number of school aged children makes the competition over resources stiffer, making school attendance less of an option for at least some of the children. This finding is important since it shows that factors that reduce participation in one type of work activity do not necessarily lead to higher school attendance in the context where children are required to perform multiple tasks.

Of the two wealth indicators, only livestock size has a significant impact with children from households that own large livestock population being more likely to attend school. It is interesting to note that children from such households are also more likely to participate in market activities that include farm work and herding. This finding does not support the argument that wealthier households are less likely to involve their children in work activities. The relationship between wealth and child labour may depend on a family's position on the wealth ladder and it may very well be the case that at a very low level, as is the case in Ethiopia, increases in wealth may trigger a higher demand for adult labour in general and that of children in particular. In the Ethiopian case, animal rearing is highly labour intensive where children are required to spend, on average, 31 hours a week looking after animals. In such a situation, an increase in wealth, which increases livestock ownership, is likely to increase the demand for child herders.[14]

5.2 Domestic Work vs. School Attendance

Table 2 present results from the bivariate probit for school attendance and domestic work participation. As with the schooling and market work equations, the coefficient of correlation between the errors is statistically significant, justifying, once again,

[14] Based on a study of the allocation of child use in Ethiopia, Woldehanna *et al.* (2005) argued that the emphasis given to the highly labour intensive Agricultural Development-Led Industrialization (ADLI) policy of the Ethiopian government has worked to the detriment of child welfare. They report that rural children are increasingly involved in work activities, especially care for livestock purchased through credit programmes designed to improve aggregate household incomes.

the use of the bivariate probit model. Unlike the findings for market work, where male children are more likely to participate, the probability of domestic work participation is higher for female children. This is in line with the discussion in Section 3 where the percentage of girls who undertake domestic work activities is found to be three times that of male children. It is interesting to note that compared with children aged 7-9, children aged 9.1-12 and 12.1-15 are more likely to participate in domestic work activities including water/firewood fetching, caretaking, and other activities. Being a biological child is also found to increases the likelihood of participation in domestic work activities. That the coefficient of birth order is negative implies that late births are less likely to participate in domestic work activities. On the other hand, none of the household demographic variables seem to have a significant impact on the likelihood of domestic work participation. The sign, magnitude and significance of the variables in the schooling equation are very similar to those in Table 1.

Table 2: Bivariate probit, domestic work & school attendance, children aged 7-15.

	Domestic work		Schooling	
	Coeff.	Std. err	Coeff.	Std. err
Male	-0.959	(0.075)**	0.161	(0.064)*
Age (9-12)	0.521	(0.090)**	0.773	(0.082)**
Age (12-15)	0.521	(0.108)**	0.669	(0.098)**
Biological child	0.348	(0.122)**	-0.032	(0.117)
Male household head	-0.118	(0.177)	-0.237	(0.165)
Age of household head	0.005	(0.004)	-0.004	(0.003)
Household head domestic worker	0.046	(0.185)	-0.139	(0.179)
Household head unemployed	0.174	(0.177)	0.09	(0.153)
Highest education of head	0.174	(0.105)	0.393	(0.090)**
Household size	0.039	(0.060)	0.197	(0.055)**
Birth order	-0.141	(0.041)**	-0.115	(0.035)**
No. of dependants (<6 or 60+ years)	-0.009	(0.066)	-0.222	(0.061)**
No. of children (6-15 years)	-0.012	(0.057)	-0.152	(0.052)**
Young adults 15 to 25 years	-0.013	(0.073)	-0.152	(0.065)*
No. adults 25 or more	-0.022	(0.072)	-0.136	(0.068)*
Off-farm activity	0.148	(0.104)	-0.117	(0.090)
Livestock (no.)	-0.01	(0.011)	0.032	(0.011)**
Land size (ha.)	-0.021	(0.036)	0.04	(0.035)
Constant	0.021	(0.333)	-1.147	(0.320)**
Region dummies	yes			
District dummies	yes			
Rho	0.107	(0.047)		
Wald test of rho=0:chi2 (1) (Prob)	5.106	(0.024)		
Log pseudo likelihood	-1891.0			
Observations	1780			

*Significant at 5%; ** significant at 1%.

The bivariate probit model allows the computation of marginal effects which give the relative magnitudes of particular effects on the joint probability of interest. Tables 3 and 4 below report marginal effects of the probability of combining the two types of work activities and schooling.

Table 3: Marginal effect, school attendance & market work[15]

	Market work & schooling [y=Pr(market=1, sch=1)=0.21]			Market work & no schooling [y=Pr(market=1, sch=0)=0.32]			No market work & schooling [y=Pr(market=0, sch=1)=0.22]		
Variable	dy/dx	Std. err	Z	Dy/dx	Std. err	Z	dy/dx	Std. err	Z
Male	0.187	0.017	10.94	0.156	0.020	7.70	-0.124	0.017	-7.14
Age (9-12)	0.190	0.024	7.86	-0.137	0.024	-5.67	0.110	0.023	4.66
Age (12-15)	0.166	0.030	5.44	-0.122	0.028	-4.32	0.095	0.028	3.34
Bio child	-0.007	0.031	-0.25	0.004	0.039	0.10	-0.036	0.034	-0.11
Male head	-0.008	0.043	-0.20	0.091	0.049	1.84	-0.086	0.052	-1.65
Age head	0.000	0.000	-0.99	0.001	0.000	1.04	0.000	0.000	-1.07
Hh size	0.063	0.015	4.07	-0.015	0.017	-0.85	0.014	0.014	0.97
Birth order	-0.027	0.009	-2.81	0.021	0.011	1.81	-0.018	0.009	-1.90
Dependants	-0.077	0.016	-4.59	0.010	0.019	0.52	-0.010	0.016	-0.65
Children	-0.070	0.014	-4.78	-0.013	0.016	-0.83	0.009	0.014	0.68
Young adults	-0.047	0.018	-2.58	0.014	0.020	0.70	-0.013	0.017	-0.78
Adult	-0.054	0.018	-2.94	-0.003	0.021	-0.15	0.001	0.018	0.07
Head dom.	-0.051	0.040	-1.28	-0.002	0.060	-0.04	-0.004	0.050	-0.09
Head unemp.	-0.074	0.031	-2.36	-0.122	0.041	-2.92	0.107	0.051	2.09
Head_educ	0.076	0.027	2.82	-0.089	0.027	-3.31	0.078	0.027	2.85
Off_farm act	-0.039	0.023	-1.72	0.001	0.030	0.05	-0.004	0.025	-0.17
Livestock	0.015	0.002	5.35	0.003	0.003	1.14	-0.002	0.002	-0.98
Land	-0.004	0.009	-0.39	-0.022	0.011	-1.93	0.019	0.009	1.93

(*) dy/dx is for a discrete change of the dummy variable from 0 to 1
Marginal effects computed at the mean values of the respective variables
Note that the marginal effects across the four possible categories should sum to zero.

In a country like Ethiopia where children are likely to undertake multiple activities and where combining school with work is common, assessing factors that affect the likelihood of combining school with each work type helps better understand the trade-off, if any, between child labour and human capital formation.[16] As can be seen from Table 3, being a male child increases the probability of combining school with market work by 19 percentage points. Ceteris paribus, children whose age is between 9-12 and 12-15 are 19 percentage points and 16 percentage points more likely to combine school attendance with market work than those aged 7-9. It is also interesting to note that an increase in family size by one (from the mean of 7.7 to 8.7) increases the probability of combining school and market work by 6 percentage points. On the other hand, a unit increase in each of the household demographic composition (dependents, children, youngsters, and adults) reduces the likelihood of combining market work and school attendance by 4 percentage points -7 percentage points. An increase in livestock by one livestock unit increases the likelihood of combining market work with schooling by 1.5 percentage points. Children from households with head having at least primary education are less likely to engage in market work without attending school. Also, being female increases the joint probability of participating in market work without attending school. Compared with children aged 7-9, those in the age group 9-12 and 12-15 are less likely to be characterised by either school attendance or participation in market work.

15 Values for marginal effects & standard errors are rounded to three decimal places.
16 Attempting to analyze such possible trade-off by lumping all types of work activities together is likely to hide interesting results, since reduction in the use of child labour in one area may increase it in another area.

Table 7 presents the marginal effect of the joint probability of combining domestic work and school. Unlike the finding for market work, where male children are more likely to combine work and schooling, female children are more likely to combine domestic work and school attendance. Compared with children aged 7-9, children over 9 years of age are more likely to combine domestic work with schooling. An increase in family size by one (from 7.7 to 8.7) increases the joint probability of combining domestic work with school attendance by around 7 percentage points. Though marginal, a unit increase in each of the household demographic composition variables reduces the likelihood of combining domestic work with school attendance. It is worth noting that later births are less likely to combine school attendance and domestic work. Also, children from households with a head having at least primary level of education are more likely (16 percentage points) to combine school attendance and domestic work than children from household heads with no education.

Table 4: Marginal effects, school attendance & domestic work

	Domestic work & schooling [y=Pr(domestic=1, sch=1)=0.36]			Domestic work & no schooling [y=Pr(domestic=1, sch=0)=0.42]			No dom. work & schooling [y=Pr(domestic=0, sch=1)= 0.09]		
Variable	dy/dx	Std. err.	Z	dy/dx	Std. err.	Z	dy/dx	Std. err.	Z
Male	-0.068	0.022	-3.07	-0.212	0.022	-9.52	0.131	0.011	11.19
Age (9-12)	0.304	0.027	11.01	-0.157	0.027	-5.65	-0.003	0.012	-0.29
Age (12-15)	0.275	0.034	7.99	-0.131	0.032	-4.02	-0.013	0.014	-0.93
Bio child	0.039	0.037	1.05	0.075	0.039	1.91	-0.052	0.023	-2.22
Male head	0.089	0.059	-1.51	0.055	0.056	0.98	-0.004	0.026	-0.17
Age head	0.000	0.001	-0.74	0.002	0.001	1.91	0.000	0.000	-1.88
Hh size	0.065	0.019	3.39	-0.054	0.019	-2.84	0.012	0.008	1.48
Birth order	-0.053	0.012	-4.29	0.010	0.012	0.86	0.007	0.005	1.28
Dependants	-0.069	0.021	-3.27	0.066	0.020	3.19	-0.018	0.009	-1.98
Children	-0.048	0.018	-2.62	0.044	0.018	2.47	-0.011	0.007	-1.47
Young adults	-0.048	0.022	-2.15	0.044	0.022	1.96	-0.011	0.010	-1.14
Adult	-0.044	0.023	-1.89	0.037	0.023	1.61	-0.009	0.010	-0.88
Head dom.	-0.037	0.060	-0.62	0.051	0.062	0.82	-0.016	0.023	-0.72
Head unemp.	0.049	0.050	0.86	-0.000	0.052	-0.01	-0.013	0.021	-0.64
Head_educ	0.145	0.031	4.600	-0.095	0.031	-3.01	0.009	0.015	0.61
Off_farm act	-0.019	0.031	-0.610	0.062	0.032	1.94	-0.026	0.012	-2.09
Livestock	0.008	0.003	2.310	-0.011	0.003	-3.260	0.004	0.001	2.64
Land	0.009	0.012	0.800	-0.016	0.012	-1.320	0.006	0.005	1.17

(*)dy/dx is for discrete change of dummy from 0 to 1
Marginal effects computed at the mean values of the respective variables

Female children are more likely (21 percentage points) to engage in domestic work only. A unit increase in the number of dependents, children, as well as adults reduces the likelihood of combining school and work attendance by 4-6 percentage points and increases that of engaging in domestic work only. While an increase in family size by one increases the probability of combining school attendance and domestic work by 7 percentage points, it reduces the likelihood of engaging in domestic work and no schooling by 5 percentage points. Other things equal, being male increases the likelihood of school attendance with no participation in domestic work activities by 13 percentage points. Also, male children are less likely to engage in domestic work. It is interesting to note that land size does not have a significant impact on any of the joint outcomes. Bhalotra *et al.* (2001) also found insignificant impact of land size on farm work by Ghanaian children.

5.3 Educational Attainment vs. Work Hours

Finally, results from Maximum Likelihood estimates of educational attainment are given in Table 5 below. As before, we use regional and district dummies to control for potential differences in educational attainment caused by differences in school infrastructure among regions/districts.

Table 5: Tobit estimates of Grade- for- Age, children Aged 7-15

	Coeff.	Std. err
Lnhr	-14.805	(2.547)**
Male	10.846	(3.944)**
Age (9-12)	8.024	(5.455)
Age (12-15)	4.176	(6.447)
Male head	-8.048	(10.82)
Age head	-0.252	(0.191)
Age started work (child)	-1.392	(1.309)
Education of head	16.679	(5.507)**
Household size	9.574	(3.382)**
Birth order	-6.124	(2.250)**
No. of dependents	-12.546	(3.711)**
No. of children (6-15)	-8.899	(3.272)**
No. of young adults (15-25)	-10.05	(3.966)*
No. of adults (25+)	-5.742	(4.170)
Head engaged in domestic work	4.137	(11.70)
Head unemployed	10.303	(9.970)
Land size (Ha.)	5.812	(2.163)**
No. livestock	2.326	(0.659)**
Region Dummies	yes	
District Dummies	yes	
Tobit Log-likelihood	-4788.85	
Observations	1563	

Dependent variable is Grade-for-Age
* Significant at 5%; ** significant at 1%
802 left-censored observations
761 uncensored observations

The fact that the dependent variable is an index and the variable of interest - (log) of work hours- is a latent variable precludes a straightforward interpretation of the estimated coefficient. Nevertheless, the negative coefficient of (log) work hours implies an inverse association between work hours and educational attainment. A similar result is obtained by Ray (2001a).

6. Conclusion

Despite the broad consensus on the detrimental impact of child labour on educational outcomes, millions of children are involved in various work activities world wide. Though Asia harbours the largest population of child labourers, SSA ranks top in terms of the participation rate of children with one in every three children below the age of 15 engaged in economic activities. Ethiopia is no exception to this. In general, Ethiopian children start participating in work activities at an early age (as early as five years old). Work participation rate is very high even by SSA standards, and children spend long hours on work activities within and outside the household. Also, 'specialization' seems to exist in the use of child labour with female children largely responsible for undertaking domestic chores

and male children responsible for market activities that include farm work and animal herding. More often than not, children combine school and work with school attendance being the only responsibility for quite a small proportion of children (one in every five). Among others, responsibilities on family farms and within the household are important factors that prevent school attendance.

Results from bivariate probit analysis reveal that male children are more likely to attend school and to combine school with market work. On the other hand, female children are more likely to combine domestic work with school attendance or engage in domestic work with no school attendance. Compared with children aged 7-9, older children are (*i*) more likely to combine market work and school, (*ii*) more likely to combine domestic work and schooling, (*iii*) less likely to be involved in market work without attending school, and (iv) less likely to be 'inactive'.

Children from households with head having at least primary education are found to be more likely (less likely) to attend school (engage in market work only) lending support to findings by previous studies. An increase in family size by one (from the average 7.7 to 8.7) increases the likelihood of combining school with both types of work activities by around 7 percentage points. It also reduces the likelihood of being 'inactive'. As such, an increase in family size is more of a burden on children. A large number of dependants is found to reduce the likelihood of both market work participation and school attendance, while it increases that of domestic work participation. This is to be expected since caretaking is an important component of domestic work undertaken by children. While a large number of dependants as well as children aged 6-15 reduces the likelihood of combining domestic work with school, late births are less likely to participate in domestic work activities. Of the two indicators of wealth, only livestock population affects the allocation of children's time. Specifically, a large livestock population (marginally) increases the likelihood of combining school attendance with market work, one aspect of which is time spent on herding. Results from tobit estimation of the equation for age-adjusted educational attainment reveals an inverse association between hours of work and educational attainment implying the detrimental impact that long hours of work have on human capital formation.

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Appendix

All variables need to be fully labelled

Table1: Descriptive statistics on model variables

Variable	Description	Mean (SD)
Child Characteristics		
age_1	(=1 if 7<=child age<=9) (Omitted Category)	0.32 (0.46)
age_2	(=1 if 9<child age<=12)	0.36 (0.47)
age_3	(=1 if 12<child age<=15)	0.32 (0.46)
bio	(=1 if a biological child)	0.85 (0.35)
sex	Child sex (=1 if male)	0.51 (0.49)
start_age	Work starting age of the child	6.41 (1.69)
sch	Current school attendance (=1 if child attendance)	0.44 (0.49)
GAGE	Grade-for-Age	27.80 (41.24)
market	(=1 if child participates in domestic work activities)	0.69 (0.45)
domestic	(=1 if child participates in market work activities, 0 otherwise)	0.55 (0.49)
Hr	Hours of work (domestic and market) (per week)	34.21(25.86)
lnhr	(Log hrs of work (domestic & market) (per week)	3.33 (0.87)
Parent Characteristics		
ageh	Household head age (in years)	49.65 (13.04)
sexh	Household head sex (= 1 if male, 0 female)	0.82 (0.38)
edu_h	Education of the head (=1 if at least primary and 0 if illiterate)	0.20 (0.40)
head_farm	(=1 if head's primary occupation is farming) (Omitted category)	0.72 (0.44)
head_dom	(=1 if head's primary occupation is domestic work)	0.11 (0.31)
head_unemp	(=1 if head is unemployed)	0.16 (0.36)
Household Characteristics		
off_farm	(=1 if at least one HH member engages in off-farm activities)	0.23 (0.42)
hsize	Household size	7.15 (2.72)
birth	Child birth order, higher value imply late births & vice versa	3.57 (1.61)
dep	# dependents less than 6 years old and above 60 years	1.80 (1.36)
child	# children aged 6-15	2.11 (1.47)
youngm	# males aged 15.1 – 25	0.73 (0.92)
youngf	# females aged 15.1 – 25	0.63 (0.76)
adult	# of individuals aged 25.1 – 60	1.87 (0.95)
land*	Land owned by the household (hectares)	1.6 (1.54)
livestock	Livestock population owned by the household	3.67 (3.7)

Notes: 1. Figures in parenthesis are standard deviations
(*) Land is the sum of cultivable land, fallow land, rented out land, shared out land, land in the garden and grazing land.

Table 2: Work starting age (%) for children aged 4-15

	Region				
Starting age	Tigray (251)	Amhara (608)	Oromia (973)	SNNPRS (786)	Total
2	.	0.49	.	1.53	0.57
3	1.2	.	0.21	4.2	1.57
4	17.93	7.89	5.14	21.5	11.92
5	43.82	27.47	15.93	54.45	32.85
6	69.32	51.81	33.7	77.35	54.35
7	86.85	76.97	64.44	88.68	76.78
8	97.21	88.98	84.89	96.69	90.57
9	98.41	92.27	88.69	98.22	93.32
10	100	98.68	97.23	99.36	98.47
11	.	99.18	98.15	99.75	99.05
12	.	99.51	99.59	99.87	99.69
13	.	99.67	99.79	100	99.85
14	.	99.84	100	.	99.96
15	.	100	.	.	100

Source: Own Computation, ERHS 1999.

'.' = no child being reported to have started working at that age.

Table 3: Average hours of work, children (4-15) (conditional on working), rural Ethiopia, 1999

Type	Total	Male	Female
1. Fetching of fuel/water (N= 1051)	11.0 (8.5)	10.0 (8.5)	11.5 (8.5)
2. Domestic Chores (N=748)	14.3 (11.3)	12.8 (12.8)	14.7 (10.8)
3. Child Care (N=335)	16.7 (13.4)	14.8 (13.8)	17.5 (13.1)
4. 'Other' Activities (N= 335)	10.0 (8.4)	10.3 (8.2)	10.3 (4.0)
5. *Domestic work*	23.6(20.0)	17.2 (15.7)	28.2 (21.6)
6. Farm Work (N= 364)	16.6 (12.2)	18.4 (12.7)	13.5 (10.8)
7. Herding (N=995)	30.9 (20.8)	33.2 (20.4)	26.9 (19.8)
8. *Market work*	31.4 (20.8)	34.7 (21.0)	25.3 (19.3)
Total hour(N= 1843)	37.5 (24.8)	37.9(23.8)	37.1 (25.9)

Source: Own Computation, ERHS 1999.

Notes: 1. Figures in parenthesis are standard deviation.

2. Zero hour of work is assumed for those with missing value.

Table 4: School Attendance for individuals aged 8-18

Category	% Attending Regularly (N=1218)	% Never attended (N=1196)	% Discontinued (N=150)
Male	57	47.6	54
Female	43	52.4	46

Source: Own Computation, ERHS 1999.

Table 5: Time allocation of children aged 8-15

Mutually exclusive categories	Percentages		
	Total (N=2452)	Boys (N=1316)	Girls (N=1136)
School only	*17*	*19*	*15*
Neither	*20*	*18.5*	*22*
Work only	*37*	*35*	*39*
Domestic Work Only	32.5	15	49.3
Market Work Only	28.7	47.5	11
Domestic Work & Market Work	38.8	37.5	39.7
Total	*100*	*100*	*100*
School and work	*26*	*27.4*	*23.8*
School and Domestic Work Only	37	20.7	56.8
School and Market Work Only	21.2	31.8	8.2
School and both Work types	41.8	47.5	35.2
Total	*100*	*100*	*100*

Source: Own Computation, ERHS 1999

Table 6: Reasons for not attending/discontinuing school (8-18)

Main Reason (In order of decreasing Importance)
Too Young
Required for Domestic Work
Required for Farm Work
Too Expensive to go to School
Child Health/Age Reasons
Absence of Schools in the Vicinity
Schooling is not believed to Increase Income
Required for Wage Work
Other Reasons*
Education not Appropriate for Female Children
Required to take care of the Elderly/Sick

Source: ERHS 1999.
(*) Included in this category are: marriage, security reasons, death of mother, language problem, academic failure, and limited knowledge about the importance of education.

Table 7: Animal unit (AU) equivalent used to compute total no. of livestock owned

Livestock Type	AU Value
Calf	0.25
Young Bull	0.34
Bull	1
Ox	1
Heifer	0.75
Cow	1
Sheep	0.13
Goat	0.13
Horse	1
Donkey	0.7
Mule	1
Chicken	0.013

Source: ERHS, 1999.