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Graduate School of Development Studies

**PRODUCTIVE PHYSICAL ASSET OWNERSHIP,  
AND CHILD WORK AND SCHOOLING DECISION IN  
RURAL ETHIOPIA:  
*MULTIVARIATE ANALYSIS***

A Research Paper presented by:

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## **DEDICATION**

TO MY LOVELY AND CARING MOTHER (BELETU SHIFERAW), MY BROTHER DR. TENA SHIFERAW AND HIS WIFE (Mrs. KIZITA ZONNEVELD), MY BROTHER (ATO TILAHUN JABESSA), AND TO ALL MY FAMILY AT LARGE

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

Worldwide children are involved in some sort of work even though the magnitude and type of work they are engaged in varies from country to country and from household to household. Because of these differences in magnitudes and types of work, it is very problematic to give a neat definition for what child work is.

Different International organizations like ILO and UNICEF argue that children should not be involved in work activities which are detrimental to their proper physical, mental, social, and psychological development. However, in Ethiopia, and other developing countries there is low schooling and high rate of child work and this low schooling and high rate of child work varies by gender. In these developing countries, children are found to be engaged in four major activities of work only, schooling only, schooling and work, and neither schooling nor work.

In categorizing children's main activities in to four, different empirical studies use different methods. Some use 15 hours of work per week as cutoff point while others categorize children in to these activities by asking children what their main activity. There are also others who classify child activities by taking an arbitrary hour of work.

An empirical study carried out in America by Steinberg and Dornbusch (1991) found that 20 hours of work per week is a critical threshold for adverse impact on school performance of children. However, in the rural Ethiopian context, 25 hours of work is found to be the critical threshold hours of work which adversely affects regular school attendance and performance of children. Hence, it is reasonable to use 25 hours of work per week in categorizing children activities in to four by combining it with the information as to whether the child attends school regularly or not. This threshold hour of work will also be used for the purpose of multivariate analysis in categorizing children in to four main activities of mainly school, mainly work, school and work, and neither school nor work. However,

some sensitivity analysis will be made by taking several hours of work per week as cutoff points.

In a rural household child time allocation decision, parents or an adult person in the household is considered to make the major time allocation decision on behalf of children. Parents or an adult person in the household makes the time allocation decision based on child characteristics, household characteristics, school characteristics, and community characteristics.

### **1.2 Statement of the Problem:**

Among the household characteristics, there are controversies as to the impact of productive physical assets on household time allocation decision because of the presence of income effect and substitution effect. Here, the income effect is that the ownership of productive physical assets increases income of households so that they have enough finance to send their children to school than to work. The substitution effect however is that the ownership of some productive physical assets increase the productivity of child labour at home that parents may decide to keep their children at home and work for them than sending to school. If the income effect of wealth or physical asset ownership dominates, we can call the productive physical assets as labour decreasing. On the contrary, we can call a productive physical asset as labour increasing if the substitution effect dominates. Regardless of the controversies, the provisions of productive assets are being used as a poverty reduction strategy. However, some of these productive assets are labour increasing and reduce the probability of the child to go to school and work against the poverty reduction strategy. Of course, there are also some productive assets, which are labour decreasing and encourage children to go to school. Thus, it is important to isolate the labour increasing productive physical assets from the labour decreasing ones. In addition to this, there is a common perception to consider children of wealthy families to work less hours of work and more likely to go to school and less likely to go to work activities which are against their regular school attendance and school

performance. Despite this common perception, a study undergone by Bhalotra & Heady (2000) on Pakistan and Ghana has found the presence of wealth paradox especially for girls. This wealth paradox, according to this study, is that children in land rich households are more likely to be in work than children of land-poor households.

### **1.3 Objectives of the Study:**

- To separate labour increasing productive physical asset from labour decreasing productive physical assets.
- To see the impact of control variables like child characteristics, school characteristics, community characteristics, and other household characteristics in child time allocation decision.
- To give policy recommendations as to how the different asset ownership patterns affect child time allocation decisions and to give a clue as to how it is possible to be at the win-win situation of reducing child work and poverty through the provision of some productive physical assets.

### **1.4 Research Hypothesis:**

- Children who belong to productive physical asset abundant households work less number of hours of work and their probability to attend school regularly is higher as compared to those who belong to productive physical asset poor households.

### **1.5 Significance of the study:**

Although a lot has been done on the determinants of schooling and child work in Ethiopia, there are only very few studies which have given an in depth analysis in separating labour increasing productive physical assets from labour decreasing productive physical assets. Despite the possibility of finding labour increasing and labour decreasing productive physical assets, the provision of productive

assets which are labour increasing are also being used in poverty reduction strategies. Thus, separating labour increasing productive physical assets from labour decreasing physical assets is of great importance to be at the win-win situation of reducing poverty and reducing child work.

### **1.6 Data Source:**

The data that has been used in this study is from the rural household survey conducted by Addis Ababa University of Ethiopia for the year 1997. It encompasses 3677 observations of children within the age group of 4-15. The data covers a sample survey of six regions out of the nine regions in Ethiopia.

### **1.7 Scope and Limitations of the Study:**

It is difficult, if not impossible, to cover all the determinants of child time allocation decision in depth. For this reason, this paper gives greater coverage to one of the household characteristics, i.e., productive physical asset ownership, and sees how it affects child time allocation. As it is mentioned in the statement of the problem, productive physical assets can have controversial effects. In resolving these controversies of the effect of productive physical asset in child time allocation decision in to schooling and work, it is better to have data as to which productive assets the household uses rather than taking the ownership of these assets. However, because of the non-availability of data on the number and size of productive physical assets used by the household, the number and size of productive physical assets owned by the household is employed in the analysis assuming therefore that all assets are fully employed by the household.

### **1.8 Organization of the Paper:**

This paper is organized in to six chapters. The first chapter gives an introduction of the whole paper. Chapters one and two give the literature review and the econometric model to be used in analyzing the impact of asset ownership on

child work and schooling. The descriptive analysis and the multivariate analysis of child work and schooling are given in chapters four and five respectively. Chapter six gives concluding remarks of the major findings.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Definitions and Typologies of Child Work

It is undeniable that children are engaged in some sort of work worldwide. However, the nature and magnitude of the work children are engaged in varies. Because of this diversity in the nature and magnitude of child work, it is very problematic to make a neat classification of child work. For instance the International Labour Organization (ILO) grouped working children according to the following categories: children who work in economic activities, those who are engaged in hazardous work and other worst forms of child labour (ILO, 2002b). Whether all kinds of economic activities including unpaid work on family farm, household enterprise, child care, herding, cooking, and, fetching water, which are detrimental to the health, education and normal development of the child should be taken as child work or whether child work should be viewed only as wage employment are still controversial issues. Some authors like Boyden (1998) and others classify working children in to three groups. The first group is comprised of children in occupations or working conditions that are clearly hazardous or seriously detrimental to their well being and development. Sometimes, they are referred to as those engaged in intolerable forms of child work which merit very high concern. The second group refers to those children who are in a 'grey' area of less objectionable work that may or may not contain potentially detrimental aspects, or who are at substantial risk of falling into detrimental work. The third group comprises of children whose work is not harmful to their well being or development and might even be beneficial. Both categorizations are more or less the same, but not identical. Somehow, this is an indication of the difficulty in coming up with a precise definition of 'what is' and 'what is not' child work.

Based on employment relationships, (Fyfe, 1993) also categorized child work into five major groups. These are domestic work, non-domestic and non-paid farm work, wage labour, employment in the informal sector and bonded or tied labour.

Mendelievich (1997) classified working children into – children who work on their own account, wage earners who are paid on the basis of the hours of time spent on work and piece rate, children who are assisting an adult who by himself or herself is engaged in a paid activity, and children who work for their family without any payment. Here, Mendelievich ignored the bonded form of child labour where children are forced to work for others to settle off debts of their parents.

According to the ILO and UN Conventions, the main criteria for classifying children activity as child work are based on the age of the child, the nature of the work, and hours of work. Age is a crucial factor because up to certain age the primary occupation of children should be obtaining an education and other activities which are appropriate for their healthy development, including play (Admassie, 2000). However, age alone may not always be a sufficient condition for defining child labour (Blanc, 1994). The ILO Convention 138 on minimum age for employment states that the minimum age, should not be less than the age of compulsory education (schooling). According to this convention, the minimum age for employment shall not be less than 15 years and this is implicitly or explicitly used as the benchmark and blue print for defining child work and for formulating national policies and practices (ILO, 1973). Although there are some who argue that any kind of work activity performed by children below the age of 15 years is illegal and should be banned, UNICEF considers all those below the age of 18 as children and argues that unless the work endangers children's physical, cognitive, social and psychological development it may not necessarily be bad (UNICEF, 1997a).

In spite of the controversies surrounding the definition of child work, it seems that there is general agreement that work becomes unacceptable when children are made to work at very young ages for long hours, work for too little pay and work under hazardous conditions (Bequelle, 1991; Fye, 1993). As Myers (1991) stressed, the concept of work hazard needs to be child centered, focusing not only on factors of immediate jeopardy but also those that retard child development over the long term.

Since the unpaid work in informal sectors are usually serious burdens and risk to children, considering child work, as only those who are engaged in paid works could be too restrictive ignoring millions of children who work in the informal sector. Hence, it is essential to understand child work in its broadest sense in order to capture its different forms. Here, it has to be noted that it may not be work by itself which is bad, rather, it is the long term effect of work that determines whether work is exploitative, detrimental or not.

For instance, the ILO Convention No. 10 (1921) provides that child work on light agricultural activities can be arranged, particularly, at harvest seasons, in such a way that total annual period of school attendance is not less than eight months. The other ILO Convention, Convention No. 33 (1932), which allows the minimum age at 14 years in non-industrial jobs, allows children over 12 years to be employed, outside school hours, on light work. This convention also imposes the restriction that such work is prohibited at night (between 8 p.m. and 8 a.m.) and is to be limited to *two hours a day* on school days or holidays.

Taking the different arguments about child work and the restrictions imposed on the hours of child work in to consideration, this paper deals with the most dominant forms of child labour in African countries. These dominant forms of child labour include domestic work, farm work, cooking, fetching water, and collecting wood, herding, and childcare. These forms of child work unlike in Asia are very common in Ethiopia and other African countries and they compete significantly the time of children for their regular school attendance and school performance. However, they are not given proper attention in most literatures so far.

## **2.2 Determinants of Child Work and Schooling**

Children have always been part of economic life in societies. Historical evidences also show that the contribution of children to family income either in kind or in cash is very significant. According to the source from International Labour Organization (ILO, 1997), about one in seven of the world's children participate in



labour activities, with significant regional differences. For instance, child labour force participation rates in South America, the Caribbean, and Central America are 13%, 8%, and 10% respectively (Grootaert & Kanbur, 1995). However, it varies from about 27% to 54% in African countries.

As it was estimated by ILO (1997), worldwide, up to 250 million children under the age of 15 are forced to work among which more than 95% are found in the developing countries. The majority of these children either do not have access to education as a result of their being in child work or they just combine child work with schooling and as a result their performance at school is poor.

Currently, the issue of child work and school outcome is receiving greater attention from the academic professionals, media, and international organizations especially with the emergence of problem of child labour. Among the international organizations, ILO and UNICEF are taking up the issue in various public forums. This concern about child labour is based largely on three broad perspectives.

"The first concern is the humanitarian concern. This concern emphasizes the need to protect children from the worst forms of child work such as the sale, trafficking, bondage and serfdom of children, compulsory recruitment, the use of children in sex industries and drug trafficking, as well as other forms of work that are likely to harm the health, safety or moral of children (ILO). The second concern of child labour is related to the interference of child work in school attendance and school performance. The final and the third concern are related to the anticipated micro-and macroeconomic impacts and the intricate linkage of child labour to poverty" (Admassie, 2001).

Although some argue that the activities of children that do not constrain the human capital development are stimulating rather than being detrimental to social and private returns, many empirical studies show that child labour directly competes with school attendance.

Work can seriously disrupt education in a number of ways (Boyden et al., 1998):

- In making children to leave early from school and start late;
- In taking children away from where schools are located;

- work can push children away from school in providing them an additional source of income and independence,
- work may exhaust children to go to school and may also decrease their concentration in class and in doing their homework;
- children who miss class because of work responsibilities may fall behind their peers and become discouraged, especially when they have to repeat school years;
- children who are exploited at work may not have the confidence to attend school.

However, child work may not necessarily be the exact inverse of school participation. If children are engaged in work, this may not necessarily mean that they do not have access to formal schooling, as there is a possibility of combining both school attendance and work. Empirical evidence from different countries also indicates that most children combine school attendance with work (Admassie, 2001). Hence, whether child labour is harmful or not may depend on whether children work longer or shorter as the number of hours of work tends to have a detrimental effect on children's ability to learn and potentially decrease the probability of the child to attend school regularly.

In reviewing different child labour literatures, a variety of child labour supply and schooling determinants were identified. Some of these determinants are economic in nature while others are sociological in nature. These determinants can be classified into four main categories of individual characteristics, household characteristics, school characteristics, and community characteristics. Among these determinants, this paper will give greater coverage to one of the household characteristics, i.e., productive physical asset ownership, and see which productive physical assets are labour increasing and which are labour decreasing.

One of the most important socioeconomic characteristics which has received much attention in different literatures of child work and schooling is permanent income. However, in developing countries like Ethiopia, where the economy does not depend heavily on market for consumption and production, it is hard to find

the inter-linkage between income and household time allocation (Admassie, 2001). Nevertheless, in rural Ethiopian context, it is reasonable to use physical asset ownership in place of monetary income and see its impact in child time allocation decision because of the view that using financial asset ownership is constrained by less financial market development in the country in general and in rural areas in particular.

Here productive physical asset ownership means the ownership of land, small animals (like goat, sheep, oxen, and farm assets), use of modern agricultural technologies (like improved seeds, herbicides, and mechanical power), use of irrigation facilities, participation in extension services and others. The multiple effects of these productive physical assets on child work and schooling can be demonstrated by using one of the productive physical assets, land. However, this does not mean that the other productive physical assets are not important since they will be discussed later on. Land is a form of wealth, and wealth is likely to have a positive effect on school attendance and decrease the probability of working. On the other hand, land ownership raises the productivity of child labour within the household, and hence the opportunity cost of school attendance (Dreze and Kingdon, 1999). Thus, policies that target the provision of physical productive assets in poverty reduction should give greater attention as to which types of productive assets increase the incidence of child work and discourage schooling. This is because of the view that some productive assets might discourage schooling and work against the poverty reduction program.

Several other factors are also expected to have an impact in parents child time allocation decision in to the four activities of mainly schooling, mainly work, school and work, and neither school nor work. These are among others poverty, tradition, size of the family, labour scarcity, wage rates, illiteracy, schooling facilities, and neighborhood effect (Dinesh, 1988). Although these factors are inter-linked and exert their influences directly and/or indirectly on the work participation of children, it is almost universally accepted that poverty is the main cause of child work in developing countries (Myers, 1991). While, this generalization may not tell us the whole story nor does it explain the immediate

factors leading some impoverished children to assume heavy economic responsibility while others do not. For instance, a straightforward survey on 100 street trading children undertaken by Oloko in Nigeria found that some young street traders are from relatively affluent families, and they are engaged in the business for excitement and pocket money (IBID). Moreover, some other studies, like Cockburn (2000) and Bhalotra (2000) have found that asset rich households, like those who have large areas of land for cultivation are the ones where child workers are common.

Although greater coverage is given to the effect of differences in ownership of productive physical assets; other household, individual, school, and community characteristics will also be discussed.

Among the other household characteristics, parental education has often emerged as a determinant of school attendance and child work among children many developing countries (Dreze and Kingdon, 1999). This pattern is usually read as a link running from parental education to school attendance, but it may also reflect the influence on both of these of some variable not included in the model (e.g. the quality of schooling facilities in the area, distance from school).

Individual characteristics like sex and age of children are also important as most rural households have differences in preferences as to whether they decide to send boys or girls to school or to work or whether they decide to send younger children or older ones to school or to work.

### **2.3 The Joint Decision of Sending Children to School and Work**

Different empirical studies approach the analysis of the determinants of child work and schooling in different ways. Some empirical studies, like Grootaert and Patrinos (1999) tend to use a sequential choice model, in which the first step models the choice between the preferred option and all other options combined and the second step models the second best choice against the remaining options, conditional on not having opted for the first-best choice. Grootaert (1999) argues that sequential approach is the most appropriate model for cases in which

a clear preference ordering of options is possible. Having this in mind, they put child time allocation decisions in the following hierarchy of choices: (1) schooling, (2) wage work, (3) home enterprise work, and (4) no work. However, there is no well-developed theoretical or empirical evidence whether households make child time allocation decision with such a sequence. The other alternative model for the analysis of the determinants of child work and schooling is to use multinomial logit model or multinomial probit model. Because of computational difficulties in handling large number of alternatives, the multinomial probit is used very rarely in recent studies. However, multinomial logit model is a power econometric model in handling large number of alternatives and is being used by many studies in dealing with cases especially where there are more than two alternatives in decision making. The results from this model also confirm many of the findings of the sequential probit model Grootaert and Patrinos (1999). Nevertheless, Multinomial logit model does also have some drawbacks due to the assumption of the independence of irrelevant alternatives (Madalla, 1983). However; this draw back can be overcome by some statistical techniques like Hausman test and by categorizing child activities in to mutual independent categories.

In developing countries in general and in Ethiopia in particular children are involved in some sort of work activities either in paid or unpaid form, schooling, combination of schooling and work or neither schooling nor work. Therefore, in order to use the multinomial logit model and reach at how productive physical assets and other household characteristics, child, school and community characteristics affect child time allocation decisions, it is very crucial to categorize child activities in to mutually independent choices. For instance, an empirical study carried out by Levison, Moe, and Knaul (2000) on Youth Education and Work in Mexico estimated their multinomial logit model by categorizing primary activities in to four independent alternatives of specializing in school, specializing in work, combining school and work, and neither school nor work. They based their categorization or cutoff by setting 15 hours per week of work and 15 hours of studying as a critical threshold level counting on their view that youth who attend a four-hour shift for at least four days per week as attending school.

Based on this way of categorization of youth (12-17 years of age) activities, they found that the presence of telephone, private bathroom, and flooring to be positively related to studying (Levison, Moe, and Knaul, 2000). However, they discovered that piped sewage has no effect on the probability of combining school and work while excluding housework from the definition of work though it has an unexpected positive effect while including housework in the definition of work. The same study has found for girls to be less likely to attend school regularly & carry out mainly work activities, and more likely to combine both school & work as compared to boys. Older youths are also found as more likely to work and sons and daughters of the household are more likely to specialize in school and less likely to specialize in work or to combine school and work than non sons and daughters living in household.

An empirical study by Grootaert (1999) also divided child activities in to four main categories and utilized sequential probit model though a comparison was made with the results of multinomial logit model. This study categorized child activities as school only (if a child attends school and not reporting any work), work only (not attending school and reporting work), school and work (attending school and reporting work), and neither school nor work (if not attending school & not reporting work). Based on this way of categorization, the empirical study found that the household's poverty status, the availability of employment opportunities within the household, geographic location, age and gender of the child, the education and employment status of parents to be the key factors for child time allocation decision.

Another study by Cartwright (1999), classified child activities in to school only (those enrolled in school who report no work), attend school and work (those who attend school and may work any number of hours), work only (children who are wage workers or family enterprise workers), and work in home care. Through this way of child activity categorization, this study found the results of multinomial logit model to be similar to the first stage of sequential probit model.

A study undertaken by Admassie (2001), on child work and schooling in Ethiopia, has also found that ownership of some assets, such as land and

livestock, can be obstacles to regular school attendance of children contrary to the view that accumulation of physical assets would raise household income and create an opportunity for school attendance. In Admassie (2001), although child activities are categorized in to four categories similar to other studies, the way of classification is not mentioned explicitly in the paper. Therefore, the current study categorize child primary activities in to the four categories of mainly schooling, mainly work, school and work, and neither school nor work by setting a specific critical threshold hour of work which is detrimental to regular school attendance and school performance of children in rural Ethiopia.

## CHAPTER THREE

### THE MODEL AND THE METHODOLOGY FOR CHILD TIME ALLOCATION DECISION

#### 3.1 Theoretical Model for Allocation of Children's Time

The decision for children to either go to school or to work or both is a time allocation decision. Here, the allocation of the time of a child is assumed to be determined by a household head or by an adult person in the household as the child below the age of 15 years is considered to be too young to make its own decision. The labour supply decision of the head of the household or the adult person in the household for children in the family is derived from a general model of consumer demand in which a fixed endowment of a commodity is divided into one part for sale on the market and another part reserved for direct consumption. In this instance, the endowment consists of a fixed block of time,  $T$ , which is to be divided between hours of child work and hours spent in non-work (like schooling and leisure). The reservation demand for hours of non-work simply consists of what is left over from hours of work.

To simplify, we consider a model of one member agricultural household that produces and consumes one marketable good and in terms of household decision making, for the time being, we adopt the unitary approach and neglect intra-household bargaining and distribution issues.

Here, the individual is considered to maximize its utility subject to its time and income constraint. Hence, the utility maximization according to a one member household model will be as follows:



$$(a) \quad U = U(C, h)$$

$$Q = f(L; A)$$

$$(b) \quad T = h + L^h \quad (\text{time constraint})$$

where, C = consumption  
 $h = S + I$   
 S = time allocated to schooling  
 I = time allocated to leisure  
 A = household asset (exogenous)  
 L = total child labour input in household  
 Production  
 $L^h$  = labour supply by the child  
 T = total time endowment of the household

Assuming that the income of the adult in the household is constant, the income constraint is:

$$(c) \quad Y + Q = C + w(L - L^h) + PS \quad (\text{income constraint})$$

where, Y = adult income  
 w = wage rate of child labour  
 P = price of schooling

Here, the assumption is there is hiring in & out of labour

By combining the time and income constraints, we get the overall constraint as:

$$Y + Q + wT = C + w(L - L^h) + PS + wS + wI + wL^h$$

$$Y + wT + Q - wL = C - wL^h + (w+P)S + wI + wL^h$$

$$(d) \quad Y + wT + \pi = C + (w+P)S + wI \quad (\text{the overall constraint})$$

where,  $\pi = \text{profit} = Q - wL = f(L; A) - wL$

The utility function, equation (a), is maximized subject to the overall constraint given in equation (d).

Hence, by considering the demand for child labour input in household production,

the profit maximization condition requires,  $f(L;A) = w$ <sup>1</sup>

Therefore, the demand for child labour input in household production depends on the wage rate the child faces and the productive physical asset the household owns. The idea of asset ownership comes in the demand for child labour input because the households demand for labour depends on whether the household owns productive physical asset or not and on whether the household owns labour increasing physical assets or labour saving physical assets as children are usually expected to be engaged on this productive physical assets.

If so, demand for child labour input can be shown as:

$$L^* = f(w, A).$$

As long as there is hiring in and out of labour without hindrance, the separation of household's production decision from its consumption decision is a well known feature of Agricultural Household Model (Hazarika and Bedi, 2002).

Hence, ultimately, the utility function to be maximized can be expressed in terms of the Lagrangian function:

$$Z = U(C, h) + \lambda[Y + wT + \pi - C - (w + P)S - wI]$$
<sup>2</sup>

$$\partial Z / \partial \lambda = Y + wT + \pi - C - (w + P)S - wI$$

$$\partial Z / \partial C = (\partial Z / \partial U) (\partial U / \partial C) - \lambda = 0$$

$$\partial Z / \partial S = (\partial Z / \partial U) (\partial U / \partial S) - \lambda(w + P) = 0$$

$$\partial Z / \partial A = (\partial Z / \partial U) (\partial U / \partial A) - w\lambda = 0$$

From the above derivatives, we can see that  $\partial U / \partial S$  (the marginal utility from each extra year of schooling) is inversely related with market wage and price of

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<sup>1</sup>  $\pi = f(L;A) - wL$

$\partial \pi / \partial L = \partial f(L;A) / \partial L - \partial wL / \partial L = 0$

$\partial f(L;A) / \partial L - w = 0$

$\partial f(L;A) / \partial L = w$

<sup>2</sup> It is taken from Hazarika and Arjun (2002) with slight modification

schooling and  $\partial U/\partial l$  (the marginal utility from each extra leisure) is inversely related with the market wage rate. However, since the labour supply by the child ( $L^h$ ) is the difference between total time endowment ( $T$ ) and  $h$  (time for schooling plus time for leisure), it is indirectly related to wage rate and cost (price) of schooling and also to asset ownership of the household and other household characteristics.

In the presence of hiring in & out of labour, increased access to physical assets will unambiguously increase income and reduce child labour (Cockburn, 2000). Therefore, labour supply by the child ( $L^h$ ) is given as:

$$L^h = f(w, P, A)$$

Up to this point the assumption is that there is no hindrance for the hiring in and out of labour. In this case the total child labour supply is the sum of child labour input in household production and child labour that works in the labour market. What if there are no labour markets? If there is no hiring in and out of child labour, the total child labour supply is equal to the child labour input in household production. The total time endowment that is not used for household production is to be allocated either for schooling or leisure or both. Hence, the indirect effect or the opportunity costs of going to school & leisure (i.e., wage and price of schooling) on child labour supply are still relevant. The impact of productive physical asset ownership on child labour input in household production however depends on whether the income effect or the substitution effect of asset ownership outweighs. If the income effect of asset ownership outweighs, then the asset is labour decreasing (reduces child labour supply). While, if the substitution effect outweighs, the asset is labour increasing (increases child labour supply).

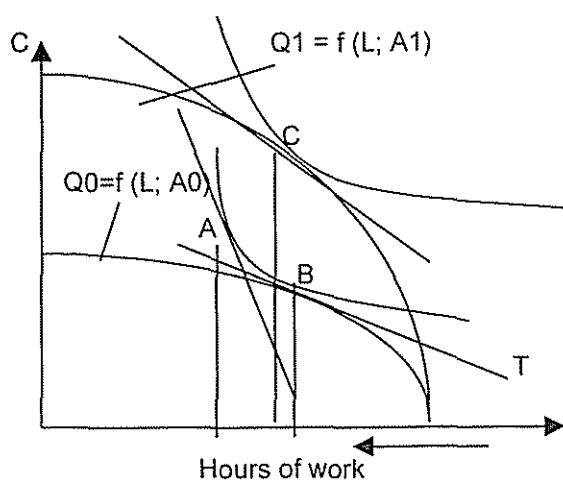
In rural Ethiopia, hiring of child labour from outside the household is not as such a common phenomena and a household's effort to optimize utility depends on the time endowment of family labour at large and access to productive physical assets on which the labour can engage.

In the absence of hiring in & out of labour, due to the impression that families might prefer to keep their child at home and work for them than sending to school by being motivated by the possibility of high marginal productivity of labour as the access to some productive physical assets increase, it is difficult to predict a priori which is the dominating effect from productive assets on child work and schooling.

Therefore, this needs empirical investigation to find out the ownership of which productive physical assets motivate the decision maker in the household to use child labour and the ownership of which productive physical assets discourage the use of child labour and increase regular school attendance.

As it has been indicated in *figure 1* below, the increase in physical asset holdings shift the production possibility curve from Q0 to Q1 and as a result the equilibrium point shifts from point A to point C (income effect) even though the substitution effect is the movement from point B to point A. This results in a net effect of increase in hour of work as indicated by the move from point B to point C (labour increasing). Here, what possibly causes the substitution effect of productive physical assets is that of the increase in marginal productivity of labour with the increase in asset ownership. If children are more productive by working at home than going to school with increase in asset ownership, the decision maker in the household attaches more shadow price (implicit value of child labour) to child work than to child schooling. In a similar way the income and the substitution effects of labour decreasing physical assets can also be

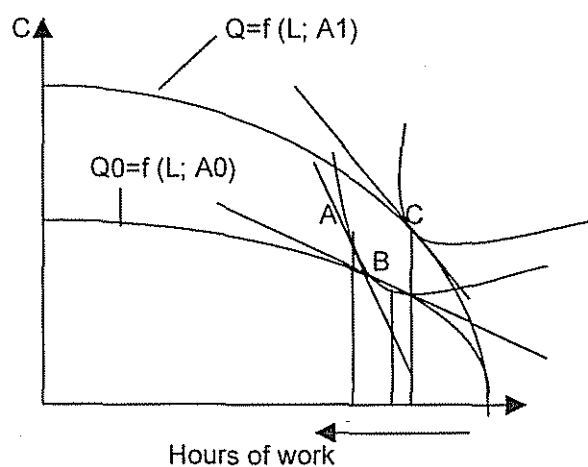
Figure 1: Labour increasing Productive Physical Assets



• Note: C = Consumption

Source: Cockburn, 2000

Figure 2: Labour Decreasing Physical Assets



seen from *figure 2*. As *figure 2* depicts, the overall effect is the movement from point B to point C (labour decreasing). Based on these two cases as indicated by the two figures, Cockburn said that, unlike asset based poverty reduction strategies, a lump-sum income transfer can unambiguously increase income, schooling, and leisure while reducing child work regardless of the presence or absence of labour market. The reason behind a lump-sum income transfer to unambiguously increase schooling and reduce child work could be because of the greater possibility of the income effect of lump-sum income transfers. However, productive physical asset provisions can have both income and substitution effects as shown in the two figures and there is a possibility for the substitution effect (work for schooling) of these assets to out weigh their income effect and thus reduce schooling.

The model indicated is based on the assumption that the household is a one member agricultural household who produces and consumes one marketable product. However, it is possible to extend the model by considering intra-household allocation of time. For instance studies undergone by Admassie (2000), Cockburn (2000), and Bhalotra al. found that the time allocation decision of parents or an adult person in the household to children in a household vary significantly by gender, and age attributes. In a country like Ethiopia where boys

and girls participate in different types of work activities, the impact of productive physical assets, and other control variables on child work and schooling can also be expected to differ. Therefore, an empirical test will also be made about the effect of productive physical assets in child time allocation decision by desegregating the data by gender.

### **3.2 Econometric Model and the Methodology for Child Time Allocation**

Households' decision to send children to school or to work or a combination of them can be modeled in different ways. If one considers children's time allocation to schooling as independent of the decision to keep the child to work at home, a univariate probit model can be used. If one considers schooling decision to be made jointly with work, a bivariate probit model can be used. We could also consider child time allocation decisions as involving a simultaneous decision making process where children are expected to mainly engaged in schooling, mainly work, combining school and work or being idle, i.e., neither working nor schooling.

This study assumes that, at a particular time, the time endowment of children can be used for four mutually exclusive activities: attending mainly school, mainly work, attending school and working, neither attending school nor working. Moreover, under this setting there is a single decision among the four alternatives rather than four decisions, each between two alternatives of schooling and no schooling, working and not working and etc. Multinomial Logit Model is intended for use when the dependent variable takes on more than two outcomes and the outcomes do not have natural ordering (STATA, 2000). In our case, the dependent variable, the time of a child, is allocated in four different possible outcomes without any natural ordering.<sup>3</sup> That is also one of the reasons why Multinomial Logit Model is preferred over other models. Hence, under this circumstance Multinomial Logit Model or polytomous logistic regression is a more

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<sup>3</sup> Here, it has to be noted that there are still some studies like that of Grootaert (1999) which argue by considering household child time allocation decisions as sequential. However, there is no concrete

straightforward solution than multinomial probit model as the decisions are also unordered rather than ordered (Greene, 2000). This Multinomial Logit Model can be demonstrated as follows:

$$\text{Prob. } (Y_i = j) = \frac{e^{\beta_j X_i + \alpha_j}}{\sum e^{\beta_j X_i + \alpha_j}} \quad j \text{ takes the values of 0, 1, 2, \& 3}$$

Here, j=0 is for inactive, i.e. , neither work nor school; j=1 is mainly schooling, j=2 is mainly working; and j=3 is combination of work and school. The multinomial probability model assumes that the possible outcomes are exhaustive in that they cover all possibilities. The probability of each outcome is a function of the same set of explanatory variables  $X_s^4$ . Taking the probability of school-work combination as base category, the normalized multinomial equation will be:

$$\text{Prob. (school)} = \frac{e^{X\beta_s}}{(1 + e^{X\beta_s} + e^{X\beta_w} + e^{X\beta_0})}$$

$$\text{Prob. (work)} = \frac{e^{X\beta_w}}{(1 + e^{X\beta_s} + e^{X\beta_w} + e^{X\beta_0})}$$

$$\text{Prob. (inactive)} = \frac{e^{X\beta_0}}{(1 + e^{X\beta_s} + e^{X\beta_w} + e^{X\beta_0})}$$

$$\text{Prob. (school \& work)} = \frac{1}{(1 + e^{X\beta_s} + e^{X\beta_w} + e^{X\beta_0})}$$

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theoretical support, which suggests that household time allocation decisions are sequential, especially in rural area settings (Admassie, 2000).

<sup>4</sup> X stands for productive physical asset ownership, other household characteristics, child characteristics, school characteristics, and community characteristics.

The subscript 's' stands for schooling, 'w' for work, and 'n' stands for neither schooling nor work.

The coefficient estimations that we get from the above specified models are difficult to interpret. Hence, by differentiating Prob. (Yi=j) with respect to the respective independent variables give us the marginal effects. This marginal effect can be shown as:

$$\begin{aligned} \partial \text{Prob. (Yi = j)} / \partial X_i &= \text{Prob. (Yi = j)} \left[ \beta_j - \sum_{j=0}^3 \beta_i \text{Prob. (Yi = j)} \right] \\ &= \text{Prob. } [\beta_j - \beta^*] \text{ where } \beta^* \text{ is the mean of all the } \beta\text{'s} \end{aligned}$$

The partial change, or the marginal effect, is the slope of the curve relating Xi to Prob. (Yi=j), holding all other variables constant. The value of the marginal effect depends on the values of all independent variables and on the coefficients for each outcome. Most frequently, the marginal is computed when variables are held at their means and dummy variables going from zero to one (Long, 1997).

The signs of marginal effects are more reliable as they give the impact of a unit change in explanatory variables rather than the impact of the absolute figure of the explanatory variables. However, it is also attractive to use elasticity as it represents the percentage change in the probability of a child performing a given activity for a one-percent change in the value of each explanatory variable. Plus it permits to standardize effects across variables and ultimately compare effects more meaningfully.

This elasticity is given as:

$$\text{Elasticity} = (\partial P_j / \partial X_i) (X/P) = \text{M.E (X/P)}$$

Where X and P are the mean of the explanatory variables and the predicted probability of the jth outcome respectively and M.E is marginal effect.



## Dependent Variables

The issues to be addressed dictate the choice of dependent variables. Accordingly, the dependent variable of importance for this paper is child activity with the four outcomes for a child to be engaged mainly in school, mainly in work, school and work, and neither school nor work activities. The variables used in categorizing child activities in to the four outcomes are whether a child attends school regularly or not and the number of hours of work. Whether a child attends school or not is used because of the limitation of the data in encompassing the number of hours of schooling.

## Explanatory variables

The explanatory variables encompass the number or the use and the use not of different productive physical assets, child characteristics (like; age, sex, biological relationship of the child to the head of the household), household characteristics (education level of the head of the household, household size, sex of the head of the household, religion, regional characteristics and school characteristics (like quality of education, distance of school from the child's home)).

## CHAPTER FOUR

### THE DATA SETTING AND DESCRIPTIVE ANALYSIS OF CHILD WORK AND SCHOOLING IN RURAL ETHIOPIA

#### 4.1 The Data Setting

The data that has been used for this study encompasses 3677 observations of children in rural Ethiopia within the age group of 4-15. Out of the total 3677 children, 1785 (48.55%) are girls while the remaining 1892 (51.45%) are boys.

In many developing countries, especially in rural areas, it is common to find children engaging in more than one activity. In rural Ethiopia as well children are found to engage in four activities of school only, work only, school and work, and neither school nor work activities (Admassie, 2001), and Cockburn, 2000). The household's or the adult person in the family is expected to make time allocation decisions of the child based on the child's own characteristics and as well as household, community, school characteristics and productive physical asset ownership of the household.

In this paper, the classification of children's main activities in to the four outcomes of mainly schooling, mainly working, schooling and working, neither schooling nor work has been done by taking 25 hours of work per week as a threshold level of working hours beyond which child work deemed detrimental to children's regular school attendance and performance.

#### 4.2 The Descriptive Analysis of Child Work and Schooling in Rural Ethiopia

##### *4.2.1 Average Hours of Work and School Attendance by Gender and Age Group*

In dealing with the number of hours of work and the rate of school attendance of children, it is very crucial to make gender and age group differentiation. This differentiation is important because the number of hours that a child works depends on whether the child is boy or girl and whether the child is younger or older. Here, child work is considered to encompass the time spent by the child to

fetch water and to collect firewood, domestic work, farm work, herding, and childcare per week both in weekdays and weekends including holidays.

What is very important in child work is not whether a child works or not, rather, it is the intensity or the number of hours that a child works and how young the child is to carry on the number of hours allocated to him or to her in a week or in a day. As it can be seen from the summary table, table 4.1, the average hours of work per week for both boys and girls is about 32, 40, and 44 for the age groups 4-7, 8-11, and 12-15 years old respectively. The same summary table shows that except for the age group 12-15 years old, boys work longer hours (above the average of boys and girls) as compared to girls on average. The average hour of work for girls is about 37.5 hours while the average for boys is 39 hours. However, what makes the average numbers of hours of work of girls and boys similar however is their tendency to increase with the age of children. This could be due to the gain of experience or more likely to higher responsibilities assigned to them in the household income supporting strategy.

The school age in Ethiopian context is seven years and it is expected for the average rate of school attendance to be minimal before these seven years. Accordingly, the average rate of school attendance is 7.7% for those below the school age with a very little gap between boys and girls. However, as the child gets older and older, the rate of school attendance and the gap between the school attendance of boys and girls increases. The rate of school attendance of boys is higher than that of girls (31.9% being that of girls and 36.1% for boys). This is an indication of the presence of gender biased ness in schooling against girls.

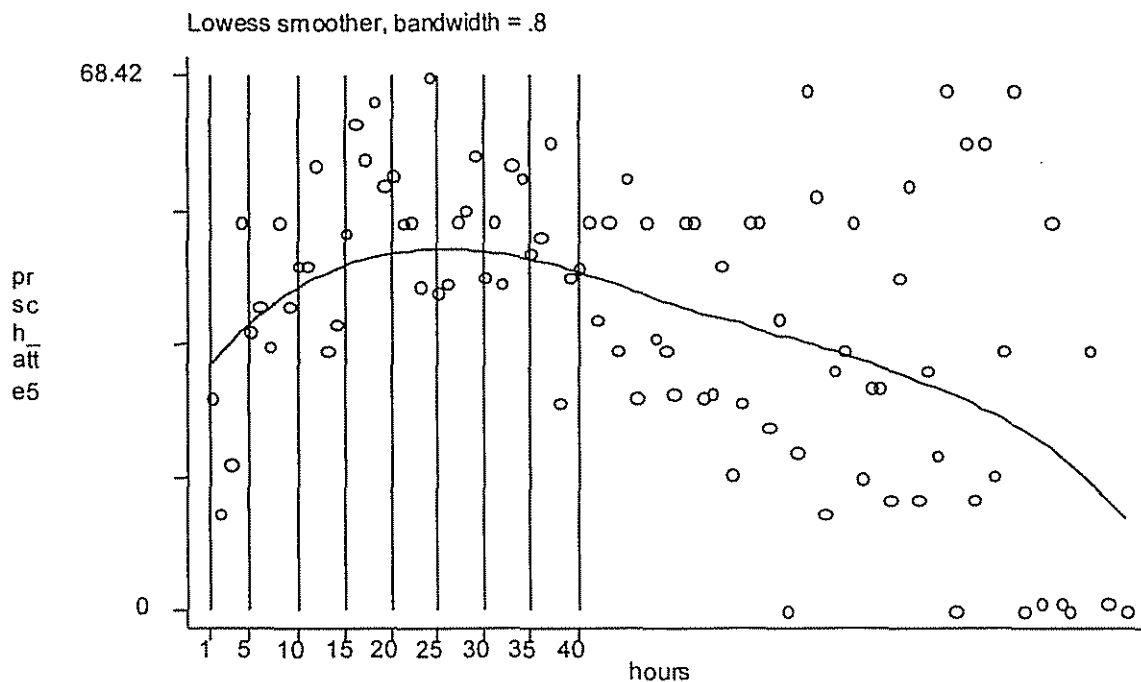
**Table 4.1: Summary of Average Hours of Work and school Attendance by Gender and Age Group**

Gender	Average hours of work per week				Average rate of school attendance (%)			
	Age Group				Age Group			
	4-7 years	8-11 years	12-15 years	Total	4-7 years	8-11 years	12-15 years	Total
Girls	29.59	39.27	43.74	37.53	7.8%	37.7%	50.4%	31.9%
Boys	33.69	40.38	43.70	39.25	7.6%	41.28%	59.6%	36.1%
Total	31.79	39.83	43.72	38.44	7.7%	39.50%	55.2%	34.1%

Source: Author's estimate from Rural Household Survey carried out by Addis Ababa University of Ethiopia in 1997

#### ***4.2.2 The Relationship between Child Work and Schooling***

The first and foremost consequence of the participation of children in economic activities is on their own education and health. The work participation of children adversely affects their education and health depending on the degree of their participation in work. There are two categories of child workers - one, which consists of those who do not go to school regularly and are mainly engaged in work activities and the other category consists of those who work as well as go to school. Children of the first category are engaged mainly in work activities at the expense of schooling. Children who are in the second category could hardly attend classes regularly due to their greater involvement in work activities they dropout gradually due to repetitions and slow progress or they are expected to perform less in school. In order to see the effect of hours of work on the probability of regular school attendance and school performance a look will be made to following two figures: figure 3 and figure 4.



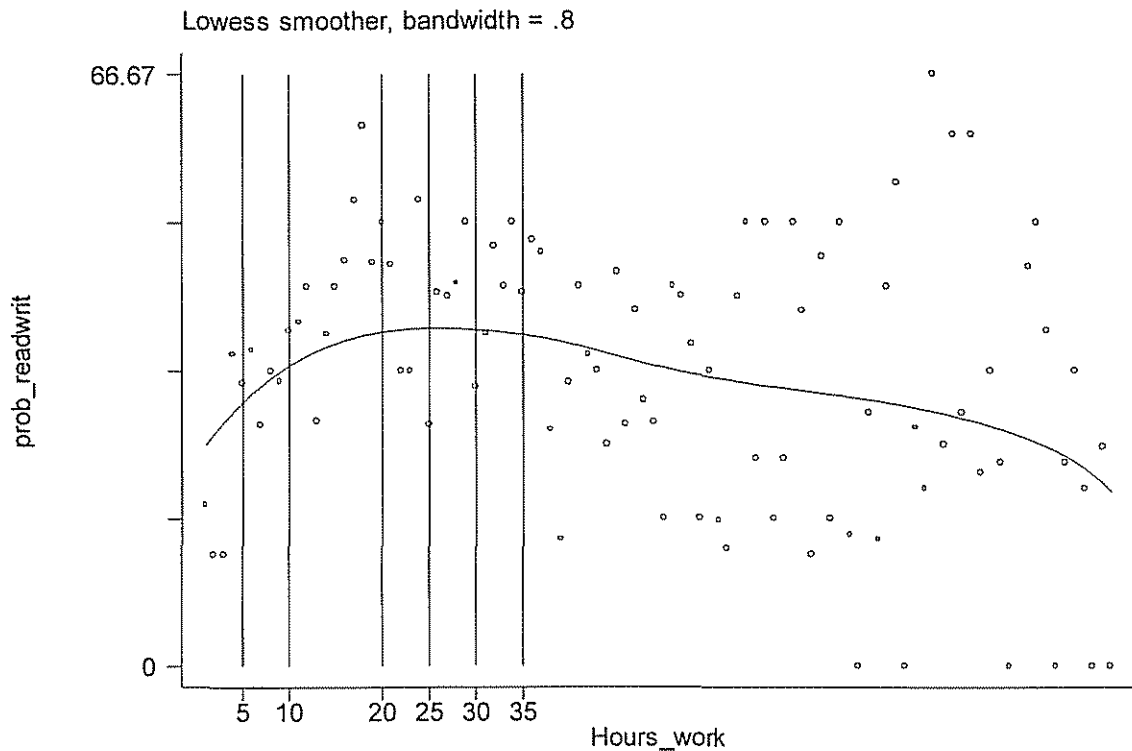
**Figure 3: The relationship between Probability of regular school attendance, and Hours of Child Work**

Source: Author's estimate from Rural Household Survey carried out by Addis Ababa University of Ethiopia in 1997

As it can be observed from the above figure, the number of hours of work per week does not adversely affect the probability of children's regular school attendance up to 25 hours of work. However, above 25 hours of work, children's probability to attend school regularly declines continuously. Thus, 25 hours of work per week can be selected as the threshold level of hours of work, which is detrimental to regular school attendance of children in rural Ethiopian context.

In addition to its negative impact on regular school attendance of children, the number of hours of work does also have a detrimental effect on school performance of children. To see this detrimental effect, a look can be made how children's probability of reading and writing ability changes with the number of hours of work per week. As it can be depicted from figure 4, again after about 25 hours of work per week, the probability of reading and writing ability of children diminish continuously. Therefore, from the two figures, it is possible to deduce that 25 hours of work per week is the threshold level of hours of work after which

child work starts having a detrimental impact on regular school attendance and school performance of children in rural Ethiopia.



**Figure 4: The relationship between Probability of reading and writing ability, and Hours of Child Work**

Source: Author's estimate from Rural Household Survey carried out by Addis Ababa University of Ethiopia in 1997

#### 4.2.3 The Main Activities of Children

As it has been discussed in the literature part, children are involved in some kind of work activities whether they go to school or not. In the rural Ethiopian context as well, children almost start working for their parents and contribute to the well being of the household before they even celebrate their fifth birth day. For this reason, it is possible to say that almost all children work some sort of work even though the intensity of work differs from one to the other. Taking in to consideration the cutoff point used by other empirical studies and the threshold hours of work per week, which is detrimental to regular school attendance and

performance of children in rural Ethiopia, the main activities of children from 4-15 years old can be categorized in to four areas. These are children who are engaged mainly in school activities, engaged mainly in work activities, combine both work and school activities, and those who are no where (i.e. those who neither are engaged in work activities nor in school activities). In order to see how children are distributed in the four main activities, a comparison will be made by taking cutoff points of hours of work for 1 hour a day (7 hours a week), 2 hours a day (14 hours a week), 3 hours a day (21 hours a week), 4 hours a day (28 hours a week), five hours a day (35 hours a week) and 25 hours a week (the critical hours of work after which work becomes detrimental to school attendance and performance of children). This distribution can be seen from the table below.

**Table 4.2 The Percentage Distribution of Main Activities of Children under different cutoffs**

Main Activities	%age Distribution of Main Activities of Children under different cutoffs					
	Cutoffs					
	7 hours per week	14 hours per week	21 hours per week	25 hours per week	28 hours per week	35 hours per week
Mainly School	1.49	4.91	8.35	10.64	12.82	16.92
Mainly Work	60.84	56.20	52.21	49.83	47.76	43.98
School and Work	33.36	29.95	26.51	24.21	22.03	17.93
Neither school nor work	4.30	8.95	12.94	15.32	17.38	21.17
Total	100%	100%	100%	100%	100%	100%

**Source: Author's estimate from Rural Household Survey carried out by Addis Ababa University of Ethiopia in 1997<sup>5</sup>**

As it can be observed from the above table, the percentage distribution of children in to the different main activities under the different cutoff points differs from one to the other. However, under all the cutoff points, the majority of children in Ethiopia are found to

<sup>5</sup> - Mainly school activity: if the child attends school regularly and works less than the cutoff point  
 -Mainly work activity: if the child does not attend school regularly and works more than the cutoff point  
 -school and work activity: if the child attends school regularly and works more than the cutoff point  
 -neither school nor work activity if the child does not attend school regularly and works less than the cutoff point

engage mainly in work only activities and school and work activities respectively followed by the neither school nor work category and school only category respectively.

#### ***4.2.4 Gender and Age Differentiation of Children's Main Activities***

Gender and age differentiation of children's main activities is very crucial because parents usually take the sex and age of children in to account while taking child time allocation decisions. As it is shown in table 4.3, the percentage of children who are engaged mainly in school activities and school and work activities increases with the age of both boys and girls. However, the percentage of children who are engaged mainly in work activities and the neither school nor work category decreases with age. This implies that as a child gets older and older, he/she is more likely to be engaged in school only activities and school-work combination and less likely to be idle and less likely to be engaged mainly in work activities. The table also displays that the majority of boys within the age group of 4-7 years and 8-11 years tend to specialize in work activities while the majority of boys within the age group 12-15 years tend to combine both schooling and work. On the other hand, the majority of girls of rural Ethiopia tend to specialize mainly in work activities at all age group levels. If we see the general trend of the percentage of children who are engaged mainly in school activities and school-work combination, it tends to increase with the age of girls while the general trend of the percentage of girls who are idle and specialize mainly in work tend to decrease consistently with their age. This is consistent with larger responsibilities and duties in the household as girls get older. This increase in percentage of children who combine school and work has tendency of competing children's time to get extra tutorial activities and to do their homework properly and thus decrease their school performance.



**Table 4.3. Main Activities of Children by Sex and Age Group in Percentage**

Main Activities of Children	Age Group of Children							
	% age of Boys				%age of Girls			
	4-7 years	8-11 years	12-15 years	Total	4-7 years	8-11 years	12-15 years	Total
Mainly School	2.61	14.60	16.43	11.40	3.61	10.94	14.44	9.83
Mainly Work	72.00	43.12	33.49	49.00	69.96	43.10	40.85	50.71
School & work	5.04	26.68	43.22	25.53	4.18	26.77	35.92	22.81
Neither school nor Work	20.35	15.60	6.86	14.07	22.24	19.19	8.80	16.65
Total	100%	100%	100%	100%	100%	100%	100%	100%

Source: Author's estimate from Rural Household Survey carried out by Addis Ababa University of Ethiopia in 1997

#### ***4.2.5 Main Activities of Children by their Sex and the Education Level of the Household Head***

The household heads are usually the ones who are expected to make child time allocation decisions. Therefore, the education level of the head of the household is important in deciding to send a child to school, to work or a combination of the two. In rural Ethiopia, about 71% of the heads of household are illiterate and the remaining 21% have some sort of primary education, while only about 8% have junior and secondary school education. To see how the education level of the head of household affects children's probability to fall in one of the four outcomes of child activities, see table 4.4 given below.

As the table depicts, the percentage of both boys and girls mainly attending schooling activities and school-work combination increases consistently with the education level of the heads while that of work only activity decreases by the education level of heads of household for both boys and girls. This can be explained by the greater awareness of educated heads of the household with the long-term benefit of children, i.e., schooling as compared to the short term utility they derive by assigning children mainly in work activities. Therefore, policies aiming at parental education or creating awareness about the impact of child

work are crucial in order to pull children out of the mainly work category activity to the mainly school category.

**Table 4.4. Percentage Distribution of Activities of Children by gender and the Education Level of the Heads of Household**

Types of Activities of Children	Gender of Children and the education level of their parents							
	Boys				Girls			
	Education Level of their Parents				Education Level of their Parents			
	Illiterate	Primary	Junior	Secondary	Illiterate	Primary	Junior	Secondary
Mainly School	9.54	14.78	20.29	21.05	8.96	12.86	9.09	9.46
Mainly Work	50.77	45.43	44.93	36.84	53.53	45.71	45.27	29.7
School & Work	25.46	25.81	25.90	26.32	21.00	24.00	32.91	41.9
Neither School nor Work	14.23	13.98	11.44	15.79	16.51	17.43	12.73	18.9
Total	100%	100%	100%	100%	100%	100%	100%	100%

Note: Illiterate is zero level of education, Primary is from grade 1-6, Junior is from Grade 7-8, and High School is from Grade 9-12

Source: Author's estimate from Rural Household Survey carried out by Addis Ababa University of Ethiopia in 1997

#### **4.2.6 Intensity of Child Work by size of Land Ownership**

The number of hours that children in rural Ethiopia work per week varies from a minimum of 0.24 hours to a maximum of 98 hour per week. This implies the presence of children who work a maximum of 14 hours a day (i.e., high intensity of child work). The intensity of child work is expected to vary by the size of land holding of the household because of the involvement of rural children directly or indirectly in farm or agricultural activities. The average hours of child work increased from 35 hours per week to 46 hours as the categorization of land size change from marginal land to small area of land for boys and from 37 hours to 42

hours per week for girls.<sup>6</sup> However, the average number of hours of work for children whose households own large area of land decreases to 43 hours for boys and 39 hours for girls. This implies the presence of high intensity of child work in households who own small areas of land (i.e. 1-3 hectare of land) followed by those who own large area of land and marginal area of land respectively for both boys and girls.

This can be seen from the table given below:

**Table 4.5. Average Hours of Child work by Land Ownership of the Household**

Land ownership of the household	Average Hours of Child Work per Week		
	Boys	Girls	Total
Marginal (<1 hectare)	34.8	36.5	35.6
Small (1-3 hectares)	46.0	42.3	44.2
Large (>3 hectares)	42.8	38.5	40.8

**Source:** Author's estimate from Rural Household Survey carried out by Addis Ababa University of Ethiopia in 1997

#### ***4.2.7 Main Activities of Children by Land Ownership of the Household***

Land is the major productive physical asset that the rural community in Ethiopia uses as a means of production and on which the livelihood of the community depends. Children also directly or indirectly work on the land owned by the family to contribute to their own livelihood and to the family at large. However, the size of land owned by the rural community of Ethiopia varies significantly from those who own a very marginal area of land to those who own a large area of land (up to 8.6 hectares of land). From these rural communities, about 50% of the households of sample children own marginal area of land, and the remaining

<sup>6</sup> The categorization of the size of land in to marginal (<1 hectare), small (1-3 hectares), and large (greater than or equal to 3 hectares) areas of land is taken from a study carried on by Bhalotra and Heady (2000) on Child Farm work in Ghana and Pakistan

36% and 14% of the rural community own small areas of land and large areas of land respectively.

Ownership of productive assets such as land can influence child time allocation decision and thus the main activities of children in the following ways. There is a standard wealth effect whereby large land holdings generate higher income and, thereby, make it easier for the household to forgo the benefit to be obtained from child work and make the household send their children to school. Moreover, capital market imperfections observed in rural areas that result in lower interest rates for households that can offer land as collateral will reinforce the wealth effect, allowing large land owners to borrow more to fulfill insurance needs or to finance the child's education (Bhalotra and Heady, 2000). Contrary to the standard wealth effect, greater stock of physical asset ownership can also be accompanied by greater marginal productivity of labour. The increase in marginal productivity of labour with the increase of stock of physical assets like land can in turn result in the raise of return to child labour and thus encourage child work. This is the case where the substitution effect (work for schooling) outweighs the income effect because of the increase in marginal productivity of child labour with the increase in ownership of productive physical assets. If labour markets are perfect and the land owning household could both hire in workers and monitor them effectively, the incentive that encourages child work and discourages schooling with stock of productive assets like land disappears (IBID). Although this is the case, in rural areas of Ethiopia, it is highly probable to find the substitution effect of land outweighing the income effect because of the inability of landowning households to hire in and out labour and where there is no market for land. The percentage distribution of children in the main activities of children by size of land ownership is indicated in table 4.6 given below.

**Table 4.6. Percentage Distribution of Main Activities of Children by Land Ownership of the Household**

Main Activities of Children	Land owned by the Household					
	Boys			Girls		
	Marginal (<1 hectare)	Small (1-3 hectares)	Large (>=3 hectares)	Marginal (<1 hectare)	Small (1-3 hectares)	Large (>=3 hectares)
Mainly School	15.0	8.4	8.3	7.9	11.5	10.7
Mainly Work	44.4	52.0	55.9	50.2	50.9	51.9
School and Work	22.9	28.1	26.6	20.4	24.8	24.1
Neither School nor Work	17.7	11.6	9.2	21.5	12.8	13.4
<b>Total</b>	100%	100%	100%	100%	100%	100%

**Source: Author's estimate from Rural Household Survey carried out by Addis Ababa University of Ethiopia in 1997**

As it has been observed from the above table, the percentage of boys who are engaged mainly in school activities is 15.0% for boys whose households own less than one hectare of land and 8.4% and 8.3% for boys whose households own small area of land and large area of land respectively. This means that percentage of boys who are engaged mainly in school activity decreases with an increase of the area of land owned by rural households of Ethiopia. In a similar manner, if we see the percentage of boys who are engaged in mainly in work activities; it tends to increase with the size of the area of land consistently. This is a good indication that the substitution effect of land size through increasing the marginal productivity of labour outweighs the income effect of land size. However, this is not a sufficient condition to say that the substitution effect of land size outweighs the income effect for boys as the productivity of labour on the land owned depends upon the quality of land, irrigation and variety of other factors. Thus, it is very important to control for those other factors, which do affect the productivity of labour on land using econometric techniques. This will be done by including those variables in our regression.

If we have a look at the percentage of girls who are engaged mainly in school activity, it tends to be higher for those whose households own small area of land

as compared to those whose household own marginal area of land and large areas of land. This does not give us a clear trend with the size of land. For girls, the percentage of children who are engaged mainly in work activities increases consistently with the size of land. However, the increase does not change significantly. Therefore, again, it is necessary to include other factors that contribute to the labour productivity of land as control variables in addition to the size of land.

## CHAPTER FIVE

### MULTIVARIATE ANALYSIS OF CHILD WORK AND SCHOOLING IN RURAL ETHIOPIA

#### 5.1 The Impact of Productive physical Asset Ownership in Child Time Allocation decision (All Children)

Income is the most studied determinant of child work and schooling among the household and socioeconomic characteristics. Economic theory suggests that as income increases, child labour supply should fall as long as leisure is a normal good. However in the Ethiopian setting, as it is mentioned in the literature review part of this paper, the rural households usually do not depend heavily on permanent income in monetary terms. Rather they depend on selling their productive physical assets or raise some income through increasing the productivity of the physical assets they own. For this reason, it is preferable to use wealth or the productive physical asset ownership instead of income and estimate its impact on the households' child time allocation decision.

Generally, it is assumed that as household wealth increases, children will progressively withdraw from labour activities in favor of schooling. Although this is what economic theory suggests, empirical work has consistently failed to demonstrate this view. As it is mentioned earlier wealth or the ownership of productive physical assets has two effects: the income effect and substitution effect. The income effect will tend to reduce child work in favor of schooling while the substitution effect tends to increase child work against schooling. Therefore, the net effect of physical asset ownership on child time allocation decision in a specific country context is indeterminate a priori because of the presence of labour increasing and labour decreasing assets. This will be seen in detail for rural Ethiopian households by using a multivariate analysis of child work and schooling. Child characteristics, other household characteristics, community characteristics, and school characteristics will also be employed as control variables in order to isolate the sole impact of productive physical asset ownership in child time allocation.

Productive physical assets used in activities traditionally performed by children, such as herding, are expected to have a stronger substitution effect on child work. In the analysis of this paper, productive physical assets are defined broadly as all non-labour production factors such as land fertility, land slope, and improved agricultural practices in addition to the assets like area of land and number of livestock owned by a household. This being the case, the time endowment of children is expected to be allocated in to four activities of mainly schooling, mainly work, neither schooling nor work, and school & work. To see the impact of productive physical asset ownership, the marginal effects and the elasticity of the independent variables on the four possible outcomes of child time allocation are reported in *table 5.1* given below.

As it is indicated in the table; land size, number of small ruminant animals, number of equine, amount of fertilizer used, amount of improved seeds used, and the use of agricultural chemicals and machinery tend to relate positively with work only activity. However, only some of these variables are significant at 95% confidence level in affecting the probability of children to go to work activities. Among the significant variables, land is one and it is the most important resource and store of wealth. The amount of fertilizer usage, the amount of improved seeds used, and the use of agricultural chemicals are insignificant at the same level of confidence.

In Ethiopia, most children work on family farm and their productivity depends on the area of land owned by the household. If the productivity of child labour on land is high, parents or an adult person in the household prefers to keep the child at home and make him or her work at the expense of regular school attendance and school performance. This might make land a labour increasing physical asset because of the outweighing of its substitution effect over income effect. The possible reason behind the outweighing of the substitution effect of land over its income effect in rural Ethiopia can be explained by the absence of market for land and the difficulty of using land as collateral to borrowings.

As indicated in the table, an increase in area of land positively affects the probability of the child to be engaged mainly in work activity. A one percent



increase in the area of land increases children's probability to be engaged mainly in work activities by 6.6 percent. Although the impact of land size on the probability of mainly schooling activity and neither school nor work activity is negative it is not significant statistically at 95% confidence level. Here, it has to be noted that the predicted probability of mainly work, mainly, and neither nor school activities in rural Ethiopia is 55%, 10%, and 14.64% while the remaining percentage of children are engaged in school & work combination.

**Table 5.1: The Elasticity and the Marginal Effect of Productive Physical Asset ownership in Child Time Allocation Decision (All Children)<sup>7</sup>**

Productive Physical Assets	Neither Schooling nor work (Pred. Prob. = 14.64%)			Mainly School (Pred.Prob. = 10.07%)			Mainly Work (Pred. Prob. = 55.03%)		
	Margin al Effect	Elasticity	Z	Margina l Effect	Elastic ity	Z	Margina l Effect	Elastic ity	Z
Land Size (Hectare)	-0.004	-0.04	0.75	-0.004	-0.061	.54	0.027	0.066	2.18
Number of Plots	0.004	.111	0.17	0.001	0.023	-0.44	-0.01	-0.066	-
Concrete or brick Wall	0.003	0.004	0.13	0.014	0.028	0.72	-0.015	-0.006	-
Iron Roof	0.019	0.04	1.21	0.009	0.026	0.92	-0.016	-0.009	0.12
Weighted land Fertility	0.014	0.148	1.36	0.023	0.358	2.39	-0.02	-0.058	0.26
Weighted Land Slope	0.017	0.148	0.84	0.004	0.048	0.37	-0.014	-0.033	0.44
Use of Irrigation	-0.024	-0.015	-1.62	-0.001	0.0001	-0.95	-0.033	-0.005	0.06
Participation in Extension Service	0.075	0.116	3.08	0.016	0.036	1.27	-0.074	-0.030	-
Taking Loan	0.01	0.036	0.85	0.026	0.138	2.14	-0.025	-0.024	1.66
No. Of Cattle	-0.006	-0.18	-2.77	0.0012	0.055	-0.89	-0.022	-0.019	-
No. Of Small ruminants	0.003	0.069	3.03	-0.002	-0.068	0.39	0.005	0.027	2.12
Number of Equine	0.006	0.038	1.54	0.005	0.050	1.75	.0043	0.007	2.94
Use of Modern Technology	-0.051	-0.233	-3.38	0.003	0.016	-1.973	-0.017	-0.026	1.53
Amount of Fertilizer (in Kg.)	-0.0004	-0.281	-4.14	-5.9E-05	-0.061	-2.29	.0003	0.055	-2.4
Amount of IM-proved seed(Kg.)	-0.0001	-0.007	0.23	0.0002	0.017	1.83	.0002	0.003	-0.6
Amount Agricultural Chemical	.0001	0.003	0.5	-0.001	-0.017	-0.2	.0012	0.005	1.03
Use Mechanical power(minutes)	.0001	0.003	1.08	6.74E-05	0.003	1.16	.0003	0.002	0.6
									1.38

**Source: Author's estimate from Rural Household Survey carried out by Addis Ababa University of Ethiopia in 1997**

In addition to the area of land, the number of cattle and the number of small ruminant animals like sheep and goat are also the most important productive assets owned by rural households in Ethiopia as a source of wealth. The ownership of cattle and small ruminants can have also two counteracting effects

<sup>7</sup> The result of multinomial logit regression derived from appendix 2 attached at the end of this paper

on child time allocation decision. On the one hand, these animals are a store of wealth to be used in time of crisis and they can be used as a source of food and income for the family. Thus, the higher the number of these animals, the greater the probability for the household to send children to school at the expense of work as income sacrificed from child work can be earned from selling the animals. This is the income effect. On the other hand, the increase in the number of cattle and small ruminant animals might also take a lot of children's time at the expense of schooling because of the fact that children are the ones who usually are engaged in herding. We call this substitution effect as child work is substituted in place of schooling. The determination of the dominant effect however is an empirical issue.

The result of the multivariate analysis shows that the ownership of cattle to be negatively associated with the probability of children to be engaged mainly in work activities and the neither school nor work category. As the above table depicts, a percentage increase in the number of cattle decreases the probability of mainly work activity and the neither school nor work category by 1.9% and 18.0% respectively. If we see the impact of the number of small ruminant animals, it increases the probability of children to specialize in work activities only. This implies that the number of small ruminants and the area of land ownership to be labour increasing physical assets while ownership of cattle is labour decreasing.

The use of modern agricultural technologies are the other productive physical assets of importance in dealing with the child time allocation decision in agriculture dominated rural areas like Ethiopia. The value of land and other productive assets in rural settings depends on the technology used and the labour employed. Modern agricultural technologies are expected to reduce child work either through replacing children doing routine, repetitive work with machine or other technologies that perform the same work efficiently; or through increasing the demand for skilled adult labour in place of child labour.

As the multivariate analysis of child time allocation decision depicted, the use of modern technology is negatively associated with the probability of mainly work

and neither school nor work category while it is positively related to mainly school activities. Accordingly, the use of modern agricultural technology by a household increases the probability of mainly school activity by 1.5 percent. Nevertheless, the use of modern agricultural technologies decreases the probability of children to be engaged mainly in work activities, and the neither school nor work category by 2.6% and 2.3% respectively.<sup>8</sup>

Taking loan increases the probability of school only activity of all children by about 14 percent and decreases the probability of work only activity by 2.5 percent.

## **5.2 The Impact of Productive physical Asset Ownership on Child Time Allocation decision by Gender**

As it has been discussed in the previous chapter, in Ethiopia, the distribution of boys and girls in different activities is different. Thus, it is advisable to see the impact of productive physical assets on child time allocation decision by gender. The gender disaggregation of the impact of the productive physical assets can be seen from the marginal effects and elasticity computed and presented in tables 5.2 & 5.3 given below.

As it can be seen from table 5.2, as in the case of all children reported earlier, the higher the area of land owned by a rural household in Ethiopia, the higher the probability of boys in the household to be engaged mainly in work activities will be. However, the impact of the size of land ownership on the probability of girls to be engage mainly in work activities is not significant statistically at 95% confidence level. This implies the greater involvement of boys than girls in activities that require land in the production process like farming.

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<sup>8</sup> Although this is the case in the current study, Admassie (2001) reported that school only and work only activities to be significant for the use of Herbicide- machinery. Probably, with a different method of categorization of child activities..

**Table 5.2: The Elasticity and the Marginal Effect of Productive Physical Asset ownership in Child Time Allocation Decision (Boys)<sup>9</sup>**

Productive Physical Assets	Neither Schooling nor work (Pred. Prob. = 13.3%)			Mainly Schooling (Pred. Prob. = 9.01%)			Mainly Work (Pred. Prob. = 56.48%)		
	Marginal Effect	Elasticity	Z	Marginal Effect	Elasticity	Z	Marginal Effect	Elasticity	Z
Land Size (Hectare)	-0.011	-0.112	0.1	-0.013	-0.195	-0.41	0.043	0.106	2
Number of Plots	0.008	0.207	1.68	-0.003	-0.122	0.16	0.004	0.029	1.14
Concrete or brick Wall	-0.021	-0.033	-0.83	0.007	0.016	-0.03	-0.004	-0.002	-0.43
Iron Roof	0.013	0.03	0.54	0.030	0.100	1.62	-0.036	-0.02	-0.21
Weighted land Fertility	0.004	0.041	0.1	0.029	0.519	1.86	-0.034	-0.097	-0.5
Weighted Land Slope	-0.014	-0.135	-0.4	0.007	0.100	0.31	0.007	0.016	0.06
Use of Irrigation	-0.044	-0.034	-1.65	0.005	0.006	-0.55	-0.026	-0.003	-1.17
Participation in Extension Service	0.071	0.110	1.65	0.038	0.087	1.32	-0.120	-0.045	-1.27
Taking Loan	-0.003	-0.013	-0.75	0.022	0.131	0.53	-0.046	-0.044	-1.35
No. Of Cattle	-0.009	-0.325	-3.02	-2.1E-05	-0.001	-1.34	-0.001	-0.005	-1.91
No. Of Small ruminants	0.0031	0.078	2	-0.0002	-0.006	0.77	0.002	0.01	1.47
Number of Equine	0.011	0.076	1.81	-0.0101	-0.107	0.04	0.024	0.041	2.06
Use of Modern Technology	-0.025	-0.132	-2.02	-0.012	-0.097	-1.89	-0.040	-0.054	-2.14
Amount of Fertilizer (in Kg.)	-.0004	-0.34	-3	8.18E-06	0.01	-0.76	.0003	0.051	-0.33
Amount of IM-proved seed(Kg.)	0.0002	0.011	1.16	0.0003	0.031	2.49	.0001	.0019	1.22
Amount Agricultural Chemical	9.92E-05	0.0023	0.24	-0.001	-0.034	-0.26	0.001	.0049	0.63
Use Mechanical power(minutes	-6.8E-05	-0.002	0.07	0.0002	0.008	0.84	3.96E-05	.0002	0.26

Source: Author's estimate from Rural Household Survey carried out by Addis Ababa University of Ethiopia in 1997

Unlike the case for all children, the impact of the number of cattle and small ruminant animals on child time allocation decision are found statistically to be insignificant at 95% level of significance except for the outcomes of neither schooling nor work in the case of boys. However, the greater the number of equines the higher the probability of boys to specialize in work only activities and the higher the probability of girls to specialize in school only activities. In rural Ethiopia, Equines are usually used for transporting goods from place to place. If a household does not own an equine, girls are the ones to do this activity at the expense of their schooling.

This being the case, taking of loan increases the probability of girls to be engaged in school only activity by 17 percent or in terms of marginal effect, girls

<sup>9</sup> The result of multinomial logit regression derived from appendix 3 attached at the end of this paper

are 3 percent more likely to be engaged in school only activity if the household they belong to takes a loan. However, taking loan is not significant for the case of boys schooling.

**Table 5.3: The Elasticity and the Marginal Effect of Productive Physical Asset Ownership in Child Time Allocation Decision (Girls)<sup>10</sup>**

Productive Physical Assets	Neither Schooling nor work (Pred. Prob. = 16.45%)			Mainly Schooling (Pred. Prob. = 9.5%)			Mainly Work (Pred. Prob. = 56.38%)		
	Marginal Effect	Elasticity	Z	Marginal Effect	Elasticity	Z	Marginal Effect	Elasticity	Z
Land Size (Hectare)	0.005	0.043	1.09	0.003	0.039	1.03	0.01	0.023	1.19
Number of Plots	0.002	0.041	-1.18	0.005	0.204	-0.37	-.021	-.134	-2.58
Concrete or brick Wall	0.039	0.044	1.36	0.018	0.036	1.13	-.028	-.009	0.48
Iron Roof	0.025	0.047	1.04	-0.02	-0.062	-0.5	0.01	0.005	0.54
Weighted land Fertility	0.027	0.262	1.99	0.014	0.237	1.73	-.004	-0.012	1.34
Weighted Land Slope	0.05	0.387	1.46	-0.002	-0.029	0.13	-.036	-.083	0
Use of Irrigation	0.002	0.002	-0.85	.0008	0.002	-0.8	-.069	-0.010	-1.62
Participation in Extension Service	0.078	0.117	2.51	-.0069	-0.018	0.48	-.033	-0.015	0.72
Taking Loan	0.020	0.065	1.74	0.030	0.169	2.51	-.011	-.011	1.25
No. Of Cattle	-.002	-0.063	-1.25	0.004	0.192	0.3	-.007	-0.059	-1.68
No. Of Small ruminants	0.003	0.048	2.1	-0.003	-0.103	0.13	0.007	0.039	1.45
Number of Equine	0.001	0.005	0.25	0.019	0.181	2.1	-.016	-0.026	-0.08
Use of Modern Technology	-.077	-0.304	-2.53	0.019	0.133	-0.31	0.008	0.003	-1.22
Amount of Fertilizer (in Kg.)	-.0004	-0.240	-2.71	-.0002	-.176	-2.48	.0004	0.075	-0.1
Amount of improved seed(Kg.)	-0.001	-0.035	-1.18	7.84E-05	0.007	-0.38	.0002	0.003	-0.6
Amount Agricultural Chemical	0.002	0.022	1.57	.0001	0.002	1.15	0.008	0.024	1.59
Use Mechanical power(minute	.0002	0.005	1.25	-6.3E-05	-0.003	0.66	.0004	0.003	1.44

Source: Author's estimate from Rural Household Survey carried out by Addis Ababa University of Ethiopia in 1997

<sup>10</sup> The result of multinomial logit regression derived from appendix 4 attached at the end of this paper

### **5.3 The Impact of Individual Characteristics in Child Time Allocation Decision**

The individual characteristics taken in to account in this study are sex, age, and Age Square of the child and the biological relationship of the child to the head of the household. The sex of children affects the probability of their being idle and their probability to be engaged mainly in work activities as it has been already discussed. However, the age and the age square variables are found significant for all the four possible outcomes of child activity. With an increase in the age of children, the probability to be engaged mainly in school activity increases at the first instance and decreases later. However, with age, children are very much less likely to be idle while they are more likely to be engaged mainly in work activities.

The other individual characteristics of importance in child time allocation decision of parents or and adult person in the household is whether the child is biologically related to the household head or not. A child is considered to be biologically related if he or she is son or daughter of the head and otherwise if not. As it is reported in appendix 2 of this paper, if children are not biologically related to the head of the household, they are more likely to be engaged mainly in work activities, and they are also more likely to be idle as compared to the non-biologically related children in the household. The lineage of the household head towards his/her biologically related child could be the expectation of help from the child during old age. Here, it has to be noted that impact of the child being biologically related to the head of the household on the probability of children to specialize mainly in school activities is insignificant at 95% confidence level and positive.

### **5.4 The Impact of Household Head Characteristics in Child Time Allocation Decision**

In addition to the productive physical asset ownership of the household, household characteristics also includes the age and sex of the head of the

household, size of the household, proportion of females, number of infants, and the education level of the head of the household. As reported in the appendix 2 of this paper, the impact of the age and sex of the head of the household on children's probability to carry out school activities, and mainly work activities are not significant at 95% confidence level. However, the report shows that if the head of the household is female, girls are less likely to be idle and boys are less likely to specialize in mainly work activities. This is explained by the view that females do care much more for their children not to specialize in mainly work activities. Despite this result, studies undergone by Grootaert (1998), Coulombe (1998) and for girls from rural part of Ghana Bhalotra & Heady (1998) have found that child labour is higher and the rate of school attendance lower in female headed households. The probability of children to be idle however decreases with the age of the head of the household because of the increase in responsibility of children to their family matters.

The other household head's attribute of great importance in child time allocation decision is education level. Theoretically, there is a common perception that educated heads of household give greater value to the long-term mental, social, psychological, and physical development of children rather than the short-term benefit obtained from work at the expense of the school attendance and performance of children. For this reason, children who belong to educated heads of household are expected to attend school regularly and perform well. As the marginal effect and the elasticity of the education level of the head of the household reported in appendix 2 also depicts, children from an educated head of household are less likely to be idle (in the neither school nor work category) and less likely to carry out mainly work activities. The estimates also show that a percentage increase in the years of education of the head of household decreases the probability of all children to be engaged mainly in work activities by 7.2 percent. In terms of marginal effect, a one-year increase in year of education of head of household decreases probability of mainly working activity by 2.7 percent for all children. If we see the gender disaggregation, a percentage increase in year of education of the head decrease probability of boys to be

engaged in mainly work activities by 5.4% while it decreases that of girls by about 8.3 percent. From this, it is possible to conclude that education of the head is more responsible in pulling girls from the work as compared to boys.

### **5.5 The Impact of School Characteristics in Child Time Allocation Decision**

Usually, parents or any adult person in a household decides to send children to school regularly by weighing the direct and the indirect costs of schooling. The direct cost of schooling includes school fees, books, uniforms, and the distance to school (Admassie, 2001). The indirect costs of schooling however are the opportunity costs of schooling (i.e., schooling, and leisure). In addition to the direct and the indirect costs of schooling, quality of education is also of importance in sending children to school regularly by sacrificing work at home. For this analysis, because of the non-availability of other school characteristics, only distance from school, qualities of education and per-capita school expenditure are considered. Here, the quality of education is the perception of quality by the head of the household. The results reported in the analysis for the case of rural Ethiopia show that the perceived quality of education decreases the probability of children to be in the neither school nor work category and increase the probability of mainly school activity. If there is a generalized perception of quality education, children are 14.5% less likely to carry out mainly work activities and 4.1% more likely to be engaged mainly in school activities. Again, if we see the gender disaggregation of the impact of quality of education, it decreases the probability of mainly work activity of boys by 17.2% and by 10.9% that of girls. It also increases the probability of mainly school activities of boys by 5.4% while it increases that of girls by only 3.5 percent at 90% level of confidence. From these results it is possible to infer that quality of education is more responsive in withdrawing boys from mainly work activities and pushing them to school as compared to girls.

The other school attribute of importance in child time allocation decision is the distance of the nearest school from where the child lives. The longer the distance



of the nearest school from where the child lives is negatively related to the probability of children to go to school and positively related to mainly work activities. In rural Ethiopia, schools are distributed very sparsely that children are obliged mostly to travel long distances by foot because of the lack of transport infrastructures in the country. As the result of marginal effect and elasticity of distance of school on child work and schooling depicts children are more likely to carry out mainly work activities. The impact of distance of the nearest school from where the child lives has much greater impact on the probability of girls to be in the mainly work category as compared to boys. A percentage increase in distance of school increases the probability of mainly work activity for girls by about 12 percent while its impact on the probability of boys to be engaged in work activities is insignificant at 95% confidence level. In terms of marginal effect, an increase in distance from school by 1 km. increases the probability of working by 0.2 percent.

## **5.6 Sensitivity Analysis**

The interpretations made in the sections 5.1 through section 5.5 are based on categorization of children's main activities in to four by taking the threshold hours of work, which is detrimental to regular school attendance and school performance of children in rural Ethiopia. These hours of work are 25 hours per week and beyond this point work starts acting against the regular school attendance and school performance of children. Using this way of categorization of child activities, statistically significant explanatory variables have the expected signs. In order to see how sensitive the impact of each of the independent variables in child time allocation decision is, categorizing of child activities is done taking critical threshold levels of 7 hours, 21 hours and 35 hours per week. The general observation that has been gotten from this sensitivity analysis is that as the critical threshold hours of work per week to be set goes farther in both directions from 25 hours; most of the statistically significant variables lose their significance. For instance, land size is statistically significant and it is positively

related to the work only activity under the 25 critical threshold hours of work per week. However, it is not statistically significant at 95% confidence level under the 7 and 35 critical threshold hours of work per week. As we come nearer and nearer to the 25 critical threshold hours of work, like under the 21 hours threshold level, most of the explanatory variables retain their significance and their expected relationship with the dependent variables (see appendixes 5-13). Regarding the magnitude of the effects of the explanatory variables, there is a larger difference to be observed as we go in both directions from the selected threshold hours of work for most of the variables. Therefore, it is reasonable to select 25 hours of work, the point beyond which work starts acting against the regular school attendance and school performance of children, as a critical threshold hours of work per week.

## CHAPTER SIX

### CONCLUSIONS AND POLICY RECOMMENDATIONS

Worldwide, children have always been part of economic life. However, their economic contribution to a family differs from country to country and from household to household. Especially, in developing countries, the economic contribution of children in a family is so high as compared to the developed ones that the majority of children are engaged in some sort of work which may be detrimental to their regular school attendance and school performance. When one talks about working children, it may be misleading to think of only children engaged in paid works to generate income for their own and for their family.

In many developing countries in general and in Ethiopia in particular, the most dominant form of child work is the engagement of children in unpaid works such as family farm activities, domestic work, and other family businesses. This unpaid form of child work is the one that is not studied extensively so that policy actions may be inclined to the paid form of child work. For this reason, this paper has addressed the most dominant form of child work in rural Ethiopia, i.e., work in the family farm, domestic work, cooking, childcare, herding, fetching and collecting water. In addressing this form of child work, this paper has given much attention to its interaction with schooling and how households decide to allocate their children's time in to the different outcomes based on the productive physical assets or wealth they own and based on some other individual, other household characteristics, and school characteristics.

The productive physical asset ownership or wealth of households in children's time allocation can have two important and counteracting effects of income effect and substitution effect. The income effect reduces the number of hours of child work in favor of schooling while the substitution effect has the tendency to increase the number of hours of child work at the expense of children's regular school attendance and performance.

To investigate about which effect of productive physical asset ownership dominates, this paper has used a multinomial logit model by categorizing child

activities in to the four outcomes of mainly work, mainly schooling, schooling and work, and neither schooling nor work.

Generally there is a common perception that children who belong to land rich households are often less likely to be engaged in work than the children of land poor households in favor of schooling. However, the current study on the rural households of Ethiopia has found that children who belong to land-abundant households tend to be engaged in mainly work activities. If we see the gender disaggregation of the impact of land size, it is positively related and statistically significant at 95% confidence level to the mainly work activity for all children and boys. However, it is not statistically significant at the same confidence level for girls. This implies the dominance of substitution effect of land size over its income effect in child time allocation decision for boys as compared to the case of girls. The possible reason for the dominance of substitution effect of land over its income effect in the case of rural Ethiopia could be due to underdevelopment of land and labour markets. The possible reason for the dominance of substitution effect (i.e., due to the productivity effect) of land over its income effect in case of boys however could be the bias that boys are considered more productive on work than girls.

Therefore, in rural Ethiopia, the creation of market for land through privatization or giving opportunity for land owners to use their land as collateral in case of crisis can possibly give chance for land owners to use their land as source of income instead of pushing children to work being motivated by the high marginal productivity of child labour.

The result of this study contradicts with the results obtained so far in a range of developed country data sets where female labour supply is found more elastic than male labour supply. It also contradicts with the finding that the substitution effect is larger for girls than for boys in the supply of wage labour in Pakistan.

Other than the size of land, attention was also paid to the other productive physical asset variables and a mixed impact has been found as some are found to be labour increasing while others are found labour decreasing. The labour increasing productive physical assets in addition to the size of land are number of

small ruminants while labour decreasing physical assets are number of cattle owned by households and the use of modern agricultural technologies with a significant gender differences. Therefore, to be at the win-win situation of reducing child work and increasing regular school attendance simultaneously, international organizations or government bodies should give more emphasis in the provision of labour decreasing physical assets instead of labour increasing assets.

The above conclusions and policy recommendations are concerning the impact of productive physical asset ownership in child time allocation decision. The results and policy implications derived from impact of other household characteristics, child characteristics, and school characteristics are given as follows:

1. Taking loan decreases the probability of mainly work activity and increases the probability of mainly school activity
2. Boys are less likely to carry out mainly work activities as compared to girls
3. Being biological related to the head of household decreases the probability of mainly work activity
4. The probability of children to be engaged in mainly work activity decreases with their age up to a certain age level and increases at later age levels
5. The higher the number of infants, the higher the probability of children to be engaged in mainly work activities. This could be because of the increase in responsibility of children to look after the infants
6. Education level of the head of household decreases the probability of children to be engaged in mainly work activities. The decrease in probability of mainly work activities with education of head of household being more significant for girls. This confirms a study done by Canagarajah & Coulombe on child labour and schooling in Ghana.
7. The probability of children to be engaged mainly in work activities increases with distance of the nearest school from residents of children, the increase being more significant for girls as compared to boys

8. The probability to be engaged mainly in work activities decreases where there is quality education as compared to where there is no quality education. However, quality of education is more responsive to boys than to girls.
9. The regional variables also indicate that relatively rich, predominantly ox plough and hoe cultures regions to more likely be engaged in the mainly school category as compared to the relatively famine and relatively hilly and mountainous regions.

From these results, it is possible to derive the policy recommendations that easing loan concession or access to the household, increasing the education level of the head of the household at least through creating awareness about the good and bad of child work, increasing the number of primary schools to shorten the distance from school, (more realistically by creating cheap transportation facilities), and increasing the quality of education are crucial policy tools in pulling children gradually from mainly work activities to combine school and work activities and then to mainly school activities. In terms of targeting, it is advisable to target girls, the relatively famine, hilly and mountainous regions, and children who are not son, daughter of the heads of the household as they are the ones who are more likely to carry out mainly work activities at the expense of schooling.

Last but not least, it is very crucial to create awareness at community, national, regional, and international levels that unpaid work in family enterprises or at home that interferes with the regular school attendance and school performance of children is equally important as the paid form of work that has been given attention in many literatures so far.

## BIBLIOGRAPHY

- Admassie, A. (2001). "Allocation of Children's Time Endowment between Schooling and Work in Rural Ethiopia", Centre for Development Research, University of Bonn
- Admassie, A. (2000). "The Incidence of Child Labour in Africa with Empirical Evidence from Rural Ethiopia", ZEF- Discussion Papers on Development Policy: Number 32, Center for Development Research, University of Bonn
- Anker, R. (2000). "The Economics of Child Labour": A Framework for Measurement, International Labour Review, Vol. 139, ILO, Geneva
- Blanc, C.S. (1994). "Urban children in distress": global predicaments and innovation strategies UNICEF, International Child Development Centre, Switzerland.
- Bequelle A. and Boyden J. (Eds.), (1988). "Combating Child Labour", ILO, Geneva.
- Boyden, J. et. Al. (1998). "What Works for Working Children", UNICEF, Radda Baren
- Canagarajah, S. & Coulombe, H. (1997) "Child Labour and schooling in Ghana", World Bank <http://www.globalmarch.org/virtuallibrary/worldbank/child>
- Cartwright (1999) in Grootaert, C & Patrinos, H.A. (1999). "The Policy Analysis of Child Labour": A Comparative Study, The International Bank for Reconstruction and Development, The World Bank, Washington, D.C.
- Canagarajah, S. & Nielsen, H. (2001). "Child Labour in Africa: Comparative Study", ANALS, AAPSS, 575,
- Cockburn, J. (2000). "Child Labour Versus Education: Poverty Constraints or Income Opportunities?" Centre for the Study of African Economies, Oxford University, Oxford
- Deaton A. & Muellbauer J. (1980). "Economics and Consumer Behavior", Cambridge University Press, Cambridge

- Dinesh, B.M. (1998). "Economic Activities of Children: Dimensions Causes and Consequences", Daya Publishing House, Delhi
- Dreze, J. & Kingdon, G.G. (1999). "School Participation in Rural India"
- Fyfe A. (1993). "Child labour : a guide to project design" - - (ILO child labour collection). ILO, Geneva
- Glewwe, P. (1999). "The Economics of School Quality Investment in Developing Countries: An Empirical Study of Ghana", Macmillan Press Limited Great Britain
- Greene, W. H. (2000). "Econometric Analysis: Fourth Edition", Prentice Hall, Upper Saddle River, New York
- Grootaert, C & Patrinos, H.A. (1999). "The Policy Analysis of Child Labour: A Comparative Study", The International Bank for Reconstruction and Development, The World Bank, Washington, D.C.
- Gujarati, D. N. (1988). "Basic Econometrics", second ed., McGRAW-HILL International Editions
- Hazarica, G. and Bedi, A. (2002). "Schooling Costs and Child Work in Rural Pakistan", <http://www.iss.nl/SeminarPapers/sp20011129/PaperBedi.pdf>
- Hamilton, L. C. (1998). "Statistics with STATA 5", An International Thomson Publishing Company, University of New Hampshire.
- Ilahi, N. (2001). "Children's work and Schooling: Does Gender Matter? Evidence from Peru LSMS Panel Data". Paper for the Policy Research Report on Gender, The World Bank
- ILO (1998 report), "Child Labour Risks Growing in Africa": OAU and ILO Convene Tripartite Meeting



ILO , Press Release, Wednesday 7 May 1997 (ILO/97/11 )  
<http://www.ilo.org/public/english/bureau/inf/pr/97-11.htm>

Judge, G.G., et al. (1980). "The Theory and Practice of Econometrics", John Wiley & Sons, Inc., New York

Levison, D., Moe K., & Knaul, F. (2001). "Youth Education and Work in Mexico", World Development Vol. 29. No. 1

Maddala, G. (1983). "Limited Dependent and Qualitative Variables in Econometrics", Cambridge, Cambridge University Press

Myers, W.E. (1991), "Protecting Working Children", Zed Books Limited in association with UNICEF, London

Sanon, C. (1998). "Working Children: A Sociological Analysis", APH Publishing Corporation, New Delhi

Steinberg and Dornbusch, (1991), "Non-School-Supervised Work Experience Berkeley": National Center for Research in Vocational Education, University of California.  
<http://ncrve.berkeley.edu/abstracts/MDS-771/MDS-771-Non-Scho.html>

Vaidyanathan, A. & Gopinathan, N. P.R. (2001). "Elementary Education in Rural India", Sage Publications, New Delhi

Wazir, R. (2000). "The Gender Gap in Basic Education": NGOs as Change Agents, Sage Publications India Pvt. Ltd., New Delhi

World Bank (1997). "Primary Education in India". Library of Congress Catalogue-in-Publication Data, Washington, D.C.

## APPENDICES

Appendix-1: Description of the explanatory variables.

variables	Variables label
hectare	Size of own cultivable land (pay tax) excluding grazing & garden
number_p	Number of plots in 1991e.c.
wall	1 if wall is made of stone, concrete, brick or cement; 0 otherwise
roof	1 if roof is made of galvanized iron; 0 otherwise
fertil_1	1 if land fertility is good and 0 otherwise
quality1	1 if land slope is flat an 0 otherwise
irrigat	1 if household practices irrigation and 0 otherwise
exten	1 if household is under extension program and 0 otherwise
loan	1 if household has taken loan and 0 otherwise
cattle	Number of cattle owned in livestock units
smallrum	Number of small ruminants owned in lu
equine	Number of equines (camels, donkeys, mule and horses) owned
mod_tech	1 if household uses modern agricultural technology and 0 otherwise
fertiliz	Amount of total fertilizer (dap and urea) used in kilograms
seed_imp	Amount of imporved seeds used in kilograms
ag_chem	Amount of agricultural chemicals (herbicides, pesticides, insecticides etc.)
machine	Amount of mechanical power (tractors and harvesters) used in minutes
sex	Sex of the child (boy=1 & girl=0)
biol_par	1 if child is son or daughter and 0 otherwise
age_chil	Age of child
age_sqr	Age square
fem_head	1 if head of the household is female and 0 other wise
hhsiz	Number of persons in the household
prop_fem	Proportion of female members in the household
age_head	Age of the household head
infants	Number of infants less than 7 years in the household
edu_head	Highest grade attained by household head in formal education
dis_scho	Distance to the nearest school in minutes (one way)
qual_edu	1 if there is quality education and 0 otherwise
pcp_exp	School expenditure per capita or per in school enrolled child (birr)
region1	1 for relatively vulnerable to famine, relatively hilly and mountainous region and 0 otherwise
region2	1 for relatively vulnerable and flat terrain regions with ox plough culture and 0 otherwise
region3	1 for relatively rich, relatively flat, and predominantly ox plough and 0 otherwise
region4	1 for relatively rich, flat and predominantly hoe culture and 0 otherwise
region5	1 for regions which are either migration dependent or self supporting and 0 otherwise
remitt	1 if the household gets remittance and 0 if not

**Appendix –2: Marginal Effects and Elasticity of the Explanatory variables on the probability of  
Neither Schooling nor work**

Explanatory Variables	All Children (Pred.Prob. = 14.64%)			Boys((Pred.Prob. = 13.3%			Girls (Pred.Prob. = 16.45%		
	Margin al Effect	Elasticity	Z	Marginal Effect	Elasticity	Z	Marginal Effect	Elasticity	Z
<b>Productive Physical Assets</b>									
Land Size (Hectare)	-0.00399	-0.03724	0.75	-0.01077	-0.11218	0.1	0.005304	0.043409	1.09
Number of Plots	0.004494	0.110984	0.17	0.00753	0.206711	1.68	0.001921	0.04177	-1.18
Concrete or brick Wall	0.002701	0.00366	0.13	-0.02086	-0.03254	-0.83	0.038759	0.044386	1.36
Iron Roof	0.019391	0.040488	1.21	0.012855	0.02973	0.54	0.025499	0.047059	1.04
Weighted land Fertility	0.013535	0.148209	1.36	0.003457	0.041482	0.1	0.026716	0.261577	1.99
Weighted Land Slope	0.017036	0.148356	0.84	-0.01415	-0.13491	-0.4	0.049696	0.38743	1.46
Use of Irrigation	-0.02381	-0.01501	-1.62	-0.04425	-0.03384	-1.65	0.002456	0.002417	-0.85
Participate in Ex-tension Service	0.074819	0.115925	3.08	0.070594	0.110491	1.65	0.078176	0.117418	2.51
Taking Loan	0.009841	0.035901	0.85	-0.00317	-0.01316	-0.75	0.020409	0.065435	1.74
No. Of Cattle	-0.00562	-0.17965	-2.77	-0.009	-0.32532	-3.02	-0.00228	-0.06302	-1.25
No. Of Small ruminants	0.003221	0.068996	3.03	0.003123	0.077744	2	0.002659	0.047599	2.1
Number of Equine	0.005909	0.037771	1.54	0.010789	0.076478	1.81	0.000954	0.00538	0.25
Use of Modern Technology	-0.05161	-0.23347	-3.38	-0.02533	-0.13227	-2.02	-0.07719	-0.30433	-2.53
Amount of Fert-ilizer (in Kg.)	-0.00039	-0.28118	-4.14	-0.00044	-0.34006	-3	-0.00037	-0.24054	-2.71
Amount of im-proved seed(Kg.)	-0.00011	-0.00655	0.23	0.000152	0.010804	1.16	-0.00069	-0.0355	-1.18
Amount Agric-ultural Chemical	0.000181	0.003054	0.5	9.92E-05	0.002293	0.24	0.00205	0.022458	1.57
Use Mechanical power(minutes)	0.000104	0.00267	1.08	-6.8E-05	-0.00178	0.07	0.000221	0.005478	1.25
<b>Child Characteristics</b>									
Boy	-0.0348	-0.12346	-3.2						
Son & daughter of head	-0.03128	-0.19742	-3.66	-0.0189	-0.14735	-2.57	-0.03931	-0.2172	-2.48
Age of child	-0.00823	-0.54334	-7.11	-0.01989	-1.45005	-5.53	0.012121	0.709583	-4.81
Age square	-0.00081	-0.57899	4.62	-0.00024	-0.19224	3.69	-0.00181	-1.14573	3.14
<b>Other Household Characteristics</b>									
Female headed hh.	-0.02757	-0.03129	-2.22	-0.00254	-0.00087	-1.21	-0.0539	-0.06077	-1.79
Hh. size	0.010506	0.685704	2.86	0.011475	0.827223	2.8	0.009515	0.550507	1.19
Proportion of females	-0.01909	-0.05513	-1.54	0.026788	0.073488	-0.29	-0.063	-0.18607	-2.08
Age of head	-0.00153	-0.50169	-2.34	-0.00155	-0.55519	-1.92	-0.00159	-0.46753	-1.52
No. Of Infants	-0.01637	-0.18309	-0.65	-0.01327	-0.16397	-0.45	-0.02006	-0.19889	-0.44
Education of head	-6.1E-05	-0.00061	-2.93	-0.00049	-0.00537	-1.36	0.001794	0.016036	-2.68
<b>School Characteristics</b>									
Distance from school	-0.00013	-0.03582	0.6	0.00017	0.053308	0.77	-0.00056	-0.13319	0.22
Quality of	-0.00565	-0.03524	-2.42	-0.0141	-0.08865	-2.35	0.001847	0.002653	-1.1

education									
Per capita expe.	-0.00038	-0.03432	-2.65	3.57E-05	0.003487	-2.8	-0.00085	-0.06865	-1.34
<i>Regional Characteristics</i>									
Region1				-0.0657	-0.04354	-0.76			
Region2	-0.0213	-0.03856	-0.28	-0.1063	-0.25053	-2.52	-0.00729	0.008221	1.45
Region3	0.040926	0.113251	0.8	-0.0606	-0.17939	-1.85	0.06191	0.180408	2.26
Region4	0.072438	0.057207	2.72				0.039142	0.066268	3.22
Region5	0.007415	0.013219	-0.05	-0.0615	-0.09395	-1.79	-0.00546	0.007081	0.97
Remitt	0.015809	0.031173	0.05	0.00896	0.020095	-0.45	0.019253	0.033484	0.39

\* The cutoff hours of work used in categorizing child activities in to four is based on 25 hours of work per week, which is detrimental to school attendance and performance

### Appendix-3: Marginal Effects and Elasticity of the Explanatory variables on the probability of Mainly Schooling

Explanatory Variables	All Children (Pred. Prob. = 10.07%)			Boys (Pred. Prob. = 9.01%)			Girls (Pred. Prob. = 9.5%)		
	Marginal Effect	Elasticity	Z	Marginal Effect	Elasticity	Z	Marginal Effect	Elasticity	Z
<i>Productive Physical Assets</i>									
Land Size (Hectare)	-0.00449	-0.06094	0.54	-0.01265	-0.19453	-0.41	0.002757	0.038963	1.03
Number of Plots	0.000661	0.023703	-0.44	-0.003	-0.12161	0.16	0.005455	0.204815	-0.37
Concrete or brick Wall	0.014308	0.028165	0.72	0.006956	0.016021	-0.03	0.018202	0.035997	1.13
Iron Roof	0.008533	0.025887	0.92	0.029528	0.100816	1.62	-0.01953	-0.06226	-0.5
Weighted land Fertility	0.022524	0.358371	2.39	0.029288	0.518872	1.86	0.014	0.23671	1.73
Weighted Land Slope	0.003801	0.048093	0.37	0.007132	0.100369	0.31	-0.00218	-0.02931	0.13
Use of Irrigation	-0.00073	0.000101	-0.95	0.004986	0.00629	-0.55	0.00081	0.001844	-0.8
Participate in Extension Service	0.016141	0.036338	1.27	0.037681	0.087069	1.32	-0.00698	-0.0181	0.48
Taking Loan	0.025935	0.138386	2.14	0.021595	0.130643	0.53	0.03044	0.169237	2.51
No. Of Cattle	0.001192	0.055363	-0.89	-2.1E-05	-0.0011	-1.34	0.004032	0.192464	0.3
No. Of Small ruminants	-0.00218	-0.06773	0.39	-0.00017	-0.00628	0.77	-0.00332	-0.10262	0.13
Number of Equine	0.005362	0.049804	1.75	-0.01019	-0.10662	0.04	0.018541	0.180659	2.1
Use of Modern Technology	0.003025	0.015668	-1.53	-0.01229	-0.09715	-1.89	0.018528	0.132803	-0.31
Amount of Fertilizer (in Kg.)	-5.9E-05	-0.06137	-2.29	8.18E-06	0.009296	-0.76	-0.00016	-0.17648	-2.48
Amount of improved seed(Kg.)	0.000192	0.017065	1.83	0.000295	0.030848	2.49	7.84E-05	0.006919	-0.38
Amount Agricultural Chemical	-0.00071	-0.01742	-0.2	-0.00101	-0.03433	-0.26	0.000105	0.00198	1.15
Use Mechanical power(minutes)	6.74E-05	0.002519	1.16	0.00021	0.008099	0.84	-6.3E-05	-0.00271	0.66
<i>Child Characteristics</i>									
Boy	0.02455	0.127285	0.11						
Son & daughter of head	0.024693	0.208011	-1.39	0.024736	0.230439	-1.14	0.033412	0.330416	-0.41
Age of child	0.08351	8.01069	-1.74	0.117313	12.62679	0.17	0.04076	4.120685	-3.03
Age square	-0.00322	-3.35439	1.35	-0.00473	-5.55363	-0.4	-0.00129	-1.40626	2.75

<i>Other Household Characteristics</i>									
Female headed hh.	-0.00159	-0.00141	-1.27	0.002847	0.006905	-1.03	-0.00601	-0.0094	-0.71
Hh. size	-0.00187	-0.17751	-0.83	-0.00326	-0.34655	-0.65	-0.00047	-0.04672	-0.55
Proportion of females	0.048603	0.203997	-0.29	-0.00899	-0.0364	-0.72	0.083745	0.427171	-0.23
Age of head	0.001096	0.520935	0.93	0.000464	0.244725	-0.13	0.001654	0.838431	1.29
No. Of Infants	0.003906	0.063481	1.56	0.016207	0.295626	2.45	-0.00953	-0.16319	-0.19
Education of head	0.010565	0.153341	0.86	0.009928	0.160295	1.51	0.009909	0.153	-0.27
<i>School Characteristics</i>									
Distance from school	-0.00024	-0.09607	-0.05	-0.0001	-0.04652	-0.02	-0.00042	-0.17379	-0.06
Quality of education	0.056611	0.412297	1.97	0.062337	0.542652	1.63	0.047415	0.346352	1.35
Per capita expe.	0.000845	0.110026	0.83	0.000988	0.142564	-0.68	0.000718	0.099784	1.62
<i>Regional Characteristics</i>									
Region1				-0.08402	-0.13102	-2.45			
Region2	0.05808	0.139567	1.34	-0.09571	-0.35793	-3.51	0.176597	0.37862	2.41
Region3	0.105189	0.362421	2.11	-0.07448	-0.3391	-2.86	0.219793	0.722836	2.93
Region4	0.282832	0.143666	4.56				0.441271	0.211221	3.88
Region5	0.08162	0.120468	1.35	-0.06333	-0.1618	-2.67	0.162857	0.207768	1.93
Remitt	0.011788	0.033663	0.09	9.24E-05	0.001027	-0.71	0.018311	0.053808	0.62

\* The cutoff hours of work used in categorizing child activities in to four is based on 25 hours of work per week, which is detrimental to school attendance and performance

#### Appendix –4: Marginal Effects and Elasticity of the Explanatory variables on the probability of Mainly Work

Explanatory Variables	All Children (Pred. Prob. =55.03%)			Boys (Pred. Prob. = 56.48%)			Girls (Pred. Prob. =56.38%)		
	Marginal Effect	Elasticity	Z	Marginal Effect	Elasticity	Z	Marginal Effect	Elasticity	Z
<b>Productive Physical Assets</b>									
Land Size (Hectare)	0.026556	0.06596	2.18	0.043107	0.105758	2	0.009698	0.023158	1.19
Number of Plots	-0.00998	-0.0656	-1.37	0.00444	0.028714	1.14	-0.0211	-0.13382	-2.58
Concrete or brick Wall	-0.01527	-0.00551	-0.12	-0.00445	-0.00164	-0.43	-0.02797	-0.00935	0.48
Iron Roof	-0.0155	-0.00862	0.26	-0.03648	-0.01988	-0.21	0.0089	0.004793	0.54
Weighted land Fertility	-0.01996	-0.05816	0.44	-0.03445	-0.09741	-0.5	-0.00417	-0.0119	1.34
Weighted Land Slope	-0.01402	-0.0325	0.06	0.007147	0.01605	0.06	-0.03631	-0.08259	0
Use of Irrigation	-0.03287	-0.00478	-1.66	-0.02628	-0.00294	-1.17	-0.06856	-0.01044	-1.62
Participate in Extension Service	-0.07358	-0.03034	-0.32	-0.12097	-0.04461	-1.27	-0.03344	-0.01465	0.72
Taking Loan	-0.02519	-0.02457	0.06	-0.04621	-0.04446	-1.35	-0.01152	-0.01106	1.25
No. Of Cattle	-0.00224	-0.01908	-2.12	-0.00055	-0.00471	-1.91	-0.0074	-0.0597	-1.68
No. Of Small ruminants	0.004795	0.027329	2.94	0.001629	0.009553	1.47	0.007462	0.038975	2.45
Number of Equine	0.004258	0.007242	1.53	0.02442	0.040783	2.06	-0.0157	-0.02584	-0.08
Use of Modern Technology	-0.01694	-0.02644	-2.4	-0.04013	-0.05364	-2.14	0.008036	0.002901	-1.22
Amount of Fertilizer (in Kg.)	0.000292	0.055409	-0.6	0.000283	0.051288	-0.33	0.000394	0.074582	-0.1

Amount of improved seed(Kg.)	0.000195	0.003167	1.03	0.000116	0.001942	1.22	0.000199	0.002966	-0.6
Amount Agricultural Chemical	0.001191	0.005333	0.6	0.000907	0.004937	0.63	0.007525	0.024046	1.59
Use Mechanical power(minutes)	0.000318	0.002174	1.38	3.96E-05	0.000244	0.26	0.000427	0.003083	1.44
<i>Child Characteristics</i>									
Boy	-0.03591	-0.03428	-2.6						
Son & daughter of head	-0.08769	-0.15611	-4.53	-0.11451	-0.19372	-3.81	-0.07303	-0.13305	-2.73
Age of child	-0.31191	-5.47972	-11.7	-0.36294	-6.23435	-8.82	-0.2747	-4.69225	-8.13
Age square	0.012955	2.470686	9.98	0.014963	2.80109	7.49	0.011616	2.144485	6.96
Female headed hh.	-0.0265	-0.00675	-1.98	-0.0811	-0.02118	-2.25	0.030692	0.010541	-0.47
Hh. size	-0.00906	-0.15736	-0.96	-0.00546	-0.09274	0.12	-0.01183	-0.19968	-1.27
Proportion of females	-0.15709	-0.12076	-2.42	-0.10681	-0.06904	-1.09	-0.20662	-0.17807	-2.6
Age of head	-0.00053	-0.0461	-1.16	-0.00025	-0.02142	-0.98	-0.00088	-0.07534	-0.84
No. Of Infants	0.026147	0.077824	2.18	0.008747	0.025464	0.93	0.04367	0.126333	2.05
Education of head	-0.02718	-0.07226	-5.73	-0.02096	-0.05402	-2.68	-0.03196	-0.08337	-5.28
<i>School Characteristics</i>									
Distance from school	0.000834	0.06076	2.15	0.00016	0.011584	0.57	0.001723	0.119712	2.63
Quality of education	-0.11395	-0.1453	-4.55	-0.1311	-0.17201	-3.81	-0.09067	-0.10781	-2.43
Per capita expe.	-0.00181	-0.04307	-3.88	-0.00394	-0.09074	-4.88	-0.00029	-0.00671	-0.88
<i>Regional Characteristics</i>									
Region1				0.182603	0.032882	0.86			
Region2	-0.02597	-0.01072	0.02	0.127018	0.075936	-0.25	-0.05813	-0.00882	1.6
Region3	-0.14198	-0.09634	-0.83	0.031551	0.027475	-0.9	-0.15823	-0.08813	1.12
Region 4	-0.24651	-0.02687	0.42				-0.3222	-0.02407	1.66
Region5	-0.10339	-0.03173	-0.94	0.024879	0.01605	-0.78	-0.07927	-0.0128	0.92
Remitt	-0.04768	-0.02503	-1.39	-0.04844	-0.02472	-1.45	-0.04053	-0.02054	-0.44

\* The cutoff hours of work used in categorizing child activities in to four is based on 25 hours of work per week, which is detrimental to school attendance and performance

Appendix-5: Marginal Effects and Elasticity of the Explanatory variables on the probability of the different child Activities (All Children)

Explanatory Vars.	Neither schooling nor Work			Mainly Schooling			Mainly Work		
	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z
hectare	-0.00171	-0.15420	-0.32	-0.000105	-0.319922	-0.8	0.02262	0.04499	1.87
number_p	0.00123	0.29333	0.98	0.000018	0.147117	0.23	-0.00730	-0.03841	-1.13
wall	-0.00778	-0.10191	-1.43	0.000081	0.035911	0.31	-0.00057	-0.00016	-0.2
roof	0.00395	0.07969	1.22	0.000452	0.307890	3.03	0.00938	0.00417	0.54
fertil_1	-0.00094	-0.09907	-0.35	0.000043	0.154372	0.29	-0.00174	-0.00407	-0.13
quality1	0.00582	0.49047	1.61	0.000268	0.760859	1.64	0.00613	0.01137	0.38
irrigat	-0.00096	-0.00535	-0.51	0.000512	0.072833	1.1	-0.05441	-0.00688	-1.45
exten	0.00608	0.09109	1.25	-0.000046	-0.023272	-0.18	-0.00337	-0.00111	0.03
loan	-0.00283	-0.09907	-1.01	0.000024	0.028050	0.03	-0.00981	-0.00765	-0.58
cattle	-0.00072	-0.22354	-1.61	0.000011	0.111711	-0.05	-0.00733	-0.04993	-2.36
smallrum	0.00076	0.15760	2.92	0.000027	0.190020	2.77	0.00802	0.03661	3.53
equine	-0.00237	-0.14665	-0.85	-0.000065	-0.135867	-0.6	0.01281	0.01745	1.08
mod_tech	-0.01630	-0.61589	-3.65	-0.000273	-0.380445	-1.7	-0.06123	-0.06619	-2.62
fertiliz	-0.00004	-0.28952	-1.75	0.000000	0.058635	0.23	-0.00001	-0.00183	-0.49
seed_imp	0.00003	0.01988	0.54	0.000001	0.016842	0.52	0.00004	0.00052	0.21
ag_chem	-0.00350	-0.56956	-0.98	-0.000125	-0.683478	-0.86	0.00373	0.01338	0.67
machine	0.00002	0.00526	0.67	-0.000001	-0.011166	-0.22	0.00038	0.00206	1
sex	-0.00607	-0.20641	-2.74	0.000037	0.042340	-0.47	-0.06456	-0.04917	-3.3
biol_par	-0.00030	-0.04264	-1.4	0.000161	0.333826	-0.14	-0.12244	-0.17093	-4.67
age_chil	-0.00591	-3.77138	-6.53	-0.000039	-0.847460	-3.55	-0.32372	-4.55485	-12.44
age_sqr	0.00012	0.80763	4.09	0.000003	0.777416	3.04	0.01245	1.90194	10.25
fem_head	-0.00584	-0.07074	-1.7	0.000213	0.066946	0.51	-0.04852	-0.01081	-1.77
hhsiz	0.00120	0.75827	2.25	0.000015	0.317935	0.68	0.00091	0.01265	0.5
prop_fem	-0.01204	-0.33628	-1.67	0.000694	0.654028	0.82	-0.15081	-0.09285	-2.26
age_head	-0.00022	-0.69217	-1.99	-0.000007	-0.779131	-1.5	-0.00197	-0.13753	-2.33
infants	-0.00175	-0.18894	-0.86	-0.000167	-0.607608	-2.05	0.00780	0.01858	0.67
edu_head	0.00087	0.08371	-0.79	0.000062	0.200555	0.85	-0.02746	-0.05847	-6.36
dis_scho	-0.00005	-0.12988	-0.26	-0.000005	-0.438759	-1.3	0.00072	0.04208	2.1
qual_edu	0.00608	0.28518	0.07	0.000380	0.651070	1.27	-0.12066	-0.12428	-5.57
pcp_exp	0.00005	0.04200	-0.91	0.000004	0.110985	0.11	-0.00234	-0.04474	-4.73
region1	-0.00027	-0.00033	0.27	-0.006698	-2.707279	0	0.05607	0.00761	0.85
region2	-0.00277	-0.05106	-0.14	-0.000432	-0.322446	-1.56	0.03913	0.01566	0.72
region3	0.00865	0.20484	1.07	-0.000319	-0.291374	-1.24	-0.02135	-0.01172	-0.31
region5	-0.00387	-0.04971	-0.62	-0.000418	-0.237034	-1.87	-0.00598	-0.00145	-0.17
remit	0.01035	0.17309	1.82	0.000580	0.291551	2.28	-0.03388	-0.01381	-1.05

\* The cutoff hours of work used in categorizing child activities in to four is based on 7 hours of work per week

Appendix-6: Marginal Effects and Elasticity of the Explanatory variables on the probability of the different child Activities (Boys)

Explanatory variable	Neither schooling nor Work			Mainly Schooling			Mainly Work		
	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z
hectare	-3.3E-05	-0.01066	0.47	-5.46E-07	-0.51232	-0.74	0.029426	0.059386	1.83
number_p	0.000527	0.45495	1.65	-1.39E-07	-0.3434	-0.35	0.009978	0.053087	1.23
wall	-0.00157	-0.07715	-0.82	1.76E-07	0.02469	0.06	-0.02091	-0.00632	-0.52
roof	0.00019	0.013839	0.03	3.00E-06	0.625004	3.56	-0.01016	-0.00455	-0.3
fertil_1	-0.00185	-0.69631	-1.64	3.65E-07	0.394707	0.35	-0.02411	-0.05608	-0.98
quality1	-0.00023	-0.0687	-0.1	1.36E-06	1.165652	1.54	0.003697	0.00683	0.09
irrigat	0.000742	0.015544	-0.04	9.31E-06	0.196719	2.15	-0.06353	-0.00808	-1.11
exten	0.001993	0.098072	0.69	2.22E-06	0.313232	1.58	-0.04708	-0.01428	-1.11
loan	-0.00195	-0.24287	-1.78	-3.21E-07	-0.11672	-0.68	-0.0477	-0.03781	-1.64
cattle	-0.00027	-0.30264	-1.49	-1.28E-07	-0.41758	-0.94	-0.01014	-0.07101	-2.16
smallrum	0.000248	0.193824	2.26	2.64E-07	0.591327	3.35	0.005459	0.026339	1.71
equine	-0.00076	-0.17004	-0.33	-1.23E-06	-0.78686	-1.71	0.035373	0.048596	2.28
mod_tech	-0.00196	-0.29772	-1.48	-8.95E-08	-0.04544	-0.4	-0.07736	-0.08034	-1.97
fertiliz	-1.4E-05	-0.34366	-1.46	-1.15E-09	-0.07946	-0.21	-4.3E-05	-0.00636	-0.43
seed_imp	6.45E-06	0.014383	0.31	-2.10E-08	-0.13417	-0.75	3.13E-05	0.000431	0.1
ag_chem	-0.00253	-1.83769	-1.45	-1.25E-06	-2.60483	-1.03	0.002113	0.009467	0.64
machine	0.000012	0.009883	0.36	-8.67E-07	-2.03939	0	-0.00019	-0.00097	-0.28
sex									
biol_par	-0.00186	-0.3624	-1.83	-9.25E-07	-0.47768	-1.72	-0.14368	-0.20215	-3.94
age_chil	-0.00176	-4.0337	-4.96	1.53E-06	10.06402	-0.35	-0.39043	-5.51683	-9.74
age_sqr	4.05E-05	1.011017	3.28	-6.74E-08	-4.822	0.1	0.015042	2.31635	8.14
fem_head	-0.00168	-0.06915	-1.29	2.15E-07	0.023191	-0.15	-0.08578	-0.01827	-1.95
hhszize	0.000621	1.407955	2.94	-2.58E-08	-0.1676	0	0.004828	0.067458	1
prop_fem	0.002062	0.177848	0.19	3.17E-07	0.07842	-0.02	-0.07973	-0.04239	-0.73
age_head	-0.00013	-1.40815	-2.19	-5.48E-08	-1.76424	-1.84	-0.00184	-0.12767	-1.45
infants	-0.00058	-0.22354	-0.96	-1.98E-07	-0.21978	-0.59	-0.00538	-0.01289	-0.4
edu_head	0.000309	0.106167	0.02	2.89E-07	0.284854	1.37	-0.02246	-0.0476	-3.47
dis_scho	6.57E-06	0.063574	0.53	-1.55E-08	-0.42857	-0.93	0.000333	0.019851	0.73
qual_edu	0.000434	0.060281	-1.04	2.55E-06	1.53844	1.8	-0.14281	-0.15444	-4.6
pcp_exp	2.98E-05	0.091625	-0.9	1.27E-08	0.11149	-0.3	-0.00407	-0.07709	-5.09
region1	0.001275	0.026431	1.03	-3.1E-05	-3.04929	0	0.14668	0.020502	1.89
region2	-0.00198	-0.13892	-0.34	-2.20E-06	-0.5403	-1.65	0.078255	0.031712	1.05
region3	0.000559	0.049598	0.27	-1.71E-06	-0.47876	-1.14	0.019028	0.010614	0.26
region5	-0.00271	-0.14882	-0.87	-1.78E-06	-0.34921	-1.55	0.034117	0.009503	0.42
remitt	0.003829	0.220473	1.53	2.84E-06	0.393037	1.71	-0.04229	-0.01755	-1.1

\* The cutoff hours of work used in categorizing child activities in to four is based on 7 hours of work per week



Appendix-7: Marginal Effects and Elasticity of the Explanatory variables on the probability of the different child Activities (Girls)

Explanatory variable	Neither schooling nor Work			Mainly Schooling			Mainly Work		
	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z
hectare	-0.0035	-0.2434296	-0.64	-0.0003	-0.33619	-0.67	0.01784	0.033941	0.92
number_p	0.00139	0.2584105	0.03	0.000168	0.495723	0.61	-0.02039	-0.10305	-2.49
wall	-0.0092	-0.0894129	-0.75	3.49E-05	0.005432	0.13	0.026723	0.007114	0.49
roof	0.00794	0.1249527	1.56	0.000647	0.16214	1.26	0.030135	0.012929	1.13
fertil_1	0.00495	0.4129587	1.27	0.000316	0.419709	0.77	0.021479	0.048889	0.99
quality1	0.01432	0.9523608	2.28	0.001006	1.065258	1.50	0.008012	0.01452	0.51
irrigat	-0.008	-0.0442742	-0.89	0.000619	0.039185	0.24	-0.0575	-0.00671	-1.21
exten	0.00391	0.0501281	0.72	-0.00134	-0.27272	-1.24	0.036924	0.012893	1.04
loan	0.00074	0.020285	0.35	0.000574	0.250488	1.08	0.017577	0.013068	0.67
cattle	-0.001	-0.2363058	-1.17	0.000135	0.50493	1.02	-0.00779	-0.05006	-1.79
smallrum	0.00054	0.0822119	1.46	5.61E-05	0.136448	1.79	0.01052	0.043778	3
equine	-0.0032	-0.1530735	-1.01	4.71E-05	0.036087	-0.04	-0.0096	-0.01259	-0.84
mod_tech	-0.0312	-0.8475579	-3.33	-0.00154	-0.70587	-2.02	-0.04344	-0.05097	-1.71
fertiliz	-4E-05	-0.2098029	-0.82	1.33E-06	0.11728	0.50	4.77E-05	0.007191	0.18
seed_imp	4.8E-05	0.0210499	0.15	7.34E-06	0.050967	1.09	-0.00037	-0.00439	-0.52
ag_chem	-0.0017	-0.1549555	-0.33	-0.00023	-0.33751	-0.48	0.008785	0.022369	1.48
machine	3.2E-05	0.0066533	0.78	-1.40E-06	-0.00471	0.16	0.000637	0.003665	1.33
sex									
biol_par	0.0066	0.3202579	-0.13	0.001467	2.012812	1.62	-0.11537	-0.1594	-2.9
age_chil	-0.006	-2.990898	-4.12	-0.00104	-8.29401	-4.18	-0.27562	-3.75097	-7.95
age_sqr	4.2E-05	0.2286266	2.36	5.58E-05	4.794251	3.86	0.010622	1.562492	6.49
fem_head	-0.007	-0.0689646	-1.00	0.000792	0.091568	0.73	-0.01729	-0.00384	-0.55
hhsiz	0.00053	0.2612347	0.45	9.82E-05	0.771636	0.98	-0.00091	-0.01219	-0.09
prop_fem	-0.0365	-0.9192859	-2.48	2.77E-03	1.111333	0.75	-0.21006	-0.14423	-2.46
age_head	-1E-05	-0.0368211	-0.65	-6.58E-06	-0.26222	-0.60	-0.00248	-0.16941	-1.96
infants	-0.0021	-0.1799544	-0.34	-0.00085	-1.14169	-2.36	0.018076	0.041663	1.2
edu_head	0.00117	0.0895311	-0.82	0.000147	0.179086	0.16	-0.03045	-0.0633	-5.29
dis_scho	-0.0002	-0.3195177	-0.67	-1.8E-05	-0.59181	-1.08	0.001267	0.070128	2.39
qual_edu	0.01008	0.3649511	0.61	0.000645	0.37295	0.43	-0.09666	-0.09243	-3.17
pcp_exp	2.8E-05	0.0189725	-0.39	1.16E-05	0.126738	0.62	-0.00129	-0.02406	-2.38
Region2	-0.0166	0.1427987	1.01	0.999678	5.506871	5.90	-0.69476	0.011834	0.78
Region3	-0.0114	0.504309	1.72	0.997472	8.08152	5.99	-0.70392	-0.00816	0.28
Region4	-0.0185	0.0430495	0.83	0.999783	1.750752	5.64	-0.70416	0.003804	0.64
region5	-0.0178	0.07537	0.61	0.999897	3.396306	5.49	-0.70675	-0.00176	0.22
remitt	0.01269	0.1665445	1.33	0.002177	0.370586	2.19	-0.02092	-0.0079	-0.29

\* The cutoff hours of work used in categorizing child activities in to four is based on 7 hours of work per week

Appendix-8: Marginal Effects and Elasticity of the Explanatory variables on the probability of the different child Activities (All Children)

Explanatory Vars.	Neither schooling nor Work			Mainly Schooling			Mainly Work		
	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z
hectare	- 0.0011	- 0.0134	0.98	- 0.0023	- 0.0404	0.72	0.0244	0.0570	2.24
number_p	0.0021	0.0679	-0.06	0.0009	0.0427	-0.22	- 0.0078	- 0.0479	-1.17
wall	- 0.0006	- 0.0010	-0.09	0.0110	0.0276	0.54	- 0.0135	- 0.0046	-0.24
roof	- 0.0037	- 0.0101	0.09	0.0063	0.0243	0.75	0.0083	0.0043	0.52
fertil_1	0.0143	0.2037	1.43	0.0202	0.4107	2.34	- 0.0206	- 0.0564	0.29
quality1	- 0.0029	- 0.0328	0.26	0.0078	0.1265	0.87	0.0115	0.0251	0.65
irrigat	- 0.0188	- 0.0153	-1.54	- 0.0077	- 0.0083	-1.14	- 0.0375	- 0.0051	-1.74
exten	0.0678	0.1363	3.25	0.0136	0.0393	1.12	- 0.0669	- 0.0259	-0.34
loan	0.0107	0.0507	0.59	0.0137	0.0932	1.08	- 0.0258	- 0.0236	-0.47
cattle	- 0.0051	- 0.2114	-2.8	0.0008	0.0459	-0.85	- 0.0029	- 0.0232	-2.2
smallrum	0.0039	0.1072	3.58	- 0.0020	- 0.0803	0.09	0.0043	0.0230	2.85
equine	0.0029	0.0240	0.78	- 0.0027	- 0.0319	0.03	0.0080	0.0128	0.96
mod_tech	- 0.0518	- 0.2983	-3.76	- 0.0064	- 0.0620	-2.04	- 0.0183	- 0.0283	-2.64
fertiliz	- 0.0003	- 0.2881	-3.87	- 0.0001	- 0.1010	-2.44	0.0002	0.0404	-0.78
seed_imp	0.0001	0.0041	0.71	0.0002	0.0273	2.52	0.0001	0.0008	0.98
ag_chem	0.0001	0.0014	0.45	- 0.0004	- 0.0129	-0.09	0.0011	0.0048	0.62
machine	0.0002	0.0053	1.36	0.0002	0.0078	1.78	0.0003	0.0019	1.51
sex	- 0.0219	- 0.1008	-2.5	0.0290	0.1924	1.12	- 0.0494	- 0.0442	-2.51
biol_par	- 0.0182	- 0.1579	-2.82	0.0328	0.4011	0.06	- 0.1051	- 0.1718	-4.3
age_chil	- 0.0103	- 0.8815	-7.15	0.0591	7.2543	-2.05	- 0.3093	- 5.1075	-11.9
age_sqr	- 0.0006	- 0.5709	4.43	- 0.0023	- 3.0654	1.57	0.0127	2.2824	10.1
fem_head	- 0.0373	- 0.0582	-2.92	- 0.0137	- 0.0279	-1.93	- 0.0173	- 0.0028	-2.1
hhsize	0.0084	0.7101	2.97	- 0.0013	- 0.1549	-0.53	- 0.0067	- 0.1091	-0.51
prop_fem	- 0.0238	- 0.0891	-1.33	0.0715	0.3838	0.79	- 0.1547	- 0.1118	-2.03
age_head	- 0.0014	- 0.5859	-2.48	0.0010	0.5863	1.02	- 0.0007	- 0.0558	-1.27
infants	- 0.0157	- 0.2280	-1.35	- 0.0005	- 0.0096	0.48	0.0255	0.0714	1.68
edu_head	0.0006	0.0076	-2.76	0.0079	0.1469	0.51	- 0.0277	- 0.0692	-6.01
dis_scho	- 0.0002	- 0.0607	0.29	- 0.0002	- 0.1090	-0.2	0.0009	0.0601	2.17
qual_edu	0.0029	0.0090	-2.31	0.0345	0.3136	0.43	- 0.1205	- 0.1440	-5.28
pcp_exp	- 0.0001	- 0.0109	-2	0.0008	0.1326	1.78	- 0.0021	- 0.0469	-3.86
region1	- 0.0598	- 0.0502	-2.01	- 0.0732	- 0.1309	-3.75	0.0972	0.0199	0.01
region2	- 0.0991	- 0.2842	-3.64	- 0.0786	- 0.3330	-4.04	0.1294	0.0724	0.01
region3	- 0.0522	- 0.1849	-2.31	- 0.0519	- 0.2687	-2.91	0.0345	0.0261	-0.84
region5	- 0.0745	- 0.1427	-3.26	- 0.0647	- 0.1935	-3.98	0.0529	0.0260	-0.86
remitt	0.0184	0.0466	0.56	0.0225	0.0789	1.09	- 0.0533	- 0.0260	-1.15

\* The cutoff hours of work used in categorizing child activities in to four is based on 21 hours of work per week

Appendix-9: Marginal Effects and Elasticity of the Explanatory variables on the probability of the different child Activities (Boys)

Explanatory Vars.	Neither schooling nor Work			Mainly Schooling			Mainly Work		
	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z
hectare	-0.00619	-0.08385	0.47	-0.00546	-0.11908	0.25	0.039368	0.091289	2.22
number_p	0.00512	0.182721	1.40	-0.00259	-0.14886	- 0.06	0.006166	0.037694	1.10
wall	0.004762	0.009658	0.08	0.02024	0.066099	0.94	-0.03059	-0.01063	- 0.35
roof	-2E-05	-6E-05	0.01	0.022162	0.107283	1.48	-0.02178	-0.01122	- 0.20
fertil_1	0.007122	0.111114	0.12	0.019619	0.492818	1.41	-0.03806	-0.10172	- 0.84
quality1	-0.03094	-0.38339	- 1.04	0.003897	0.077744	0.27	0.02995	0.063573	0.30
irrigat	-0.04701	-0.05045	- 1.87	0.004802	0.008336	- 0.38	-0.02183	-0.0017	- 1.05
exten	0.068452	0.139287	1.92	0.028781	0.094291	1.17	-0.12133	-0.04229	- 1.46
loan	0.000315	0.001413	- 0.80	0.007603	0.064875	- 0.26	-0.04982	-0.04529	- 1.71
cattle	-0.00753	-0.35376	- 2.94	-0.00082	-0.0621	- 1.45	-0.00198	-0.01592	- 2.00
smallrum	0.003498	0.113215	2.17	-0.00137	-0.07147	- 0.17	0.001622	0.008991	1.18
equine	0.00781	0.071967	1.49	-0.0124	-0.184	- 0.69	0.027619	0.043596	1.91
mod_tech	-0.02274	-0.15565	- 2.17	-0.02529	-0.26384	- 2.72	-0.04815	-0.06287	- 2.47
fertiliz	-0.00038	-0.3762	- 2.99	-1.3E-05	-0.0207	- 0.95	0.000229	0.039202	- 0.48
seed_imp	0.000188	0.017335	1.27	0.000283	0.041968	2.90	0.000133	0.002102	1.21
ag_chem	-9.7E-05	-0.0029	- 0.12	-0.00111	-0.05374	- 0.29	0.001137	0.005853	0.64
machine	-0.00024	-0.00821	- 0.23	0.000238	0.012999	1.21	0.000243	0.001415	0.41
biol_par	-0.00815	-0.09737	- 1.95	0.02787	0.417122	- 0.08	-0.12767	-0.20157	- 3.62
age_chil	-0.01917	-1.81654	- 5.52	0.084971	12.96719	0.34	-0.35671	-5.79138	- 8.91
age_sqr	-0.00021	-0.21513	3.48	-0.00344	-5.71339	- 0.53	0.01461	2.585197	7.53
fem_head	-0.01318	-0.0181	- 1.59	-0.01283	-0.03079	- 1.71	-0.07336	-0.01709	- 2.36
hhsiz	0.00904	0.8472	2.87	-0.00195	-0.29442	- 0.31	-0.00271	-0.04343	0.53
prop_fem	0.02564	0.091444	- 0.04	0.013318	0.076476	- 0.09	-0.10531	-0.06433	- 0.84
age_head	-0.00132	-0.61537	- 1.92	0.000349	0.26097	- 0.07	-0.00049	-0.03873	- 1.04
infants	-0.01283	-0.20611	- 0.84	0.012201	0.315545	2.20	0.009557	0.026295	0.73
edu_head	0.001172	0.016656	- 1.21	0.006271	0.14355	0.86	-0.0227	-0.05528	- 3.11
dis_scho	4.05E-05	0.0162	0.34	-0.0002	-0.12708	- 0.68	0.000322	0.02207	0.53
qual_edu	-0.00068	-0.01961	- 2.05	0.039459	0.479448	0.85	-0.14285	-0.17594	- 4.30
pcp_exp	0.000139	0.017608	- 2.38	0.000852	0.174325	0.09	-0.00407	-0.08859	- 4.77
region1	-0.04514	-0.03936	- 0.45	-0.05559	-0.1176	- 1.90	0.157348	0.025626	0.99
region2	-0.09176	-0.29081	- 2.55	-0.0686	-0.36615	- 3.28	0.099803	0.057312	- 0.19
region3	-0.0533	-0.20773	- 1.78	-0.05005	-0.32211	- 2.51	0.011045	0.011441	- 0.83
region5	-0.06572	-0.14365	- 2.08	-0.04716	-0.17427	- 2.59	0.023834	0.015103	- 0.67
remitt	0.004072	0.0121	- 0.44	0.004529	0.021057	- 0.30	-0.04624	-0.02231	- 1.31

\* The cutoff hour of work used in categorizing child activities in to four is based on 21 hours of work per week

Appendix-10: Marginal Effects and Elasticity of the Explanatory variables on the probability of the different child Activities (Girls)

Explanatory Vars.	Neither schooling nor Work			Mainly Schooling			Mainly Work		
	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z
hectare	0.0060	0.0651	1.03	0.00004	0.00067	0.59	0.0094	0.0210	1.02
number_p	- 0.0003	- 0.0090	- 1.21	0.00554	0.26192	0.06	- 0.0187	- 0.1104	-2.35
wall	- 0.0055	- 0.0084	- 0.04	-0.00599	-0.01491	- 0.13	0.0174	0.0054	0.27
roof	- 0.0094	- 0.0229	0.04	-0.01780	-0.07145	- 0.55	0.0439	0.0220	0.89
fertil_1	0.0229	0.2977	2.02	0.01661	0.35367	1.94	0.0006	0.0015	1.44
quality1	0.0262	0.2705	1.35	0.01028	0.17428	0.87	- 0.0089	- 0.0189	0.61
irrigat	0.0205	0.0156	- 0.49	-0.01215	-0.01390	- 1.11	- 0.0850	- 0.0118	-1.82
exten	0.0625	0.1244	2.41	-0.00791	-0.02586	0.32	- 0.0146	- 0.0059	0.88
loan	0.0201	0.0857	1.51	0.02162	0.15133	1.87	- 0.0117	- 0.0103	0.87
cattle	- 0.0026	- 0.0954	- 1.33	0.00347	0.20839	0.37	- 0.0070	- 0.0522	-1.66
smallrum	0.0038	0.0907	2.70	-0.00192	-0.07485	0.52	0.0062	0.0302	2.58
equine	- 0.0016	- 0.0120	- 0.41	0.00803	0.09855	0.61	- 0.0132	- 0.0202	-0.73
mod_tech	- 0.0827	- 0.4169	- 2.84	0.01737	0.15728	- 0.10	0.0146	0.0076	-1.11
fertiliz	- 0.0003	- 0.2347	- 2.39	-0.00015	-0.21144	- 2.34	0.0003	0.0536	-0.17
seed_imp	- 0.0002	- 0.0124	- 0.59	0.00015	0.01688	0.07	- 0.0003	- 0.0042	-0.67
ag_chem	0.0015	0.0223	1.64	0.00075	0.01780	1.46	0.0081	0.0240	1.67
machine	0.0004	0.0130	1.81	0.00004	0.00240	1.04	0.0003	0.0017	1.41
biol_par	- 0.0221	- 0.1727	- 1.93	0.03955	0.54909	0.50	- 0.0936	- 0.1543	-2.63
age_chil	0.0061	0.4703	- 4.84	0.01814	2.30980	- 3.65	- 0.2711	- 4.3040	-8.23
age_sqr	- 0.0014	- 1.1368	3.04	-0.00048	-0.66715	3.20	0.0113	1.9347	7.00
fem_head	- 0.0610	- 0.0972	- 2.35	-0.00997	-0.02078	- 0.90	0.0353	0.0123	-0.55
hhsiz	0.0073	0.5628	1.23	-0.00027	-0.03358	- 0.41	- 0.0097	- 0.1520	-1.06
prop_fem	- 0.0647	- 0.2534	- 1.92	0.09993	0.64206	0.52	- 0.2068	- 0.1656	-2.32
age_head	- 0.0014	- 0.5531	- 1.66	0.00138	0.88014	1.21	- 0.0010	- 0.0760	-0.95
infants	- 0.0183	- 0.2404	- 1.03	-0.01641	-0.35403	- 1.48	0.0426	0.1146	1.51
edu_head	0.0011	0.0128	- 2.56	0.00772	0.15013	- 0.25	- 0.0306	- 0.0742	-5.20
dis_scho	- 0.0005	- 0.1561	0.16	-0.00026	-0.13408	0.27	0.0016	0.1061	2.74
qual_edu	0.0070	0.0333	- 1.20	0.02512	0.22491	0.08	- 0.0928	- 0.1022	-2.98
pcp_exp	- 0.0003	- 0.0367	- 0.79	0.00066	0.11518	2.12	- 0.0006	- 0.0140	-0.84
region2	- 0.0492	- 0.1070	0.31	0.11706	0.32655	1.98	0.0326	0.0286	1.65
region3	0.0257	0.1058	1.61	0.17726	0.71331	2.69	- 0.0897	- 0.0378	1.15
region4	0.0417	0.0581	2.51	0.35397	0.19585	3.24	- 0.2513	- 0.0137	1.33
region5	- 0.0258	- 0.0303	0.36	0.11557	0.18825	1.66	- 0.0197	0.0028	0.95
remit	0.0309	0.0702	1.10	0.03566	0.12539	1.65	- 0.0561	- 0.0255	-0.20

\* The cutoff hour of work used in categorizing child activities in to four is based on 21 hours of work per week

Appendix-11: Marginal Effects and Elasticity of the Explanatory variables on the probability of the different child Activities (All Children)

Explanatory Vars.	Neither schooling nor Work			Mainly Schooling			Mainly Work		
	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z
hectare	0.0013	0.007777	0.92	-0.13184	-0.10076	-0.08	0.01983	0.0566	1.55
number_p	0.0038	0.061541	0.14	-0.12843	0.092063	0.39	-0.0095	-0.072	-0.9
wall	0.0135	0.011981	0.54	-0.11758	0.025481	0.91	-0.0285	-0.0118	-0.1
roof	0.0054	0.00741	0.51	-0.09888	0.008485	0.57	-0.0027	-0.0017	0.35
fertil_1	0.0031	0.021963	1.06	-0.03170	0.204257	2.08	-0.0084	-0.0283	0.91
quality1	0.0382	0.218162	0.43	-0.01584	-0.12237	-1.08	-0.0351	-0.0935	-1
irrigat	-0.0417	-0.0163	-2.86	-0.01217	-0.01686	-2.94	-0.0095	0.00023	-2.5
exten	0.1113	0.11304	3.07	-0.00637	0.012839	0.69	-0.1122	-0.0532	-1
loan	-0.0020	-0.00497	0.67	-0.00344	0.096979	2.15	-0.0144	-0.0162	0.57
cattle	-0.0072	-0.15034	-2.83	-0.00307	0.086159	-0.76	-0.0004	-0.0038	-1.8
smallrum	0.0030	0.041506	2.72	-0.00124	-0.06537	0.67	0.00475	0.03114	2.91
equine	0.0049	0.02059	1.09	-0.00023	-0.01742	0.55	0.00553	0.01082	1.1
mod_tech	-0.0646	-0.19402	-2.86	0.00003	0.150604	-0.29	-0.0062	-0.0137	-1.7
fertiliz	-0.0003	-0.15906	-2.91	0.00003	0.020841	-0.52	0.00024	0.05337	0.08
seed_imp	-0.0002	-0.00993	-0.25	0.00014	0.001691	0.4	0.00028	0.00531	0.63
ag_chem	0.0015	0.016652	1.26	0.00020	0.014422	1.24	0.00381	0.01962	1.29
machine	-0.0002	-0.00349	0.98	0.00067	0.003152	1.79	0.00063	0.00493	1.97
sex	-0.0621	-0.14437	-2.94	0.00097	0.165244	1.35	-0.0082	-0.0093	-1.2
biol_par	-0.0710	-0.27273	-4.09	0.00126	0.334632	-0.54	-0.0461	-0.106	-3.5
age_chil	-0.0064	-0.2755	-6.52	0.00304	9.590349	-0.71	-0.307	-6.1993	-11
age_sqr	-0.0011	-0.51492	4.42	0.00420	-4.04804	0.37	0.013	2.84944	9.12
fem_head	-0.0361	-0.02667	-1.93	0.00458	0.02207	-0.4	-0.0159	-0.0046	-1.4
hhsz	0.0106	0.45374	2.10	0.00934	-0.07157	-0.27	-0.0092	-0.1834	-0.8
prop_fem	-0.0853	-0.16155	-1.47	0.01322	0.352365	1.14	-0.0943	-0.0833	-1.2
age_head	-0.0020	-0.42551	-2.88	0.01371	0.195471	-0.82	0.00012	0.01222	-1.6
infants	-0.0235	-0.17227	-0.48	0.02103	0.001952	1.2	0.03306	0.11308	2.42
edu_head	-0.0050	-0.03276	-4.40	0.02120	0.117128	-0.77	-0.0213	-0.0652	-5.7
dis_scho	-0.0001	-0.01686	1.37	0.02275	-0.05687	0.96	0.0008	0.06673	2.58
qual_edu	-0.0157	-0.05603	-2.80	0.02982	0.327216	1.07	-0.1019	-0.1483	-4.2
pcp_exp	0.0001	0.007829	-2.55	0.03555	0.100034	-0.1	-0.0024	-0.0666	-4.4
region1	-0.1278	-0.05101	-2.94	0.05216	-0.08875	-3.93	0.17039	0.03893	-0.5
region2	-0.1332	-0.17107	-3.67	0.05937	-0.24839	-4.56	0.16099	0.10846	-1
region3	-0.0732	-0.12357	-3.36	0.07515	-0.29003	-4.67	0.06171	0.06111	-2.1
region5	-0.1025	-0.08494	-3.34	0.13750	-0.12237	-4.06	0.07869	0.04193	-1.5
remit	0.0135	0.01772	-0.33	0.16374	0.024137	-0.21	-0.0429	-0.026	-1.4

\* The cutoff hour of work used in categorizing child activities in to four is based on 35 hours of work per week

Appendix-12: Marginal Effects and Elasticity of the Explanatory variables on the probability of the different child Activities (boys)

Explanatory Vars.	Neither schooling nor Work			Mainly Schooling			Mainly Work		
	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z
hectare	-0.01197	-0.0828	- 0.07	-0.02347	-0.19271	- 0.85	0.042469	0.11864	1.46
number_p	0.006871	0.125257	1.56	-0.00365	-0.07904	0.66	0.004256	0.03134	1.29
wall	-0.02534	-0.02625	- 0.54	0.022367	0.02751	0.40	-0.00079	-0.0003	- 0.12
roof	0.003301	0.00507	0.23	0.031976	0.05831	1.11	-0.03053	-0.0189	- 0.13
fertil_1	0.001919	0.015292	0.20	0.035422	0.33516	1.50	-0.03384	-0.1089	- 0.28
quality1	0.004801	0.030392	- 0.69	-0.01684	-0.12657	- 1.24	-0.01532	-0.0392	- 0.99
irrigat	-0.05807	-0.0273	- 2.37	-0.03167	-0.01575	- 2.17	-0.00391	0.00207	- 1.85
exten	0.11502	0.119554	1.94	0.047694	0.05886	0.96	-0.16922	-0.0711	- 1.62
loan	-0.00988	-0.02701	- 0.38	0.046769	0.1513	1.36	-0.04061	-0.0446	- 0.62
cattle	-0.00873	-0.20951	- 2.64	0.003008	0.08569	- 1.00	-0.00054	-0.0052	- 1.78
smallrum	0.004102	0.067818	2.09	-0.00106	-0.02087	0.90	0.000484	0.00323	1.42
equine	0.0073	0.034363	1.46	-0.02113	-0.11809	- 0.07	0.029721	0.05652	2.03
mod_tech	-0.02883	-0.09965	- 1.51	0.028804	0.11914	- 0.41	-0.036	-0.0524	- 1.45
fertiliz	-0.00054	-0.27557	- 2.70	0.000104	0.06331	0.18	0.00037	0.07643	0.36
seed_imp	-0.00012	-0.00553	0.36	0.000156	0.00874	1.17	0.000193	0.00368	0.92
ag_chem	0.000379	0.005823	0.55	0.000369	0.00673	0.56	0.001509	0.00936	0.58
machine	-0.00033	-0.0058	0.48	0.000499	0.01027	1.55	0.000452	0.00317	1.08
biol_par	-0.05768	-0.25435	- 2.89	0.072802	0.40955	- 0.11	-0.07597	-0.1545	- 2.87
age_chil	-0.02669	-1.29221	- 5.14	0.221062	12.7078	0.21	-0.363	-7.0998	- 7.93
age_sqr	-7.8E-05	-0.0412	3.62	-0.00892	-5.58645	- 0.56	0.015168	3.23318	6.75
fem_head	-0.00813	-0.00451	- 1.02	0.048164	0.04183	0.05	-0.07651	-0.0233	- 1.68
hhsize	0.014648	0.701228	2.57	-0.0035	-0.19872	- 0.20	-0.0092	-0.1779	- 0.13
prop_fem	-0.01825	-0.03325	- 0.33	0.055315	0.11965	0.27	-0.05724	-0.0421	- 0.42
age_head	-0.0026	-0.6183	- 3.00	-0.00039	-0.10998	- 1.93	0.001132	0.10856	- 1.50
infants	-0.02154	-0.17674	- 0.58	0.011624	0.11324	1.39	0.016904	0.05603	1.01
edu_head	-0.00333	-0.02416	- 2.19	0.011882	0.10246	- 0.12	-0.0186	-0.0546	- 2.99
dis_scho	1.94E-05	0.003963	0.80	-3.9E-05	-0.00951	0.76	0.00034	0.02805	1.12
qual_edu	-0.04007	-0.15066	- 2.65	0.097883	0.44375	1.29	-0.10546	-0.1589	- 3.10
pcp_exp	0.000422	0.027382	- 2.88	0.001956	0.15083	- 0.99	-0.00441	-0.1158	- 5.06
region1	-0.08134	-0.02877	- 0.94	-0.14487	-0.10863	- 2.51	0.209399	0.0425	0.39
region2	-0.12073	-0.17031	- 2.63	-0.15363	-0.2911	- 3.71	0.153636	0.10539	- 0.86
region3	-0.05502	-0.09717	- 2.39	-0.14795	-0.35999	- 3.93	0.04601	0.05138	- 1.75
region5	-0.06271	-0.05132	- 2.08	-0.11376	-0.14814	- 3.25	0.027912	0.02493	- 1.41
remitt	0.023534	0.034337	- 0.06	0.020212	0.03498	- 0.06	-0.06167	-0.0363	- 1.25

\* The cutoff hours of work used in categorizing child activities in to four is based on 35 hours of work per week

Appendix-13: Marginal Effects and Elasticity of the Explanatory variables on the probability of the different child Activities (Girls)

Explanatory Vars.	Neither schooling nor Work			Mainly Schooling			Mainly Work		
	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z	Marginal Effects	Elasticity	Z
Hectare	0.0188	0.1009	1.56	-0.00049	-0.00447	0.89	-0.00351	-0.01010	0.94
Number_p	0.0033	0.0477	-0.89	0.01157	0.27746	0.35	-0.02288	-0.17490	-2.22
Wall	0.0686	0.0517	1.53	0.01204	0.01521	0.84	-0.05936	-0.02390	0.13
Roof	0.0032	0.0038	0.36	-0.02829	-0.05760	-0.56	0.03401	0.02207	0.69
Fertil_1	0.0062	0.0401	1.52	0.00911	0.09842	1.68	0.01794	0.06176	1.75
Quality1	0.0783	0.4011	1.17	-0.01922	-0.16536	-0.55	-0.06160	-0.16886	-0.63
Irrigat	-0.0201	-0.0056	-1.76	-0.02310	-0.01303	-1.96	-0.04231	-0.00657	-2.03
Exten	0.1069	0.1055	2.17	-0.02948	-0.04887	-0.25	-0.05964	-0.03150	0.03
Loan	0.0037	0.0077	1.19	0.01656	0.05857	1.67	0.00821	0.00912	1.30
Cattle	-0.0063	-0.1148	-1.71	0.00552	0.16832	0.16	-0.00345	-0.03352	-1.33
Smallrum	0.0005	0.0061	1.49	-0.00549	-0.10836	-0.03	0.00976	0.06143	2.46
Equine	0.0039	0.0145	-0.06	0.01110	0.06912	0.56	-0.01787	-0.03545	-0.67
Mod_tech	-0.0911	-0.2421	-2.06	0.04301	0.20411	0.23	0.01774	0.01957	-0.78
Fertiliz	-0.0002	-0.1033	-1.55	-0.00007	-0.04723	-1.08	0.00026	0.05858	0.23
Seed_imp	-0.0005	-0.0152	-1.09	0.00004	0.00229	-0.77	0.00001	0.00022	-0.81
Ag_chem	0.0035	0.0252	1.44	-0.00064	-0.00768	1.12	0.00714	0.02751	1.46
Machine	-0.0002	-0.0025	0.81	-0.00010	-0.00271	0.90	0.00078	0.00677	1.64
Biol_par	-0.0847	-0.2915	-2.87	0.05495	0.34897	-0.36	-0.02941	-0.08135	-2.21
Age_chil	0.0183	0.7030	-4.29	0.10824	6.99227	-1.49	-0.27532	-5.66698	-7.46
Age_sqr	-0.0023	-0.9768	2.87	-0.00387	-2.70429	1.37	0.01187	2.64145	6.40
Fem_head	-0.0655	-0.0470	-1.68	-0.00184	-0.00056	-0.69	0.04195	0.01626	-0.38
Hhsize	0.0056	0.2133	0.46	0.00137	0.08724	0.06	-0.00791	-0.16086	-0.76
Prop_fem	-0.1522	-0.2956	-1.70	0.21321	0.69493	1.33	-0.13032	-0.13534	-1.32
Age_head	-0.0014	-0.2709	-1.14	0.00180	0.58307	0.84	-0.00100	-0.10332	-0.82
Infants	-0.0260	-0.1692	-0.16	-0.01066	-0.11659	0.19	0.04843	0.16882	2.27
Edu_head	-0.0060	-0.0351	-3.77	0.01372	0.13536	-0.74	-0.02343	-0.07365	-4.81
Dis_scho	-0.0002	-0.0344	1.15	-0.00053	-0.14038	0.35	0.00140	0.11694	2.51
Qual_edu	0.0075	0.0149	-1.34	0.05182	0.23544	0.31	-0.09782	-0.13798	-2.77
Pcp_exp	-0.0001	-0.0042	-0.87	0.00085	0.07546	0.92	-0.00116	-0.03279	-1.49
Region2	0.0562	0.0602	1.19	0.01599	0.03051	0.83	-0.02715	-0.01406	0.69
Region3	0.1271	0.1939	1.51	0.04141	0.11163	0.97	-0.12929	-0.10667	0.04
Region4	0.2113	0.0757	3.15	0.13529	0.07882	2.92	-0.24066	-0.03927	1.03
Region5	0.0459	0.0320	1.00	0.04517	0.04974	1.07	-0.05118	-0.01731	0.48
Remitt	-0.0029	-0.0032	-0.58	-0.00060	-0.00098	-0.54	-0.01429	-0.00870	-0.73

\* The cutoff hour of work used in categorizing child activities in to four is based on 35 hours of work per week