

**Determinants of Child Labour and Schooling in Rural Households  
of Ethiopia:**

The Case of Kuyu Woreda, Central Ethiopia.

*A thesis Submitted to the School Graduate Studies of Jimma University  
for Partial Fulfillment of the Award of the Degree of Master of Science  
(MSc) in Economic Policy Analysis (Economics).*

By:

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**JIMMA UNIVERSITY  
COLLEGE OF BUSINESS AND ECONOMICS  
MSc PROGRAM**

**NOVEMBER, 2019**

**JIMMA, ETHIOPIA**

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## DECLARATION

I, the undersigned, declared that this thesis is my original work and has never been presented for the award of degree or diploma in any other university or institution and that all the sources of information used for this thesis have been duly acknowledged. The advisors' and examiners' comments have also been duly taken into account.

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## Contents

DECLARATION .....	<b>Error! Bookmark not defined.</b>
DECLARATION .....	<b>Error! Bookmark not defined.</b>
ACKNOWLEDGEMENT .....	III
ABBREVIATIONS AND ACRONYMS .....	VI
ABSTRACT.....	IX
CHAPTER ONE .....	1
INTRODUCTION .....	1
1.1. Background of the Study.....	1
1.2. Statement of the Problem.....	6
1.3. Objectives of the Study .....	10
1.3.1. General Objective of the Study .....	10
1.3.2. Specific Objectives of the Study .....	10
1.4. Significance of the Study .....	11
1.5. Scope and Limitation of the Study.....	11
1.6. Organization of the Study .....	12
CHAPTER TWO .....	13
REVIEW OF RELATED LITERATURES .....	13
2.1. Review of Theoretical Literatures.....	13
2.2. Review of Empirical Literatures .....	18
2.2.1. Determinants of Child Labour and Schooling .....	18
2.2.1a. Poverty's Effect on Child Labour .....	18
2.2.1b. Poverty's Effect on Child Schooling .....	21
2.2.1c. Parental Education Effects .....	23
2.2.1d. Household Land Size Effects.....	28
2.2.1e. Household Size Effects .....	29
2.2.1f. Household Composition Effects .....	31
2.2.1g. Household Head Gender Effects.....	34
2.2.1h. Age of Household Head Effects.....	35
2.2.1i. Relation to Household Head Effects.....	36
2.2.1j. Child Gender Effects.....	37
2.2.1k. Child Age Effects.....	40
2.2.1l. Region Effects.....	42

2.2.1m. Community Infrastructure Effects .....	42
2.2.1n. Household Assets Effects.....	45
2.2.1o. Household Head Health Shocks Effect .....	45
2.2.1p. Welfare Effects .....	46
CHAPTER THREE .....	48
METHODOLOGY OF THE STUDY .....	48
3.1. The Study Area .....	48
3.2. The study Design .....	49
3.3. Sample Size Determination and Sample Techniques.....	49
3.4. Data Collection .....	51
3.5. Methods of Data Analysis.....	51
3.6. The Model.....	51
3.6.1 Test for Independence Irrelevant Assumption (IIA) .....	56
3.6.2. Test for Multicollinearity .....	57
3.7. Specification of Variables .....	57
CHAPTER FOUR.....	60
DISCUSSION OF THE RESULTS .....	60
4.1. Descriptive Statistics.....	61
4.1.1. Child Work-School Participation.....	61
4.1.2. Types of Work Activities Performed by Children .....	63
4.2. Econometric Results .....	64
4.2.1. Chi <sup>2</sup> Tests of Categorical Variables against Child Activities.....	64
4.2.2. Child Characteristics and Child Work-School Participation	<b>Error! Bookmark not defined.</b>
4.2.3. Household Characteristics and Child Work-School Participation .....	78
4.2.4. The Character of Household Assets and Child Work-School Participation .....	81
4.2.5. School Related Factors and Child Work-School Participation .....	84
4.2.6. Differences in Area of Residence and Child Work-School Participation .....	86
CHAPTER FIVE .....	87
CONCLUSIONS AND RECOMMENDATIONS .....	87
REFERENCES .....	92
APPENDICES: .....	101

## LIST OF TABLES

Table 3.1: Variables in the model and their definitions.....	58
Table 4.1: Number and Percentage of Children by Sex, Age Group and Area of Residence .....	61
Table 4.2: Number and Percentage of Male and Female Children by Activity Status.....	62
Table 4.3: Number and Percentage Children across Different Age Group in Different Activity Status.....	62
Table 4.4: Number and Percentage of Children by Sex and Type of Work Activities Performed by Children.....	64
Table 4.5: Chi <sup>2</sup> Tests of Categorical Variables against Child Activities.....	67
Table 4.6: Summary of estimated coefficients of each categorical activity status .....	74
Table 4.7: Marginal effects on the probabilities of work-school participation outcomes for child characteristics.....	78
Table 4.8: Marginal effects on the probabilities of child work-school participation outcomes for household characteristic .....	80
Table 4.9: Marginal effects on the probabilities of child work-school participation outcomes for household assets.....	84
Table 4.10: Marginal effects on the probabilities of child work-school participation outcomes for school related factors .....	85
Table 4.11: Marginal effects on the probabilities of child work-school participation outcomes for area of residence .....	86



## LIST OF FIGURES

Figure 1: Determinants of child labour and schooling conceptual frame work.....	47
Figure 2: Map of the study area .....	48

## ABBREVIATIONS AND ACRONYMS

CRC	Convention on the Rights of the Child
CSA	Central Statistical Agency
EGS	Employment Generation Scheme
GADM	Global Administrative
HIV	Human Immune deficiency Virus
IIA	Independence of Irrelevant Alternatives
ILO	International Labour Organization
IPEC	International Program on the Elimination of Child Labour
MDGs	Millennium Development Goals
MLR	Multinomial Logistic Regression
MNL	Multinomial Logit
N	Number
OCSSCO	Oromia Credit and Saving Share Company
ODI	Overseas Development Institutes
OSHO	Oromo Self Help Organization
PADETES	Participatory Demonstration and Training Extension System
PSNP	Productive Safety Net Program
RRR	Relative Risk Ratio
SIMPOC	Statistical Information and Monitoring Program on Child Labour
UNICEF	United Nations Children's Fund
WB	World Bank

## **ABSTRACT**

*Parallel to other low-income countries, child labour remains a multi-dimensional grave problem and policy issue in Ethiopia. It has long been recognized as an important barrier to national human capital development and thus magnifies the risks of turning a country's most prized assets into its biggest liabilities. This study attempts to comprehensively investigate the various determinants of child labour and schooling for children aged 7 to 17 using the data collected from rural households of Kuyu woreda, Oromia Regional National State. The study employed multinomial logit model to achieve the main objectives. The results from the empirical analysis suggest that socio-economic characteristics of both child and household are found to be significant determinants of child labour and school participation among rural households of Kuyu woreda. The study has revealed the existence of positive and significant relationship between child school and being the direct off-spring of the household head, the household head education attainment and being free of recurrent health shocks of the household head, whereas negative association between child school, and age and sex of the child, the presence of female child aged between 7 and 17 in the household and loose of livestock. Besides, it has also revealed the existence of positive and significant relationship between child work, and age of the child and household size, whereas, negative association between sex and birth order of the child, sex of the household head, household land size and inaccessibility to welfare programs. From policy perspectives, improving the livelihood of rural communities, extending rural communities' access to welfare programs, developing micro-insurance programs including micro-health insurance programs and working in collaboration were recommended to hold back child labour in turn enhancing child schooling.*

**Keywords:** *Child Labour, Schooling, Determinants, Multinomial Logit, Kuyu Woreda*

# CHAPTER ONE

## INTRODUCTION

### 1.1. Background of the Study

The Convention on the Rights of the Child (2015) defines a ‘child’ as a person under the age of 18, unless the laws of a particular country set the legal age for adulthood younger. The Committee on the Rights of the Child, however has encouraged states to review the age of majority if it is set below 18 and to increase the level of protection for all children under 18. Accordingly, the term ‘child’ is not specifically defined under Ethiopian law. Instead, Ethiopian laws make use of such terms as ‘minors’, ‘infant’, ‘young workers’ or ‘young persons’. As though, under chapter 12 of the Ethiopian Revised Family Code (2000) a ‘minor’ defined as a person of either sex who has not attained the full age of 18 years old.

According to International Labour Organization (2003), labour<sup>1</sup> is defined as economically active, when a person works on a regular basis for which he/she is paid or that results in output meant for market. It includes both physical and mental work undertaken for some monetary reward. But in the Ethiopian context where labour market is missing, this definition is too restrictive. Although there is no agreed-upon definition of child labour in the literatures, it is often defined as work that deprives children of their childhood, their potential and their dignity, and work that is mentally, physically, socially or morally dangerous and harmful to children; and interferes with their schooling by depriving them of the opportunity to attend school; obliging

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<sup>1</sup>In this study labour is used alternatively with work which includes all work related to activities which potentially affect the overall development of a child.

them to leave school too early or requiring them to attempt to combine school attendance with excessively long and heavy work. The most severe forms of child labour involves children those are enslaved, separated from their families or guardians, exposed to serious hazards or illnesses and left to take care for themselves on the streets of large cities at their early age (ILO, 2012).

Whatever it takes, child labour, as defined by International Labour Organization (2000) Conventions, damages children's health, threatens their education and leads to further exploitation and abuse. UNICEF, however, does not oppose work that children may perform at home, on the family farm or for a family business as long as that work is not a danger to their health and welfare and if it doesn't put off them from going to school and enjoying childhood activities.

In Africa, however, child labour is generally defined based on two factors: type of work and minimum appropriate age of the work. Accordingly, if a child is involved in an activity that is harmful to his/her physical and mental development, he/she is generally considered as a child labourer. Appropriate minimum age for each work, however, depends on the effects of the work on the physical health and mental development of children. Although 12-14 years old may be permitted for light works under strict conditions in very poor countries, ILO Convention No. 138 suggests the minimum age for admission to employment under which, 18 years old for hazardous works and 13-15 years old for light works (ILO, 2010).

According to Global Estimates of child labour (2017) worldwide 218 million children between 5 and 17 years are in employment. Among them, 152 million are victims of child labour; almost half of them, 73 million children those are aged 5-11, work in hazardous child labour. In absolute terms, almost half of child labour (72.1 million) is to be found in Africa, 62.1 million in the Asia

and the Pacific, 10.7 million in the Americas, 1.2 million in the Arab States and 5.5 million in Europe and Central Asia.

In terms of prevalence, 1 in 5 children in Africa is in child labour, whilst prevalence in other regions (Arab States (1 in 35 children), Central Asia (1 in 25), America (1 in 19) and Asia and the Pacific region (1 in 14)). Among 79 million child labourers, 42 million are 12-14 years old and 37 million are 15-17 years old. Even though, hazardous child labour is most prevalent among the 15-17 years old, a fourth of all hazardous child labour (19 million) is done by children less than 12 years old. Among 152 million children in child labour, 88 million are boys and 64 million are girls; 58% of all children in child labour and 62% of all children in hazardous work are boys (Global Estimates of child labour, 2017).

According to National Labour Force Survey (2013), a total of 10 million children aged between 10 and 14 years were economically active in Ethiopia. The country has still many children who are engaged in the worst forms of child labour, including strained labour in domestic work and in harmful tasks in agriculture. Likewise, according to the results of NCLS (2015), about 16 million children aged between 5 and 17 engaged in child labour in different regions of the country. Many children are trafficked from rural areas to Addis Ababa and to other regions of the country for forced labour in the weaving industry and in domestic work. Families also continue to play a role in financing and coercing their children to go abroad or to urban areas to look for work (UNESCO Institute for Statistics, 2019).

In Ethiopia, the proportion of children living in rural areas who are engaged in child labour is higher as compared to the proportion of children living in urban areas. In rural area of the country, children involved in child labour represent about 28% of the total number of children

living in rural areas. This rate is about three times higher than the percentage of children engaged in child labour in urban areas. In the 5 to 11 age group, the prevalence rates of child labour in rural areas is about four times higher than in urban areas. Amhara, Afar, Tigray and Oromia regional states with have the highest percentage of children involved in child labour (UNESCO Institute for Statistics, 2019).

Even if the country is witnessing a considerable expansion in the provision of educational services with the construction of more schools in the rural and urban vicinities, recent evidences revealed that only 48.93% of adult population (aged 15 years and above) in Ethiopia are able to read and write. Accordingly, about 29,029,030 adults are illiterate. The literacy rate for adult male population is 57.21% while the literacy rate for adult female population is 41.09%. The youth literacy rates however, are 71.13% and 67.81% for males and females respectively. The overall youth literacy rate of the country is 69.48% (UNICEF, 2018).

In developing countries like Ethiopia, rural child labour is usually invisible as it is hidden in remote farms, in mountain areas herding livestock, in domestic work in private homes, in informal rural enterprises and markets, in mines, in forest exploitations. Kuyu woreda is found in rural Oromia regional state, where higher incidence of child labour and relatively lower child schooling participation is observed; hence needs intervention to tackle the problem.

International Labour Organization estimates that agriculture is the largest employer of child labour in Africa in which vast majority are unpaid family workers. Child labour is concentrated primarily in Agriculture (71%), which includes fishing, forestry, livestock herding and aquaculture and comprises both subsistence and commercial farming; 17% in Services; and 12% in the Industrial Sector, including mining (ILO, 2017).

Children in Ethiopia, in fact, live in poverty and the society consider child labour as a way to survive from hunger and other problems caused by poverty. And child labour seems a normal thing in the country because child labour is also part of the cultural values. In our culture, children are encouraged to work at a young age to develop some skills. Children in the country are already given the responsibility to work and earn for the living and help to their parents (Nardos, 2014).

Whatever it is, child labour is a multidimensional societal problem. It is not just a problem of Ethiopia; it is a complaint of all countries around the world. Everyone has the responsibility and moral obligation to get rid child labour and promote child schooling. Children will be the next generation and they have the right to obtain brighter future and live in a better place. Since poverty is the root cause of child labour and in order to make children free from child labour, poverty must be addressed first (Unethiopia.org, 2014).

Although gaps exist in all of its efforts to adequately protect children even from the worst forms of child labour, Ethiopia has been making a moderate advancement in efforts to eliminate the worst forms of child labour. She has established laws and regulations, and ratified all key international conventions concerning child labour, including ILO C.138 which deals with minimum age in 1999, ILO C.182 dealing with worst forms of child labour in 2003, UN CRC, UN CRC Optional Protocol on Armed Conflict, UN CRC Optional Protocol on the sale of children dealing with child prostitution and child pornography in particular and Palermo Protocol on trafficking in persons (Bureau of International Labour Affairs, 2018).

Generally, the way to get rid of child labour depends on what the actual determinants of child labour are. If poverty is the main determinant, an outright ban on child labour might only result



in the children who must work to survive being involved in more dangerous work; if children are not recognized by the law as workers, child workers cannot be protected by the law. Similarly, a developed country's decision to boycott goods from developing countries with child labour might only worsen the well-being of children in those countries by lowering their living standards and forcing them to work longer hours in hazardous conditions (ODI Report, 2016).

Furthermore, the determinants of child labour are highly debated, especially the effect of poverty on parents' decisions to send their children to work. The literatures suggest that these determinants are largely country specific, indicating that any policies aimed at reducing child labour must look carefully at the causes of child labour in context (Lindsay, 2009).

## **1.2. Statement of the Problem**

Evidences show that Ethiopia is a country where the incidence of child labour is higher and at the same time the rate of schooling is relatively lower. The Somali and Afar regions had the lowest rates of school attendance. Only 38.6% and 50.2% of school-age children enrolled in Somali and Afar region respectively. In 2018, the number of internally displaced persons (IDPs) nearly doubled, from 1.6 million to 2.95 million, and many of them are children who may encounter difficulty to access education in host communities or IDP camps (UNESCO Institute for Statistics, 2019).

Child work<sup>2</sup> participation rate is estimated to be higher than 35% in Ethiopia. Children often begin to participate in work activities at their early age usually when they are 4 or 5 and on average contribute 29 to 30 hours of labour per week (Asefa and Arjun, 2005). Children are

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<sup>2</sup>Child work is necessary to teach a child to do some minor household chores, without being posed to health hazards and all basic needs are provided by the parents or guardians.

engaged in almost all forms of paid work, in factories, commercial as well as subsistence agriculture, service industries, shops, market places and in household chores (Kifle et al., 2005).

Ethiopia has given greater attention to education to enhance the country's human capital accumulation. But the problem is if children are obliged to start work at their early ages and toil for longer hours, their ability to attend (and do well in) school is seriously impaired. This proposition indicates that child work is forgone human capital which translates to economic retardation in the long-run. Child work may be viewed as a means to socialization and acquiring necessary skills for adult life, but not subject a problem. Through this parents may prefer keeping them at home and do along with them to sending them to school (cited in Tseganesh, 2011).

Likewise, it has long been recognized that promoting and ensuring universal basic education is crucial to promote development in developing countries. Although, primary education is almost free in Ethiopia, however, registration fees, expenses for school uniforms and learning materials, travel costs and time, and other miscellaneous expenses make sending children to school an additional burden for poor families. In addition, one needs to carefully consider the opportunity costs of children attending school which include: foregone income from economic activities, foregone learning by doing, value of children's time in household production and the role children's earnings sometimes play as a defense against shocks.

Although many scholars and agencies have confirmed that poverty is the driving force behind exploitative child labour, studies in developing countries have revealed that child labour is badly needed to supplement the subsistence income of families both in rural and urban areas restricting healthy overall development of children and which can mainly be manifested by reduced or complete absence of access to formal education.

In Africa where, child labour is primarily a rural phenomenon, there has been a marked increase in the number of empirical studies that examine this phenomenon. Several studies, for instance, Asefa (2002), Asefa and Arjun (2005), Arjun and Asefa (2009), Beliyou (2003), Cockburn (2000), Cockburn (2001), Tassew et al. (2005), Chaudhury et al. (2006), Getinet and Beliyou (2007), Tseganesh (2011), Bisrat (2014) and others have been conducted to investigate the determinants of child labour in Ethiopia in different ways\_\_ on basis of sector, for instance. However, they didn't capture the role of household head health shocks and government welfare programs which would have important child work-school participation implications.

Apparently, the effect of one individual's bad health on the labour supply of other family members is substantial and generally studied as an "added worker effect"<sup>3</sup>. In theory, a negative health shock can have several effects on the labour supply of the other healthy members of the family. In a couple, the healthy member may increase his/her labour supply, as the household has suffered a drop in income. As a result, in developing countries, children have a greater tendency to work when either parent has recently had health shocks.

In Ethiopia, where there is almost no insurance provision among rural households, so that a reduction in income as a result of illness or handicap experienced by the household head can be an important determinant of the labour force participation of the children. In a context of credit constraints and the absence of formal insurance, child labour tends to increase for sure. It is obvious that the general state of the Ethiopian population is poor (Pankhurst et al., 2018).

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<sup>3</sup>Added worker effect is the effect of parental health shocks on the labour supply of a child. See in (Humphrey, 1940, p. 412).

Therefore, the health status of the household head is incorporated in this study to consider the possible role of household head health shocks on the labour supply of children or more generally the degree to which the decision concerning a child's labour force participation is conditional on its parents' force participation in rural households of Ethiopia, so as to complete the existing gap.

Huge rural dwellers are vulnerable to shocks such as food insecurity, drought, environmental degradation, flood, and other relevant sudden risks in Ethiopia. Children are one of the most vulnerable segments of the population in particular. Repeated economic shocks in turn encourage child labour and child school dropout. However, the government has designed typical welfare programs in order to support the poor and reduce vulnerability for decades. These measures may have important potential to reduce poverty, cope with repeated shocks and positive impact on child well-being. Increment in household income may lead a decrease in the need for children to work.

In order to create a win-win situation where both national economic development and children's rights are realized, it is very important to have a good understanding of the relationship between government and/or NGO supportive program and child labour, and schooling. Therefore, the welfare is incorporated in this study as one of the most important determinants of child labour and schooling in rural households of Ethiopia, so as to complete the existing gap.

Furthermore, many studies focused on child labour-school participation in economic activities in general at country level, and did not let the understanding of the issue in such at a specific study area (at woreda level) excessively. Moreover, any study to investigate determinants of child labour and schooling in Kuyu woreda has not been conducted yet. Therefore, this study also aims to fill the existing gap by investigating major socio-economic factors of child labour and school

participation in the woreda. Detailed analysis of determinants of child labour and schooling drawing on up-to-date data is of a principal importance for the future development prospect of children in particular and the country in general as children of today are growth engines of tomorrow.

The researcher poses three questions that the thesis seeks to address:

- ▶ What factors influence family's decision to subject their child to specialize in work only?
- ▶ What factors contribute significantly to child school attendance and/or its combination with work?
- ▶ Does gender have an impact on child work-school participation?

Hence, the main focus of this study is to assess the major determinants of child labour and schooling amongst the children aged between 7 and 17 in rural households of the study area drawing on recent data.

### **1.3. Objectives of the Study**

#### **1.3.1. General Objective of the Study**

The main objective of the study is to investigate the major determinants of child labour and schooling in rural households of Kuyu woreda.

#### **1.3.2. Specific Objectives of the Study**

The specific objectives of the study are:

- To examine the level of the incidence of child labour in rural households of Kuyu woreda via assessment of children's participation in paid and unpaid economic activities,

- To empirically assess the major factors those determine children’s participation in work, school and/or a combination of them,
- To observe the existence of gender difference, if any, related to child work-school participation, and
- To provide empirical evidences for policy makers in the move against exploitative child labour and promote schooling.

#### **1.4. Significance of the Study**

The study can be an impetus to the understanding that efforts to mitigate child labour and foster schooling should have a look in to such associations as well. Besides, the majority of the studies so far encompass those children aged 4-15 with some adjustments on the lower and upper age limits. Even if such works are important for the investigation of the incidence of child labour, the findings would be biased to show the right picture of tradeoff between child work and school, if any, since the official age to start formal schooling in Ethiopia is seven.

The result of the study can provide policy makers with invaluable information to formulate appropriate policies and to make competent decisions to address the issue. It can also inspire further academic work and hence broaden the frontier of knowledge in the area.

#### **1.5. Scope and Limitation of the Study**

The study is to assess the major determinants of child labour and school attendance in rural households of study area. It does not go forth to examine the effect of working and its duration on school performance/achievement of enrolled children and also the detrimental impacts working would have on the health of children. This potentially limits the scope of the study.

## **1.6. Organization of the Study**

The paper comprises five chapters. It begins with introduction which encompasses background of the study, statement of the problem, objective, significance, and delimitation of the study. Chapter two provides review of related literature while the third chapter deals with the methodology used in the study. The fourth chapter presents the major findings of the study. And the last chapter concludes and put forward policy implications.

## CHAPTER TWO

### REVIEW OF RELATED LITERATURES

#### 2.1. Review of Theoretical Literatures

Child labour is an age old phenomenon and a widespread issue affecting over 160 million of the world's children Diallo, Etienne and Mehran (2013) and sometimes, is difficult to define because of societal and cultural differences across countries in the world. Furthermore, in developed countries, a child is defined by his or her age, whereas in developing countries, a child is defined by his or her social responsibility (Rogers and Standing, 1981).

The age of a child and the nature of work performed, however, are to be considered as the main criteria for defining child labour. Furthermore, there is a clear distinction between child work and child labour. Because child work refers to those kinds of economic activities in which there is no economic compulsion forcing the child into employment. These activities include housekeeping, child-minding, helping and assisting adults for no pay on the family farm, in small enterprises and shops, domestic services, selling articles on the streets, running errands, etc (Khanam and Rahman, 2010). On the other hand, an economic activity can be considered as child labour if it affects a child's leisure, health and educational activities (Lavalette, 1994).

Even if there exist a wide array of and growing empirical literature on child labour, theoretical writings on the area are scanty. Isaac (2016) argues that child labour is a complex global phenomenon. And very little attention has been given to the policies that drive efforts to address child labour and how they are framed and to the relationships and power dynamics underlying



the policy-making process that surrounds this discourse. Of particular interest is how we determine who is a child and the notions of childhood underpinning these policies.

According to ILO (2017) Africa ranks the highest in the percentage of children engaged in child labour as compared to Asia and Latin America. Particularly, child labour is widespread in developing countries. Most of working children, about more than one in five children in the world work live in poor countries (Edmonds et al., 2011).

While child labour has been declining in Asia and Latin America, economic crises, war, famine and HIV/AIDS have combined to prevent this in Africa. Contrary to the popular image of child labour in factories managed by Dickensian<sup>4</sup> employers, the overwhelming majority of working children in Africa are employed on household-run farms and enterprises. Recent theoretical and policy-level discussion has neglected to recognize the implications of this fact. Thus, for example, considerable attention has been dedicated to consideration of the impact on child labour of minimum wages or trade sanctions when, given the nature of work performed by most children in Africa these interventions are largely irrelevant (Bhalotra, 2003).

Bhalotra (2003) argues that since education is not the exact inverse of child labour, it is better to consider recent evidences on the extent to which school attendance and school performance trade-off against child labour. Fetuga, Njokanma and Ogunlesi (2007), on the other hand, argue that in addition to being hazardous and harmful to children's health, child labour interferes with education. Therefore, attention is being paid to its effect on education because schooling is a major development task of a child with regular attendance and academic achievement as major

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<sup>4</sup>See in BBC News Magazine (Davis, 2012)/<https://www.bbc.com › news › magazine-16907648>

goals. Thus, the impact of child labour on a child's development, especially cognitive, is the key in determining when such work becomes a problem.

Since studies on child labour and school absence have come up with different outcomes across countries the effect of child work on educational achievement may not be accurately reflected by its impact on school attendance. Hence, there is a well-built case for measuring direct effects of child work on what children are able to do. Beliyou (2003) states that early theoretical explanations about child labour do emphasize on the close interdependence between household fertility decisions and the preference to engage children in work.

Baland and Robinson (2000) explain the phenomenon by emphasizing on the time inconsistency problem faced by parents. The authors stipulate that parents may overuse child labour to secure old age savings while denying them access to formal education. There is no particularly compelling reason why the productivity gains from educating a child from a poor family should be any larger or smaller than the gains for a child from a high-income family. Nevertheless, poverty could have a direct effect on schooling decisions. Families who are barely surviving are likely to discount the future heavily, thereby giving less weight to future income earned by their educated children (Drusilla, 2001).

Parents are discouraged to send their children to school when direct costs of books, uniforms, writing materials, transportation to school, need to be covered by families. Immediate and tuition fees also lower the likelihood of the child ever entering school. The cultural aspect for household's head gives the adults authority over children in different activities a child. Parents may demand labour from any employing firms and individual employers and send their children

to work because they are considered as safe, manageable and less troublesome, so as to get earnings (Akarro et al., 2011).

Child labour has long-lasting consequences where excessive involvement in harmful work traps children in a vicious cycle of poverty. Likewise, child work in the expense of schooling makes them lose opportunities to develop skills and competencies that are achieved during their school years. Although not all children involved in child labour are out of school, competing demand of work and education have consequences, like dropping out of school, grade repetition, registering lower level of academic achievement and an impact on children holistic human development where early employment could lead to lower earnings in the future which transmits into poverty across generations (Brown, 2012).

Child labour has many determinants ranging at first hand from demographic variables to working condition along with parental and socio-economic determinants. The general perception that child labour is embedded in poverty need not be fit in every context and cultures rather could be viewed as a complex phenomenon which required simplification. The association between the underlying bases of child labour and the surrounding exploitation is not that much simple as the literature demonstrate. An additional effort is needed to determine the root cause of the issue so that to carry out specific measures, as generalization of the issue mean we are avoiding different measures regarding different fundamental causes (Khan, Sadozai and Khattak et al., 2018).

Various policies and programs that aim to increase access to basic services already exist in Ethiopia, but challenges remain in providing these services in a more comprehensive manner. Priority should be given to complementary services, ensuring the delivery of a child sensitive social protection system/welfare, so as to combat child labour in the country.

In Ethiopian context welfare can be defined as “a set of formal and informal interventions that aim to reduce social and economic risks, vulnerabilities and deprivations from all people and facilitate equitable growth” (MoLSA, 2016). Accordingly, the FDRE government codifies the right to social protection, including access to an adequate standard of living; special care for children and women; rehabilitation and assistance to disadvantaged groups such as children who are left without parents or guardians; and people with physical and mental disabilities.

Typical welfare programs have been integral component of poverty-reduction and development strategies over the past 15 years in Ethiopia. These include the first and second Growth and Transformation Plans, which serve as all-embracing strategies for the government. The second Growth and Transformation Plan (GTP II), which lasts for 2020, identifies welfare as the principal mechanism for enhancing social protection and development. It also calls for the expansion of welfare to people with disabilities and the elderly as well as for a scaling-up of employment and labour-market services (National Planning Commission, 2016).

In recent years, the government has endorsed a number of key policy frameworks for social protection that chart a way forward for the sector. These include the NSPP in 2014, the NSPS in 2016 and an Action Plan for the implementation of the NSPS in 2017. These frameworks are based on five focus areas for social protection: promote productive safety nets; promote employment opportunities and improve livelihoods; promote social insurance; increase access to health, education and other social services; and address violence, abuse and exploitation and provide legal protection and support.

## **2.2. Review of Empirical Literatures**

### **2.2.1. Determinants of Child Labour and Schooling**

This section reviews the findings of many of the empirical studies that use micro-level and other data to analyze the possible determinants of child labour and schooling. The researcher has tried to divide the review into separate subsections for the main potential factors that are found in this study.

#### **2.2.1a. Poverty's Effect on Child Labour**

Many theoretical models of child labour are based on what Basu and Van (1998) called the Luxury Axiom, i.e. that a family will send a child to work only if the family's non-child-labour income drops below some threshold. However, despite the seemingly obvious link between poverty and child labour, the evidence for a significant income effect is mixed. An insignificant income effect is reported in Coulombe (1998) in Côte d'Ivoire, Sasaki and Temesgen (1999) in Peru, Patrinos and Psacharopoulos (1997) in Peru, Ilahi (2001) for rural boys in Peru, Ray (2000) in Pakistan and Ersado (2005) for urban children in Nepal, Peru and Zimbabwe.

In her survey of field studies of child labour in India, Bhatta (1998) concludes that there is no clear association between poverty and child labour. In a review of empirical studies of Côte d'Ivoire, Ghana and Zambia, Canagarajah and Nielsen (2001) for instance conclude that there is little evidence which support the view that poverty is a considerable cause of child labour. A positive coefficient on income is obtained in Cartwright (1999) for household farm/enterprise work in rural Colombia and in Patrinos and Psacharopoulos (1995) in Paraguay.

Likewise, Bhalotra and Heady (2003) provide a theoretical justification for the existence of a positive coefficient. They explain that owning land has both wealth and substitution effects on a

household's supply of child labour. The wealth effect suggests that large landholdings generate higher income, making it easier for households to forgo the income that child labour brings. They test this model by considering households in Ghana that run their own farms and find that richer households in developing countries tend to own more land and households tend to employ family members (including children) on this land. Consequently, richer households, on average, make greater use of child labour than poorer households.

This scenario is also supported by Dumas (2007), who considers rural households in Burkina Faso and finds that child labour seems to be due to the absence of labour market rather than to household subsistence needs.

Negative income effects are found by Cartwright (1999) for wage work in rural Colombia, by Cigno and Rosati (2000) in rural India and by Ilahi (1999) for rural girls in Peru. Amin, Quayes, and Rives (2004) also find a negative income effect for both urban and rural boys and girls in Bangladesh, as do Rosati and Tzannatos (2000) in Vietnam, Liu (1998) for wage work in Vietnam, Ray (2000) in Peru, Bhalotra and Heady (2000) for rural farm work for boys in Pakistan and girls in Ghana and Ersado (2005) for rural children in Nepal, Peru and Zimbabwe.

Edmonds (2005) on the other hand finds that income growth in Vietnam can account for a large part of the reduction in child labour observed there during the 1990s. Carvalho (2000) examines the introduction of an old-age pension in Brazil and finds that it resulted in a reduction in child labour amongst children living with grandparents, with the impact of a grandmother's pension on her granddaughters' labour being especially large. Edmonds (2006) considers how cash transfers affect child labour in South Africa and documents large declines in total hours worked when black South African families become eligible for social pension income.

Schady and Araujo (2006) study cash transfers in Ecuador and find that the transfers have a large negative impact on work, about 17 % points. Considering these studies have less methodological problems than cross sectional data (Edmonds (2001) is based on two years of data and the rest are natural experiments), Bhalotra and Tzannatos (2003) postulate that the variance of the income effect indifferent studies might come from methodological issues rather than actual country variations. However, Bourguignon, Ferreira and Leite (2002) and Cardoso and Souza (2004) find that, in Brazil, conditional income transfers requiring a child to go to school had no significant impact on the incidence of child labour.

Using the data collected with DHS and MICS between 1999 and 2005 from 35 developing countries, Huebler (2008) finds the strong support for the poverty hypothesis that suggests that parents only send their children to work if the additional labour is needed to add-on household income because consumption needs cannot be convened from other sources.

The study conducted by Gebremedhin (2013) in Mekelle city of Ethiopia indicates that nearly all the child workers that participated in the study were with disadvantaged background involving coming from poor families. Similarly, Osment and Abou (2014) in Nigeria and in Côte d'Ivoire respectively, find that the household poverty remains a determinant of child labour. The findings by Coster and Adekoya (2014) also affirmed the relationship between child labour and poverty in Ogun State.

Likewise, Nyamubi (2015) finds that children got involved in child labour to meet their basic needs; reason being poor or loss of parents in Tanzania. Cheema and Shah (2016) also find that the single greatest driver of child labour in Sindh of Pakistan is poverty and more specifically the fact that many families need their children to bring additional income. Based on the univariate

estimation approach, Sam (2016) moreover, finds that poverty is a very important determinant of child labour in Ghana.

### **2.2.1b. Poverty's Effect on Child Schooling**

Although child labour and schooling are not mutually exclusive and are often done together, it is interesting to consider whether the effect of poverty on schooling is any stronger than the effect of poverty on child labour. Behrman and Knowles (1999) survey estimates the income elasticities for a range of indicators of educational enrollment and attainment for the US and a number of developing countries. In their own analysis of five indicators of schooling in Vietnam in 1996, Behrman and Knowles (1996) find higher income elasticities than the previous literature. According to Bhalotra and Tzannatos (2003), this is at least partly on account of Behrman and Knowles' more careful attention to the choice of indicators and the specification of the equation.

A significant positive effect of income on child schooling is found in Ray (2000) for Pakistan, Cigno, Rosati and Tzannatos (2001) in rural India, Ilahi (2001) for girls in Peru, Canagarajah and Coulombe (1999) in Ghana, Coulombe (1998) in Côte d'Ivoire, and Jensen and Nielsen (1997) in Zambia. In Côte d'Ivoire, Grootaert (1999) shows that for poor households, in both urban and rural areas, there is a higher probability for selecting non-schooling options than richer households. Rosati and Tzannatos (2006) also find that the effect of income on schooling in Vietnam is non-linear and that the significant positive effect of income on the probability that a child will only go to school decreases with the level of income.

Similarly, Edmonds (2006) finds that cash transfers in the form of pensions lead to large increases in child schooling in South Africa. Schady and Araujo (2006) study cash transfers in



Ecuador and find that the transfers have a large, positive impact on school enrollment, about 10 percentage points, perhaps partly because some households believed that there was a school enrollment requirement attached to the transfers (though not monitored or enforced). Similarly, Bourguignon, Ferreira and Leite (2002) and Cardoso and Souza (2004) find in Brazil that conditional income transfers requiring a child to go to school increased the likelihood of schooling.

However, Ray (2000) finds no significant income effect on child schooling in Peru, nor does Ilahi (2001) for boys in Peru or Ersado (2005) for urban children in Nepal, Peru and Zimbabwe. Patrinos and Psacharopoulos (1995) did not find monthly family income to be a significant determinant of years of school attainment in Paraguay, but did find a positive association with school enrollment. Cheema and Shah (2016) analyze the wider problem of child labour in Pakistan. Accordingly, drawing on their research in rural Sindh, they write that poverty is the primary reason that parents keep their children away from schooling.

A negative effect of income on child schooling is found by Patrinos and Psacharopoulos (1997) in Peru. Overall, though, it seems that income has a bigger effect on schooling than on child labour. In fact, higher income can lead to more schooling even in regions where higher income leads to more child labour. For example, Bhalotra and Heady (2003) find that in Ghana and Pakistan income has a significant positive effect on schooling attendance even though larger farm size leads to richer households employing more child labour.

Basumatary (2012) finds that in India many organizations have been promoting education for all children, however, there have been high rate of school dropouts in India, because of poor economic conditions. Ahmad (2012) on the other hand, carried out a research in Aligarh city of

Uttar Pradesh in India, where he assumes that poor children under the age of 14 years are obliged to work in different sectors. According to him the city has low school participation however children are forced to work due to poverty. About 90% of child labour is illiterate. Many of these children are migrant workers, the majority coming from surrounding areas of Aligarh district and Bihar, who are forced to work to increase family income (Cited in Osment, 2014).

Osment (2014) argues that children under the age of 14 years old are still engaged in economic activity in India and Nigeria and tend to work more consequently they are not regularly in school.

### **2.2.1c. Parental Education Effects**

There is consistent evidence that the mother's education has a negative effect on child labour, and the size of this effect is often greater than that of the father's education. Using data combined for boys and girls in rural and urban areas in Ghana, Canagarajah and Coulombe (1999) find that the father's secondary level education has a negative effect on child work participation while the mother's education has no effect. Using the same data, Bhalotra and Heady (2000) find a negative effect for the mother's middle or secondary level education for rural boys, but no effect for the father's education.

Bhalotra and Heady (2000) also find that on family farms in rural Pakistan, the mother's middle or secondary level education has a negative effect for boys and girls (larger in the case of girls) and the father's secondary education has a negative effect that is restricted to girls. Cigno and Rosati (2000) find that in rural India the children of mothers with less than primary education are significantly more likely to be in full-time work as compared with full-time study, and having a

mother who completed middle school reduces the probability of combining work and school as compared with full-time study, while the father's education has no significant effect.

Ravallion and Wodon (1999) find negative effects of the mother's and father's education level on child labour in Bangladesh. Emerson and Souza (2008) similarly, find that in Brazil, both father's and mother's education have a negative effect on child labour and a positive effect on schooling for both boys and girls. Kruger (2007) finds the same effects in Brazil for parents' education.

However, in Vietnam, years of father's education have no effect on child labour, but mother's education has a negative impact on the probability of work (full-time and part-time) as well as on the probability of being neither in work nor in school (Rosati and Tzannatos, 2000). Liu (1998) also finds insignificant effects for both mother's and father's years of schooling on child labour in Vietnam, whether market or home based.

Amin, Quayes and Rives (2004) examine child labour in Bangladesh, dividing the children by gender, region, and age groups: younger (aged 5-11) and older (aged 12-14). They find that the education of the male head significantly lowers the probability of working for all rural boys (older and younger), all urban girls, urban older boys, and rural older girls, with no effect on urban younger boys and rural younger girls. The education of the female head has significant negative effect on child labour for boys in all four groups, and for all rural girls, but no effect for urban girls (older and younger).

Bhalotra and Heady (2003) find that the father's education has a negative effect on the probability that rural girls in Pakistan work, but no effect on work for rural boys in Pakistan or for rural boys and girls in Ghana. The father's education does, however, have a positive effect on

school attendance for rural boys and girls in both Pakistan and Ghana. The mother's education has a significantly negative impact on child labour for rural boys in Ghana, and rural boys and girls in Pakistan, and a significant positive effect on schooling for rural girls in Pakistan, and rural boys and girls in Ghana. It has no effect on labour for rural girls in Ghana and no effect on schooling for rural boys in Pakistan.

Patrinos and Psacharopoulos (1997) find that the probability of combining work and school as compared with the probability of full-time study is reduced by the years of the father's education in Peru and by years of mother's education in Paraguay. Using the same Peruvian data, Sasaki and Temesgen (1999) find that the probability of combining work and school as compared with full-time study is reduced by the father's college education and the mother's secondary and college level education. By using a binomial logit and a multinomial logit, respectively, they find that mother's education has no effect on these outcomes relative to study only, while the father's secondary education has a negative effect on the probability of work only relative to study only.

Controlling for household-specific effects using a random effects probit on the Peruvian data for two years (1994 and 1997), Ilahi (1999) finds a negative effect of the education of the oldest prime-age female on the probability of children working in an income-generating activity in Peru, and this effect is similar for rural and urban areas. While the results of the three studies for Peru do not contradict one another, they do show the importance of which sub-sample is being discussed and whether the education affects area allowed to be nonlinear (Bhalotra and Tzannatos, 2003).

In Colombia, multinomial logit estimates reported in Cartwright (1999) indicate that there is a negative effect of the father's years of schooling on the probability of full-time child work

whether this is for wages, on the family farm or enterprise, or for full-time home care (with full-time study as the reference category). The mother's years of schooling have no effect on child labour producing marketable goods, but have a positive effect on the probability that a child is at home in full-time care. This result is consistent with the view that educated women are more likely to work and so their children may have to substitute for them at home at the expense of going to school (Bhalotra and Tzannatos, 2003).

These effects are similar in rural and urban areas, though the effects of the mother's education are stronger in urban areas. In their analysis of child labour in urban Bolivia, Cartwright and Patrinos (1997) find a negative effect of the mother's years of education on the probability of children working in wage-based labour as opposed to being in school. Unlike in the case of Colombia, there is no effect of mother's education on child time in home-care. They do not include the father's education in the model.

Using a multinomial logit, Ersado (2005) finds that the years of the mother's education have a significant positive effect on schooling for rural and urban children in Nepal and Zimbabwe and urban children in Peru, and a significant negative effect on child labour for rural children in Nepal and rural and urban children in Zimbabwe. However, he finds insignificant effect of the mother's education on schooling for rural children in Peru or on child labour for urban children in Peru, and a significant positive effect on child labour for rural children in Peru.

With regard to the father's education, Ersado (2005) finds no effect on schooling for urban children in Zimbabwe and no effect on child labour for all children in Zimbabwe and rural children in Peru and Nepal, a significant positive effect on schooling for rural children in

Zimbabwe and all children in Peru and Nepal, and a significant negative effect on child labour for urban children in Peru and Nepal.

Rosati and Tzannatos (2006) also use a multinomial logit model to examine child labour in two different years in Vietnam (1993 and 1998). They find that years of the father's education have a significant negative effect on the probability a child only works as opposed to only studies for both years and on the probability a child works and studies in the 1998 survey (again, with "only studies" as the reference group). The father's education has no effect on the probability a child works and studies in the 1993 survey. The mother's education has a negative impact on the children only working for both years, but no effect on the children working and studying (again, for both years).

Grootaert (1999) finds that in Côte d'Ivoire, the probability of full-time study as opposed to full-time work is positively influenced by years of the father's education in urban areas and by years of the mother's education in rural areas; in each case, the education of the other parent has no effect. For rural and urban regions, both the father's and mother's education raise the probability of a child combining school with work as opposed to working full time. Analysis of the same Côte d'Ivoire data by Coulombe (1998) using a bivariate probit shows no effect of the father's schooling on either work or school participation. The mother's education has no effect on work although it does increase school participation.

Nielsen (1998) also finds no effect of the father's schooling on child work or school decisions in bivariate probit estimates of data for Zambia, but she does not investigate mother's schooling. Using a fixed-effect logit model, Tunali finds no parental education effects in Turkey, but the

probit analysis by Dayioglu (2006) shows that the mother's and father's education levels have a strong negative correlation with child labour in Turkey.

However, Zegeye (2017) find a negative significant relationship for parents with an occupation and education level with child labour; meaning, engagement in child labour is less likely in a household with educated parents or for those with an occupation.

#### **2.2.1d. Household Land Size Effects**

The vast majority of working children lives in rural areas and work on farms, predominantly family-run farms (Bhalotra and Tzannatos, 2003). As mentioned in the previous section on poverty's effect on labour and schooling (2.2.1a and 2.2.1b), the lack of a labour market can lead to children being used for labour on a large farm, despite the increased wealth that owning land brings the household (Bhalotra and Heady, 2003).

In order to separate the income effect (which should lead to decreases in child labour as land size increases) and the substitution effect (which would lead to increases in child labour as land size increases), some measure of income must also be included in the model. After controlling for income, the theoretical model would assume that land size or the mere ownership of land would be positively correlated with child labour, since the amount of land raises the opportunity cost of children's time.

Canagarajah and Coulombe (1999) find no effect of farm size on child work participation rates in Ghana. Distinguishing boys and girls and restricting the sample to rural farming households, Bhalotra and Heady (2003) on the other hand, find a positive effect of farm size on girls' work in rural Pakistan and Ghana, though no effect for boys. They also find a negative effect on school participation for rural girls in Pakistan, though no effect for girls in Ghana for boys.

Cigno and Rosati (2000) find a positive effect of land size on child labour in rural India, combining data on girls and boys. Rosati and Tzannatos (2006) find that in Vietnam, the size of cultivable land owned by the household raises the probability that children will combine work with school the probability of full-time work as opposed to studying full time. They also find that relative to study, unsurprisingly; owning land reduces the probability that a child is idle.

Although poverty is generally considered as the primary cause of child labour in Africa, recent studies show that the relationship between child labour and poverty is not as simple as a downward linear relationship. For example Oryoie, Alwang and Tideman (2017) showed that child labour generally decreases as per capita land holding increases, but there can be an upward bump in the relationship between child labour and landholding near the middle of the range of land per capita.

### **2.2.1e. Household Size Effects**

Since size and composition are clearly correlated, the relation between household size and child work will depend upon whether household composition is held constant. In empirical results, there is a tendency to find a positive association of household size and child work. However, this finding cannot be regarded as robust since the studies differ in whether or not land size and household composition are held constant (Bhalotra and Tzannatos, 2003).

Bhalotra and Heady (2003), controlling for these factors, find negative effects of household size on child's labour participation for boys in rural Pakistan and girls in rural Ghana with no effect for girls in rural Pakistan or boys in rural Ghana. They also find positive effects of household size on child school participation for boys and girls in rural Pakistan and girls in rural Ghana, with no effect for boys in rural Ghana.



Cigno, Rosati and Tzannatos (2001) find a negative effect of household size for participation in work in rural India. Ilahi (1999) also finds a negative effect on child labour for boys and no effect for girls in Peru. Using data from Peru, Patrinos and Psacharopoulos (1997) also find a negative effect of the number of siblings (not household size) on the probability of combining work and school relative to the probability of simply attending school if the number of children not in school is held constant (insignificant if this control variable is not included).

Likewise, in Vietnam, Rosati and Tzannatos (2006), after controlling for total number of children, find a significant negative effect of household size on the probability of being in work and on the probability of combining work and school, relative to the probability of simply being in school for both 1993 and 1998 surveys. There is no effect for the children who report being in neither work nor school.

Positive estimated effect of household size on child work are found in Patrinos and Psacharopoulos (1995), who, for Paraguay (in contrast to Peru), find a positive effect of the number of siblings (not household size) on the probability of combining work and school relative to the probability of simply attending school. Also, Amin, Quayes, and Rives (2004) find a significantly positive effect of household size on all groups of boys (rural/urban, younger/older) and all girls except urban older girls, for whom they find no effect, though they do not control for household composition.

In a study by Akarro et al. (2011) household size was examined as an important in determining children's labour activities and educational opportunities. It has been argued that high fertility rate is positively correlated with the incidence of child labour, high fertility increase the chance that children from the large families to do work to support house hold income. In such families, children are considered as preferred commodity, in the context of poverty and basic survival

needs, compared with other goods because of their economic utility. In Ethiopia, Tseganesh (2011) finds that household size and average schooling level of the community, among others, has a significant, but negative effect on child work specialization in rural Ethiopia. Similarly, Zegeye (2017) finds that household size has a positive significant association with child labour in Wolaita Zone of Ethiopia.

#### **2.2.1f. Household Composition Effects**

Household composition effects refer to the age and gender structure of the household. Additional compositional effects that may be taken into account are whether both parents are alive and whether they are present in the household (or have, for example, migrated away for work). We would expect that the absence of a parent would create economic hardship and increase child labour, especially if the absent parent was the primary wage earner (usually the male) (Lindsay, 2009).

Given that pre-school children are too young to work, and that an increase in the number is thus, equivalent to a lump-sum reduction in full income (an income-dilution effect), we would expect from the theoretical model that full income raises the probability of full-time work, lowers that of full time study, and has ambiguous effect on that of part-time work. According to the theoretical model, an increase in the number of school-age children, holding full income constant, raises the probability of part-time work, and lowers that of full-time study, but has no effect on full-time work (Ibid, 2009).

Grootaert (1999) finds no clear evidence of sibling effects in Côte d'Ivoire although Coulombe (1998), using the same data, finds that the number of children under 6 raises work participation for older children. In Vietnam, both the number of siblings under 6 and the number of school-age

siblings (6-15 years) raise the probability of school-age children working only and the probability of children working and studying for both 1993 and 1998 (relative to full-time study), except siblings under 5 had no effect on working and studying in 1998 (Rosati and Tzannatos, 2006).

Ilahi (1999) also finds no household composition effects on child labour in Peru. Using the same data, Sasaki and Temesgen (1999) confirm that the number of children in the household does not affect full-time work participation of children in Peru, but they find it does increase the probabilities of doing school and work and being idle, relative to full-time study.

On the other hand, estimates of binary probit models in Ray (2000) suggest a positive effect of the number of siblings on work probabilities in Peru. In Brazil, Emerson and Souza (2008) find a positive effect of the number of children on the probability of child labour, and a negative effect on the probability of school participation. The presence of younger siblings discourages work participation amongst girls in rural Ghana, household composition having no effect on the work hours of Ghanaian boys (Bhalotra and Heady, 2000).

The same study finds that the presence of younger boys (under 10) in the household reduces the work participation of both boys and girls aged 10-14 in rural Pakistan, whereas the presence of little girls in the household has no effect. Ray (2000) uses the same Pakistan data as Bhalotra and Heady (2002) and, aggregating over the sibling terms, finds no effects of number of siblings on child labour. Kruger (2007) finds that in Brazil, the number of 0-5 year old children has a positive effect on child labour and a negative effect on child schooling, and that the number of 6-14 year old children has a positive effect on child labour, but also a positive effect on schooling for girls (no effect on schooling for boys).

Cigno, Rosati and Tzannatos (2000) find that having both younger siblings (0-6) and siblings in one's own age group (6-12) raises the probability of working of school-age children in rural India. Similarly, the number of 0-6 year old siblings raises the probability of work relative to school-only in Peru (Patrinos and Psacharopoulos 1997). Ersado (2005) finds no effect on the number of children under 5 on the probability that a child works in Peru or in rural Nepal, and a positive effect on this probability in Zimbabwe and urban Nepal. He finds no effect of children under 5 on the probability of schooling in rural Peru and Nepal, and urban Zimbabwe, and a significant negative effect in urban Peru and Nepal, and rural Zimbabwe.

Using data from Colombia and Bolivia respectively, Cartwright (1999) and Cartwright and Patrinos (1999) find that having older brothers and sisters reduces the probability that a younger child works. Canagarajah and Coulombe (1999) who use the same data find that the number of adult males in the household has a significantly positive effect on the work participation of 11-14 year old children in rural and urban areas, though there is no effect for 7-10 year olds. They find that the numbers of siblings and other compositional variables have no effect.

The presence of men and women over 60 reduces the probability that a girl in Pakistan works, there being no effects on Pakistani boys or on Ghanaian children. Overall, the effects of household composition are gender-specific and they are stronger in Pakistan than in Ghana (Bhalotra and Heady, 2000). Bhalotra and Heady (2003) also find that the number of women over 60, though decreasing child labour, also decreases child participation in school for boys and girls in rural Ghana, and has no effect on boys and girls in rural Pakistan.

In Brazil, Kruger (2007) finds that the number of people in the household over 65 has a significant negative effect on child labour participation for both girls and boys, though no effect on child schooling rates.

### **2.2.1g. Household Head Gender Effects**

The prevalence of female-headed households varies considerably across countries. It tends to be greater in sub-Saharan Africa than in Asia. For example, it is 30% in rural Ghana as compared with 3% in rural Pakistan (Bhalotra and Heady, 2000). Most of the studies that include female headship in their econometric model also include a measure of household income. If female headship significantly raises child labour participation at a given level of income, then it must indicate a degree of vulnerability of the household that is not picked up by household income.

Bhalotra and Tzannatos (2003) postulate that this could be the result of a female-headed household's borrowing ability or, more generally, its ability to deal with a crisis, its perception of the range of job alternatives available to it, or its assessment of its human capital. The result is also consistent with women being less altruistic towards children than men, but empirical evidence indicates this is not the case.

Rubalcava, Teruel and Thomas (2009) find that women allocate more resources toward investment in the future. Similarly, Cardoso and Souza (2004) find that cash transfers to women have a larger positive effect on schooling than transfers to men). Supports for the hypothesis that children of female-headed households are more likely to work and less likely to be in school is found for Paraguay in Patrinos and Psacharopoulos (1995) and Grootaert (1999) for rural children in Côte d'Ivoire.

Bhalotra and Heady (2003) find positive effect of female headship on the labour participation rates of boys and girls in rural Pakistan and for girls in rural Ghana. They find no effect of female headship on child schooling for any of the groups. Amin, Quayes, and Rives (2004) find that in Bangladesh, female headship is positively correlated with child labour for most of the groups of children (except for rural older boys). Ersado (2005) on the other hand, finds no effect of female headship on schooling or labour for the majority of the children in Nepal, Peru and Zimbabwe. He does find a negative effect of female headship on child labour in urban Zimbabwe, but also a negative effect on schooling in rural Nepal and urban Zimbabwe.

Canagarajah and Coulombe (1999) do not separate the data by gender and they find that the indicator for female headship is insignificant. Although he does allow gender-specific effects, Ilahi (1999) finds no role for female headship in Peru. Ray (2000) finds no relationship between child labour and female headship for children in Peru and Pakistan, but does find a positive relationship between female headship and schooling for girls in Pakistan. This is consistent with empirical evidence indicating that the higher altruism of mothers is often focused more on girls than boys; Duflo (2003) finds that grandmothers give more of their pension to their grandchildren than grandfathers, and more to granddaughters than grandsons.

### **2.2.1h. Age of Household Head Effects**

This is an indicator of the stage of the lifecycle that the household is at. If the oldest male reports as head, this variable may also indicate whether the child lives in a vertically extended household, with grandparents. If the equation also includes a full set of age-gender variables that reflect household composition, the age of the household head has a less clear meaning and a weaker role to play (Bhalotra and Tzannatos, 2003).

Perhaps because of this fact, most studies do not include this in their model. Those studies that do include it and find it significant do not have full controls for household composition, e.g. Nielsen (1998), Ray (2000), Cardoso and Souza(2003), Ersado (2005), and Emerson and Souza (2008). Tseganesh (2011) finds that age of the household has significant, but negative effect on child work specialization in rural Ethiopia.

### **2.2.1i. Relation to Household Head Effects**

Households in developing countries are large and complex and often contain not just vertical, but also horizontal extensions (Bhalotra and Tzannatos, 2003). As a result, nephews, nieces, sisters-in-law, and grandchildren may be counted amongst children along with sons and daughters of the head of household. Additionally, in sub-Saharan Africa, there is a high prevalence of child fostering and orphans. Assuming that the head plays the primary role in decisions regarding child labour, an interesting hypothesis is that the children of the household head are preferred and hence less likely to work.

Cockburn (2001) investigates this variable in probit estimations for work and school in Ethiopia and finds that children of the household head are more likely to attend school. In contrast, Bhalotra and Heady (2003) find that children of the head are more likely to be in work in rural Pakistan, but in rural Ghana, sons are less likely to be in work (no effect for daughters). They also find no effect on schooling for sons in rural Pakistan or for sons and daughters in Ghana, but a negative effect on schooling for daughters in rural Pakistan.

However, Blunch and Verner (2001), also analyzing data from Ghana, find that being the child of the head is positively correlated with child labour for rural boys, negatively correlated for urban girls, and has no effect on rural girls or urban boys. Jensen and Nielsen (1997) find that in

Zambia having a non-biological relation to the head of household negatively affects the probability of attending school. Given the increasing proportion of orphaned children in Africa (Subbarao, Plangemann and Mattimore, 2001), it is important to investigate whether outcomes are different for children living with adult caretakers other than their parents.

Based on data from Uganda, Bishai et al. (2003) finds that biological relatedness is a strong predictor of the quality of care offered to children. Evidence from the DHS for 10 countries in sub-Saharan Africa in which households were interviewed between 1992 and 2000 shows that orphaned children in Africa live, on average, in poorer households and are significantly less likely than other children to be enrolled in school.

The lower school enrolment of orphans as compared with other children is not explained by their greater average poverty since orphans are less likely to be in school than non-orphans with whom they co-reside. This suggests that distant relatives and unrelated caregivers invest less in orphaned children than in their own children or closer child relatives (Case, Paxson and Ableidinger, 2004). Tseganesh (2011) finds the existence of positive and significant association between child work and number of infants and biological relationship to the household head in Ethiopia.

### **2.2.1j. Child Gender Effects**

The effect of a child's gender on their labour and schooling varies widely by country, and has a great deal to do with the cultural norms of that country. These can affect parents' attitudes towards their children, the returns to education, the opportunity cost of education\_\_all of which in turn affects child labour and schooling decisions. There is also a great deal of evidence that the effects of other variables on child labour and schooling change according to gender, indicating



that the determinants for male and female child labour and schooling should be considered separately (Lindsay, 2009).

Liu (1998) finds that the probability of engaging jointly in schooling and market work is significantly higher for boys than for girls in Vietnam, while the probability of engaging jointly in school and house work is higher for girls than for boys. Cartwright and Patrinos (1999) in Bolivia find that boys are more likely to work full time than are girls. In Colombia, Cartwright (1999) finds that boys are more likely to work than girls, but girls are more likely to be working full time (as compared to combining work and school).

Rosati and Tzannatos (2006) use a multinomial logit model to show that females are more likely to be working full time (compared to full-time study), and that they are just as likely to be combining work and school (relative to full-time study). Ersado (2005) finds that girls are more likely to work in Nepal and Zimbabwe.

For children in Pakistan and Peru, Ray (1998) and Ersado (2005), in Paraguay Patrinos and Psacharopoulos (1995), in Ecuador Sasaki (2000), and for older children (aged 12-14) in Bangladesh Amin, Quayes and Rives (2004), find that girls are less likely to work than boys. Results from Côte d'Ivoire Grootaert (1999) and Coulombe (1998) are slightly different while girls are less likely to engage in work and schooling activities than only work, they are more likely to undertake household work. Deb and Rosati (2004) find that girls are more likely to be inactive (neither work nor school) in Ghana and India, but assert that this may just reflect the fact that girls are expected to perform household chores.

In Ghana, Canagarajah and Coulombe (1999), find that there is no significant difference in the probability of being economically active between male and female children. However, using

more recent data, Blunch and Verner's (2000) estimation shows that Ghanaian girls are slightly more likely to work than boys. In Zambia, Nielsen (1998) finds no significant difference in participation rates between boys and girls. Amin, Quayes, and Rives (2004) find no difference in child labour for younger girls and boys (aged 5-11) in Bangladesh.

Ray (1998) finds that males attend school more than females in Pakistan. In Ghana, Canagarajah and Coulombe (1999) find that boys are more likely than girls to attend school. Similarly, school enrollment is higher for boys than for girls in Zambia Nielsen (1998), in Côté d'Ivoire, Grootaert (1999), in Nepal, Coulombe (1998) and in Zimbabwe, Ersado (2005).

However, in some countries in Latin America (Colombia, Paraguay, Nicaragua), studies find that girls are much more likely to go to school than boys. Boys often leave school after completing the basic primary cycle while girls continue schooling for a few more years. This finding is consistent with the higher labour force participation of boys mentioned earlier. However, Ersado (2005) finds that in Peru, despite females being significantly less likely to work, they are significantly less likely to go to school. In Vietnam, Liu (1998) finds that there is no gender difference in the predicted probability of falling in the category of "school only" –there is no discrimination against girls with respect to educational opportunities.

Similarly, Agbo (2017) finds that there are more female child labourers as compared to male children in Nigeria. The phenomenon is linked to practices by parents of giving away their female children to work as house-helpers or in hawking business. Child labourers are observed to engage in such work like; hawking, begging and carrying heavy loads.

### 2.2.1k. Child Age Effects

The theoretical model would expect older children to be more likely to engage in labour activities (especially wage work) as the returns to participating in the labour market are likely to be higher, raising the opportunity cost of the child's time. Also, as the child ages, they are less likely to be required to attend school by compulsory schooling laws, which usually set the minimum age to leave school at around 14 or 15 in developing countries.

With compulsory schooling laws and diminishing returns to education, children are less likely to go to school as they get older as well. However, a quadratic effect should also be allowed, since very young children are probably less likely to go to school as well (Lindsay, 2009).

In Bangladesh, Amin, Quayes, and Rives (2004), using a linear term for age, find that child labour increases with age for rural and urban older boys (aged 12-14), rural younger boys (aged 5-11), and urban younger girls, but has no effect for urban younger boys, urban older girls, and rural older and younger girls. In Ray's (1998) study on Peru and Pakistan, participation rates in labour activities increase with age in both countries. In both countries, data show that child labour increases with age, though in Pakistan older girls are less likely to participate in the labour force. However, girls are likely to remain engaged in household work as they grow older.

For the case of Columbia, Cartwright (1999) finds that the probability of children working increases with age. In urban Bolivia, Cartwright and Patrinos (1999) find that age increases the probability that a child will work (full time or a combination of work and school). Similar results with respect to age are found for Côte d'Ivoire, Grootaert (1999), Paraguay, Patrinos and Psacharopoulos (1995), Philippines, Sakellariou and Lall (1999), Turkey, Tunali (1997), Ecuador and Sasaki (2000), Bangladesh, Ravallion and Wodon (1999), Brazil, Emerson and Souza (2008), and Ghana and Pakistan, Bhalotra and Heady (2003).

Rosati and Tzannatos (2006) in Vietnam use a multinomial logit model and find that age has a quadratic (concave) effect on the probability that a child works only and the probability that a child works and studies, relative to study only. According to Ray (1998), the school enrollment rate is 90% for children aged 6 years in Peru, and it peaks at 9 years of age 98% and then steadily falls to 62% by 17 years of age. In Pakistan, the school enrollment rate starts at 65% for children aged 10 year and peaks at 11 years of age (70%). It steadily falls to 40 percent by 17 years of age. This quadratic relationship between attendance and age is also demonstrated by Rosati and Rossi's (2003) analysis for Pakistan and for Nicaragua.

Coulombe (1998) finds that for Côte d'Ivoire, there is a quadratic relationship between school enrollment and age, with enrollment peaking at 11 years. Liu (1998) allows a quadratic relationship in her multinomial logit model for Vietnam. She finds that the probability of schooling increases with age till the age of 11 and then falls slightly. Similar results are obtained in a study of Bangladesh Ravallion and Wodon (1999) and Ghana Canagarajah and Coulombe (1999), Bhalotra and Heady (2003). Other studies that have used linear variable forage usually find a negative relationship between schooling and age, including Patrinos and Psacharopoulos (1997) in Peru, Ersado (2005) in Nepal, Peru, and Zimbabwe and Bhalotra and Heady (2003) in Pakistan.

Coster and Adekoya (2014) find that child labour participation is gender sensitive and that child work and schooling increases with age in Ogun State. Male children of different age categories attended school more than their female counterparts. Although children work to supplement family needs, they are likely to be on receiving end because of their entrance into labour force which may affect their health. Zegeye (2017) on the other hand finds that most children's started

working below the age of eight and male children are engaged in households' unpaid work like agriculture while the girls are engaged in home activities.

### **2.2.1l. Region Effects**

Within countries, rural areas support a higher incidence of child labour than do urban areas for nearly all of the empirical studies surveyed here (the one exception being in Bangladesh, Amin, Quayes and Rives (2004), where urban areas have significantly higher labour rates). Since most of the studies control for household income, a higher percentage of poverty in rural areas is not a sufficient reason. Bhalotra and Tzannatos (2003) offer other possible reasons: relatively weak school infrastructure and lower rates of technical change in rural areas may discourage school attendance.

Children may also be more easily absorbed into the informal economies of rural areas, on account of the prevalence of self-employment, relatively low skill requirements in agricultural work, and the greater degree of market imperfection in rural regions. As with child gender, there is considerable evidence that the determinants of child labour and schooling change depending on whether the region is rural or urban, indicating that regressions should be done separately for these two groups.

### **2.2.1m. Community Infrastructure Effects**

Besides the importance of the presence and quality of schools on child labour and schooling decisions, other measures of community infrastructure, such as access to public transport, safe drinking water, and electricity, often play a role in whether a child will work and/or go to school. We would expect communities with better, more established infrastructure to have higher school

attendance since the costs would be less (if the school is closer or if there is public transportation) and/or the benefits greater (if the quality of the school is better).

Examining child labour and schooling in rural areas of Ghana and Pakistan, Bhalotra and Heady (2003) find that the presence of a girls' primary school has no effect on children in Ghana or Pakistan, but a boys' primary school increases the probability that girls will work in Pakistan with no effect for boys. Surprisingly, the presence of a girls' primary school significantly lowers the probability that a girl in Pakistan will attend school, but raises the probability that a boy in Ghana will attend school.

Bhalotra and Heady (2003) finds the presence of a middle school and/or a secondary school significantly lowers the probability of working for boys and girls in Ghana, but has no effect on child schooling rates. The availability of public transport also lowers the probability of work in both countries, but only for girls. Public transport also raises the probability of schooling for boys in Pakistan, but lowers it for boys and girls in Ghana.

Blunch and Verne (2001) also analyze data from Ghana and find that the distance to the nearest primary school is significantly correlated with child labour for rural children, but not urban children; the same result is true of distance to the nearest secondary school. This is probably the result of the scarcity of schooling in rural areas due to their geographic isolation. This could also help explain why rural areas have a higher incidence of child labour and lower child schooling rates than urban areas.

Ersado (2005) on the other hand finds that in rural Nepal, the number of schools in the area is positively correlated with schooling, but has no effect on child labour (no data for number of schools available for urban Nepal, or for Peru and Zimbabwe, the other two countries he

surveys). Also, having electricity is positively correlated with schooling for urban children in Peru and negatively correlated with child labour for rural children in Nepal (no effect for Zimbabwe or for other groups in Peru and Nepal); bad water storage is positively correlated with child labour in rural Nepal and rural Zimbabwe, but also positively correlated with schooling for rural Zimbabwe and urban Nepal.

In Ray (2000), having electricity lowers the probability of child labour for boys in Peru, but raises it for girls in Pakistan, with no effect on girls in Ghana and boys in Pakistan. Having electricity also significantly raises the probability of girls in Peru and boys in Pakistan going to school, with no effect on boys in Peru or girls in Pakistan. Bad water storage is significantly positively correlated with child labour for boys in Pakistan, and negatively correlated for girls in Peru, with no effect for girls in Pakistan and boys in Peru; it is also significantly negatively correlated with child schooling for boys and girls in Pakistan, but has no effect on schooling for children in Peru.

Tseganesh (2011) also finds the major determinants of school attendance including eqqub membership of household, average schooling level in the peasant association and distance to school. Zegeye (2017) suggests that improved infrastructure would create job opportunity for parents, and in-turn reduce child labour in Ethiopia.

Studies conducted on child labour aligns with theoretical argument that classified child labour supply to three characteristics Edmonds (2003), that is; child, household and community characteristics. A study by Conagarajah and Coulombe (2006) on child labour and schooling in Ghana find that majority of child labour was in unpaid work especially within the family agricultural enterprises. They find that 90% of the children between 7-14 years were involved in

domestic chores. They also revealed that high cost of schooling, low quality and weak relevance of education pushed many children into work.

### **2.2.1n. Household Assets Effects**

Household durable assets such as radio, television, bicycle etc. has positive effects on both 'grade completed' and exam performance for children of age 6-18 and youth of age 18-24 in Tanzania. Unlike agricultural assets, household durables are not labour using technology and they are unlikely to increase the opportunity cost of schooling (Kashi, Dean and Alex, 2016). John and Benoit (2004) find fairly strong evidence that the returns to and demand for child work vary between households according to their asset profiles and demographic composition in Ethiopia.

### **2.2.1o. Household Head Health Shocks Effect**

Using a bivariate probit model with data from the 2000 Household Expenditure Survey of Bangladesh, Bazen and Salmon (2010) find that father's ill-health increases the likelihood of labour force participation of children and children have a greater tendency to work when either parent has recently had treatment. However, the probability that the mother works is increased only when the father has a chronic illness. And, they suggest that income replacement through sickness benefit could significantly reduce child labour.

Likewise, Mendolia, Nguyen and Yerokh (2017) find that maternal health shocks substantially decrease chances of being enrolled in school for children between 10 and 13 years old and, at the same time, increases the children's likelihood of entering the labour market and working more hours for children aged between 10 and 15 years in Vietnam. The effect is particularly



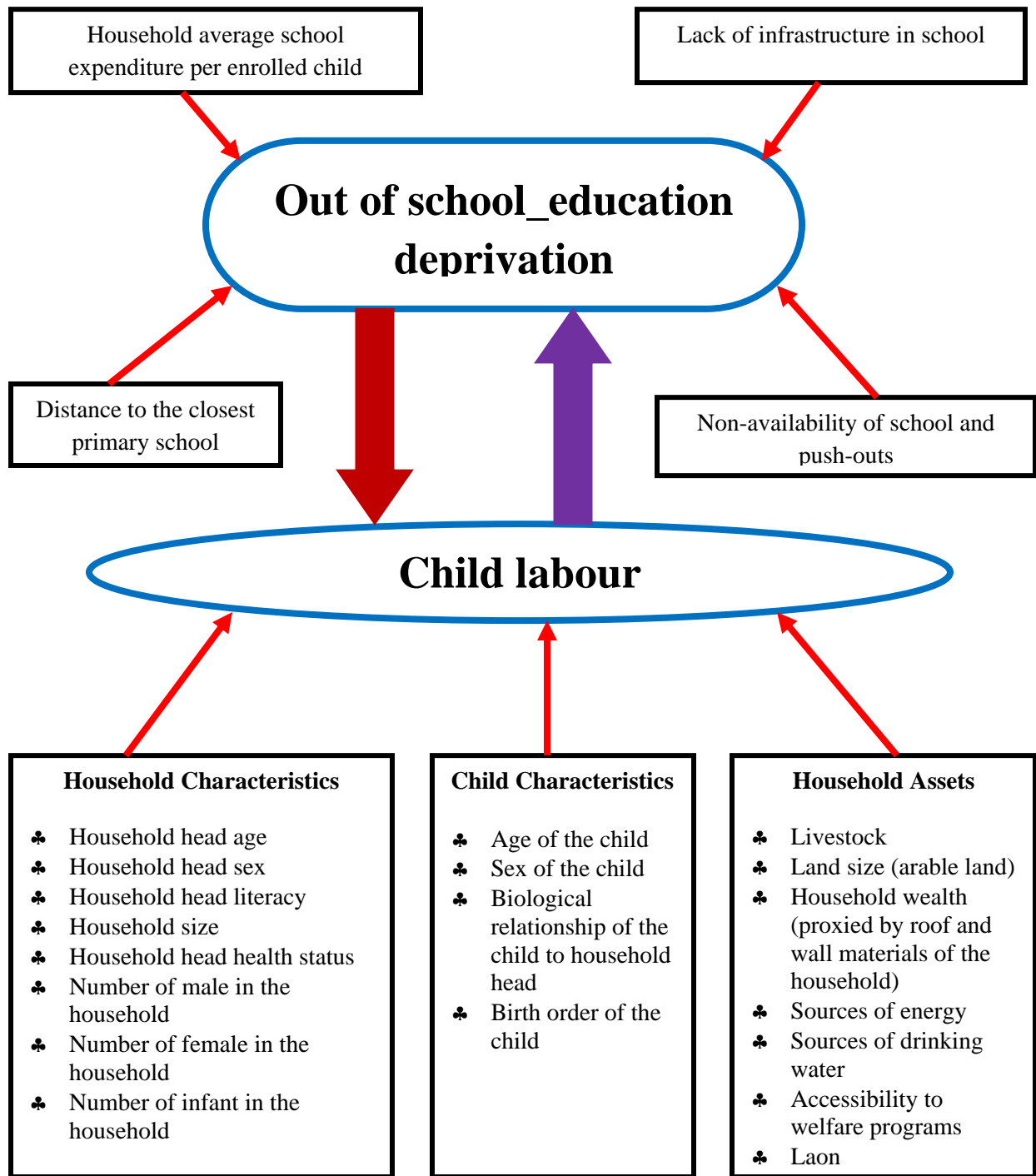
pronounced for girls and children aged between 15-18 years, who seem to experience worst adverse consequences in terms of education and labour market engagement.

Using panel data from the Young Lives Study, a longitudinal study of childhood poverty conducted in four low income countries (Ethiopia, India, Peru and Vietnam), Dhongde and Shemyakina (2017) also find that among younger children (7-8 years old), death of both parents lowers the probability of enrolment by nearly 80%. Particularly, among older children (14-15 years old), the death of a father significantly reduces the likelihood of children remaining enrolled at school.

### **2.2.1p. Welfare Effects**

Jennifer and Tassew (2008) find that social protection programs in Ethiopia are having unexpected impacts on children's time allocation between work and school activities. They suggest that guaranteeing children's immediate well-being, so as to avoid potential long-term negative effects on children's lifetime chances and earnings, a more in-depth investigation is needed into why these impacts resulted in households' participation in the EGS and PADETES. They also revealed that given the similarities between these programs and major components of the PSNP, this is a live and pressing question.

Welfare programs are weakly and positively correlated with working in Philippines. This weak outcome is most likely due to the existence of small number of people who actually know about these programs. Those who do know about the programs are generally well off, while who don't know about the programs are worse off usually (Lindsay, 2009).



**Figure 1: Determinants of child labour and schooling conceptual frame work**

# CHAPTER THREE

## METHODOLOGY OF THE STUDY

### 3.1. The Study Area

The study was conducted in Kuyu woreda of North Shewa zone of Oromia Regional State. It is found between 9° 20' (9.333°) North-Latitude and 39° 15' (38.25°) East-Longitude with altitudinal range of 1200-2800m.a.s.l. Kuyu woreda is bordered on the south and west by Muger River which separates it from West Shewa zone, on the north by Wara Jarso woreda, on the northeast by Hidabu Abote woreda, and on the east by Degem woreda. The administrative center of Kuyu woreda is Gerba Guracha, which is 156 km far to the north from Addis Ababa, the capital of the region.

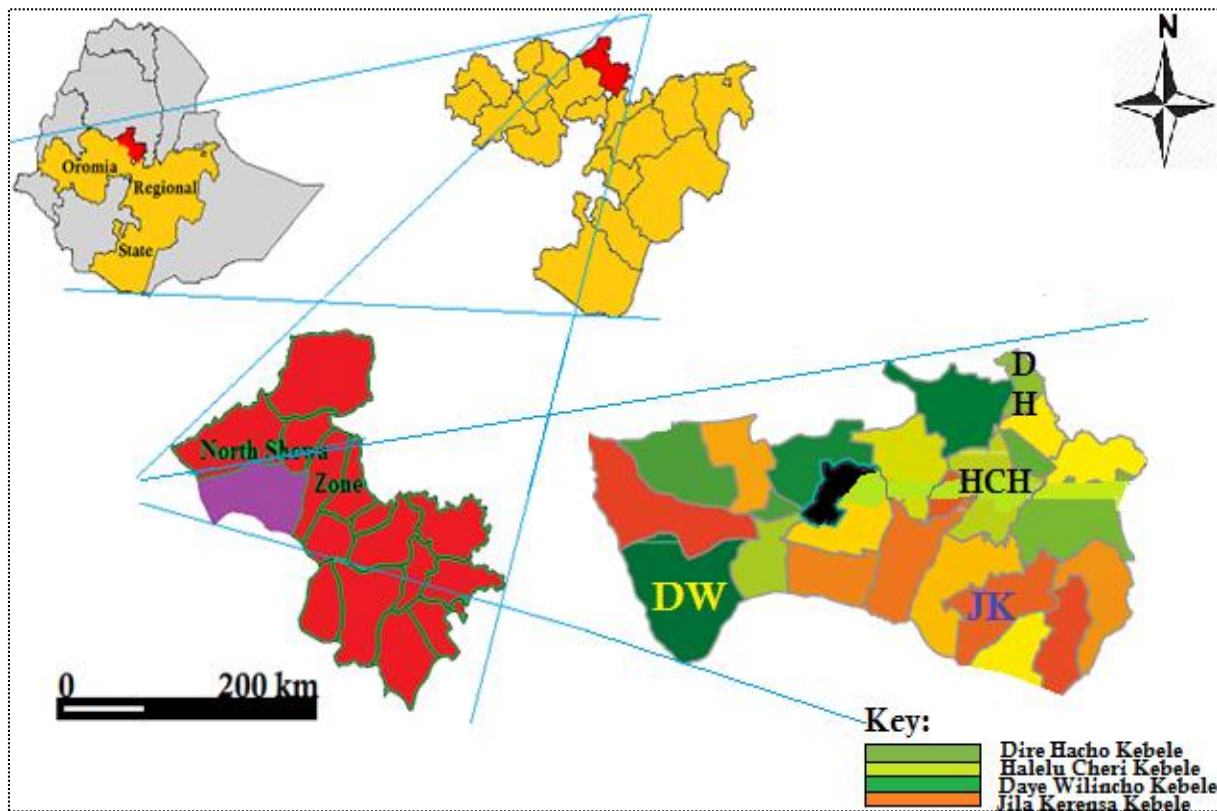


Figure 2: Map of the study area (GADM, 2018)

With an estimated area of 939.22 km<sup>2</sup>, the woreda has an estimated population density of 149.3 people per square kilometer, which is greater than the zone average of 143. It comprised 26 (3 urban and 23 rural) kebeles.

By 2018 the total population for Kuyu woreda was reported to be 171,176, of whom 85,192 (49.9% of the total population) were men and 85,984 (50.1% of the total population) were women. Likewise, the number of children aged between 0 and 5 years account 28, 124 (16.43% of the total population), while females aged between 15 and 49 years account 5,940 (3.47% of the total population) (Kuyu Woreda Social Affairs Bureau, 2019).

### **3.2. The study Design**

A cross-sectional study design was employed to look for the determinants of child labour and schooling in central Ethiopia. Based on various comparability factors including some socio-economic characteristics and development programs, four kebeles, namely Dire Hacho, Halelu Cheri, Jila Kerensa and Daye Wilincho, were selected out of 20 purposively identified kebeles of the woreda. All the households residing in the selected kebeles for more than six months, constitute the study population.

### **3.3. Sample Size Determination and Sample Techniques**

Multi-stage sampling technique was employed to select the sample kebeles and sample households. In stage one: among 13 woredas in North Shewa zone, Kuyu woreda was selected purposively. Then in stage two: having the secondary data from social affairs bureau of the woreda, out of 23 rural kebeles of the woreda, 20 vulnerable rural kebeles were selected. In the third stage: by taking the available resource into account, out of 20 selected kebeles, four kebeles were selected. In addition to available resource, they were selected because of the following

reasons: firstly, as per the secondary data obtained from the social affairs bureau of the woreda, the selected kebeles do have higher vulnerability in relation to other kebeles in the woreda; secondly, they do have higher incidence of food insecurity problem and hence, helped by different social protection programs. And thirdly, they are expected to represent the rural kebeles in the woreda in terms of socio-cultural and economic characteristic. Finally, lists of households were obtained from the agricultural and rural development bureau of the woreda.

By using probability proportionate selecting method, the researcher selected sample household who has child as the respondent. Using simple random sampling method based on proportion respondents from the selected kebeles were households having children. The study employed simple random sampling method since it gives equal chance for all the targeted population.

The total households of the selected kebeles were 4449 (1115, 1200, 1261 and 873 in Dire Hacho, Halelu Cheri, Jila Kerensa and Daye Wilincho kebele respectively). To obtain the representative sample size, the study employed the sample size determination formula designed by Yamane (1967).

$$n = \frac{N}{1 + N(e)^2}$$

Where, n - denotes the sample size,

N - denotes total number household in the four kebeles, and

e - denotes the margin of error (MoE) which equals 5% in this case

Therefore,  $n = \frac{N}{1+N(e)^2}$    $n = \frac{4449}{1 + 4449(0.05)^2} = 367$

### **3.4. Data Collection**

Both qualitative and quantitative data were used in the study. The data were obtained from both primary and secondary data sources. Primary data were collected using structured questionnaire that was administered by the trained enumerators. The questionnaire was pre-tested and necessary corrections were made before actual use. Secondary data were also collected from relevant sources in the woreda.

### **3.5. Methods of Data Analysis**

The data processing phase involves many interdependent activities. These include data editing, coding, data entry and data cleaning. In this study both descriptive and econometric methods were used to analyze the data.

### **3.6. The Model**

Earlier studies on the determinants of children's participation Assefa (2002), Nkamleu (2009) and Cockburn (2001) in different activities status have used categorical outcome models. Hence, the empirical model used to analyze the data is Multinomial Logit Model (Maddala, 1983 and Crammer, 1991). Multinomial (Polytomous) logistic regression model is employed when dependent variable has more than two nominal or unordered categories. It uses maximum likelihood estimation to evaluate the probability of categorical membership.

Furthermore, for regressors that are invariant across alternatives, the appropriate model is the multinomial logit model. The advantage of this model is that it allows the analysis of decisions across more than two categories-enabling the determination of choice probabilities for different categories of child's activity status. This approach is more appropriate than the conventionally used tobit or probit models which have two dichotomous alternatives (Nkamleu, 2009). The

Multinomial Logit has 'S' possible states or categories i.e.,  $s=1, 2, 3, \dots S$ , that are exclusive and exhaustive (Crammer, 1991).

Likewise, Tabanick et al. (2001) argue that multinomial logistic regression model has a number of advantages over other models. Firstly, it is more robust to violations of assumptions of multivariate normality and equal variance and co-variance matrices across groups. Secondly, MLR can easily interpretable diagnostic statistics. Its third most important advantage is that, MLR does not assume a linear relationship between the dependent and independent variables. Fourthly, independent variables need not be interval in MLR and it does not require that the independents be unbounded and lastly. Finally, in MLR, normally distributed error terms are not assumed. With the above and other advantages, MLR is a widely used problem solving tool and usually attractive.

Multinomial Logit relies on the assumption of Independence of Irrelevant alternatives (IIA) which states that for any individual, the ratio of probabilities of choosing two alternatives is independent of the presence or attributes of any other alternative. The hypothesis is that other alternatives are irrelevant to the decision of choosing between the two alternatives in the pair. The ratios of the probabilities for each alternative depend only on the attributes of those alternatives and not on the attributes of the third alternative and would remain the same. In effect IIA argues that there are neither substitutes nor compliments for the alternatives. The major implication of the IIA property is that it allows additions or removals of an alternative from the choice set without affecting the structure or parameters of the model.

Multinomial Logit Model assumed that error components are extreme-value (or Gumbel) distributed, outcome follows a categorical distribution which is linked to the covariates via a link

function as in ordinary logistic regression, independence of observational units, linear relation between covariates and (link-transformed) expectation of the outcome, error components are identically and independently distributed across alternatives and error components are identically and independently distributed across observations/individuals.

Accordingly, the MNL model for the study is specified as follows:

$$\begin{aligned}
 \text{Activity} = & \beta_0 + \beta_1 \text{Cage} + \beta_2 \text{Cage}^2 + \beta_3 \text{Csex} + \beta_4 \text{Biol}_{\text{rnship}} + \beta_5 \text{B}_{\text{order}} + \beta_6 \text{Hhh}_{\text{sex}} + \\
 & \beta_7 \text{Hhh}_{\text{age}} + \beta_8 \text{Hh}_{\text{size}} + \beta_9 \text{Nf}_{717} + \beta_{10} \text{Nm}_{717} + \beta_{11} \text{Nif} + \beta_{12} \text{Hhh}_{\text{litr}} + \beta_{13} \text{Hhh}_{\text{healthst}} + \\
 & \beta_{14} \text{Hh}_{\text{livestock}} + \beta_{15} \text{Hh}_{\text{landsize}} + \beta_{16} \text{Hh}_{\text{awelfare}} + \beta_{17} \text{Hh}_{\text{loan}} + \beta_{18} \text{Hh}_{\text{roofmater}} + \\
 & \beta_{19} \text{Hh}_{\text{wallmater}} + \beta_{20} \text{Hh}_{\text{senergy}} + \beta_{21} \text{Hh}_{\text{swater}} + \beta_{22} \text{Avg}_{\text{schexp}} + \beta_{23} \text{Dis}_{\text{school}} + \\
 & \beta_{24} \text{Dire Hacho} + \beta_{25} \text{Jila Kerensa} + \beta_{26} \text{Halelu Cheri} + \beta_{27} \text{Daye Wilincho} + \varepsilon_i \dots \dots \dots (3a)
 \end{aligned}$$

Where, the variables are as defined in table 1;  $\varepsilon_i$  is the disturbance term of the equation which is *iid* gumble distributed i.e.,  $\varepsilon_i \sim \text{Gumble}(0, \lambda)$ .

This study assumes that the child's unit time endowment can be used for four mutually exclusive activities. At a particular time, a child could be only attending school, only working, working and attending school at the same time, or being idle /inactive, i.e., neither working nor attending school (leisure). This gives rise to a polychotomous choice framework.

Hence, the probability of a child having activity  $j$  ( $j=1$  school only;  $j=2$  school and work; and  $j=3$  work only and  $j=4$  inactive) is given by the following multinomial logit model.

$$\text{Prob}(Y_{i=j}) = \frac{\exp(\alpha_j + \beta_j)}{\sum_k \exp(\alpha_k + \beta_k)} \text{ for } j, k=1, 2, 3, 4 \dots \dots \dots (3b)$$

The multinomial probability model assumes that the possible distinct states are exhaustive in that they cover all possibilities. The likelihood function for a sample of  $N$  independent observations is then:



$$L_N = \prod_{i=1}^N \prod_{j=1}^m P_{ij}^{y_{ij}} \dots \dots \dots (3c)$$

Where the subscript  $i$  denotes the  $i^{\text{th}}$  of  $N$  individuals and the subscript  $j$  denotes the  $j^{\text{th}}$  of  $m$  alternatives.

The log-likelihood function is:

$$L = \ln L_N = \sum_{i=1}^N \sum_{j=1}^m y_{ij} \ln p_{ij} \dots \dots \dots (3d)$$

Where  $p_{ij} = F_j(x_i, \beta)$  is a function of parameters  $\beta$  and regressors. More generally, the number of alternatives may vary across different individuals, so that  $m$  choices become  $m_i$  choices. The first-order conditions for the MLE  $\beta$  are that it solves  $\frac{\partial L}{\partial \beta} = \sum_{i=1}^N \sum_{j=1}^m \frac{y_{ij}}{p_{ij}} \frac{\partial p_{ij}}{\partial \beta} = 0$  which is usually nonlinear in  $\beta$ . The distribution of  $y_i$  is necessarily multinomial that ensures consistency as then  $E[y_{ij}] = p_{ij}$ .

But, the maximized log likelihood function with respect to the parameters will be:

$$\frac{\partial LL}{\partial \beta_k} = \sum_i [y_{ik} - p_{ik}] x_i$$

$$\frac{\partial p_{ij}}{\partial \beta_j} = p_{ij} x_i - p_{ij} p_{ij} x_i$$

For  $j \neq k$ ,  $\frac{\partial p_{ij}}{\partial \beta_j} = -p_{ij} p_{ij} x_i$ .

The Second Order Condition, however, becomes:

$$\frac{\partial^2 L}{\partial \beta_j \partial \beta'_k} = - \sum_{i=1}^N \sum_{j=1}^J p_{ij} (\delta_{ij} - p_{ij}) x_i x'_j$$

Where  $\delta_{ij}$  is an indicator variable equal to 1 if  $j=k$  and equal to 0 if  $j \neq k$ .

Unlike the standard regression analysis, the parameter value ( $\beta$ ) is not directly interpretable as the effect of the change in the explanatory variable on the mean or expected value of the

dependent variable. In particular, for MNL models a positive regression parameter does not mean that an increase in the regressor leads to an increase in the probability of that alternative. Instead, interpretation for the MNL model is relative to the reference or base category group (Greene, 2012).

The coefficients need to be adjusted to be marginal effects in the case of the logit model. In other words, the marginal effect, which gives the partial derivatives indicating the change in the probability of the dependent variable relative to a unit change in one of the independent variables, needs to be computed. As the relationship between the regressors and the absolute probabilities in non-linear, marginal effects vary according to the choice of vector X and, consequently, they will vary among individuals according to the point of evaluation.

By differentiating the multinomial logit model, we find the marginal effects of the explanatory variables on the probabilities as:

$$\frac{\partial p_{ij}}{\partial x_i} = p_{ij} (\beta_j - \bar{\beta}) \dots \dots \dots (3e)$$

Where,  $\bar{\beta}_j = \sum_j p_{ij} \beta_j$

$$\delta_j = \frac{\partial p_j}{\partial x_i} = [\beta_j - \sum_{k=0}^J p_k \beta_k] = p_j [\beta_j - \bar{\beta}] \dots \dots \dots (3f)$$

For continuous variables the marginal effect is the probability change in response to a unit change in the value of the independent variable at the mean value. For dummy variables the marginal effect is computed as the difference in probabilities of the dependent variable between the group with designated value 1 and the base category. Furthermore, it should be noted that the signs of the beta coefficients are not necessarily the same as that of the marginal effects.

### 3.6.1 Test for Independence Irrelevant Assumption (IIA)

The multinomial logistic model assumes that data are case specific; that is, each independent variable has a single value for each case, meaning that the dependent variable cannot be perfectly predicted from the independent variables for any case. As with other types of regression, there is no need for the independent variables to be statistically independent from each other (unlike, for example, in a naive Bayes classifier); however, collinearity is assumed to be relatively low, as it becomes difficult to differentiate between the impact of several variables if this is not the case (Belsley and David, 1991).

Therefore, multinomial logit models are valid under the Independence of Irrelevant Alternatives (IIA) assumption that states that characteristics of one particular choice alternative do not impact the relative probabilities of choosing other alternatives. This implies that the probability ratio of individuals choosing between two alternatives does not depend on the availability or attributes of the other alternatives.

A number of tests of the IIA exist. One of them was devised by Hausman and McFadden (1984) as a variation of the Hausman (1978) test. However, independence of irrelevant alternative assumption (IIA) of Hausman test is roughly used in multinomial model. IIA means that adding or deleting alternative outcome categories does not affect the odds among the remaining outcomes. And the test for IIA can be performed by using the STATA command, 'mlogtest, iia'. However, as of April 23, 2010, mlogtest, iia does not work with factor variables (<https://stats.idre.ucla.edu/stata/dae/multinomiallogistic-regression/>).

In line with the probability of testing IIA which states for a specific individual the ratio of choice probabilities of any two alternatives is completely unchanged by symmetric utilities of other

alternatives which is closely related with the assumption that all disturbances are mutually independent. According to Dow and Endersby (2003), for most applications, the IIA property is not particularly restrictive and even not relevant. The acceptance or rejection of IIA depends both on which test and which variant of a given test is used. Therefore, Hausman IIA test no longer employed in this study.

### **3.6.2. Test for Multicollinearity**

When there is a perfect linear relationship among the predictors, the estimates for a regression model cannot be uniquely computed. Collinearity implies that two variables are near perfect linear combinations of one another.

The variance inflation factor (VIF) test has been employed to test for the presence of severe multicollinearity problem among the explanatory variables included in the empirical model. As a rule of thumb, a variable whose VIF values are greater than 10 may merit further investigation. A tolerance value lower than 0.1, is comparable to a VIF of 10. It means that the variable could be considered as a linear combination of other independent variables. Accordingly, the VIF test result showed that multicollinearity is not of a thoughtful problem in the data set (See in the Appendices).

### **3.7. Specification of Variables**

From detailed review of literature on child labour and schooling the following variables are found to be essential factors that explain household decision as to the allocation of child time to work, school and leisure.

- I) Child characteristics: sex of child, age of child, age squared, birth order, biological relationship with head.

- II) Household characteristics: age of household head, sex of household head, household head education level, household size, number of male children between 7 and 17 years old, number of female children between 7 and 17 years old, number of infants below five years, household head health shock, household wealth proxied by house quality (roof and wall), access to electricity, access to water and welfare.
- III) Other determinants: distance to the closest school in minute and average schooling level in the community and household average school expenditure per enrolled child.

**Table 3.1: Variables in the model and their definitions**

Variables	Definitions
Activity	Main activity of a child (1 if schooling only; 2 if both schooling and working; 3 if working only; and 4 if the child is neither going to school nor working)
<b>Child Characteristics</b>	
Cage	Age of the child
Cage <sup>2</sup>	Age square of the child
Csex	Dummy for the sex of the child (1 if male, 0 otherwise)
Bio_rnship	Dummy variable equal to (1 if child is the household head's son, daughter, brother, sister, or grandchild, 0 otherwise)
B_order	Birth order of the child
<b>Household Characteristics</b>	
Hhh_sex	Dummy for male-headed household (1 if male; 0 otherwise)
Hhh_age	Age of household head in years
Hh_size	Number of household members
Nf_717	Number of female members aged between 7 and 17 in the household
Nm_717	Number of male household members aged between 7 and 17 in the household
Nif	Number of infants (children aged below than 5 years) in the household
Hhh_lit	Dummy for household head's literacy level (1 if literate, 0 otherwise)
Hhh_healthst	Dummy variable equal to (1 if the household head has no recurrent health shocks/problems, 0 otherwise)
<b>Household Assets</b>	
Hh_livestock	Dummy variable (1 if the household has livestock, 0 otherwise)
Hh_landsize	Land size the household owns in hectare
Hh_awelfare	Dummy variable equal to (1 if household knows about governmental welfare programs, 0 otherwise)
Hh_loan	Dummy variable equal to (1 if the household is access to loan provided by formal or informal financial institutions, 0 otherwise)
Hh_roofmater	Categorical variable for roof material (1 if made from galvanized iron)

	(korkoro), 2 if thatch, 3 if shanty, 0 others )
Hh_wallmater	Categorical variable for wall material (1 if made bamboo, 2 if cement, 4 if wood with sand, 0 others)
Hh_senergy	Categorical variable equal to (1 if household uses wood, 2 dung/manure, 0 others)
Hh_swater	Categorical variable equal to (1 if household's main source of drinking water is tube /piped inside the compound, 2 if it is pipe-borne outside side its compound, 3 if it is protected well, 4 if it is unprotected well, 5 if river/pond)
<b>School Related Factors</b>	
Avg_expendsch	Household Average school expenditure per enrolled child
Dis_school	Distance to the closest government primary school in minutes
<b>Area of Residence</b>	
Kebele	(Dire Hacho, Halelu Cheri, Jila Kerensa, and Daye Wilincho)

## CHAPTER FOUR

### DISCUSSION OF THE RESULTS

Understanding the underlying causes of child labour and addressing their interconnectedness is the key premise behind the prevention and response approach by concerned bodies. Moreover, effective action against child labour must address the full range of vulnerabilities that children face and must recognize that these wider concerns are not always adequately dealt with in existing response strategies.

To allow better understanding of the seriousness of the issue, the researcher presents information on the incidence of child labour and schooling in rural households of Ethiopia using survey data collected from four rural kebeles of Kuyu woreda in Oromia Regional National State.

Evidently, schooling and child labour are not necessarily mutually exclusive categories. Therefore, it is very important to explore and understand their potential negative interaction. The data were collected before the end of the summer season of 2019, when the schools were closed. This allowed obtaining a comprehensive overview of the main activities performed by children (schooling, economic and non-economic activities) and assessing their participation in one or more activities simultaneously.

All categories of children aged between 7 and 17, in relation to education and work were studied: children in schooling only, working only, those combining school and working together, and those are neither schooling nor working. Furthermore, the issue of child activity status was studied in detail in view of identifying children who undertake intensive in all activities performed by them in the area, beyond acceptable limits.

Furthermore, the data were collected for a total of 367 children in age category of 7 to 17, of which 55.59% are males and 44.41% are females. Out of this, 25.34%, 28.07%, 27.25%, and 19.35% have been living in Dire Hacho, Jila Kerensa, Halelu Cheri, and Daye Wilincho, respectively.

## 4.1. Descriptive Statistics

### 4.1.1. Child Work-School Participation

Main activities performed by a particular child have been summarized under four categories. These activities include: schooling only, working only, both schooling and working, and neither schooling nor working.

Table 4.1 shows that the proportion of the child population aged 7 to 17 years, who are under the consideration, and residing in Dire Hacho, Jila Kerensa, Halelu Cheri and Daye Wilincho kebele is 25.34%, 28.07%, 27.25% and 19.35% , respectively.

**Table 4.1: Number and Percentage of Children by Sex, Age Group and Area of Residence**

Main background characteristics	Male		Female		Total	
	N	%	N	%	N	%
<b>Age Group</b>						
7-10 years	55	23.31	39	29.77	94	25.61
11-14 years	102	43.22	50	38.17	152	41.42
15-17 years	79	33.47	42	32.06	121	32.97
<b>Kebeles</b>						
Dire Hacho	62	26.27	31	23.66	93	25.34
Jila Kerensa	50	21.19	53	40.47	103	28.07
Halelu Cheri	75	31.78	25	19.08	100	27.25
Daye Wilincho	49	20.76	22	16.79	71	19.35
<b>Total</b>	<b>236</b>	<b>100.00</b>	<b>131</b>	<b>100.00</b>	<b>367</b>	<b>100.00</b>

Source: Computed from own survey data, 2019



Table 4.2 and 4.3 below reveal that female children (28.22%) have been slightly more engaged only in schooling activity than their corresponding male children (27.94%). Similarly, female children (31.29%) have been more likely engaged in working activity only than their counterpart male children (23.53%). However, 41.67% and 25.15% of male and female children respectively have been engaged in both working and schooling. Only 6.86% and 15.34% of male and female children respectively have been neither schooling nor working (inactive). Generally, as the age of children increases, their probability of engaging in schooling only decreases in both sexes and age groups; but their engagement in working and schooling increases, as their age increases.

**Table 4.2: Number and Percentage of Male and Female Children by Activity Status**

Activity Status	Male		Female		Total	
	N	%	N	%	N	%
Schooling only	57	27.94	46	28.22	103	28.07
Working only	48	23.53	51	31.29	99	26.98
Both working and schooling	85	41.67	41	25.15	126	34.33
Neither schooling nor working	14	6.86	25	15.34	39	10.63
<b>Total</b>	<b>204</b>	<b>100.00</b>	<b>163</b>	<b>100.00</b>	<b>367</b>	<b>100.00</b>

Source: Computed from own survey data, 2019

**Table 4.3: Number and Percentage Children across Different Age Group in Different Activity Status**

Activity Status	All males and females						Total	
	7-10		11-14		15-17			
	N	%	N	%	N	%	N	%
Schooling only	39	41.49	45	29.61	19	15.70	103	26.07
Working only	7	7.45	48	31.58	44	36.36	99	26.98
Both working and schooling	26	27.66	49	32.24	51	42.15	126	34.33
Neither schooling nor working	22	23.40	10	6.58	7	5.79	39	10.63
<b>Total</b>	<b>94</b>	<b>100.00</b>	<b>152</b>	<b>100.00</b>	<b>121</b>	<b>100.00</b>	<b>367</b>	<b>100.00</b>

Source: Computed from own survey data, 2019

#### **4.1.2. Types of Work Activities Performed by Children**

Table 4.4 shows that about half per cent (49.05%) of children aged 7 to 17 years are engaged in domestic works. Female children are more likely to undertake these activities than male children in relative terms (50.33% of total female children against 48.13% of total male children). Likewise, female children are more likely to engage in household chore activities than male children.

Common household chores include babysitting, cleaning, cooking, shopping and caring for sick household members. These activities can interfere with schooling and affect health in a similar way to economic activities. Moreover, since there is a considerable gender difference in the performance of household chores, with girls largely overrepresented, any analysis that overlooks this important category of work will not capture the full set of working activities.

As age increases, the probability of performing household chores increases. Moreover, gender difference is noticeable in all age categories and by area of residence. Nearly, more than three out of every ten girls aged 11 to 17 years perform household chores, as compared to about three of every ten boys in the same age categories. It is also relevant to highlight that despite the gender angle, for both male children and female children, household chores are among one the most common forms of work performed by children at the woreda level.

**Table 4.4: Number and Percentage of Children by Sex and Type of Work Activities Performed by Children**

Activity status	Sex				Total	
	Male		Female		N	%
	N	%	N	%		
Domestic work (Work done in the home)	103	48.13	77	50.33	180	49.05
Farm work	34	15.89	19	12.42	53	14.44
Household chores	63	29.44	51	33.33	114	31.06
Other paid and unpaid activities	14	6.54	6	3.92	20	5.45
<b>Total</b>	<b>214</b>	<b>100.00</b>	<b>153</b>	<b>100.00</b>	<b>367</b>	<b>100.00</b>

**Source: Computed from own survey data, 2019**

## 4.2. Econometric Results

As it has been introduced earlier, the method of empirical analysis is Multinomial Logit model using maximum likelihood estimation to estimate the parameters of the MNL equation. Before running the model variables were assessed employing the gladder test in STATA to come up with the appropriate transformation of count variables. All count variables are found to have symmetric distribution at their level.

### 4.2.1. Chi<sup>2</sup> Tests of Categorical Variables against Child Activities

#### A. Chi<sup>2</sup> Tests for Child Characteristics

The age of a particular child is among the major determinants of the likelihood of a child whether going to school or not. Apart from the age, sex of a particular child also affects the likelihood of the child whether going to school or engaging in economic activities (i.e., the production of goods and services for the market, or production of goods for self-consumption) or non-economic activities (the production of domestic and personal services by a household member for consumption within their own household). The vast majority of these activities are found to be done by both male and female children. Therefore, there is a strong relationship

between the sex of a child and activities performed by that child, with p-value of 0.000.

Biological relationship with the household head has also strong relationship with activities performed by a particular child, with p-value of 0.000. Because, most of the time the household head is assumed to make the decision about a child in all aspects. It is most likely that children who are the direct off-springs of the head would be more likely to attend school than the other children lived as member in the household.

As of table 4.5 below, it is observed that birth order of a particular child can also determine the likelihood of the child to engage in child work-school activities. Logically, older child in particular are more likely to engage in working activities than the its younger siblings. Therefore, there is a strong relationship between birth order and activities performed by a child, with p-value of 0.000.

#### **B. Chi<sup>2</sup> Test for Household Characteristics**

As it can be observed from table 4.5 below, household head recurrent health shock has a very strong effect on child work-school participation. The negative effect of household head recurrent health shock can be mediated through an increase in health expenditure, that reduces family income and funds available for schooling and at the same time may increase the need for the children to enter the labour market to replace a sick head. Therefore, there is strong relationship between the health status of the household head and activities performed by children, with p-value of 0.000.

### **C. Chi<sup>2</sup> Test for Household Assets**

Lack of suitable shelter, poor sanitation, inadequate and unsafe water supply, and inadequacy of basic housing facilities, etc.; in general, describe the extent of poverty in a household. Therefore, evidence on housing quality is an important indicator of the well-being of a household. Good quality houses are usually related to better income, which could be taken as an indicator of better economic well-being. Children who are not working seem to be living in better types of dwelling than those who are working or who are engaged in child labour.

Compressed occupation of rooms and use of low quality materials in the construction of houses are likely to have adverse effects on general development of children. As it can be observed from table 4.5 below, there is strong relationship between the household roof and wall materials, and activities performed by children, with p-value of 0.034 and 0.000 respectively.

Apart from the dwelling materials of the household, sources of energy used for light and cooking, and drinking water have also anticipated to affect the likelihood of child whether to participate in economic and non-economic activities or school enrolment. Evidently, wood is the main source of energy in rural areas, and is substantially collected by female children in the household. Econometric results in table 4.5 below, supports this fact, i.e. there is strong relationship between activities performed by children and source of energy for the household, with p-value of 0.004.

### **D. Chi<sup>2</sup> Test for School Related Factors**

Likewise, the availability of the school around the residence of the household can determine the school enrolment and working habit of a child in the household. As it can be observed from table 4.5 below that there is strong relationship between activities performed by children, and distance

between household residence and the nearest school, with p-value of 0.001.

**Table 4.5: Chi<sup>2</sup> Tests of Categorical Variables against Child Activities**

<b>Variables</b>	<b>Chi<sup>2</sup></b>	<b>P-value</b>
<b>Child characteristics</b>		
Cage	54.212	0.000*
Csex	15.344	0.002*
Biol_rnship	20.703	0.000*
B_order	33.298	0.000*
<b>Household characteristics</b>		
Hhh_sex	1.205	0.752
Hhh_lit	6.910	0.075***
Hhh_healthst	20.188	0.000*
<b>Household asset</b>		
Hhh_livestock	7.579	0.056***
Hh_welfare	1.762	0.623
Hh_loan	2.603	0.457
Hh_roofmater	13.643	0.034**
Hh_wallmater	45.524	0.000*
Hh_senergy	19.234	0.004*
Hh_swater	17.754	0.123
<b>School related factors</b>		
Dis_school	17.645	0.001*

**Source: Computed from own survey data, 2019**

Note: \*, \*\* and \*\*\* represent significance at 1%, 5% and 10% levels of significance.

Provided that, detailed analysis of the econometric results is discussed as follows. As it was introduced in the previous sections, there are four categories of activity status performed by a particular child in the alternative, with the one serving as a base category (reference), and in this case, both schooling and working is labeled as a reference (base category) and every coefficient interpretation takes this variable as a reference. Where,  $\beta$ 's being the raw regression coefficients from the output, and using the relative risk ratio, the interpretation of the significant variables is presented as follows in accordance with the results in table 4.6 below.

**Age of the Child:** the relative risk ratio of one year increase in the age of a child aged between 11 and 14 lowers the probability of schooling only and neither schooling nor working by the factor of 1.032 and 1.780 respectively, relative to both schooling and working. Similarly, the relative risk ratio of one year increase in the age of a child aged between 15 and 17 lowers the probability of schooling only and neither schooling and working by the factor of 2.157 and 2.327 respectively, relative to both schooling and working.

However, the relative risk ratio of one year increase in the age of a child aged between 15 and 17 increases the probability of working only by the factor of 2.155 relative to both schooling and working. Likewise, the relative risk ratio of age squared of children aged 7 to 17 lowers the probability of working only by the factor of 0.205 relative to both schooling and working.

Generally, participation in child labour increases with the age of the child. This pattern is largely due to the fact that the productivity of children increases as they grow older, meaning that the opportunity cost of keeping children in school as opposed to the workplace also goes up.

**Sex of the Child:** sex of the child also affects the probability of schooling only, working only, and neither schooling nor working relative to both schooling and working in a similar way. That is male children do have less probability of schooling only as compared to their female children counterparts, as the relative risk ratio of male children decreases the probability of schooling only by the factor of 1.469 relative to both schooling and working. This implies that female children are more likely to attend school.

Similarly, male children do have less probability of working only as compared to their female children counterparts, as the relative risk ratio of male children decreases the probability of working only by the factor of 1.335 relative to both schooling and working. And the relative risk

ratio of male children decreases the probability of neither schooling nor working by the factor of 2.206 relative to both schooling and working. Thus, they do have less probability of neither schooling nor working relative to both schooling and working than female children.

**Biological Relationship of the Child with the Household Head:** most of the time parents do value their children as investments having a long term return in the future; hence, encourage their biological child to schooling. The econometric result shows that the relative risk ratio of being the direct off-spring of the household head of a child lowers the probability of working only by the factor of 2.320 relative to both schooling and working. This implies that non-biological children of the household head do have higher probability to engage in working only than biological children / direct off-spring of the household head.

**Birth Order of the Child:** birth order has also significant impact on activities performed by a child. The relative risk ratio of being the second and third child in the household lowers the probability of working only by the factor of 2.632 and 2.069 respectively, relative to both schooling and working. However, the relative risk ratio of being the fourth and above child in the household increases the probability of neither schooling nor working by the factor of 2.785 relative both schooling and working. Therefore, the older child is more likely to engage in work than its younger siblings.

**Household Head Sex:** female headed households are more likely to send their children to work as compared to their male counterparts. The econometric result shows that the relative risk ratio of male headed child lowers the probability of working only by the factor of 1.956 relative to both schooling and working. Therefore, male head does lower the probability of child work, while female head raises it.



**Household size:** the relative risk ratio of one person increase in the household increases the probability of working only and neither schooling nor working by the factor of 0.946 and 2.100 respectively, relative to both schooling and working. This implies that larger household is more likely to increase child work participation and idleness than smaller household does.

**Number of Female Children in the Household:** the relative risk ratio of the presence of one female aged between 7 and 17 in the household lowers the probability of schooling only, working only and neither schooling nor working by the factor of 1.129, 1.392 and 2.699 respectively, relative to both schooling and working.

**Number of Male Children in the Household:** the relative risk ratio of the presence of one male aged between 7 and 17 in the household lowers the probability of working only by the factor of 0.323 relative to both schooling and working. Generally, as the number of female and male children increases in a household, their labour supply on working only decreases significantly.

**Number of Infants in the Household:** the relative risk ratio of the presence of one infant (child aged below five year) in the household lowers the probability of neither schooling nor working by the factor of 1.698 relative to both schooling and working.

**Household Head Literacy:** Literate household head is more likely to send its child to school. The econometric result shows that the relative risk ratio of being literate of the household head increases the probability of schooling only by the factor of 1.682 relative to both schooling and working of a child in household. One possible explanation on this is that household heads that are more educated might have a better understanding of the economic returns to education and/or are in a better position to help their children realize these returns.

**Household Head Health Status:** household head with no recurrent health shock is more likely to send his/her child to school. The econometric result suggests that the relative risk ratio of being free of recurrent health shocks of the household head increases probability of schooling by the factor of 1.952 relative to both schooling and working. Similarly, the relative risk ratio of being free of recurrent health shocks of the household head increases the probability of working only by the factor of 1.738 relative to both schooling and working. However, the probability on school participation is quite greater than the probability in work specialization. Therefore, a household head with no recurrent health shock is definitely more likely to increase the school attendance of its child than its counterparts.

**Household Livestock:** the relative risk ratio of livestock loose of the household lowers the probability of schooling only and working only by the factor of 3.677 and 4.562 respectively, relative to both schooling and working. The magnitude is different between schooling only and working. Therefore, losing livestock ownership greatly reduces the working probability of children among rural households. This is due to the fact that children usually the responsibility to care for, for instance, herding responsibility, the livestock the household owns. On the other hand, livestock ownership of the household usually leads the household to hire / share labour (child labour) from others.

**Household Land Size:** the relative risk ratio of one hectare increase in land (arable land) size lowers the probability of schooling only and working only by the factor of 0.585 and 1.505 respectively, relative to both schooling and working. However, the relative risk ratio of one hectare increase in land (arable land) size increases the probability of neither schooling nor working by the factor of 1.962 relative to both schooling and working. Generally, larger land (arable land) may need larger labour (child labour) to cultivate, consequently, may decrease child

schooling. On the other perspective, owning larger land (arable land) may enable the household to pay for expenditure on schooling easily, consequently, may decrease work specialization of a child in the household.

**Household's Availability to Welfare Programs:** as the parents' accessibility to welfare programs increase, the tendency to use child labour may decrease, as welfare programs have important potential to reduce poverty, cope with repeated shocks and positive impact on child well-being. Furthermore, increasing household income may decrease the need for children to work. The econometric result also suggests that the relative risk ratio of having access to welfare program by the household lowers the probability of schooling only and working only by the factor of 1.646 and 1.952 respectively, relative to both schooling and working. This weak effect is most likely due to the limited availability of the programs.

**Household Loan:** the econometric result suggests that the relative risk ratio of having debt lowers the probability of schooling only and working only by the factor of 1.882 and 2.823 respectively, relative to both schooling and working. On one hand, households are thought to be more likely to rely on children's labour if they lack access to credit. On the other way, children from households with serious debt are more likely to be engaged in working than schooling. Most of the time, due to drought related factors, households who are unable to repay loans to microfinance institutions like OCSSCO, OSHO or individual money lenders usually rely on children's labour to supplement the family income, this is usually at the expense of their children's schooling.

**Household Roof Materials:** the econometric result shows that the relative risk ratio of living in thatch house increases the probability of schooling only by the factor of 1.956 relative to both

schooling and working. Households living in iron sheet house/ korkoro are less likely to send their children to school. This implies that living in such a house doesn't necessarily indicate actual per-capita income of the household. Because sometimes households may expose themselves for unnecessary burden to have such a house which may cause loose of cash and in kind assets.

**Household Wall Materials:** the econometric result suggests that the relative risk ratio of living in the house made of cemented wall increases the probability of schooling only and working only by the factor of 7.880 and 8.314 respectively, relative to both schooling and working. Likewise, the relative risk ratio of living in the house made of wood with sand increases the probability of schooling only and working only by the factor of 4.049 and 3.691 respectively, relative to both schooling and working.

**Source of Energy:** the econometric result shows that the relative risk ratio of using dung/manure lowers the probability of neither schooling nor working by the factor of 1.810 relative to both schooling and working. This implies that collecting dung/manure creates at least a task for a child and makes it to be active.

**Source of water:** source of the water a household used has strong impact on the activities performed by children in the household. Econometric result suggests that the relative risk ratio of using water from pipe-borne outside the compound of the household and river/well/pond increase the probability of schooling only and working only relative to both schooling and working. But the relative risk ratio of using water from protected well increase the probability of schooling only by the factor of 3.357 relative to both schooling and working.

**Average School Expenditure Per Enrolled Child:** the econometric result shows that the relative risk ratio of one birr increase in the school expenditure per enrolled child increase the probability of schooling only, working only and neither schooling nor working relative to both schooling and working. This weak effect implies that the average school expenditure per enrolled child is not such a costly among rural households.

**Table 4.6: Summary of estimated coefficients of each categorical activity status**

Variables	Activity Status					
	Schooling only		Working only		Neither schooling nor working	
	Coef.	Std. Err	Coef.	Std.Err	Coef.	Std. Err
Cage						
11-14	-1.032**	.469	1.191***	.687	-1.780*	.631
15-17	-2.157*	.652	2.155**	.916	-2.327*	.813
Cage_sqr	.064	.069	-.205**	.092	.114	.093
Csex						
1=male	-1.470*	.467	-1.335*	.497	-2.605*	.634
Biol-rnship						
1=Biological	.361	.765	-2.320*	.651	.629	.933
B_order						
2=second	-1.094	.823	-2.632*	.944	-1.229	1.292
3=third	-1.482	.711	-2.069**	.811	.523	1.0.67
4=forth and above	.842	.904	-1.542	1.174	2.785**	1.286
Hhh_sex						
Male	-.037	.750	-1.956*	.816	-1.516	1.064
Hhh_age	.070	.056	.035	.060	-.084	.089
Hh_size	.285	.401	.946**	.458	2.100*	.569
Nf_717	-1.130**	.544	-1.392**	.615	-2.699*	.784
Nm_717	-.156	.546	-.323	.616	-1.016	.814
Nif	.756	.566	-.200	.612	-1.698**	.813
Hhh_lit						
1=literate	1.682*	.534	.300	.600	-1.047	.780
Hhh_hethst						
1= the house hold has no recurrent health problem	1.952*	.534	1.738*	.605	1.002	.804
Hh_livestock						
2=no	-3.677*	1.302	-4.562*	1.400	-1.368	1.220
Hh_landsize	-.585	.390	-1.501*	.434	-1.962*	.600
Hh_awelfare						
2=no	-1.646**	.683	-1.952*	.753	.522	.946

Hh_loan							
1=yes	-1.882**	.780	-2.823*	.850	1.619	1.095	
Hh_roofmater							
2=thatch	1.956*	.588	.634	.697	-1.319	.9477	
3=shanty	-.336	1.149	-1.304	1.287	-2.147	1.900	
Hh_wallmater							
2=cement	7.880*	1.506	8.313*	1.672	.764	2.591	
4= wood with sand	4.049*	.737	3.691*	.816	1.810***	1.030	
Hh_senergy							
2=dung/manure	1.238	2.076	4.514***	2.354	-13.668	804.160	
4=kuraz	-.388	.549	.810	.582	1.824**	.826	
Hh_swater							
2= pipe-borne outside compound	4.118**	1.723	6.761**	3.226	18.824	867.1899	
3=protected well	3.357**	1.636	5.434***	3.202	18.316	867.1901	
4=unprotected well	1.207	1.841	2.641	3.354	14.307	867.1913	
5= river/well	3.897**	1.826	6.913**	3.406	19.448	867.1902	
Avg_expendsch	.004*	.001	.006*	.002	.005**	.002	
Dis_school							
1=yes	-.408	.799	.616	.829	-.774	1.147	
Kebele							
Jila Kerensa	-1.216	.742	-.365	.805	.828	1.065	
Halelu Cheri	1.143	.636	1.643**	.792	.943	.997	
Daye Wilincho	1.447**	.687	1.595***	.870	-.013	1.234	
_cons	-10.260	3.633	-7.312	4.468	-19.194	867.200	
LR chi <sup>2</sup> (105)	386.35				Pseudo R <sup>2</sup>	0.4002	
Prob > chi <sup>2</sup>	0.0000				Log likelihood	-289.54805	

**Source: Computed from own survey data, 2019**

**Note:** \*, \*\* and \*\*\* represent significance at 1%, 5% and 10% levels of significance, respectively.

#### 4.2.2. Child Characteristics and Child Work-School Participation

The marginal effects of child characteristics on the probability of all children work-school participation are presented here in table 4.7 below.

Among the characteristics of children: age, sex, biological relationship with the household head and birth order are likely to have evident effects on the likelihood of child work and schooling.

The direction of their effects on the activities performed by a particular child can be different from one another across different categories.

Econometric results suggest that the age of a child has significant effect on its activity status. One year increase in the age of a child aged between 11 to 14 years decreases the probability of schooling only on average by about 15% and neither schooling nor working on average by about 11.6% while it increases the probability of engaging in working only on average by about 17.1%. Generally, children aged 11 to 17 years are less likely to attend school than those are aged 7 to 10 years. Therefore, in line with Cartwright and Grootaert (1999), Amin, Quayes and Rives (2004), Rosalti and Tzannatos (2006), and Coster and Adekoya (2014) it has been established that involvement in child labour increases with the age of the child.

In poor families older children are most likely be needed to supplement household income by engaging in paid activities; in return this may confine their school enrolment as compared to their younger siblings in the household owing to their relative working capacity.

However, children in rural areas are most likely engaged in un-paid activities like household chores, un-paid family businesses, doing any work on his/her own or the household's plot, farm, food garden, or help in growing farm produce or in looking after household livestock for the household, fetching water or collecting firewood for the household use, and producing any other good for the household use. Older children might be forced to combine work and school together, even work at the expense of schooling, while their younger siblings might overtake the herding and home chore activities.

In the Ethiopian context, where late school enrolment is common, we would expect that the probability of schooling would rise at the primary level. Therefore, the relationship between

child outcome and age may not be linear in long term. Hence, the age square of child has been incorporated to capture such non-linear effect. The age squared of the child has the contrasting impact; implying that children are more likely to engage in schooling only, but decreasing the likelihood of working only in its later ages.

Sex of the child is also found to be significant in neither schooling nor working. Child labour does appear to have an important sex dimension, as male and female children participate in work disproportionately. Accordingly, it has been observed that male children are less likely to be inactive on average by about 11% than their female counter parts. It is worth recalling in interpreting this result that it includes engagement in typical household chores, a form of work where typically female children predominate. For this reason, the outcomes may not understate female children's engagement in child labour relative to that of male children.

Another important factor of children's participation in labour market and schooling is their biological relationship with the household head. The household head as its name implies, shall decide almost all matters about the members in household. In line with Jensen and Nielsen (1997), children who are the direct off-springs of the household head are more likely to engage in schooling on average by about 16.1% than non-biological children of the household head in the household. This can be hold when the household head might be inclined towards the future human capital development of his/her own child, while those who are not his/her direct off-springs may be discriminated in favour of work.

Birth order of the child is another important factor which significantly increases the likelihood of older children to engage in working only. That is older children are more disadvantaged group in



school enrolment as compared to its younger siblings. For example the probability of working is on average about 24.4% lower for a child born as a second than the older child in the household.

**Table 4.7: Marginal effects on the probabilities of work-school participation outcomes for child characteristics**

Variables	Activity Status					
	Schooling only		Working only		Neither schooling nor working	
	Marginal Effect (Standard Error)		Marginal Effect (Standard Error)		Marginal Effect (Standard Error)	
	dy/dx	Std. Err	dy/dx	Std.Err	dy/dx	Std. Err
Cage						
11-14	-.150**	.059	.171*	.041	-.116*	.044
15-17	-.341*	.061	.376*	.070	-.140*	.047
Cage_sqr	.017**	.008	-.027*	.009	.008	.005
Csex						
1=male	-.058	.050	-.034	.044	-.110*	.036
Biol-rnship						
1=Biological	.161*	.062	-.326*	.070	.062	.037
B_order						
2=second	.031	.082	-.244*	.091	-.005	.062
3=third	.074	.073	-.224*	.083	.015	.055
4=forth and above	.084	.106	-.307*	.101	.276**	.111

**Source: Computed from own survey data, 2019**

**Note:** \* and \*\* represent significance at 1% and 5% levels of significance, respectively.

#### 4.2.3. Household Characteristics and Child Work-School Participation

A household is a person or group of persons who live together in the same house or compound, who share the same housekeeping arrangements and who are catered for as one unit. However, members of a household are not necessarily related to each other either by blood or by marriage.

Household members may select the household head for reasons related to age or respect, regardless of their sex, and provides economic support or manages the household. Therefore, household head characteristics may have prominent impact on activities performed by children.

Based on the econometric results, marginal effects of household characteristics on the probability

of all children work-school participation are presented here in table 4.8 below.

Sex of household head is found to be significant in schooling only and working only in different ways. The probability of working is on average about 13.5 % higher for male headed child than female headed child. This implies that female headed households may need their children to complement and/or substitute their labour supply, thus inclined to working only disproportionately.

Among household characteristics, household size is another important factor that has significant impact on child activity status. Larger households may have higher vulnerability to poverty than smaller household. Therefore, larger households may use their children's labour to get away exacerbated vulnerability by specializing child labour.

Likewise, larger households may have little per capita income, which may limit their ability to pay for children's schooling. Thus, larger size of household may increase inactivity of a child in the household. Furthermore, as family size increases, the increment in dependency ratio in household may accelerate the inactivity of a child. Generally, one person increase in the household results in increment of children's idleness/inactivity in the household on average by about 11.1%.

The presence of females aged between 7 and 17 in the household is assumed to liberate younger children from engaging in work only, thereby increasing their potential to attend school and work. Generally, the presence of a female aged between 7 and 17 in the household decreases the probability of being idle for a child in the household on average by about 12%.

Number of infants (children aged below five) in the household has also significant impact on

child work-school participation. The presence of infants in the household is likely to increase child schooling on average by about 16.3%, but decrease the inactivity of a child on average by about 12.3%.

Literacy rate of the household head has also an important implication for child work-school decision. Better education background of the household head is more likely to favour child schooling as the household head become more aware of the benefits of investing in human capital in the future. Besides, it is logical to hypothesize that better educated household head would be well informed about the negative impacts of child labour on the general development of children. Likewise, in line with Asefa and Arjun (2003), Tassew et al. (2005) and Tseganesh (2011) the econometric result shows that, educated household head is more likely to increase child schooling on average by about 23.8% than uneducated household head, while to decrease child inactivity by about by about 11.8%.

Another important factor that has significant impact on child school-work participation is the health status of the household head. Household heads with no recurrent health shock are more likely to increase child schooling on average by about 15.7% than households with recurrent health shock. Generally, recurrent household head health shocks can undermine the psychological make-up and financial well-being of the household at large.

**Table 4.8: Marginal effects on the probabilities of child work-school participation outcomes for household characteristic**

Variables	Activity Status					
	Schooling only		Working only		Neither schooling nor working	
	Marginal Effect (Standard Error)		Marginal Effect (Standard Error)		Marginal Effect (Standard Error)	
	dy/dx	Std. Err	dy/dx	Std.Err	dy/dx	Std. Err
Hhh_sex						
male	.135**	.066	-.197**	.082	-.068	.071

Hhh_age	.010	.007	.001	.006	-.008	.005
Hh_size	-.067	.042	.063	.041	.111*	.029
Nf_717	-.012	.061	-.060	.056	-.120*	.042
Nm_717	.023	.063	-.015	.058	-.055	.046
Nif	.163*	.062	-.042	.056	-.123*	.044
Hhh_lit						
1=literate	.238*	.050	-.042	.052	-.118**	.047
Hhh_healthst						
1= the house hold has no recurrent health problem	.157*	.058	.076	.053	-.013	.045

**Source: Computed from own survey data, 2019**

**Note:** \* and \*\* represent significance at 1% and 5% levels of significance, respectively.

#### 4.2.4. The Character of Household Assets and Child Work-School Participation

Child work-school participation is overwhelmingly performed for the child's own household. Therefore, differences among households in asset ownership are likely to strongly influence the returns to child labour and, consequently, its magnitude. In Ethiopian context assets include household durables, housing quality characteristics, and social services. Housing quality characteristics includes information about type of floor, roof and wall materials, number of rooms, source of energy, source of drinking water, toilet facility, etc.

Livestock is among essential assets for rural households. The possession of more livestock enables the household to pay for schooling materials in addition to decreasing the need for children to engage in income generating activities which may affect their schooling potential. Econometric result suggests that possession of the more livestock, the less likely a child is to engage in working only, but it is likely that more livestock demands more child labour to herd/care for. Therefore, households own livestock are more likely to decrease child schooling on average by about 21.7% than their counterparts. Similarly, households own livestock are more likely to decrease the child work participation on average by about 22.7% than their counterparts.

Larger land size owned by the household decreases a child's engagement in working only and being inactive. In contrast to Tseganesh (2011) and Welay (2014) findings, households who possess much arable land are more likely to increase child schooling on average by about 5.13% than their counterparts. In contrast to this, the possession of much arable land helps the household to decrease work specialization of its child on average by about 11.0%.

Welfare programs like productive and social safety net programs, for instance, are very essential to address social problems like food insecurity. As the parents start to be supported by welfare programs, their tendency to specialize their children in working only decreases gradually. Households who are not available to welfare programs are more likely to decrease the schooling and working probability of their children on average by about 13.2% and 13.2% respectively than their counterparts. However, they are likely to increase the inactivity probability by about 10.1%.

Credit market in rural area is almost absent. Rural households might have been able and willing to educate their children if they had access to credit under the notion of that child labour is a borrowing across generations. Hence, children from households having access to credit are less likely to participate in working only. That is, households having access to credit decrease the probability of specializing in child labour on average by about 20.2%.

However, debt crisis in household can increase the probability of a child to be inactive on average by about 17.3%. Because, providing direct labour to the creditor by adult household members when the loan is from individual lenders may lead to withdrawal of child (ren) from the school.

Household roof material is another important factor in child work-school analysis. Obviously, favorable environment encourages a child to dear schooling. On the other perspective, quality roof material indicates relatively higher household income.

Similarly, household wall materials can also affect the child work-school participation. Quality wall materials help a child to more likely emphasize on schooling only. Children who are not participating child labour seem to be living in better types of dwelling than those who are engaged in child labour.

Rural households use different types of energy for lighting and cooking, depending on the availability and/or affordability of some facilities. Wood, dung/manure and kerosene lamps (kuraz), the most widely used sources of energy in rural areas. The econometric results suggest that children are more likely to engage in child labour in households that use kuraz for lighting and firewood for cooking. Because, collecting firewood and dung/manure creates additional work burden on children in the household.

Safe and readily accessible water is important for community health, whether it is used for drinking or domestic use. Improved water supply and sanitation can contribute greatly to poverty reduction. When water comes from improved and more accessible sources, people especially children spend less time and effort to collect it, meaning they can be more likely productive in other activities like schooling. On the other hand, better water sources mean less expenditure on health, as people are less likely to fall ill and incur medical costs, and are better able to remain economically productive.

This can also result in greater children's well-being by reducing the need to make long or risky journeys to collect water. With children particularly at risk from water-related diseases, access to

improved sources of water can result in better health, and therefore better school attendance, with positive longer-term consequences for their lives.

**Table 4.9: Marginal effects on the probabilities of child work-school participation outcomes for household assets**

Variables	Activity Status					
	Schooling only		Working only		Neither schooling nor working	
	Marginal Effect (Standard Error)		Marginal Effect (Standard Error)		Marginal Effect (Standard Error)	
	dy/dx	Std. Err	dy/dx	Std.Err	dy/dx	Std. Err
Hh_livestock						
2=no	-.217*	.061	-.227*	.048	.024	.078
Hh_landsize	.051	.039	-.110*	.034	-.088*	.032
Hh_awelfare						
2=no	-.132**	.066	-.132**	.063	.101**	.050
Hh_loan						
1=yes	-.121***	.063	-.202*	.057	.173*	.056
Hh_roofmater						
2=thatch	.249*	.057	-.022	.065	-.140**	.059
3=shanty	.056	.110	-.081	.096	-.123	.096
Hh_wallmater						
2=cement	.378**	.149	.418*	.152	-.108***	.059
4= wood w` sand	.264*	.038	.176*	.041	-.003	.059
Hh_senergy						
2=dung/manure	-.130	.166	.502**	.212	.142*	.022
4=kuraz	-.062	.060	.137**	.061	-.096*	.033
Hh_swater						
2=pipe-borne outside compound	.180	.127	.309*	.085	.111**	.049
3=protected well	.167	.115	.206*	.060	.120*	.029
4=unprotected well	.068	.140	.077	.081	.020	.018
5=river/well	.120	.139	.330*	.098	.160*	.058

**Source: Computed from own survey data, 2019**

**Note:** \*, \*\* and \*\*\* represent significance at 1%, 5% and 10% levels of significance, respectively.

#### 4.2.5. School Related Factors and Child Work-School Participation

Child work is already recognized as a major hindrance to child schooling by restricting the right of millions of children to access and benefit from education. Large numbers of child labourers

are denied the fundamental opportunity to attend school, while those who combine work with schooling are frequently unable to fully profit from the education on offer.

Furthermore, a child can be out of school for many more reasons. For instance, a child may not have somebody to care for, the household may not be able to afford for schooling, he/she may be severely needed by the household to work, schools may not be available around the residence, the school facilities can be too poor, or by considering employment prospects in today's labour market and the socio-cultural environment, parents may think that schooling is not appropriate for the child.

Having this, another factor that can affect child schooling is average school expenditure per enrolled child. In circumstances when school expenditure is higher, parents may not be able to afford schooling for children. Although rural households are expected to pay for school materials, the available schools are government schools; therefore, there is no tuition fee. It has been observed that increase in average school expenditure per enrolled child increases the probability of a child's engagement in working.

**Table 4.10: Marginal effects on the probabilities of child work-school participation outcomes for school related factors**

Variables	Activity Status					
	Schooling only		Working only		Neither schooling nor working	
	Marginal Effect (Standard Error)		Marginal Effect (Standard Error)		Marginal Effect (Standard Error)	
	dy/dx	Std. Err	dy/dx	Std.Err	dy/dx	Std. Err
Avg_expendsch	.000	.000	.000*	.000	.000	.000
Dis_school						
1=yes	-.000	.096	-.037	.083	-.031	.073

**Source: Computed from own survey data, 2019**

**Note:** \* represents significance at 1% levels of significance.



#### 4.2.6. Differences in Area of Residence and Child Work-School Participation

A child with similar child specific, parental, household and community characteristics may have different likelihood of schooling and working backgrounds depending on where he/she is living. Although the data were collected from rural households living in the same woreda, who have been expected to have almost similar living standard, it is important to consider kebele disparities as they may be different from one another in school infrastructure, socio-cultural and environmental settings. Among the four kebeles, Dire Hacho kebele has been used as a reference (base) category.

Accordingly, econometric results show that area of residence significantly affects the likelihood of a child to participate in work, in school or being inactive relative to being in Dire Hacho kebele. The probability of schooling only is on average about 15.2% lower for children living in Jila Kerensa kebele than those are living in Dire Hacho kebele. This implies children in Jila Kerensa are less likely to attend school than children in Dire Hacho kebele.

**Table 4.11: Marginal effects on the probabilities of child work-school participation outcomes for area of residence**

Variables	Activity Status					
	Schooling only		Working only		Neither schooling nor working	
	Marginal Effect (Standard Error)		Marginal Effect (Standard Error)		Marginal Effect (Standard Error)	
	dy/dx	Std. Err	dy/dx	Std.Err	dy/dx	Std. Err
Kebele						
Jila Kerensa	-.152**	.070	-.003	.067	.095	.070
Halelu Cheri	.049	.080	.110	.077	.002	.052
Daye Wilincho	.124	.093	.090	.089	-.048	.047

**Source: Computed from own survey data, 2019**

Note: \*\* represents significance at 1% levels of significance.

## CHAPTER FIVE

### CONCLUSIONS AND RECOMMENDATIONS

Parallel to other low-income developing countries, child labour remains a grave problem and policy issue in Ethiopia. In urban and rural areas, children are engaged in economic and non-economic activities not compatible with their ages or with their working capacity. Children are usually forced into the labour market due to a situation of persisting poverty and vulnerability, which demands the involvement of all family members to contribute to the household income. In rural areas, children are largely involved in the agricultural sector performing activities such as herding domestic animals, weeding and harvesting; in addition, children particularly girls, are sometimes heavily involved in housekeeping activities (household chores), which usually prevents them from devoting adequate time to schooling, games, rest and leisure.

In general, activities performed by children are perceived as unavoidable or even as necessary part of their socialization and general development process. The social tolerance of child labour by society further complicates top-down strategies to deal with it. For some, it is widely accepted as part of the natural order of bringing up children to be responsible future adults, and hence, child labour is often equated with child work.

However, the International Labour Organization (ILO) makes a distinction between child work and child labour, defining the latter as the engagement of children in prohibited work and, more generally, in types of work to be eliminated as socially and morally undesirable. Therefore, the main concern is not child work as such, but rather those activities that are detrimental to children's physical and mental development.

The issue of child labour and schooling is critical concern in the sense that working children lack the opportunity to formal schooling than the non-working ones. Child labour has long been recognized as a significant violation of children's rights, fundamental rights at work and other human rights as well as an important barrier to national development. It adversely affects human resource development and thus magnifies the risks of turning a country's most prized assets into its biggest liabilities.

The problem is more pronounced in the rural parts of the developing countries like Ethiopia. Although labour market doesn't exist in rural Ethiopia, child labour is prevalent disproportionately. Drawing on data from rural households of Kuyu woreda, assuming broader concepts of child labour and schooling, and using multinomial logit model, this study has assessed major socio-economic determinants of child labour and schooling in rural households.

The results suggest that children usually participate in domestic and farm activities, economic activities including unpaid and illegal work, work in the informal sector and the production of goods for own consumption, and non-economic activities including household chores which are potentially detrimental to their educational achievement.

This study shows that child, household and community characteristics play significant roles in determining child school-work outcome. The findings of the study suggest that well planned and research based economic and social policies with the purpose of combating the problem of child labour will have double outcomes by promoting schooling.

The major conclusions that emanate from the study are:

- Age of the child is found to have negative and significant impact on the likelihood of child school participation, but positive and significant impact on child work participation and being inactive.
- Sex of the child is found to have a negative and significant impact on children work-school analysis. Accordingly, male children are less likely to engage in child work-school than their female counterparts. Therefore, there is gender difference across activities performed by children in the kebeles.
- Biological relationship of the child with household head has important effect on the probability of work engagement. Direct off-spring child is more likely to attend school than non-biological child, but less likely to engage in child work. Non-biological children are the most deprived groups as they have lower probability of schooling at the same time bear the disproportionate work burden.
- Birth order of the child is another important factor in work participation of a child. Elder child has more likelihood of work specialization than its young siblings.
- Sex of household head is one of the main factors determining work participation of a child. Accordingly, male headed child has less probability of work specialization, but more probability of school attendance than female headed child.
- Household size has also important implication in work participation and inactivity of a child. That is a child from larger household is more likely to either engage in work or being inactive than a child from smaller household.
- Household head education attainment is found to be significant in school participation of a child. That is educated household head is more likely to send its child to school than

uneducated household head.

- Household head recurrent health shock is found to be significant hindrance on child schooling. Household head with no recurrent health shock is more likely to increase school participation of its child than household head with recurrent health shock does.
- Household physical assets have also found to be significant in child work-school participation. Owning large land (arable land) size of the household decreases the probability of children's engagements in work only and being inactive. Similarly, loose of livestock decreases the probability of children's engagements in work only and school participation.
- Welfare programs in line with loan are found to another influential figure in child work-school outcomes. Households who don't have access to welfare programs, have access to credit are more likely to decrease child work-school participation, but increase inactivity of their children than their counterparts.
- Average school expenditure is found to be significant with weak effect on child work-school participation outcome. This is mainly due the provision of fee-free or low school expenditure among rural households.

Eliminating child labour in turn enhancing child school participation requires addressing its root causes, including poverty and failures in labour markets along the weak enforcement of laws. Therefore, based on the major findings listed above, the following policy implications have been recommended.

- ▶ Improving rural livelihoods and creating decent employment for youth and adults to curb the scaling up of unemployment rate, so as to create positive attitude towards education value is very important.

- ▶ The government should extend rural communities' access to welfare programs, such as old-age pensions, basic health services, maternity benefits, social assistance and public work programs.
- ▶ The government should develop inclusive micro-insurance programs to smooth risks associated with natural disasters and adverse climatic conditions, which can affect agricultural production and micro health insurance programs to protect rural families from loss and disability of breadwinners.
- ▶ Developing a tripartite consultation among government, non-governmental organization and the community at large is very indispensable task.
- ▶ Developing hazardous work lists that define jobs, activities and working conditions prohibited for children under age 18 (as per [C. 182]<sup>5</sup>) is indispensable. The list should ensure proper coverage of tasks and conditions in rural areas, especially considering small scale informal undertakings, family farms and aquaculture, livestock herding.
- ▶ Providing training in occupational health and safety, including through agricultural extension agents and rural labour inspectors, to improve working conditions and increase capacity to make informed judgments as to when activities are safe enough for children above the minimum legal age. Additionally, adult education can have undisputable positive effect in increasing child schooling, thus should be extended beyond the present coverage.
- ▶ Generally, the everlasting solution to hold back the problem of child labour in turn enhancing human capital accumulation is to get rid of poverty!

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<sup>5</sup> Convention No. 182 on the worst forms of child labour was adopted by ILO in June, 1999. It calls for the prohibition and the elimination of the worst forms of child labour, as a matter of urgency.

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## APPENDICES

### A. Research questionnaire

JIMMA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

#### **Determinants of Child Labour and Schooling in Rural Households of Ethiopia: the case of Kuyu Woreda, Central Ethiopia.**

The questionnaire designed to assess determinants of child labour and schooling in rural households of Ethiopia (Case Study of Kuyu Woreda).

This questionnaire is prepared to get relevant data to assess determinants of child labour and schooling in rural households of Ethiopia, in the case of Kuyu woreda in particular. So that you are kindly requested to respond the questions forwarded below. Please fill the entire questions correctly and clearly. The researcher confidently promise that the data collected from you will be for research purpose only and kept confidently.

#### **Notice:**

Dear respondents: please respond the questions frankly and honestly; your feedback is very important.

#### **General Directions for Enumerators:**

- There is no need to write the name respondents on the questionnaire!
- Please ask each question clearly and patiently until the respondents understand it fully!
- To answer closed ended questions use “□” and put “√” in the box to show your choice and fill the completed number for quantitative questions. But to answer the open ended questions use the space provided!

Enumerator's name \_\_\_\_\_

Signature and date \_\_\_\_\_



**A) Demographic characteristics of the child and household**

1. Age of the child in completed year: \_\_\_\_\_
2. Sex of the child:
  - Male
  - Female
3. With whom are you living?
  - Both parents
  - Father
  - Relatives
  - Mother
  - Alone
  - Others, (specify) \_\_\_\_\_
4. Are both your parents alive?
  - Yes
  - No
5. If the response for question 4 is 'No', who is deceased?
  - Father
  - Mother
  - Both of them
6. For your parent are you the \_\_\_\_\_ boy/girl?
  - First
  - Third
  - Second
  - Fourth and above
7. What were you doing during the last 12 months?
  - Schooling
  - Neither schooling nor working
  - Working
  - Others, (specify) \_\_\_\_\_
  - Both schooling and working
8. At what age did you begin primary school? Age in complete years
9. At what age did you leave school? Age in completed years
10. Why did you leave school?
  - Too old for school
  - Education is not considered valuable
  - Illness
  - School is not safe
  - Disablement
  - To learn a job
  - Injury
  - To work for pay as employee
  - No school/school too far
  - To work as unpaid worker in family business/farm
  - Cannot afford schooling
  - Help the family at home with household tasks
  - Family did not allow schooling
  - Poor in studies/not interested in school
  - Other, (specify) \_\_\_\_\_

**B) Current activities of all children aged between 7 and 17 years**

**11.** Did you engage in any work at least one hour during the last seven days? (As employee, self-employed or unpaid family worker)

- Yes  No

**12.** During the past 7 days, did you do any of the following activities, even for only one hour?  
Running or doing any kind of business, big or small, for himself/herself or with one or more partners

- Doing any work (except domestic work) for a wage, salary, commission or any payment in kind
- Doing any work as a domestic worker for a wage, salary or any payment in kind
- Helping unpaid (except normal housework) in a household business of any kind?
- Doing any work on your own or the household's plot, farm, food garden, or help in growing farm produce or in looking after /herding animals for the household or other person
- Doing any work on your own plot, or business or those of the household
- Catching any fish, shells, wild animals or other food for sale or household food
- Fetching water or collecting firewood for the household use
- Producing any other good for the household use

**13.** Even though you did not do any of these activities in the past 7 days, do you have a job, business, or other economic or farming activity that you will definitely return to? (For agricultural activities, the off season in agriculture is not a temporary absence).

- Yes  No

**14.** Where did you carry out your main work during the past 7 days?

- At home  Shop/Market/Kiosk/restaurant/Hotel
- Where customer available  Different places/mobile
- Industry/Factory  On street
- Farm area/field  Pond/Lack/River
- In construction site  Others, (specify)\_\_\_\_\_
- Quarrying/mining

**15. Why do you work?**

- |   |  |
|---|--|
| <input type="checkbox"/> Supplement family income           | <input type="checkbox"/> Cannot afford school material fees            |
| <input type="checkbox"/> Help pay family debt               | <input type="checkbox"/> Not interested in school                      |
| <input type="checkbox"/> Help in household enterprise       | <input type="checkbox"/> Relative/peer influence                       |
| <input type="checkbox"/> Learn skills                       | <input type="checkbox"/> To temporarily replace someone unable to work |
| <input type="checkbox"/> Schooling is not useful for future |  |
| <input type="checkbox"/> School too far / no school         | Others, (specify) _____  |

**16. What do you usually do with your earnings?**

- |   |   |
|---|---|
| <input type="checkbox"/> Give all/part of money to my parents/guardians           | <input type="checkbox"/> Buy materials for school |
| <input type="checkbox"/> Employer gives all/part of money to my parents/guardians | <input type="checkbox"/> Buy things for household |
| <input type="checkbox"/> Pay my school fees                                       | <input type="checkbox"/> Buy things for myself    |
|   | <input type="checkbox"/> Save                     |
|   | Other, (specify) _____                            |

**17. Who decides you to work?**

- |                                  |   |                         |
|----------------------------------|---|-------------------------|
| <input type="checkbox"/> My-self | <input type="checkbox"/> Family/guardians | Others, (specify) _____ |
|----------------------------------|---|-------------------------|

**18. As per your interest; what you prefer to do now?**

- |   |  |
|---|--|
| <input type="checkbox"/> Going to school full-time                                  | <input type="checkbox"/> Part-time in household enterprise or business |
| <input type="checkbox"/> Working for income full-time                               | <input type="checkbox"/> Part-time in household chores or housekeeping |
| <input type="checkbox"/> Helping full-time in household enterprise or business      | <input type="checkbox"/> Complete education/training and start to work |
| <input type="checkbox"/> Working full-time in household chores or housekeeping      | <input type="checkbox"/> Find a better job/work than the present one   |
| <input type="checkbox"/> Going to school part-time and working part-time for income | Other, (specify) _____   |

**C) Demographic characteristics the household**

**19. Sex of household head:**

- |                               |                                 |
|-------------------------------|---------------------------------|
| <input type="checkbox"/> Male | <input type="checkbox"/> Female |
|-------------------------------|---------------------------------|

**20. What is the age of household head?\_\_\_\_\_ (age in completed years)**

21. What is the size of the household? \_\_\_\_\_ (number)

22. How many female(s) whose age is between 7 and 17 is (are) there in the household?  
\_\_\_\_\_ (number)

23. How many male(s) whose age is between 7 and 17 is (are) there in the household?  
\_\_\_\_\_ (number)

24. How many female(s) or/and male (s) whose age is below 5 is (are) there in the household  
\_\_\_\_\_ (number)

25. What is the educational attainment level of the household head?

- Literate  Illiterate

26. Who earns the main source of income for the household?

- Mother  Relatives  
 Father  Other combination of the above  
 Child

27. Do you think the total amount of household income sufficient to support the household?

- No  Yes  No response

28. Has the household head been faced recurrent health shocks in the last 12 months?

- No  Yes  No response

29. If the response for 28 is 'Yes', what is that shock? (the most important faced)

- Natural ill  Epidemic ill  Others, (specify)\_\_\_\_\_

30. Has the household been adversely affected by any problem in the last 12 months?

- No  Yes

31. If the response of question 30 is 'Yes', what was the problem? (Indicate the most important faced)

- |   |  |
|---|--|
| <input type="checkbox"/> Natural disaster (drought, flood, storms, hurricane, landslides, Forest fires) | <input type="checkbox"/> Food shortage                           |
| <input type="checkbox"/> Drought/ famine  | <input type="checkbox"/> Falling in prices agricultural products |
| <input type="checkbox"/> Illness/death of main income source of household member                        | <input type="checkbox"/> Price inflation                         |
| <input type="checkbox"/> Epidemics  | <input type="checkbox"/> Serious loss of harvest/livestock       |
|   | <input type="checkbox"/> Insecurity                              |
|   | <input type="checkbox"/> Theft/robbery                           |

Fall in prices of products Others, (specify) \_\_\_\_\_

**32.** Has the household suffered a fall in income due to any of the following household specific problems in the last 12 months?

- |   |   |
|---|---|
| <input type="checkbox"/> Loss of employment of any household member                       | <input type="checkbox"/> Criminal act by household member                     |
| <input type="checkbox"/> Bankruptcy of a family business                                  | <input type="checkbox"/> Land dispute   |
| <input type="checkbox"/> Illness or serious accident of a working member of the household | <input type="checkbox"/> Loss of cash support or in-kind assistance           |
| <input type="checkbox"/> Death of a working member of the household                       | <input type="checkbox"/> Fall in prices of products of the household business |
| <input type="checkbox"/> Abandonment by the household head                                | <input type="checkbox"/> Loss of harvest                                      |
| <input type="checkbox"/> Fire in the house/business/property                              | <input type="checkbox"/> Loss of livestock                                    |
|   | Others, (specify) _____   |

**33.** How was it possible for the household to overcome this hardship?

- |  |   |
|--|---|
| <input type="checkbox"/> Financial assistance from government agencies                           | <input type="checkbox"/> Placed child (ren) in other household(s)   |
| <input type="checkbox"/> Financial assistance from NGOs/religious /local community organizations | <input type="checkbox"/> Additional work hours by household members |
| <input type="checkbox"/> Financial assistance from relatives / friends                           | <input type="checkbox"/> Sold property/used savings                 |
| <input type="checkbox"/> Took children out of school as could not afford it                      | <input type="checkbox"/> Reduced household expenditures             |
| Others, (specify) _____  | <input type="checkbox"/> No serious impact                          |

**D) Characteristics of the household asset (s)**

**34.** Does the household own any livestock?

- Yes  No

**35.** Yes If the response is ‘Yes’ for question 34, please fill in the following table. ( i.e. the number of livestock by type that the household owned currently)

Types of livestock the house hold owns												
	Oxen	Cows	Bull	Heifers	Calves	Goats	Sheep	Mule	Donkey	Poultry	Horses	Total
No												

**36.** Who is responsible to care for/herding the livestock?

- Parents  Hired labourer  
 Own children  Other, (Specify) \_\_\_\_\_

**37.** If your answer for question 36is‘own children’, when do they look after /herd the livestock?

- During working days  Both  
 During weekends  Other, (specify)\_\_\_\_\_

**38.** Does the household own any land (arable land)?

- No  Yes

**39.** If the response for question 38 is ‘Yes’, how many hectare/ square meter of land does the household own? (1Hectare = 10,000 square meter)?

Agricultural (arable):\_\_\_\_\_Others, (specify) \_\_\_\_\_

**40.** How does the household operate farming activity?

- Using own oxen  By coupling oxen with others  
 By borrowing oxen from others  Others, (specify) \_\_\_\_\_

**41.** Did the household ever face labour shortage seasonally?

- No  Yes

**42.** If ‘Yes’ for question 41, how did you overcome the problem of seasonal labour shortage?

- By hiring labour  Using child labour  
 By Labour exchange (sharing)  Others, (specify) \_\_\_\_\_

**43.** Does the household access to any government/NGO(s) welfare programs?

- Yes  No

**44.** If 'Yes' for question 43, which government/NGO(s) welfare program is accessed by the household?

- Safety net programs Financial or non-financial assistance from NGO(s)
- Financial and in kind assistance from government agencies
- Financial assistance from local community organization
- Others, (specify) \_\_\_\_\_

**45.** Did any of your household members have any outstanding loans or obtain a new loan during the past 12 months?

- Yes
- No

**46.** What was the main reason for obtaining a loan?

- To meet essential household expenditures (buying food, child education etc.)
- To purchase/remodel/repair/construct a house
- To meet health related expenditures for household members (medicine /hospital fees)
- To meet the following ritual expenditures: birth, funeral and wedding
- To pay previous loan
- Others, (specify) \_\_\_\_\_

**47.** Where did the household obtain the loan from?

- Bank/credit card
- Employer/landowner
- Micro-credit/finance groups like OCSSCO, OSHO, etc.
- Supplier of merchandise, equipment or raw materials
- A friend/relative of employer/land owner
- Individual money lender
- A friend/relative of borrower
- Other, (specify) \_\_\_\_\_

**48.** Was the debt paid back?

- Yes, wholly
- Yes, partly
- No

**49.**

**A.** How was the debt paid back?

**B.** How will the debt be paid back?

- Cash, by borrowing money from someone else
- Cash, by selling some assets
- Cash, by getting income from work
- Provide direct labour to the creditor by adult household member
- Provide direct labour to the creditor by child household member
- In kind
- Others, (specify) \_\_\_\_\_

**50.**

**A.** Was any child withdrawn from school to pay the debt back?

**B.** Will any child be withdrawn from school to pay the debt back?

- |                                |  |
|--------------------------------|--|
| <input type="checkbox"/> Yes   | <input type="checkbox"/> No need to withdraw |
| <input type="checkbox"/> Maybe | <input type="checkbox"/> Not applicable      |

**51.** Will the child (ren) withdrawn from school be sent back to school after the debt situation improves?

- |                              |                                |                             |
|------------------------------|--------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> Maybe | <input type="checkbox"/> No |
|------------------------------|--------------------------------|-----------------------------|

**52.** In what type of dwelling (roof materials) does the household live?

- Iron sheet house/Korkoro
- Thatch house
- Shanty
- Shelter not meant for living purposes

Others, (specify) \_\_\_\_\_

**53.** In what type of dwelling (wall materials) does the household live?

- |                                 |   |
|---------------------------------|---|
| <input type="checkbox"/> Bamboo | <input type="checkbox"/> Wood with sand |
| <input type="checkbox"/> Cement | Others, (specify)                       |
| <input type="checkbox"/> Stone  | _____                                   |

**54.** What is the main source of energy?

- |                                      |  |
|--------------------------------------|--|
| <input type="checkbox"/> Wood        | <input type="checkbox"/> Bio Gas       |
| <input type="checkbox"/> Charcoal    | <input type="checkbox"/> Solar         |
| <input type="checkbox"/> Kerosene    | <input type="checkbox"/> Butane Gas    |
| <input type="checkbox"/> Electricity | <input type="checkbox"/> Kerosene lamp |



- Lantern
- Local kerosene lamp (Kuraz)
- Dung/manure
- None

**55.** What is the main source of drinking water?

- Pipe-borne in compound
- Unprotected well/spring
- Pipe-borne outside the compound
- River/pond/well
- Protected well/spring
- Others, (specify) \_\_\_\_\_

**E) Characteristics of the school**

**56.** Is there any school near to your residence?

- Yes
- No

**57.** How far is to the nearest government primary school in minutes? \_\_\_\_\_ (Mint').

**58.** What is the household's average school expenditure per enrolled child? \_\_\_\_\_ (in Birr).

**59.** How often does (do) the household's child (children) go to school?

- Once in a week
- Four times in a week
- Twice in a week
- Everyday
- Three times in a week
- Never

**F) Interview questions for either the household or children aged between 7 and 17 years**

**60.** What do you think about child work and schooling?

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**61.** When does child work become child labour?

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**62.** What are the causes of child labour in this kebele?

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**63.** Who most probably get the chance of schooling between girls and boys in this kebele?

i. If boys are getting more chance than girls, why?

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ii. If girls are getting more chance than boys, why?

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**64.** What factors influence your decision to subject your child to specialize in work only?

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**65.** Is child labour a barrier to school enrolment in this kebele? How?

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**66.** What are the child working conditions/ violence at its work places?

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**67.** What are available measurements to curb child labour and promote child schooling?

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**68.** Who else is involved in efforts to combat child labour?

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**69.** If you have any suggestion that you want to add:

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## B. Econometric tests for explanatory variable

### i. Omitted variable test

```
. estat ovtest
```

Ramsey RESET test using powers of the fitted values of Activity

Ho: model has no omitted variables

F(3, 339) = 0.09

Prob > F = 0.9668

### ii. Test for heteroskedasticity

```
. estat imtest, white
```

White's test for Ho: homoskedasticity

against Ha: unrestricted heteroskedasticity

chi2(270) = 308.71

Prob > chi2 = 0.0526

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	308.71	270	0.0526
Skewness	54.67	24	0.0003
Kurtosis	13.54	1	0.0002
Total	376.92	295	0.0009

### iii. Variation Inflation Factor test

. vif

Variable	VIF	1/VIF
Hh_size	9.44	0.105987
Nf_717	4.19	0.238821
Nm_717	3.88	0.257557
Hhh_age	3.76	0.265698
Nif	3.07	0.325397
Hh_loan	2.15	0.465694
Hh_awelfare	2.08	0.480024
Hh_landsize	1.72	0.582053
Hh_roofmater	1.70	0.586993
Hhh_sex	1.64	0.607919
Cage	1.64	0.608670
Cage_sqr	1.60	0.625135
Avg_expend~h	1.59	0.627502
Hhh_lit	1.56	0.642655
Hhh_healthst	1.54	0.649064
Hh_wallmater	1.51	0.663374
Hh_senergy	1.48	0.676466
Hh_swater	1.46	0.684260
Hh_livestock	1.43	0.697287
B_order	1.43	0.697729
Kebele	1.41	0.707944
Dis_school	1.35	0.740854
Biol_rnship	1.28	0.782764
Csex	1.21	0.827558
Mean VIF	2.26	

**iv. Correlation matrix for explanatory variables**

	Cage	Csex	Biol_r~p	B_order	Hhh_sex	Hhh_age	Hh_size	Nf_717	Nm_717	Nif	Hhh_lit
Cage	1.0000										
Csex	-0.0504	1.0000									
Biol_rnship	-0.1159	0.0661	1.0000								
B_order	-0.0048	0.1274	-0.0260	1.0000							
Hhh_sex	-0.0810	0.1925	0.1474	-0.0183	1.0000						
Hhh_age	0.0469	0.1097	-0.0462	0.1921	0.2625	1.0000					
Hh_size	0.0001	0.0819	-0.0014	0.2029	0.3194	0.7198	1.0000				
Nf_717	0.0702	0.0189	0.0190	0.1148	0.1446	0.5842	0.7373	1.0000			
Nm_717	0.0083	0.2074	0.0199	0.2003	0.1507	0.6258	0.5707	0.2880	1.0000		
Nif	0.0685	-0.1447	-0.1142	0.0709	-0.0704	0.1361	0.4540	0.2116	-0.1371	1.0000	
Hhh_lit	-0.0288	-0.1073	-0.1630	-0.0685	-0.1068	0.0216	0.0641	0.1211	0.0012	0.0070	1.0000
Hhh_healthst	0.0183	0.0475	0.1192	-0.0632	0.1234	0.2290	0.1925	0.1245	0.2793	-0.0583	-0.1036
Hh_livestock	0.1070	-0.0943	-0.2196	0.1913	-0.0514	-0.0433	-0.0094	-0.0787	-0.0936	0.1182	0.0093
Hh_landsize	-0.0194	0.0466	0.1178	0.2051	0.1475	0.3612	0.2119	0.0596	0.3586	-0.1322	-0.0643
Hh_awelfare	-0.0123	-0.0349	-0.1748	-0.1927	-0.0735	0.0781	-0.0561	-0.0575	-0.0370	-0.0035	0.0305
Hh_loan	0.0428	0.0397	0.1993	0.0538	0.1149	0.0361	0.2078	0.2025	0.1404	0.0456	-0.0406
Hh_roofmater	0.0934	0.0228	0.0361	0.0664	-0.1676	-0.3180	-0.1662	-0.1206	-0.1389	0.0763	-0.3276
Hh_wallmater	-0.0941	-0.0305	0.1125	-0.0511	-0.0430	-0.1959	-0.3262	-0.2192	-0.1200	-0.3721	-0.1121
Hh_senergy	0.1772	0.0135	-0.1025	0.1214	-0.1423	-0.1549	0.0183	0.1125	-0.1571	0.2140	0.0648
Hh_swater	0.0540	0.0697	-0.0830	0.0318	-0.0367	0.0105	-0.0427	0.0829	-0.0006	-0.0658	-0.2927
Avg_expend~h	-0.1492	-0.0165	0.1913	0.1157	0.1426	0.1031	0.1713	0.0080	0.3078	-0.0217	0.0547
Dis_school	0.0065	0.1522	-0.0632	0.1777	-0.0908	0.1880	0.1305	0.0939	0.1044	0.0458	0.2184
Kebele	0.0975	0.0730	-0.1080	-0.2367	0.0542	0.0424	-0.0288	0.0724	0.0074	-0.1054	0.0203
Cage_sqr	0.5708	-0.0732	-0.1180	0.0154	-0.1035	-0.0191	-0.0454	-0.0115	-0.1228	0.0842	-0.0547

	Hhh_he~t	Hh_liv~k	Hh_lan~e	Hh_awe~e	Hh_loan	Hh_roo~r	Hh_wal~r	Hh_sen~y	Hh_swa~r	Avg_ex~h	Dis_sc~l
Hhh_healthst	1.0000										
Hh_livestock	-0.0187	1.0000									
Hh_landsize	0.0706	-0.1949	1.0000								
Hh_awelfare	-0.1440	-0.2733	0.2003	1.0000							
Hh_loan	0.3835	0.0513	-0.0359	-0.5744	1.0000						
Hh_roofmater	0.0482	0.1765	-0.2646	-0.2370	0.0285	1.0000					
Hh_wallmater	-0.0388	-0.0659	0.1206	-0.0038	-0.0877	-0.1104	1.0000				
Hh_senergy	0.0197	0.0773	-0.2166	-0.0611	0.0856	0.2330	-0.2834	1.0000			
Hh_swater	0.0395	-0.1439	-0.1346	0.1113	-0.1653	0.2606	-0.0469	-0.0739	1.0000		
Avg_expend~h	0.2622	-0.1323	0.3164	-0.0781	0.0657	-0.0943	-0.0084	-0.1349	-0.1294	1.0000	
Dis_school	0.0425	0.1493	0.0635	-0.0467	0.0882	-0.1037	0.0695	0.0004	-0.0367	-0.1276	1.0000
Kebele	0.0138	-0.0517	0.0578	0.2969	-0.1733	-0.0306	-0.0679	-0.1321	0.1578	-0.2170	0.1105
Cage_sqr	-0.0362	0.1084	-0.0773	-0.0172	0.0326	0.0284	-0.0171	0.1552	0.0366	-0.1776	0.0032

	Kebele	Cage_sqr
Kebele	1.0000	
Cage_sqr	-0.0139	1.0000



Working							
	Cage						
	11-14	1.191221	.6873086	1.73	0.083	-.1558787	2.538322
	15-17	2.155201	.9156771	2.35	0.019	.3605068	3.949895
	1.Csex	-1.334902	.4967813	-2.69	0.007	-2.308575	-.3612282
	1.Biol_rnship	-2.319795	.6512582	-3.56	0.000	-3.596237	-1.043352
	B_order						
	2	-2.631797	.9434569	-2.79	0.005	-4.480938	-.7826551
	3	-2.068698	.8107273	-2.55	0.011	-3.657694	-.4797013
	4	-1.542103	1.173993	-1.31	0.189	-3.843088	.7588819
	Hhh_sex						
	Male	-1.956119	.8155505	-2.40	0.016	-3.554568	-.3576691
	Hhh_age	.0347604	.0601264	0.58	0.563	-.0830852	.152606
	Hh_size	.9463966	.4575917	2.07	0.039	.0495333	1.84326
	Nf_717	-1.391962	.614882	-2.26	0.024	-2.597109	-.1868158
	Nm_717	-.3226776	.6160252	-0.52	0.600	-1.530065	.8847096
	Nif	-.1990173	.6116379	-0.33	0.745	-1.397806	.999771
	1.Hhh_lit	.2992044	.6002758	0.50	0.618	-.8773144	1.475723
	1.Hhh_healthst	1.738031	.6052834	2.87	0.004	.5516972	2.924365
	2.Hh_livestock	-4.562189	1.400885	-3.26	0.001	-7.307872	-1.816505
	Hh_landsize	-1.504886	.4335928	-3.47	0.001	-2.354713	-.6550602
	2.Hh_awelfare	-1.952315	.7524658	-2.59	0.009	-3.427121	-.4775095
	1.Hh_loan	-2.823322	.8500152	-3.32	0.001	-4.489321	-1.157323
	Hh_roofmater						
	2	.6341913	.6974202	0.91	0.363	-.7327272	2.00111
	3	-1.304075	1.287169	-1.01	0.311	-3.82688	1.218729
	Hh_wallmater						
	2	8.313899	1.672392	4.97	0.000	5.036071	11.59173
	4	3.691339	.8156534	4.53	0.000	2.092688	5.289991
	Hh_senergy						
	2	4.514202	2.353546	1.92	0.055	-.0986642	9.127067
	4	.8098256	.5822763	1.39	0.164	-.331415	1.951066
	Hh_swater						
	2	6.761082	3.226326	2.10	0.036	.4376	13.08456
	3	5.433878	3.202082	1.70	0.090	-.8420885	11.70984
	4	2.640527	3.353722	0.79	0.431	-3.932648	9.213702
	5	6.912748	3.405944	2.03	0.042	.23722	13.58828
	Avg_expendsch	.0055448	.0016899	3.28	0.001	.0022325	.008857
	1.Dis_school	-.6164416	.8293903	-0.74	0.457	-2.242017	1.009133
	Kebele						
	Jila Kerensa	-.3653207	.8048883	-0.45	0.650	-1.942873	1.212231
	Halelu Cheri	1.642993	.7924006	2.07	0.038	.089916	3.196069
	Daye Wilincho	1.594637	.8695196	1.83	0.067	-.1095901	3.298864
	Cage_sqr	-.2046218	.0923197	-2.22	0.027	-.385565	-.0236785
	_cons	-7.311701	4.467919	-1.64	0.102	-16.06866	1.445259



Both_schooling_and_working	(base outcome)						
Neither_schooling_nor_working							
Cage							
11-14	-1.780259	.6305759	-2.82	0.005	-3.016165	-.5443528	
15-17	-2.32707	.8127551	-2.86	0.004	-3.920041	-.7340997	
1.Csex	-2.605882	.6317963	-4.12	0.000	-3.84418	-1.367584	
1.Biol_rnship	.628559	.9328031	0.67	0.500	-1.199701	2.45682	
B_order							
2	-1.228465	1.291576	-0.95	0.342	-3.759908	1.302978	
3	-.5232698	1.06709	-0.49	0.624	-2.614728	1.568188	
4	2.785081	1.285608	2.17	0.030	.2653357	5.304827	
Hhh_sex							
Male	-1.515484	1.063824	-1.42	0.154	-3.600541	.5695734	
Hhh_age	-.0837958	.0892854	-0.94	0.348	-.258792	.0912004	
Hh_size	2.099733	.5693301	3.69	0.000	.9838668	3.2156	
Nf_717	-2.698502	.7842486	-3.44	0.001	-4.235601	-1.161403	
Nm_717	-1.016155	.8143177	-1.25	0.212	-2.612188	.5798785	
Nif	-1.697964	.8130645	-2.09	0.037	-3.291541	-.1043869	
1.Hhh_lit	-1.046979	.780317	-1.34	0.180	-2.576372	.4824147	
1.Hhh_healthst	1.001887	.804245	1.25	0.213	-.5744041	2.578178	
2.Hh_livestock	-1.367815	1.219708	-1.12	0.262	-3.758398	1.022768	
Hh_landsize	-1.961449	.5998783	-3.27	0.001	-3.137189	-.7857095	
2.Hh_awelfare	.5221363	.9459913	0.55	0.581	-1.331973	2.376245	
1.Hh_loan	1.618672	1.09509	1.48	0.139	-.5276647	3.76501	
Hh_roofmater							
2	-1.318532	.9477255	-1.39	0.164	-3.17604	.538976	
3	-2.146702	1.900398	-1.13	0.259	-5.871414	1.57801	
Hh_wallmater							
2	.7639096	2.590875	0.29	0.768	-4.314113	5.841932	
4	1.809635	1.029536	1.76	0.079	-.2082194	3.827489	
Hh_senergy							
2	-13.66793	804.1604	-0.02	0.986	-1589.793	1562.458	
4	-1.823962	.8262723	-2.21	0.027	-3.443426	-.2044983	
Hh_swater							
2	18.8237	867.1899	0.02	0.983	-1680.837	1718.485	
3	18.31591	867.1901	0.02	0.983	-1681.345	1717.977	
4	14.30645	867.1913	0.02	0.987	-1685.357	1713.97	
5	19.44823	867.1902	0.02	0.982	-1680.213	1719.11	
Avg_expendsch	.0048031	.001912	2.51	0.012	.0010557	.0085504	
1.Dis_school	-.7736821	1.146843	-0.67	0.500	-3.021453	1.474088	
Kebele							
Jila Kerensa	.827616	1.065151	0.78	0.437	-1.260042	2.915274	
Halelu Cheri	.9430978	.9966874	0.95	0.344	-1.010374	2.896569	
Daye Wilincho	-.0132556	1.233805	-0.01	0.991	-2.43147	2.404959	
Cage_sqr							
_cons	.114158	.0926912	1.23	0.218	-.0675135	.2958295	
	-19.19383	867.2004	-0.02	0.982	-1718.875	1680.488	



Working							
	Cage						
	11-14	3.291098	2.262	1.73	0.083	.8556629	12.65841
	15-17	8.629625	7.90195	2.35	0.019	1.434056	51.92992
	1.Csex	.2631841	.1307449	-2.69	0.007	.0994028	.69682
	1.Biol_ rnship	.0982938	.0640146	-3.56	0.000	.0274267	.3522719
	B_order						
	2	.0719491	.0678809	-2.79	0.005	.0113228	.4571905
	3	.1263502	.1024356	-2.55	0.011	.0257919	.6189682
	4	.2139308	.2511533	-1.31	0.189	.0214273	2.135887
	Hhh_sex						
	Male	.1414062	.1153239	-2.40	0.016	.0285937	.6993044
	Hhh_age	1.035372	.0622532	0.58	0.563	.9202727	1.164866
	Hh_size	2.576409	1.178944	2.07	0.039	1.050781	6.317098
	Nf_717	.248587	.1528517	-2.26	0.024	.0744886	.8295966
	Nm_717	.7242073	.4461299	-0.52	0.600	.2165217	2.422281
	Nif	.8195357	.5012591	-0.33	0.745	.2471387	2.717659
	1.Hhh_lit	1.348785	.8096431	0.50	0.618	.4158983	4.374198
	1.Hhh_healthst	5.686135	3.441723	2.87	0.004	1.736197	18.62239
	2.Hh_livestock	.0104392	.0146241	-3.26	0.001	.0006702	.162593
	Hh_landsize	.2220425	.096276	-3.47	0.001	.0949208	.5194108
	2.Hh_awelfare	.141945	.1068088	-2.59	0.009	.0324803	.6203264
	1.Hh_loan	.0594083	.0504979	-3.32	0.001	.0112283	.3143266
	Hh_roofmater						
	2	1.885497	1.314984	0.91	0.363	.4805965	7.397261
	3	.2714234	.3493677	-1.01	0.311	.0217775	3.382884
	Hh_wallmater						
	2	4080.191	6823.678	4.97	0.000	153.8643	108198.9
	4	40.09852	32.70649	4.53	0.000	8.106679	198.3416
	Hh_senergy						
	2	91.30463	214.8897	1.92	0.055	.9060469	9200.998
	4	2.247516	1.308675	1.39	0.164	.7179072	7.036185
	Hh_swater						
	2	863.5765	2786.179	2.10	0.036	1.548985	481453.5
	3	229.0357	733.3911	1.70	0.090	.4308098	121764.5
	4	14.02059	47.02116	0.79	0.431	.0195917	10033.67
	5	1005.005	3422.99	2.03	0.042	1.26772	796733.3
	Avg_expendsch	1.00556	.0016993	3.28	0.001	1.002235	1.008896
	1.Dis_school	.5398621	.4477563	-0.74	0.457	.106244	2.743223
	Kebele						
	Jila Kerensa	.6939741	.5585716	-0.45	0.650	.1432917	3.360976
	Halelu Cheri	5.17062	4.097203	2.07	0.038	1.094082	24.43629
	Daye Wilincho	4.926541	4.283724	1.83	0.067	.8962014	27.08186
	Cage_sqr	.8149555	.0752364	-2.22	0.027	.6800663	.9765996
	_cons	.0006677	.0029831	-1.64	0.102	1.05e-07	4.242952

Both_schooling_and_working	(base outcome)						
Neither_schooling_nor_working							
Cage							
11-14	.1685945	.1063116	-2.82	0.005	.0489887	.5802172	
15-17	.0975812	.0793096	-2.86	0.004	.0198403	.4799374	
1.Csex	.073838	.0466506	-4.12	0.000	.021404	.2547217	
1.Biol_rnship	1.874907	1.748919	0.67	0.500	.3012841	11.66764	
B_order							
2	.2927415	.378098	-0.95	0.342	.0232859	3.680239	
3	.5925798	.632336	-0.49	0.624	.0731877	4.797949	
4	16.20114	20.82831	2.17	0.030	1.303869	201.3062	
Hhh_sex							
Male	.2197018	.2337242	-1.42	0.154	.0273089	1.767513	
Hhh_age	.919619	.0821086	-0.94	0.348	.7719836	1.095489	
Hh_size	8.163993	4.648007	3.69	0.000	2.674779	24.91824	
Nf_717	.0673063	.0527848	-3.44	0.001	.0144711	.3130467	
Nm_717	.3619842	.2947701	-1.25	0.212	.0733738	1.785821	
Nif	.1830558	.1488362	-2.09	0.037	.0371965	.9008766	
1.Hhh_lit	.3509967	.2738887	-1.34	0.180	.0760494	1.619981	
1.Hhh_healthst	2.723416	2.190294	1.25	0.213	.5630403	13.17312	
2.Hh_livestock	.2546628	.3106142	-1.12	0.262	.0233211	2.780882	
Hh_landsize	.1406544	.0843755	-3.27	0.001	.0434046	.4557962	
2.Hh_awelfare	1.685625	1.594586	0.55	0.581	.2639561	10.76441	
1.Hh_loan	5.046387	5.526248	1.48	0.139	.5899811	43.16412	
Hh_roofmater							
2	.2675278	.2535429	-1.39	0.164	.0417507	1.714251	
3	.116869	.2220976	-1.13	0.259	.0028189	4.845306	
Hh_wallmater							
2	2.146652	5.561709	0.29	0.768	.0133784	344.4442	
4	6.108216	6.288631	1.76	0.079	.8120288	45.94703	
Hh_senergy							
2	1.16e-06	.000932	-0.02	0.986	0	.	
4	.161385	.133348	-2.21	0.027	.031955	.8150561	
Hh_swater							
2	1.50e+08	1.30e+11	0.02	0.983	0	.	
3	9.01e+07	7.81e+10	0.02	0.983	0	.	
4	1633852	1.42e+09	0.02	0.987	0	.	
5	2.79e+08	2.42e+11	0.02	0.982	0	.	
Avg_expendsch	1.004815	.0019212	2.51	0.012	1.001056	1.008587	
1.Dis_school	.4613113	.5290515	-0.67	0.500	.0487304	4.367052	
Kebele							
Jila Kerensa	2.287858	2.436915	0.78	0.437	.2836421	18.45387	
Halelu Cheri	2.567924	2.559418	0.95	0.344	.364083	18.1119	
Daye Wilincho	.9868318	1.217559	-0.01	0.991	.0879075	11.07797	
Cage_sqr	1.120929	.1039003	1.23	0.218	.9347151	1.344241	
_cons	4.62e-09	4.00e-06	-0.02	0.982	0	.	

## vii. Marginal effects on the probabilities of work-school participation outcomes

Average marginal effects  
Model VCE : OIM

Number of obs = 367

Expression : Pr(Activity==Working), predict(out(2))  
dy/dx w.r.t. : 2.Cage 3.Cage 1.Csex 1.Biol\_rnship 2.B\_order 3.B\_order 4.B\_order 1.Hhh\_sex Hhh\_age Hhh\_size  
2.Hh\_awelfare 1.Hh\_loan 2.Hh\_roofmater 3.Hh\_roofmater 2.Hh\_wallmater 4.Hh\_wallmater  
1.Dis\_school 2.Kebele 3.Kebele 4.Kebele Cage\_sqr

	Delta-method				[95% Conf. Interval]	
	dy/dx	Std. Err.	z	P> z		
Cage						
11-14	.1707096	.0405719	4.21	0.000	.0911902	.250229
15-17	.3761679	.0702004	5.36	0.000	.2385777	.5137581
1.Csex	-.0338762	.0438445	-0.77	0.440	-.1198098	.0520573
1.Biol_rnship	-.3263848	.0701154	-4.65	0.000	-.4638084	-.1889612
B_order						
2	-.2441679	.0908496	-2.69	0.007	-.42223	-.0661059
3	-.2234846	.0827934	-2.70	0.007	-.3857567	-.0612125
4	-.3071813	.1009745	-3.04	0.002	-.5050877	-.109275
Hhh_sex						
Male	-.1965485	.0814594	-2.41	0.016	-.356206	-.0368911
Hhh_age	.001087	.0058807	0.18	0.853	-.0104391	.012613
Hh_size	.0631076	.0405961	1.55	0.120	-.0164594	.1426745
Nf_717	-.0594523	.0562215	-1.06	0.290	-.1696445	.0507399
Nm_717	-.014674	.0577577	-0.25	0.799	-.1278769	.0985289
Nif	-.0416942	.0560078	-0.74	0.457	-.1514675	.068079
1.Hhh_lit	-.0416892	.0520095	-0.80	0.423	-.143626	.0602475
1.Hhh_healthst	.0758485	.0534146	1.42	0.156	-.0288423	.1805392
2.Hh_livestock	-.2264764	.0481689	-4.70	0.000	-.3208857	-.1320671
Hh_landsize	-.1101662	.0341632	-3.22	0.001	-.1771249	-.0432076
2.Hh_awelfare	-.1321758	.0627781	-2.11	0.035	-.2552186	-.0091331
1.Hh_loan	-.201517	.0564603	-3.57	0.000	-.3121771	-.0908569
Hh_roofmater						
2	-.0217795	.0649084	-0.34	0.737	-.1489977	.1054387
3	-.0808543	.0959282	-0.84	0.399	-.26887	.1071615
Hh_wallmater						
2	.4175266	.1521591	2.74	0.006	.1193002	.715753
4	.1754924	.040844	4.30	0.000	.0954396	.2555453
Hh_senergy						
2	.5016315	.2120589	2.37	0.018	.0860036	.9172594
4	.1373567	.0608638	2.26	0.024	.018066	.2566475
Hh_swater						
2	.3078836	.0845213	3.64	0.000	.142225	.4735422
3	.2063976	.0596623	3.46	0.001	.0894617	.3233335
4	.0767704	.0808704	0.95	0.342	-.0817325	.2352734
5	.3301875	.0982873	3.36	0.001	.1375479	.5228271
Avg_expendsch	.0003252	.0001598	2.03	0.042	.000012	.0006383
1.Dis_school	-.0372804	.082875	-0.45	0.653	-.1997123	.1251516
Kebele						
Jila Kerensa	-.0032627	.0668637	-0.05	0.961	-.1343132	.1277877
Halelu Cheri	.1095722	.0771256	1.42	0.155	-.0415913	.2607356
Daye Wilincho	.0895863	.0894156	1.00	0.316	-.0856651	.2648378
Cage_sqr	-.0273557	.0088154	-3.10	0.002	-.0446336	-.0100777

Note: dy/dx for factor levels is the discrete change from the base level.

Average marginal effects  
 Model VCE : OIM

Number of obs = 367

Expression : Pr(Activity==Working), predict(out(2))  
 dy/dx w.r.t. : 2.Cage 3.Cage 1.Csex 1.Biol\_rnship 2.B\_order 3.B\_order 4.B\_order 1.Hhh\_sex Hhh\_age  
 2.Hh\_awelfare 1.Hh\_loan 2.Hh\_roofmater 3.Hh\_roofmater 2.Hh\_wallmater 4.Hh\_wallmater  
 1.Dis\_school 2.Kebele 3.Kebele 4.Kebele Cage\_sqr

	Delta-method				[95% Conf. Interval]	
	dy/dx	Std. Err.	z	P> z		
Cage						
11-14	.1707096	.0405719	4.21	0.000	.0911902	.250229
15-17	.3761679	.0702004	5.36	0.000	.2385777	.5137581
1.Csex	-.0338762	.0438445	-0.77	0.440	-.1198098	.0520573
1.Biol_rnship	-.3263848	.0701154	-4.65	0.000	-.4638084	-.1889612
B_order						
2	-.2441679	.0908496	-2.69	0.007	-.42223	-.0661059
3	-.2234846	.0827934	-2.70	0.007	-.3857567	-.0612125
4	-.3071813	.1009745	-3.04	0.002	-.5050877	-.109275
Hhh_sex						
Male	-.1965485	.0814594	-2.41	0.016	-.356206	-.0368911
Hhh_age	.001087	.0058807	0.18	0.853	-.0104391	.012613
Hh_size	.0631076	.0405961	1.55	0.120	-.0164594	.1426745
Nf_717	-.0594523	.0562215	-1.06	0.290	-.1696445	.0507399
Nm_717	-.014674	.0577577	-0.25	0.799	-.1278769	.0985289
Nif	-.0416942	.0560078	-0.74	0.457	-.1514675	.068079
1.Hhh_lit	-.0416892	.0520095	-0.80	0.423	-.143626	.0602475
1.Hhh_healthst	.0758485	.0534146	1.42	0.156	-.0288423	.1805392
2.Hh_livestock	-.2264764	.0481689	-4.70	0.000	-.3208857	-.1320671
Hh_landsize	-.1101662	.0341632	-3.22	0.001	-.1771249	-.0432076
2.Hh_awelfare	-.1321758	.0627781	-2.11	0.035	-.2552186	-.0091331
1.Hh_loan	-.201517	.0564603	-3.57	0.000	-.3121771	-.0908569
Hh_roofmater						
2	-.0217795	.0649084	-0.34	0.737	-.1489977	.1054387
3	-.0808543	.0959282	-0.84	0.399	-.26887	.1071615
Hh_wallmater						
2	.4175266	.1521591	2.74	0.006	.1193002	.715753
4	.1754924	.040844	4.30	0.000	.0954396	.2555453
Hh_senergy						
2	.5016315	.2120589	2.37	0.018	.0860036	.9172594
4	.1373567	.0608638	2.26	0.024	.018066	.2566475
Hh_swater						
2	.3078836	.0845213	3.64	0.000	.142225	.4735422
3	.2063976	.0596623	3.46	0.001	.0894617	.3233335
4	.0767704	.0808704	0.95	0.342	-.0817325	.2352734
5	.3301875	.0982873	3.36	0.001	.1375479	.5228271
Avg_expendsch	.0003252	.0001598	2.03	0.042	.000012	.0006383
1.Dis_school	-.0372804	.082875	-0.45	0.653	-.1997123	.1251516
Kebele						
Jila Kerensa	-.0032627	.0668637	-0.05	0.961	-.1343132	.1277877
Halelu Cheri	.1095722	.0771256	1.42	0.155	-.0415913	.2607356
Daye Wilincho	.0895863	.0894156	1.00	0.316	-.0856651	.2648378
Cage_sqr	-.0273557	.0088154	-3.10	0.002	-.0446336	-.0100777

Note: dy/dx for factor levels is the discrete change from the base level.

Average marginal effects  
 Model VCE : OIM

Number of obs = 367

Expression : Pr(Activity==Neither\_schooling\_nor\_working), predict(out(4))  
 dy/dx w.r.t. : 2.Cage 3.Cage 1.Csex 1.Biol\_rnship 2.B\_order 3.B\_order 4.B\_order 1.Hhh\_sex Hhh  
 2.Hh\_awelfare 1.Hh\_loan 2.Hh\_roofmater 3.Hh\_roofmater 2.Hh\_wallmater 4.Hh\_wall  
 1.Dis\_school 2.Kebele 3.Kebele 4.Kebele Cage\_sqr

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
Cage						
11-14	-.1162005	.0440666	-2.64	0.008	-.2025694	-.0298315
15-17	-.1403978	.0469363	-2.99	0.003	-.2323913	-.0484043
1.Csex	-.1099467	.0357326	-3.08	0.002	-.1799813	-.039912
1.Biol_rnship	.0615907	.0366166	1.68	0.093	-.0101765	.1333579
B_order						
2	-.0048679	.0623698	-0.08	0.938	-.1271105	.1173746
3	.0148298	.0546135	0.27	0.786	-.0922108	.1218703
4	.276033	.1105138	2.50	0.012	.0594299	.492636
Hhh_sex						
Male	-.068266	.0712775	-0.96	0.338	-.2079674	.0714355
Hhh_age	-.0075105	.005217	-1.44	0.150	-.0177356	.0027146
Hh_size	.1110055	.0293282	3.78	0.000	.0535232	.1684878
Nf_717	-.1199818	.0424351	-2.83	0.005	-.2031531	-.0368104
Nm_717	-.0548912	.0458468	-1.20	0.231	-.1447493	.0349669
Nif	-.1232386	.0437176	-2.82	0.005	-.2089236	-.0375536
1.Hhh_lit	-.1182088	.0466638	-2.53	0.011	-.2096682	-.0267494
1.Hhh_healthst	-.0133022	.0453954	-0.29	0.769	-.1022756	.0756712
2.Hh_livestock	.0244212	.0781951	0.31	0.755	-.1288384	.1776807
Hh_landsize	-.0875201	.0316239	-2.77	0.006	-.1495019	-.0255383
2.Hh_awelfare	.1009335	.0503808	2.00	0.045	.0021889	.1996781
1.Hh_loan	.1733808	.0555647	3.12	0.002	.064476	.2822855
Hh_roofmater						
2	-.1394631	.0586126	-2.38	0.017	-.2543417	-.0245844
3	-.1229269	.0961354	-1.28	0.201	-.3113488	.065495
Hh_wallmater						
2	-.1078393	.0586228	-1.84	0.066	-.2227378	.0070592
4	.0031117	.0591366	0.05	0.958	-.112794	.1190174
Hh_senergy						
2	-.1423711	.0220467	-6.46	0.000	-.1855818	-.0991604
4	-.0955045	.0332079	-2.88	0.004	-.1605907	-.0304182
Hh_swater						
2	.1112819	.049434	2.25	0.024	.0143931	.2081707
3	.1199206	.0293673	4.08	0.000	.0623619	.1774794
4	.0199064	.018219	1.09	0.275	-.0158022	.055615
5	.159694	.0583511	2.74	0.006	.0453279	.2740601
Avg_expendsch	.0001168	.0001039	1.12	0.261	-.0000869	.0003204
1.Dis_school	-.0307059	.0731427	-0.42	0.675	-.174063	.1126512
Kebele						
Jila Kerensa	.0952751	.070317	1.35	0.175	-.0425436	.2330939
Halelu Cheri	.0017815	.0521508	0.03	0.973	-.1004322	.1039952
Daye Wilincho	-.0476872	.0469324	-1.02	0.310	-.1396729	.0442986
Cage_sqr	.0078685	.0050116	1.57	0.116	-.0019541	.017691

Note: dy/dx for factor levels is the discrete change from the base level.