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The Impact of Urban Poverty on Child Labor: The Case of Arba Minch Town, Southern Ethiopia

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Abstract
Although urban child labor is a considerable issue, it has attracted little attention in previous studies. As a result, child labor in most of the medium and small towns remains unstudied. In addition, the previous literature suggests that the impact of poverty on child labor are largely country specific, indicating that any policies aimed at reducing child labor must look carefully at country specific characteristics that expose children to work. This study is conducted in one of unstudied areas, Arba Minch town, and its main objective is to examine the impact of urban poverty on child's school participation in the study area. This research adds to the empirical work on child labor by investigating what household, parental and children characteristics are most common among working children in the study area, using primary data collected from selected kebeles of the town via structured questionnaire, and analyzed with the use of both descriptive and econometric tools of analysis. The multinomial logit model was employed with child activity as the dependent variable, where the four possible outcomes are working-only, schooling-only, combination of work and schooling, and leisure time. The finding show that poverty (proxied by family per capita income) has a slightly weaker negative impact on the likelihood of a child works full time relative to schooling-only category, as do the engagement of household head on stable income generating economic sectors. Being son or daughter to the household head has a significantly positive effect on the probability of a child participating in schooling-only category. In addition, the findings show that incidence of child labor versus schooling depends on (among other factors) age, gender, and education level of a child; household size, ownership of tap water directly in the house and home ownership; age, gender, and educational level of the household head; presence of elderly person and infants in the household. From policy perspective, measures directed at expanding stable income generating employment opportunities and house ownership for the poor are of immense importance in reducing child labor. In addition, family planning, mainly concerned with the spacing and timing of births, and strategies that enhances old age welfare benefit may have an important role to tackle child labor in the town.
Keywords: Arba Minch, child labor, income and asset poverty, multinomial logit model

1.1 Introduction

Poverty is one of a factor that discourages the economic well being of a given country, specially a challenge in developing countries. Ethiopia is among the poorest countries in the world. The country's score of 0.363 on human development is among the lowest in the world with a rank of only 174th out of 187 countries in the year 2011. However, there is an improvement in HDI as compared to decade ago with an increase of approximately 33percent (2011 UNDP). In other hand, according to the African statistical annual report of human development indicators, Ethiopia has scored adult illiteracy rate of 64.1% in the year 2008 and 56% of its people have no access to safe water in the year 2010 (African Statistical Year book 2012). These lowest achievements and other indicators relative to other nations of the world may have cheered a supply of child in economic activity.

ILO (2010) report on child labor estimated that about 215 million children aged between 5 and 17 years were engaged in child labor around the world. According to the estimate of Ethiopian national child labor survey, the number of children engaged in economic activities in Ethiopia aged between 5 to 17years is estimated at 9.48 million, which represents about 52 percent of the total population of that age group (CSA 2002). The survey also showed that the incidence of child labor in SNNP region was very high. Out of the 3,875,484 child population in the region between the age of 5 and 17 years, 2,102,658 (54%) of the children were engaged in economic activities while 34.6percent of 2,102,658 children are specialized in household activities for the same age group. Even if there is unavailability of data for the study area, the regional figure indirectly shows the existence of child labor in the study area in particular.

1.2 Statement of the Problem

According to international labor convention (2004) article 3 of effective abolition of child labor states that the minimum age for admission to any type of employment shall not be less than 18 years (ILO 2005). Activities performed by children are exploitative, hazardous or inappropriate for their age, as well as detrimental to their schooling, social, mental, spiritual and moral development.

The ultimate causes of child labor might differ among spatial variation, rural or urban. The urban child labor might be related to several factors like poverty, inequality, socio-economic vulnerability, inadequate and

inappropriate educational opportunities, and cultural norms and values. Among these factors the most pronounced reason in urban Ethiopia is poverty where the children are required to supplement family income compared to their counterparts in the rural areas. Children are therefore used as one source of income of the household and income status of households considerably affects the decision of households to send their children to school. However, the cause of child labor is not always related to poverty. But also cultural factors also expose children to economic activity, among others. In Ethiopia for example cultural beliefs that educated men will not live around his area of birth in search of better environment which puts in turn hesitation on the rich families for transferring their assets in the form of bequest. However, different studies are in contradiction in terms of their findings in regard to decision among poor and non poor households either to send their children to school or not.

A study by Basu and Van empirically indicates that child labor arises if adult household income falls below some threshold level. They argued that parents do not want to send their children to work unless they are compelled for reasons of survival. Indicating that poverty is the main derive for child labor. They call this "Luxury Axiom" (Basu and Van 1998). On the other hand, in the absence of labor and land market, Bhalotra and Heady (2003) provide theoretical and empirical evidence that children in wealthier households are more likely to work and less likely to attend school compared to their counterparts. They refer to this phenomenon as "Wealth Paradox".

Studies using micro data sets as cited in Jackline (2001), for example, Nielsen (1998), Patrinos and Psacharopoulos (1997), Grootaert (1998), and Canagarajah and Coulombe (1997) and Ray (1999) examine the effect of household poverty on child labor, though with mixed results. Ray (1999) tests the luxury axiom, of Basu and Van, on Peru & Pakistan by examining the relationship between child labor hours and household poverty. He studied the probability of poor households sending their children to work, and found hybrid evidence; a positive significant relationship between household poverty and child labor in Pakistan, but not in Peru. In addition, Nielsen (1998) finds that in the case of Zambia, poverty and low income have very small effect on the probability of child labor, and she concludes that poverty is not the main cause of child labor in Zambia. Canagarajah & Coulombe (1997) also find that household welfare has a weak effect on the probability of child labor, but in the case of Ghana.

A study by Alan and Robert (2002) using bivarite probit model in USA examined that household income as the proxy for poverty has little effect on child labor independent of other factors. Similarly Dawit (2010) in rural areas of Ethiopia attested that increased access to productive asset has a significant positive impact on child labor and the ownership of cash crops strongly favors boys schooling (as opposed to working). According to findings by Subha, John, and John H. in rural Ethiopia (2008) provided improvements in household income are positively associated with improvements in schooling and which in turn increased children's participation to school rather than work. .

The above conflicting research findings on the relationship between child labor and poverty may be due to a number of differences in these studies such as definitional differences, methodological differences, socio-economic difference and spatial differences. Different results can be obtained when child labor is defined differently in different studies (World Bank 2005). Even when the definitions of child work have been homogeneous, different results can still be obtained if different methodologies have been used. This indicates the need for region specific child labor studies. This research is intended to examine the impact of income and asset poverty on child labor using cross sectional survey data rather than secondary data by specifying multinomial logit approach.

1.3 Objective of the Study

The major objective of the study is to examine the impact of urban poverty on child's school participation in the study area. The specific objectives are:

- to examine the impact of income and asset poverty on school participation of children.
- to find out the incidence, nature and type of child labor in Arba Minch town.
- to investigate the impacts of household, parental and child factors on child school participation.

1.4 Hypothesis of the Study

Although there are no well-established theories, there were empirical works in some urban areas of Ethiopia. Assuming that there are similarities between the urban areas of the country, the following important hypothesis will be tested in the empirical finding of the research:

- Poorer households are more probably send their children to work rather than schooling
- Size of the household is positively related with the probability of sending their child to work than schooling and
- The number of infant population in the household is positively related with the probability of a child to be laborer.

1.5 Scope of the Study

To examine the impact of poverty on child labor, the study does not include any information on variables that may affect the demand for schooling, for example, availability, accessibility, quality of schooling, and cost of schooling, among others. In addition since poverty is multi-dimensional, this study focuses on the impact of income and asset poverty on child labor. Depending on the International Labor convention of the minimum age for employment, the age scope of the target children is between the ages of 5 to 17 years old, which is above the national age scope of 14years. Households that do not have children are out of the scope of the study. The study has the following limitations:

- The study is based on household survey which could miss child laborers who are street dwellers.
- Since the study is based on cross sectional analysis which could not show the longitudinal impacts of child labor in the study area.

2. Methodology of the Study

2.1. Description of Arba Minch Town: Arba Minch town is one of the rapidly growing towns of Ethiopia which is located in Southern Nations, Nationalities and Peoples regional state of Ethiopia. The name Arba Minch was derived from the "forty springs" which means a collection of more than forty springs which are located in the Arba Minch natural forest. Astronomically Arba Minch is located at 60 04' North Latitude and 36040' East Longitude. It is found in Gamo Goffa zone and used as a zonal capital of the zonal administration in Southern Nation's Nationalities and Peoples Regional State of Ethiopia. It is located at about 505kms south of Addis Ababa and 275kms of Hawassa, the regional capital (AMM 2006).

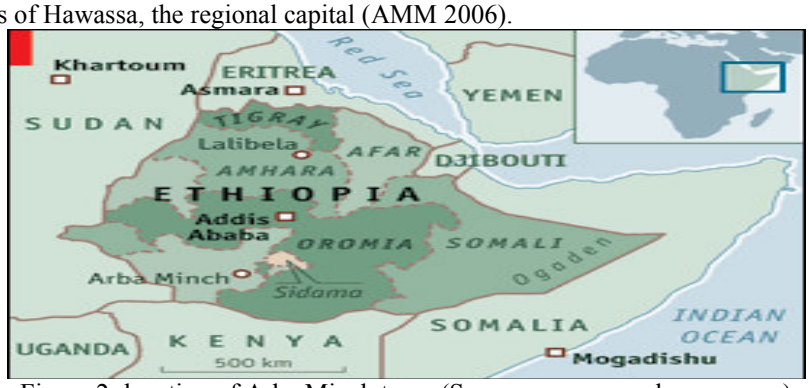

Figure 2: location of Arba Minch town (Source: www.googlemaps.com)

2.2. Survey Methodology

Purposive sampling method has been used based on the administrative division of the town. The town has four sub towns with a total of 11 kebeles. Based on this administrative division, one kebele from each sub town is taken for collecting data purposively. Then the total household samples allotted for each kebele was determined based on the proportion of their population which is intended to minimize sampling bias. The number of household is determined by dividing the total population of each kebele to the average household size of the town estimated by CSA regional statistics for SNNPR state.

A total of 150 households are sampled out of the target population of the town. The sample size was limited to 150 based on Yamane (1967) sample size computation, which is shown below. According to Yamane (1967) sample size at 95% confidence interval, degree of variability 0.5 and level of precision 9percent is computed as follows:

$$n = \frac{N}{1 + N(e^2)}$$ Where; N- total population, e- the level of precision, which is equal to 0.09, n- the required sample size. By substituting N=20,267 we have:

$$n = \frac{20{,}267}{1+20{,}267(0.09^2)} = \underline{122}$$ However, to increase the representativeness of the sample the study included an additional of 28 households. Thus our total sample size is 150. As the sampling procedure indicates that the data is collected from every 47 household ranges of the households, who have with child aged 5 to 17years. In the survey, the question was posed to the head of the household or to his/her spouse and the responses, therefore, represent an individual's evaluation about the overall information included in the questionnaire.

Table 2.1: Sample size distribution among the four kebeles,

Kebele (*sub-city*)	**Bere (*Secha*)**	**Mehal-ketema (*Nech Sar*)**	**Dilfana (*Sikella*)**	**Kulfo (*Abaya*)**	***Total***
Sample size	39	30	36	45	*150*
Household size	1847	1435	1703	2108	*7093*

Source: Population and statistics office of Arba Minch town, and own computation (2015/16)
The data analysis is based both on descriptive and econometrics methods.

2.3. Econometric analysis model

Consider that a given household has 4 alternative choices for a child time allocation for which the utility maximizing choice of the household among m alternatives will be chosen. The choices in this study are indexed as $\tau = 1, 2, 3, 4$. Where:

- τ=1 if child is working only
- τ=2 if child is attending school only
- τ=3 if child is combining work with schooling
- τ=4 if child is remain idle "leisure" (no-work and no-schooling)

On other hand, a child is defined working only (τ=1) if his/her total weekly working hours are equal to or greater than 14 hours per week and doesn't attend school. A child is defined as attending school (τ=2) if the working hours are below 14 hours per week and attending school with minimal work. The child is labeled as working and attending school (τ=3) if he/she attends school and works for more than 14 hours per week. A child is labeled as idle, neither working nor attending school (τ=4) if the working hours are below 14 hours per week and doesn't attend school at the school year of the data collection. On this study the econometric analysis has used these categories of children time choice as a dependent variable for econometric inference reasons.

Thus the utility level that household j (of child i) attaches to each of the alternatives will be given by:

$$U_{ij\tau} = U_{ij1}, U_{ij2}, U_{ij3}, U_{ij4} \quad \text{..... (1)}$$

Where U_{ij}^{τ} represents the utility derived by household j of child i, from choosing child time allocation of category choice τ. The household j (where child i comes from) chooses among the alternatives that yields maximum utility, where by the marginal utility of each choice is also equalized.

The multinomial logit model is better to capture the four mutually exclusive states which are decided jointly at the same time. The basic assumption of the multinomial model is the log Waibull distribution of identical and independent utility error terms. The great advantage of this model is that it is easy to compute and the probability of a given household's child time allocation is easily expressed by formation and maximization of likelihood function straight forwardly (Kennedy 1994). The maximum likelihood method is used to estimate the estimators; conditional on the explanatory variables (Wooldridge, 2000). The maximum likelihood estimation concept of simple binomial logit models can be extended similarly to the multinomial case.

The density of y_i given x_i is given by:

$$F(y/x_i;\beta) = [G(x_i\beta)]\, y\, [1 - G(xi\beta)]1 - y,\ y = 0,1 \quad \text{..... (2)}$$

The log-likelihood form of the function for observation i is a function of the parameters and the data (x_i, yi) and is obtained by taking the log of

$$li(\beta) = yi \log[G(xi\beta)] + (1 - yi)\log[1 - G(xi\beta)] \quad \text{..... (3)}$$

Because G (.) is strictly between zero and one for logit, l_i (β) is well defined for all values of β. The log-likelihood for a sample of total size k can be obtained by summing each individual likelihood i across all

observations. Thus, Maximum Likelihood Estimator (MLE) of β, denoted by β', maximizes this log-likelihood. For β' to be a logit estimator, G (.) should be the cumulative distribution function (Wooldridge, 2000).

$$l(\beta) = \sum_{i=1}^{n} l_i(\beta) \quad \text{..... (4)}$$

Given the above time choices, the household j (where child i comes from) chooses among the alternatives that yield maximum utility, where by the marginal utility of each choice is also equalized.

If $U_{ij\tau} = \max \{ U_{ij1}, \dots, U_{ij4} \}$ …….. (5)

Since the utility levels are not observable additional assumptions to formulate linear relationship is necessary. Therefore, there will be assumed

$$U_{ij\tau} = \mu_{ij\tau} + \varepsilon_{ij\tau} \quad \text{……..…..... (6)}$$

Where: μ_{ij} = a non-stochastic function of observables (Q, TS, TH; V), where Q-household consumption of goods, TS- child school time, TH- child leisure time, V-a vector of exogenous variables that includes characteristics of child and household, and

ε_{ij} = an unobservable error term

Thus, the interest will be to compute how parents in the household j=1,2,….,J chose child time τ=1,2,3, 4 (work only, schooling only, combination of schooling and work, leisure (no-work and no-schooling) respectively) for child i=1,2,….,I from the basic utility maximization problem.

$$y_{ij\tau} = \alpha_{j\tau} + X_{ij}\beta_\tau + Z_j\theta_\tau + W_j\gamma_\tau + \varepsilon_{ij\tau} \quad \text{……..…..... (7)}$$

Where $\alpha_{j\tau}$ is the household specific intercept term of household j for child activity τ. X_{ij} is a vector of individual specific characteristics of children and Z_j is a vector of household specific characteristics. W_j is a vector of parental specific characteristics. Note that the convention $\varepsilon_{ij\tau}$ (the error term) is with mean zero and constant variance. Child activity τ is chosen over τ^* if $y_{ij\tau} > y_{ij\tau^*}$. If the indicator of the actual choice is represented by Y_{ij} $(\tau = 1,2,3,4)$, then the multinomial logit is represented as:

$$P_{ij\tau} = P\left(Y_{ij} = \frac{\tau}{\alpha_{j\tau}, X_{ij}, Z_j W_j}\right) = \frac{\exp(\propto_{j\tau} + X_{ij}\beta_\tau + Z_j\theta_\tau + W_j\gamma_{\tau^*})}{\sum_{\tau^*=1}^{\tau} \exp(\alpha_{j\tau^*} + X_{ij}\beta_{\tau^*} + Z_j\theta_{\tau^*} + W_j\gamma_{\tau^*})} \quad \text{……. (8)}$$

Up on standard normalization of the multinomial logit, the child time 2 (child schooling only category) is taken as a reference or base category. Thus taking logs of relative probabilities with respect to P_{ij2}, which shows the log odds of each response category with respect to the baseline category. The equation is given as:

$$\log\left(\frac{P_{ij2}}{P_{ij\tau}}\right) = \propto_{j2} + X_{ij}\beta_2 + Z_j\theta_2 + W_j\gamma_2 \quad \text{……..…..... (9)}$$

The equation 9 indicates the probability of observing child working only, combination of work and schooling, and leisure as compared to schooling only category given the individual, parental and household specific exogenous variables. This can serve for comparisons of the probability occurrence of category choice interest relative to the base category for a given explanatory variable holding other things constant. In addition, we use the relative risk ratio (RRR) approach to show the overall significance of the variables in affecting the probability of occurrence (a choice being chosen by households) marginally.

3. Findings and Discussions

3.1. Descriptive statistics Findings

It can be noted from Table 3.1the minimum age of a sample child is 5 years while maximum years are 17 years old. The average age of child is 12 years old. The minimum educational level of a child is 0 and the maximum where grade 12 with the mean of grade 6.

Table 3.1: Summary of continuous independent variables

VARIABLES	OBS	MEAN	STD. DEV.	MIN	MAX
ageHHH	302	44.00993	10.16426	24	73
HHsize	302	5.741722	2.066867	2	11
no5yrs	302	.4039735	.6280149	0	2
no5to18yrs	302	2.397351	1.23933	0	7
no18to30yrs	302	1.417219	1.33622	0	7
no30to60yrs	302	1.413907	.7717211	0	4
no60yrs	302	.1092715	.3229538	0	2
ageCH	302	12.21192	3.716908	5	17
educCH	302	5.519868	3.587252	0	12
FamPCI	302	444.916	297.4818	79.57143	4199.106

Source: Own computation from survey data, 2015/16

The other hypothesized independent variables were dummies for household characteristics. Status of literacy of household head, spouse, and child's relationship with the household head, house ownership of the household, source of water for home consumption, occupation of household head are found to have higher relation with child status of time decision among the four categories (i.e. work-only, schooling-only, both work and schooling and none of the two activities). The number of literate mothers and fathers is 241(85.2%) and 216(94.7%), respectively. The figures reflect the prevalence of widespread literacy in urban areas in our country. 165(54.6%) of children's were reported as biological off-springs of the household head where as the rest 137 (45.4%) are either other relatives or non-relatives. Around 80.5percent of the surveyed households were reported as getting tap water directly in the house while the remaining 19.5percent get water from other sources (either from public tap water or rental water from private owners/ surrounding river/ others). In addition from the surveyed households 61.3percent living in their own house where as 38.8percent are living in rented house. Around 57.6percent of household heads are with stable or regular occupation as compared with 42.38percent of the household head with non-stable occupation (see Table 3.2).

Table 3.2: Summary for independent categorical variables

No	Independent variables	Yes (%)	No (%)
1	Mother's Literacy Status	241(85.2)	42 (14.8)
2	Father's Status of Literacy	216 (94.7)	12 (5.3)
3	Son or Daughter of the Household Head	165 (54.6)	137(45.4)
4	Self Owned House	185(61.2)	117(38.8)
5	From tap water directly from house	243(80.5)	59(19.5)
6	Household Head With Stable/Regular Occupation	174(57.6)	128(42.4)

Source: own computation from survey data, 2015/16

Table 3.3: Mean-comparison tests (income variation among house owners)

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
self own	185	471.0465	25.53741	347.3463	420.6627	521.4303
private	44	633.5515	16.54848	109.7702	600.1783	666.9247
combined	229	502.2702	21.28573	322.1115	460.3283	544.2121
diff		-162.505	53.06084		-267.0598	-57.95022
diff = mean(self own) - mean(private)					t =	-3.0626
Ho: diff = 0		degrees			of freedom =	227
Ha: diff < 0		Ha: diff != 0			Ha: diff > 0	
Pr(T < t) = 0.0012		Pr(T > t) = 0.0025			Pr(T > t) = 0.9988	

Source: own computation from survey data, 2015/16

3.2. Results of Econometric Data Analysis

3.2.1 Econometric tests

Before going to estimate the specified models, it is important to undertake different tests on whether the basic assumptions of the model are met or not. In addition, since the study is a cross-sectional, autocorrelation, which is a common problem in time serious data, is ruled out. Hence, the rest tests including the goodness of fit of the model should be tested as follows.

Multicollinearity is an inevitable phenomenon in all multivariate analysis, no matter how small or big the problem is. However, if the co-variation is strong it will affect the significance of the estimates and remedial

is necessary. The existence of multicollinearity is tested using Collin test for both dummy and continuous independent variables in multinomial logit model estimation simultaneously. A rule of thumb is employed in characterizing the multicollinearity of variables. By the rule of thumb, the variance inflating factor (VIF) greater than 10 is an indicator of serious problem. The mean VIF of all independent variables are greater than 10, that is equal to 10.30, besides other variables with VIF of greater than 10, hence we suspect there is a series correlation among some variables. Since there is correlation among household size and composition, i.e. the VIF result of household size, the number of children in the age category of 5 to 18years and the number of individuals in the productive age category is greater than 10 (see Appendix 1A). Therefore, the problem cannot be tolerated. To mitigate the problem, one of the variables should be dropped depending on the theoretical significance of the variable in the model, and the correlation coefficient value among the variables. Here the household age composition categories (age between 5 to 18 years, 19 to 30years and 31 to 60years) are dropped and thereby household size is included in the model (see Appendix 1B). After doing so the multicollinearity problem is minimized among the independent variables with their average VIF of 1.92 (see Appendix 1C) and the correlations of other variables are not so strong.

In multinomial logit estimation the study used two alternative ways to test the model; namely, the likelihood ratio test for model adequacy and Ramsey Resete test for omitted variable bias. As we see from the results in Appendix 1D the Ramsey test result the p-value is 0.0622 which is greater than 1% level of significance and in bias of accepting the null hypothesis, which indicates that there is no omitted variable, except by chance.

In addition, the summary statistics of the multinomial logit specification on Appendix 1E show that the model adequately fitted the data. The Log likelihood ratio is -147.86236 and statistically significant at 1% level of significance indicating the existence of an overall significant relationship between (at least with one of) the independent variables and the dependent variable with Prob > chi2 = 0.0000.

A multinomial logit model assumes constant variance of the error term. So, the error term is not expected to be hetroscedastic by the nature of the model itself, we need to test for hetroscedasticity problem. As indicated in Appendix 1G, the Breusch-Pagan / Cook-Weisberg test for the problem of heteroskedasticity showed that the data have no problem of heteroskedasticity. The multinomial model assumes a standard logistic distribution rather than normal distribution. The error term is not assumed to follow a normal distribution. Therefore, there is no need to conduct a normality test.

3.3 Econometric Estimation Results

The survey data contains information on 302 children (156 boys and 146 girls) aged 5 to 17years. The model was estimated using stata 11.00. Regressions were run for the time choice of children by taking main activity of a child as a dummy variable. The impact of child characteristics, parental characteristics and household characteristics are discussed below.

As it is evident in the Table 3.4, most of the variables included in the model have the expected sign. Moreover, six of the variables found statistically significant at least at 5percent level of significance. In addition the econometric results of the variables were in agreement with the findings in the descriptive.

Table 3.4: multinomial logit estimation results (taking schooling-only as a base category)

Independent Variables	Work-Only		Work and Schooling		Leisure/ Remain Idle	
	Coeff.	RRR	Coeff.	RRR	Coeff.	RRR
cons	**-10.3*****(4.6)		-1.078		1.759	
Gender of household head	-.37465 (1.3276)	.687 (.913)	-1.18(.7817)	.3068 (.239)	-6.432(616.6)	.002 (.992)
Age of household head	.0596164 (.057629)	1.062 (.062)	.027181 (.025)	1.027 (.026)	*-.471*** (.236)	.6243** (.147)
Education level of household head (illiterate as a reference)						
< grade 5	*-.1454(1.582)*	.865(1.368)	-.669(1.196)	.512(.612)	5.388(7.549)	218.85(1652.2)
grade [5,8]	*-1.193(1.535)*	.303 (.466)	.1554(.9617)	1.168 (1.13)	3.493(4.317)	32.872(141.90)
grade [9,12]	*-2.979 *(1.64)*	.051*(.083)	-.848(.9068)	.428 (.388)	6.311(4.856)	550.368(2672)
> grade 12	-1.905(1.77)	.149 (.264)	*-2.127**(.964)*	.119**(.115)	-.198(4.233)	.8205 (3.473)
occupation of household head (casual worker as a reference)						
Salary earn	*-4.33***(2.23)*	.013**(.030	.6106(1.286)	1.842 (2.37)	7.91**(4.095)	2709**(11096)
Self emp'ed	-2.476(1.98)	.084 (.167)	-.287(1.321)	.7504 (.992)	6.108*(3.22)	449.57*(1446)
Unempl'ed	.523(2.777)	1.686(4.68)	1.134(2.113)	3.107 (6.57)	4.962(3563.)	142.99(50951)
pensioner	*-5.24***(2.37)*	.005**(.013	-2.456(1.66)	.085(.143)	-3.467(12.63)	.031(.395)
Others	-5.264*(2.87)	.005*(.015)	-20.98(4680)	10.93(3.81)	15.36(6716)	469(3.15e+10)
marital status of household head (married head as reference)						
Single	-4.99(3.106)	.007 (.022)	.455(1.0892)	1.576 (1.72)	-26.42(3233)	2.866(1.09e-8)
Divorce	-3.097(2.17)	.045 (.098)	.0544(.9941)	1.056 (1.05)	-13.96(1651)	16.513(.0014)
Widowed	*-3.78***(1.75)	*.023***(.039)*	.465(.90758)	1.593(1.45)	3.597(616.5)	36.475(22488)
Household size	**-1.467***** (.388)	.231*** (.089)	*-.22453*** (.111)	.799** (.089)	.28180 (.496)	1.325517 (.657)
No. infants	*2.41***(.724)*	11.06(8.01)	.059(.36563)	1.062 (.388)	-1.478(1.260)	.228 (.287)
age >60yrs	2.292*(1.33)	9.891*(13)	.158(.903)	1.170 (1.06)	*18.948***(8.42*	12.59** (12.88)
house ownership of household (own house as a reference)						
kebele	1.651*(9541)	5.213*(4.9)	-.099(.5371)	.905(.486)	3.457(2.566)	31.707(81.355)
private	-2.142*(1.27)	.117*(.149)	-1.075(.781)	.341(.266)	-.391(1.708)	.677 (1.1557)
Child's relation with household head (son/daughter as a reference category)						
Other relat.	1.067 (.924)	2.907(2.68)	*1.79***(.475)*	*5.99***(2.85)*	2.937(1.976)	18.875(37.299)
Nonrelative	**6.49***(1.44	662***(936	**4.21***(1.14	67.14***(77	-15.71(892.5	4.007 (.00013)
source of water for home consumption (tap water directly from the house as a reference)						
Others	1.669**(.874)	5.31**(4.6)	.175(.539)	1.191 (.642)	*4.93***(2.505)	138.84**(347.8
Family PCI	-.003*(.002)	.803*(.002)	**-.008***(.01)	.99*** (.002)	-.0007(.0014)	.999 (.00147)
Sex of child	-.078(.7536)	.925 (.697)	.712*(.4068)	2.04* (.829)	-2.949(2.290)	.052 (.120)
Age of child	1.64***(.312)	*5.17***(1.6)*	.372**(.131)	1.46***(.191	.91009(.594)	2.484 (1.476)
Education of child	-.81843*** (.212356)	.441*** (.094)	-.07684 (.13041)	.926 (.121)	-4.21*** (1.702)	.014*** (.023)

MODEL SUMMARY STATISTICS	
Number of observation	302
Wald Chi squared	412.09
Significance level	0.0000
Log likelihood function	-147.86236
Pseudo R2	0.5822

Source: the researcher's survey result, 2015/16
Figures in parenthesis are standard deviations
***, ** and * indicates 1%, 5% and 10% level of significance respectively.

The impact of household characteristics: The strong, positive and statistically significant coefficient of the variable "no5yrs" variable suggests the existence of positive association between the numbers of infants in the household with the likelihood of a child to participate in work-only activity relative to schooling-only category. Other things being constant, children in the household with high number of infants are 11times more likely to specialize in work-only activity than attending school. This might be due to the more siblings; the more likely that a child will pass his/her time on rearing of siblings and/ or need to work to generate income, rather than a child going to school. This finding is consistent with the hypothesis of the study and the discussion in the summary statistics where minding of younger siblings was identified to be the most time consuming domestic work for children.

Household size has a significant impact on the decisions of child time allocation. The result shows that

an increase in the household size decreases a child to be laborer, which is contradiction with the hypothesis of the research. Other factors held constant, an increase in household size by a person decreases the relative risk ratio (RRR) of being in the category of work-only by 77percent at 1percent level of significance. This shows that an increase of an additional household member leads to higher probability of child schooling as observed in the magnitude of reduction in the probability of child labor. This might be due to the fact that an increase in family size is associated with more productive adults and less dependent persons, especially young children. So that children tend to specialize on schooling with lesser probability of attending in the labor market. On other hand, an increase in household size by a person decreases the RRR of being in the category of combining work and schooling-only by 20percent at 5percent level of significance. This shows that an increase of an additional household member leads to higher probability of specializing on schooling than the magnitude of reduction in the probability of combining both schooling and work. In addition this is due to higher probability of an augmented productive member from each additional person in the household. However the impact of household size on leisure category is insignificant.

The finding indicates that parents with old age, above 60years, members in the household prefer a child to be laborer than investing on schooling. Holding other variables constant, households with more number and composition of old age members are 9 times more likely to send their child to work than schooling, which is statistically significant at 10percent level of significance. This could be due to the fact that an increase in old age person means an increase in dependent persons so that children tend to work more with lesser opportunities for schooling. On the other hand, the impact of old age members in the household is statistically significant at 10percent level of significance for the leisure category with unexpected sign and insignificant for combining both work and schooling category. The result indicates that, households with old age persons are 18 times more likely to enjoy their child on leisure related activity, holding other factors constant.

The slightly weaker significance of home ownership on the category of being work-only and statistically insignificant on the rest category compared to schooling-only category is observed from the model results. Holding other factors constant, household that live in rented house from kebele are 5times more likely to send their children to labor activity rather than schooling-only category as compared to households who live on their own house at 10percent level of significance. This might be due to children of house owners are more, not less, affected by the conditions in their neighborhoods than renter children because of house owners' relatively greater residential stability. Greater residential stability minimizes the need to change schools and increases the opportunity to develop closer ties, so that children's pass their time on schooling rather than dropping out from school. The finding by Aaronson's (2000), homeownership has more positive effects on high school graduation, is consistent with this speculation. Another explanation, supported by some empirical evidence, is that homeownership produces greater life satisfaction or self-esteem for adults, which, in turn, provides a more positive home environment for children (Rossi and Weber 1996). Sherraden (1991) argues that the psychological benefits of homeownership for adults derived from its function as an asset. In consistent way McCarthy, Van Zandt, and Rohe (2001) argue that house ownership increases housing security for families and there by provides a ready mechanism to borrow money and get credit to.

In addition, families who live in rented house from private owner's decreases the RRR of being in the category of work-only by 88.3percent at 10percent level of significance. This indicates that families who are living in rented house from private owners are better-off as compared to self owned families. This might be consistent with the argument by Green and White (1997) that family income matters more for children of renters than children of house owners. Since higher income households tend to both live in more expensive rental houses and more equity in their houses. These arguments are consistent with the finding of this study since the mean income between house owners and renters are significantly different in bias of renters as shown in Appendix 1I. In addition wealth status of the household in terms of house ownership might be related with years of residence in the town so that households with self owned house are relatively high opportunity in the past to have the access to land relative to the current limited access to land policy in the emerging towns because of high migrant populations.

The strong significance of source of water in reducing child labor and increasing leisure activity is observed from the model output. Holding other factors constant, households who use water for home consumption from other sources other than tap water directly from the house prefer their child to participate in work-only category than schooling. Children's from these households are 5times more likely to participate in work-only category than households from tap water directly in the house at 5percent level of significance. Similarly they have by far more likely to enjoy their time on leisure relative to schooling-only category than households with tap water directly in the house. The latter might be due to the further the distance between their home and source of water, the higher children spent time on leisure activity, since they are free from the control of their families as being stayed around the water source in the name of fetching water.

In the literature on child labor, household poverty is often mentioned as the main cause behind the use of child labor. In an attempt to capture the impact of household poverty on child domestic work hours, a proxy

variable – family per capita income - was considered in this study. Though weak, the negative coefficient attached to the 'FamPCI' lends some support to the 'household poverty-child labor' nexus implying lower probability of participating in labor market by children from better off families. Family per capita income has a negative and significant association with the likelihood of a child within the household to participate on full time (part-time) labor activity at 10percent (1percent) level of significance. Other factors held constant, an increase in family income by a unit decreases the RRR of being in the category of work-only by 20percent. This shows that an increase of family income leads to higher probability of child to specialize on schooling than the magnitude of reduction in the probability of working-only category. Overall, the results show strong support for the luxury axiom; i.e. as households become richer their children's are less likely to be engaged in child labor (both part-time and full-time) than to schooling. In addition, low level of family income appears to influence the demand for schooling, not only because it affects the inability of households to pay school fees and other costs associated with education, but also because it is associated with a high opportunity cost of children schooling.

The impact of Parents characteristics: The results shows that children's living with female head (old age head) are less (more) likely to participate on work (part-time and full-time) activity but statistically insignificant. In addition, as age of the head increases by a year decreases the RRR of being in the leisure category by 38percent at 5percent level of significance, ceteris paribus. That is an increase of the age of the household head leads to higher probability of child schooling than the magnitude of reduction in leisure. To analyze the impact of household education level on the decision of child time the variable is categorized in to five categories. As compared to household with illiterate head, those children living with literate heads are more likely to specialize in schooling than other categories, but some of them are statistically not significant. The primary school completion of the head has no significant impact on the household's decision on their child's time. From the theoretical foundation, the assertion that education at lower level has lower private benefit compared to the costs is a good explanation for this finding. Moreover, individuals with primary education have lower chance of employment in formal sector. Secondary and tertiary level educations, on the other hand, have a negative and significant relation with the probability of a child being a laborer as full-time and part-time, respectively. Children's in the head with senior secondary level of education decreases the RRR of being in the category of work-only by 95percent at 10percent level of significance as compared to illiterate heads. Similarly, Children's in the head with tertiary level decreases the RRR of being in the category of combination of work and schooling by 88percent at 5percent level of significance as compared to illiterate heads, ceteris paribus. This shows that being in the head with senior secondary (tertiary) educational level of the head increases the probability of a child to specialize in schooling than reduction in the magnitude of work-only (combination of work and schooling) category. The importance of education was also confirmed by studies in other countries (Ray 2001). In general, the results regarding education may be due to that if the head has attained relatively better education, the other members have better probability of being educated. Moreover, more educated heads might have a better knowledge of the returns from education and/or be in a better position to enable their children to exploit the earning potential acquired through education. In this case, the head's education could be a proxy for returns to education.

All dummies, except unemployment, for the occupation of the head are also significant at least in one category of the dependent variable. Salary/wage work, self employment and pensioner are found to have a negative (positive) significant (at least 10%) relationship with a child being a laborer (enjoying leisure) than specializing in schooling-only category. Accordingly, those households with the head employed in these sectors have earning stable income from these economic engagements. Being a child of households that are engaged in salary/wage earning work decreases the RRR of participating in the category of work-only by 99percent at 5percent level of significance, ceteris paribus. This shows households that are engaged in salary/wage earning activity prefer their children to specialize on schooling rather than labor market. While, holding other factors constant, engagement in these activities is extremely more likely to enjoy leisure at 5percent level of significance than engagement being as casual worker. In addition, children from self employed household head are more likely to enjoy leisure than schooling. They are extremely more likely to enjoy leisure at 10% level of significance. These might be due to households who engaged in casual work are more likely prefer their child to be laborer than taking leisure/remain idle.

The results regarding marital status are not expected outcome. In most empirical works, those with married heads are more likely to send their children on schooling than others, since they have the probability of getting income from diverse sources. But the results here show that those households with single/divorced/widowed are more likely to send their children to schooling than married heads, but statistically insignificant except for widowed heads.

The impact of Child's characteristics: Female children's are 2times more likely to combine work and schooling than boys at 10percent level of significance, ceteris paribus, as compared to schooling-only category. This is due to the case for female child domestic work responsibility in the household. In other hand, statistically significant and positive coefficient attached to "sex of a child" variable in the child's time of combining both

work and schooling category suggests that girls tend to combine work and schooling more hours than boys suggesting gender bias. This should not be a surprise given that girls are usually the one to be called up on to take domestic work responsibilities.

According to the result, the age of a child has a positive and strongly significant association with the likelihood that a child participates in labor market (both full-time and part-time). Holding other factors constant, an increase in the age of a child by a year yields a child to participate 5times more likely in full-time work than schooling-only category at 1% level of significance. Similarly an increase in the age of a child by a year increases the RRR of being in the category of combining work and schooling by 46percent at 1percent level of significance, ceteris paribus. These findings are inconsistent with the findings of Yunita (2006) in Indonesia and Rickey (2009) in Philippines.

Educational level of a child has positively and strongly significant association with the likelihood of a child to specializing in schooling as compared to other categories. Taking dummies for the child's relationship with the household head, children who are son/daughter of the head are more likely to specialize in schooling than other relatives and non-relatives. Keeping other factors constant, children who are other relatives (non-relatives) of the head are 6times (67times) more likely to combine work and schooling at 1percent level of significance than children of the head. Similarly, non-relative children's are extremely more likely to participate in work-only category at 1percent level of significance than biological children of the head. This suggests that when it comes to domestic and out-reach work, parents discriminate among children residing in the household on the basis of their relationship with the head or because other members of those households are less likely to be children of school age (increasing the opportunity costs of schooling).

5.1 Conclusions

This study was conducted in accordance with the perception that policies that focus on minimizing the problem of child labor in poor countries should better take into account the impact of income and asset poverty, among others, as root causes of child labor which are prevalent at household level. There are many factors identified as the prime cause of child labor in urban areas broadly categorized into household, parental and individual characteristics.

The findings in the descriptive statistics part indicated that out of the sampled children, the number of children that combine school and work is 97(32.1%) of which male children are 42(43.3%) while female children consisted 55 (56.7%). On the other hand, 47(15.6%) of the sample children were engaged in different works without attending school, and among the surveyed children's one-in-three children start working at or below the age of 5. The findings also shows that children aged between 5 to 17years in Arba Minch town are engaged in family based household chores, family business and other activities that generate income. Female children consist the majority of the children specializing in work accounting 34(72.3%) of total children working-only category as compared to 13 (27.7%) for male children.

The multinomial logit analysis indicated that levels of asset holding in terms homeownership, family per capita income as a proxy for income poverty status of the household, the level of education of household head, household size, ownership of tap water directly in the house, educational level of child and being son/daughter of the household head had a positive impact on children's school enrollment. In contrast, factors that exacerbate child labor in the finding of this study are the number of elders above the age of 60 years, and number of infants in the household, married household head, being a girl and age of a child.

The finding generally indicate that households engaged on stable income generating economic sectors are more likely send their children to schooling. Taking family per capita income as a proxy for income poverty status of the household shows strong support for the luxury axiom of Basu and Van (1998). In addition, house ownership as the wealth status of the household is also significantly affecting the likelihood of child labor. Households with their own house are more likely to send their children to school indicating in bias of wealthier households. In addition, there exists a gender bias as witnessed by the higher probability of girls tend to combine work with schooling than boys.

5.2 Recommendations

Based on the findings of the study, the following directions of action are recommended to minimize child labor problem in the town.

Firstly, that the child schooling variable has significant impact on child labor supply which suggests that making schooling compulsory may be enough to reduce the child labor. On the other hand, a trade-off situation seems to exist between current school attendance and child work. This suggests that education policy targeted towards increasing the supply of schooling facilities could help to reduce child labor. In this regard, the current education policy that targets at increasing primary school coverage should be encourage.

Secondly, since households with casually employed head are more vulnerable to poverty, and thereby increase child labor new development projects should primarily consider the employment and income generating

opportunities of those sections of the society.

Thirdly, the number of infants in the household, as the indicator of higher fertility rate is found to have positive relationship with child labor. Thus family planning, mainly concerned with the spacing and timing of births, may have an important role to tackle child labor in the town.

Fourthly, since significant proportion of families with old age members are found suffering from enormous number of child labor, the government or welfare organizations has to design a strategy to incorporate this section of the society in to welfare benefits (schemes).

Fifthly, the results highlighted the gender differential in work and school participation and identified gender differences in the participation of child labor. This is a useful guide for interventions designed to close the gender gap. Therefore, closing the gender gap would substantially reduce overall child work participation rates. Thus, reducing female child work and increasing female schooling requires effective institutions taking care of very young children like pre-primary schools.

Sixthly, since growth in the income of the poor can go a long way to reduce directly income generating child work, the concerned bodies should give more emphasis for poor households by participating directly them on income generating activities, and strengthening the expansion of house ownership for the poor via the current condominium housing strategy in the study area.

Seventhly, since around 7percent of the children from the surveyed household are engaged in cobblestone activity, the government must establish policy that prohibits the participation of children in such kind of activity. Lastly but most importantly, deeper research concerning child labor is needed to be conducted both at macro and micro level so as to allow empirical evidence for policy implication.

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Appendix I

Appendix 1A: multicollinearity test for independent variables

VARIABLE	VIF	SQRT VIF	TOLERANCE	R-SQUARED
gender	2.56	1.60	0.3904	0.6096
ageHHH	2.02	1.42	0.4950	0.5050
educHHH	2.05	1.43	0.4867	0.5133
occupHHH	1.88	1.37	0.5316	0.4684
marstat	3.57	1.89	0.2799	0.7201
HHsize	76.10	8.72	0.0131	0.9869
no5yrs	7.41	2.72	0.1350	0.8650
no60yrs	3.74	1.93	0.2673	0.7327
houseOwn	1.32	1.15	0.7547	0.2453
sexCH	1.24	1.11	0.8078	0.1922
ageCH	3.79	1.95	0.2639	0.7361
educCH	3.61	1.90	0.2773	0.7227
relHHH	1.36	1.17	0.7361	0.2639
sourcH2O	1.22	1.11	0.8184	0.1816
FamPCI	1.18	1.09	0.8469	0.1531
no5to18yrs	29.16	5.40	0.0343	0.9657
no18to30yrs	31.46	5.61	0.0318	0.9682
no30to60yrs	11.74	3.43	0.0852	0.9148
Mean VIF	**10.30**			

Source: own computation from survey data, 2015/16

Appendix 1B: Correlation coefficients for suspected variables

	HHsize	no5yrs	no5to1~s	no18to~s	no30to~s	no60yrs
HHsize	1.0000					
no5yrs	0.1267	1.0000				
no5to18yrs	0.6692	-0.0959	1.0000			
no18to30yrs	0.5877	-0.0352	-0.0383	1.0000		
no30to60yrs	0.5192	-0.1611	0.4110	-0.0263	1.0000	
no60yrs	-0.0969	-0.1365	-0.2250	-0.0136	-0.1821	1.0000

Source: own computation from survey data, 2013

Appendix 1C: Remedial measure for multicollinearity

VARIABLE	VIF	SQRT VIF	TOLERANCE	R-SQUARED
gender	2.52	1.59	0.3969	0.6031
ageHHH	1.73	1.32	0.5776	0.4224
educHHH	1.99	1.41	0.5028	0.4972
occupHHH	1.85	1.36	0.5407	0.4593
marstat	3.00	1.73	0.3332	0.6668
HHsize	1.40	1.18	0.7133	0.2867
no5yrs	1.17	1.08	0.8583	0.1417
no60yrs	1.67	1.29	0.5989	0.4011
houseOwn	1.22	1.10	0.8195	0.1805
sexCH	1.24	1.11	0.8089	0.1911
ageCH	3.78	1.94	0.2646	0.7354
educCH	3.60	1.90	0.2775	0.7225
relHHH	1.35	1.16	0.7414	0.2586
sourcH2O	1.21	1.10	0.8292	0.1708
FamPCI	1.15	1.07	0.8669	0.1331
Mean VIF	**1.92**			

Source: own computation from survey data, 2015/16

Appendix 1D: Ramsey test for omitted variables

Ramsey RESET test using powers of the fitted values of mactCH

Ho: model has no omitted variables

F(3, 272) = 2.47
Prob > F = 0.0622

Source: own computation from survey data, 2015/16

Appendix 1E: Model adequacy for multinomial logit estimation

MODEL SUMMARY STATISTICS	
Number of observation	302
Wald Chi squared	412.09
Significance level	0.0000
Log likelihood function	-147.86236
Pseudo R2	0.5822

Source: own computation from survey data, 2015/16

Appendix 1F: Link test result for model adequacy

MACTCH	COEF.	STD. ERR.	Z	P>Z	[95% CONF.	INTERVAL]
_hat	.9874435	.2123126	4.65	0.000	.5713185	1.403569
_hatsq	-.0199164	.1384226	-0.14	0.886	-.2912198	.2513869
_cons	.0213492	.275677	0.08	0.938	-.5189678	.5616661

Source: own computation from survey data, 2015/16

Appendix 1G: Heteroskedasticity test for the error term

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of mactCH

Chi2(1) = 0.13

Prob > chi2 = 0.7205

Source: own computation from survey data, 2015/16