Socio-Economic and Demographic Determinants of Children's Primary School Enrollment in Ethiopia

Eshetu Gurmu and Dula Etana
Center for Population Studies, Addis Ababa University

Abstract

Achieving universal primary education is among the development goals that every nation has promised to achieve in 2015. As children's school enrollment is partly dependent on parental decision that considers various factors, this study attempts to examine the effects of socio-economic and demographic characteristics of households on children's primary school enrollment. Using the 2005 Ethiopian Demographic and Health Survey data, a binary logistic regression model was fitted to identify determinants of children's school enrollment. The findings indicate that the increase in the number of siblings decreases the likelihood of children's enrollment in early ages (7-10 years) but increases at later ages. Low socio-economic status of households, loss of mother, and residence in rural areas tend to reduce the likelihood of enrollment whilst those living in female headed households and born to educated parents have higher chances. Findings of the study generally entail the importance of improving household wellbeing to widen the opportunity of children's school enrollment.

Introduction

The multifaceted importance of education in the socio-economic development of a country is well documented (Burney and Irfan, 1995; Iram et al., 2008). At individual level, it enables making informed choices, broaden mental horizons and opportunities to have a voice in public decision making, and better economic returns. Education of children benefits parents through augmenting family income, providing economic support during old age, enhancing social status (Lloyd and Blanc, 1996), improving agricultural productivity (Axinn, 1993) and speeding-up the process of demographic transition (Kravdal, 2002). Females' education, in particular, decreases fertility and mortality via its effect on age at first marriage, knowledge about and acceptance of modem family planning methods, and improvement of the wellbeing of children and their survival (Bongaarts, 2003; Riyami et al., 2004).

Cognizant of its paramount role, achievement of universal primary education (UPE) in 2015 has become one of the United Nations Millennium Development Goals, which Ethiopia is also working towards achieving it. The country has made efforts to improve school enrollment by increasing the proportion of budget allocated to expand primary education. The global monitoring report (UNESCO, 2011), however, noted that a lot has to be done to achieve UPE in Ethiopia as the Country still has more than 2.7 million children out of school. The enrollment of all school age children and their progression to higher grades to complete primary education is curtailed by high dropout rates, regional differences in public participation, and gender disparities.

Available evidences (Burney and Irfan, 1995; Lloyd and Blanc, 1996) indicate that children's school enrollment is not only the function of government initiatives and investment on education but also that of parental decisions to send their children to school. Parents often decide whether to send children to school or not, the age at which they would go to school, and for how long they would stay in the school system. As noted by Pereznieto and Jones (2006), despite allocating resources to expand access to schooling, parental decisions on children's schooling could prevent realization of the anticipated goals. The latter is apparently based on the calculation of the immediate cost and long run benefits of children's schooling, their contributions and costs on household economies, roles in domestic chores and the like. This is found to be important in Ethiopia where the labor intensive agricultural activity is the main source of livelihood for the majority of the country's population, and where child labor has paramount importance in managing family owned business activities (MOFED and UN, 2004).

Given the importance of the demand side determinants of school enrollment and progression to higher grades, this paper attempts to examine the roles of demographic and socio-economic characteristics of households in promoting or retarding the educational outcomes of primary school children in Ethiopia.

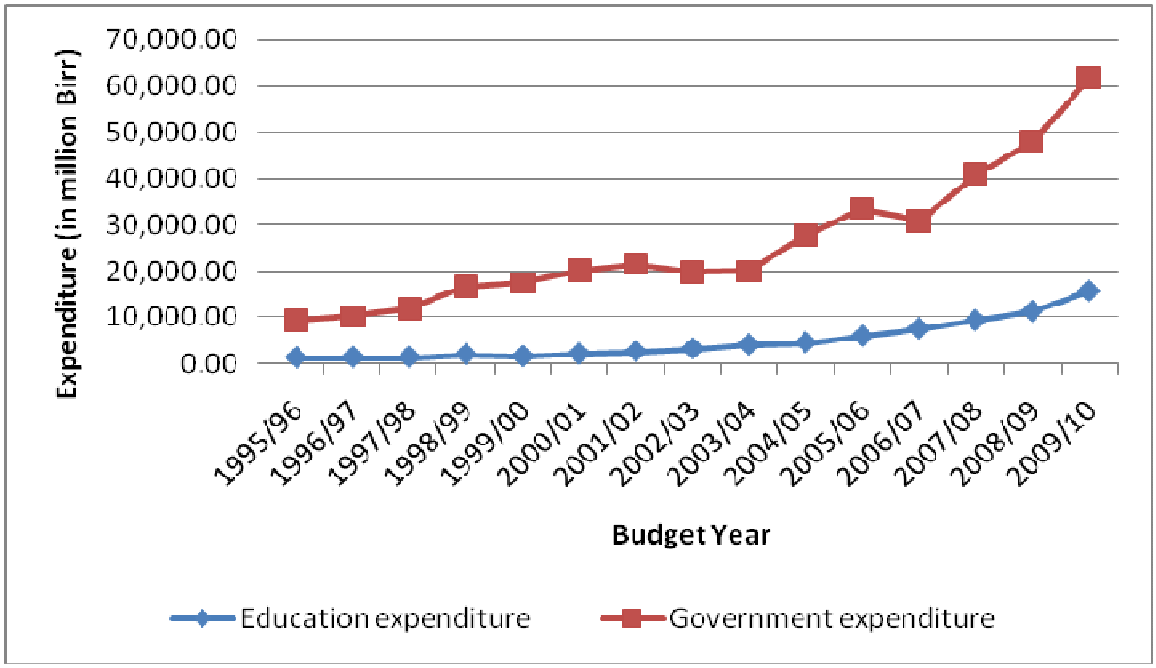
Education in Ethiopia: An Overview

Modern Education in Ethiopia that was started at the beginning of the 20th Century (Amdissa, 2008) has been protracted with multiple problems for longer period. Modern education in the Country, being influenced by foreign scholars, generally lacked responsiveness in the sense that it did not consider the socio-economic and cultural context of the country and the needs of its society (Seyoum, 1996 and Fikre, 2007 cited in Amdissa, 2008). Besides, according to the government of Federal Democratic Republic of Ethiopia, it was not well functioning due to the inadequacies in the number and quality of teachers, educational inputs such as classes, text books, laboratories, libraries, etc. (FDRE, 1994).

Recognizing the magnitude of these education related problems in the past, Ethiopia developed Education and Training Policy in 1994 with the primary objectives of developing the physical and mental potential of individuals who have the necessary capacity to wisely use resources, stand for all-round wellbeing of people, and enhance the development and dissemination of science and technology (FDRE, 1994). In line with this policy, there were also reforms in the structure of the education system. Primary education which lasts for eight years is divided into two: first cycle (grade 1-4) and second cycle (grade 5-8). Its overall goal is functional literacy and preparation for further education and training (Lasonen et al., 2005). The primary education is followed by two years of general secondary education (grade 9-10) and second cycle secondary education (grade 11-12) that prepare students for further education at tertiary level. Students who would not join universities often enroll into the technical and vocational education after completing general secondary education in grade 10. In an attempt to achieve the objectives of primary education, the policy puts emphasis on the professional development of teachers, use of local languages at the first and second cycles of primary education, supply and distribution of educational materials, strengthening of educational organization and management, and education financing (FDRE, 1994).

In order to enhance the achievement of the objectives of the education and training policy in general and UPE in particular, three Education Sector Development Programs (ESDPs) have been developed so far. These three ESDPs covered the period between 1997/98-2001/02, 2002/03-2004/05, and 2005/06-2009/10. The programs generally aimed at addressing problems related to quality, relevance, equity, and efficiency of education; and to expand access with special emphasis on primary education in rural and underserved areas, as well as the promotion of education for girls in an attempt to achieve universal primary education by 2015 (Ministry of Education, 2005).

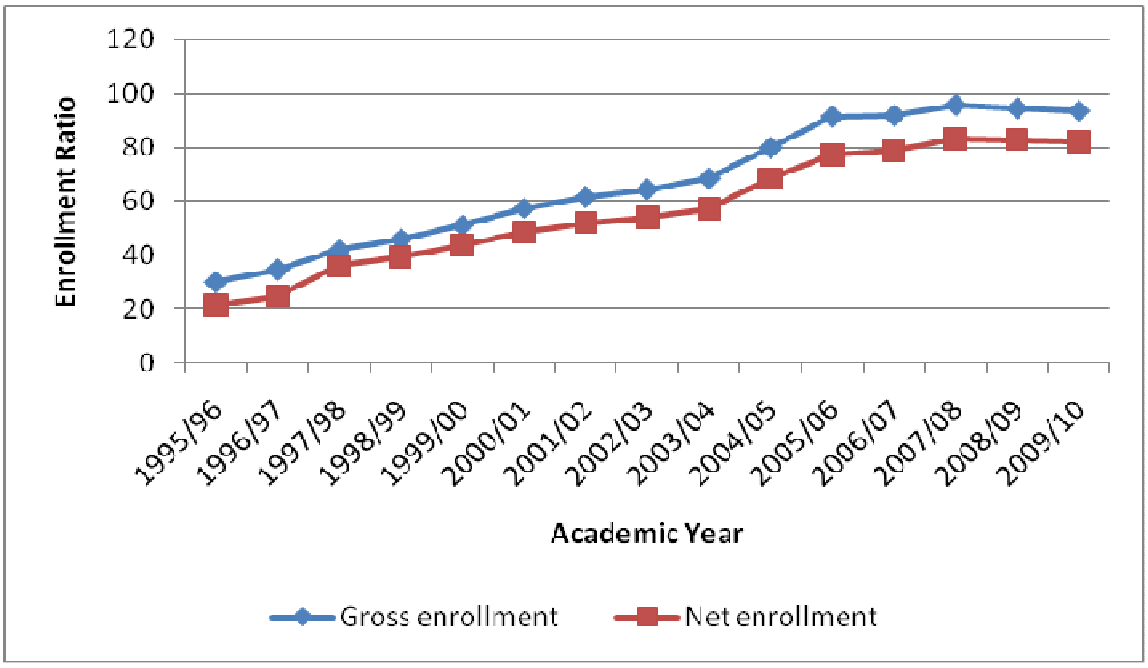
Figure 1: Trends of Education Expenditure in Ethiopia (1995/96 – 2009/10)



Source: Ministry of Education, Education Statistics, Annual Abstracts of Various Years (1995/6 – 2009/10)

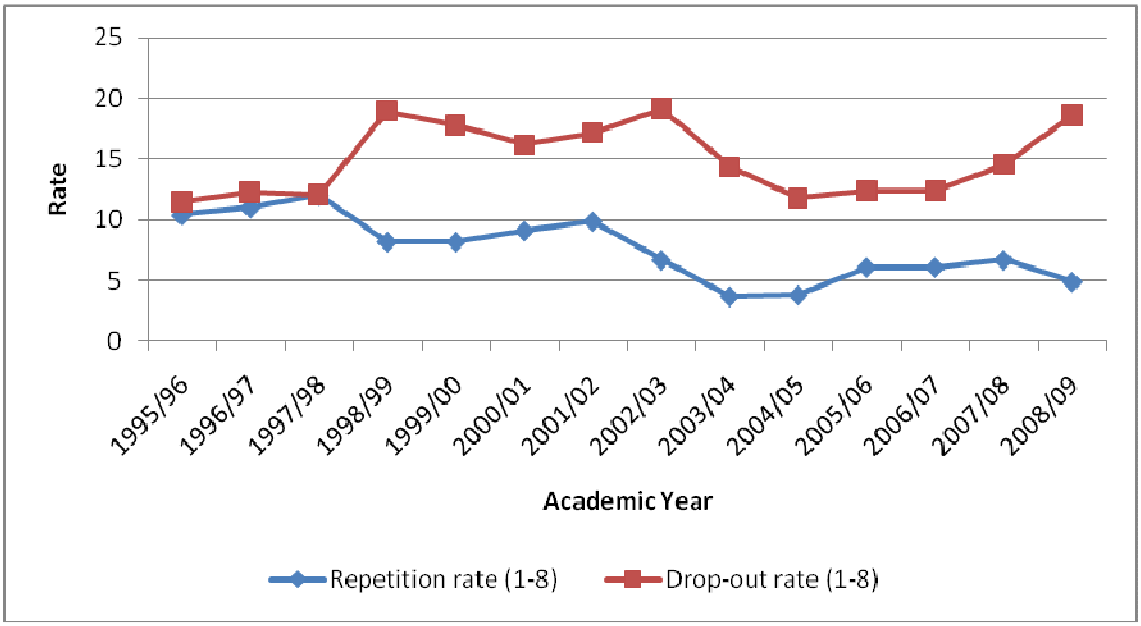
The effort of the country to enhance access to education is manifested through increased allocation of government budget for educational activities. As indicated in Figure 1, the share of education expenditure from the total government expenditure has shown an increasing trend. For instance, the share of education in total government expenditure was 10.4% (2.2 million Birr) in 2000/2001 which increased to 25.4% (15.7 million Birr) in 2009/10. This has resulted in the expansion of schools and increase in the number of teachers in the country. In 1995/96, there were 9,847 primary schools in the country which increased to 11,780 schools at the turn of the 21st century. In the past ten years, the number of schools increased by 128% to reach 26,951 primary schools in 2009/10 (Ministry of Education, 2010). Likewise, the number of teachers in primary schools has increased by 186% from 102,121 in 1995/96 to 292,130 in 2009/10. First cycle primary schools were the most beneficiary of such huge allocation of resources (Ministry of Education, 2010).

Figure 2: Trends of Gross and Net Enrollment Ratios in Primary Education (1-8) in Ethiopia (1995/96 – 2009/10)



Source: Ministry of Education, Education Statistics, Annual Abstracts of Various Years (1995/6 – 2009/10)

Figure 3: Trends of Repetition and Drop-out Rates in Ethiopia (1995/96 – 2008/09)



Source: Ministry of Education, Education Statistics, Annual Abstracts of Various Years (1995/6 – 2009/10)

The increase in the number of schools and teachers has yielded dramatic increase in primary school gross enrollment ratio. As shown in Figure 2, the gross enrollment ratio increased from 34.7% in 1996/97 to 93.4 in 2009/10. Similarly, net enrollment ratio increased from 24.9% to 82.1% during the same period. Both gross and net enrollment ratios are particularly the highest in first cycle primary schools.

Despite the tremendous progress in expanding primary education at the national level, there are also challenges and issues to be addressed to achieve UPE in Ethiopia. Firstly, though the gender gap in primary education is getting closer, there is still disparity in primary school enrollment rate. For instance, in 2009/10, the gross enrollment rate of primary education was 97% for males while it was 90% for females. Similarly, net enrollment rate of females was 81% compared to 84% for males (Ministry of Education, 2010). Secondly, as shown in Figure 3, the drop-out rate of primary school students tends to rise during the last four years while the repetition rate in primary school remains to be constant with slight rate of decline. Thirdly, there is substantial disparity between regions in terms of gross and net enrollment ratios. While Tigray and Amhara regions have the highest gross and net enrollment ratios, such figures are observed to be relatively low in SNNPR and the lowest in Somali region (Ministry of Education, 2010). There is also considerable variation in school enrollment between urban and rural areas. This is exceptionally large in Ethiopia (World Bank, 2005). While nearly equal percentage of male and female students in urban areas are enrolled to primary schools (50.6% of males and 49.4% of females), the percentage of female students in rural areas that were enrolled to school in 2009/10 was less than their male counterparts by 6.2% with respective figures of 53.1% and 46.9% (Ministry of Education, 2010). Given the expansion of schools and the increase in the number of teachers due to concerted effort of the government to ensure access to education, these problems call for analysis of demand side determinants of schooling that are equally important to ensure the achievement of UPE.

Theoretical considerations

As noted above, the enrollment of children to school, the age of entry, and the duration of stay in the school system is not only the function of government's policy but also parent's decision. Even if a greater proportion of parents want to enroll their children to school, their decision, in most of the cases, is based on the consideration of a range of factors that influence the current and future economic wellbeing of family members (Buchmann, 2000; Pal, 2004; Marteleto, 2010). Various theoretical perspectives have been developed in the past to examine multiple factors that influence children's schooling. One of these frameworks often used for the analysis of broader factors of school enrollment is the human capital model.

Based on the arguments of Becker and Tomes (1986), the human capital model focuses on intergenerational mobility of education to discuss about children's education in relation to family decisions of resource allocation that determines investment in human capital. The model indicates that parental decision to educate children is dependent on the expected return to child education and the cost of sending children to school (Morduch, 2000; Pal, 2004). Because of altruism, parents care about their children and the decision to invest in children's education is based on the consideration of maximization of resources and redistribution among family members based on their preferences (Becker and Tomes, 1979 cited in

Morduch, 2000). With the objective of increasing family resources and enhancing the wellbeing of all family members through distribution of the resources, parents differently invest on children's education based on the differing perception of returns to schooling so that some children benefit from educational decisions while others not (Lloyd and Blanc, 1996; Ota and Moffatt, 2007). The pattern of decision making is influenced by varying socio-economic and demographic characteristics of parents and children, which in turn result in differential human capital investment.

The decision to enroll children to school is dependent on educational level of parents or household heads. Studies generally show that the likelihood that a child is enrolled to school and progresses to higher grades increases with increase in the level of education of parents or household heads (Lloyd and Blanc, 1996). The likelihood that children are enrolled to school is also dependent on the respective sex of a household head. The micro analysis of the determinants of children's schooling in Urban Pakistan, for instance, showed that among male household heads, only 40% of them sent all their children to school while the figure is 49% for female household heads (Hamid, 1993). Similarly, while a substantial percentage of male headed households had at least one child not in school, the figure drops to 51% for female-headed households indicating that the latter are more enthusiastic to enroll their children to school.

According to the family-economy hypothesis, limited family resources constrain poor parents not to play altruistic goals for their children (Morduch, 2000). The hypothesis indicates that the decision of parents to enroll their children to school depends on the analysis of the immediate and future needs of the family. While relatively better-off parents can cope-up with the current costs associated with sending children to school, poor parents can not afford the same if enrolling children to school with the objective of ensuring maximum future return negatively affects the current wellbeing of family members. In such conditions, parents may decide to use child labor as a survival strategy to supplement family income engaging in various productive activities at the expense of the child's educational development.

The demographic characteristic of households is also among the factors that influence the decision of parents on children's schooling. In this regard, the siblings' resource-dilution hypothesis (Blake, 1985) explains the pattern of interaction between sibling size, family resources, patterns of parental allocation of resources, and children's educational outcome. This hypothesis argues that parents do not only differ in their possession of resources which are important for children's schooling but also with regard to the number of siblings among whom the resources are to be divided. Consequently, the likelihood of school enrollment is generally low for children born to parents with many siblings compared to their counterparts. However, empirical evidences that examine the determinants of school enrollment based on sibling resource-dilution hypothesis show contrasting results. For instance, studies conducted in Philippines (DeGraff et al., 1996), Malaysia (Shreeniwas, 1997), and Brazil (Marteleto, 2010) found better educational outcome of children from smaller families compared to those living in larger families. On the other hand, studies undertaken in Kenya (Gomes, 1984), Botswana (Chernichovsky 1985), and Nigeria (Akpotu et al., 2007) showed positive and significant relationship between the number of siblings and investment in children's education. While the former findings are attributable to dilution of parental resources with

increase in the number of siblings, the latter is associated with the resource producing activities of children (Marteleto, 2010).

Given the indispensible role of parents in supporting children that enable them not only to be enrolled to school but also to succeed in the school system, the loss of either or both of the parents is another channel through which the pattern of allocation of household's resources influences investment in children's human capital. The death of either of the parents results in differential valuing of the importance of education and hence differential educational outcome. However, the impact of parental loss on children's education varies based on the sex of a child and the loss of either a father or a mother. It is commonly argued that female children bear the disproportionate share of the effects of parental death particularly maternal death due to their expected role of assuming domestic responsibilities. The effect of the loss of either a father or a mother on school enrollment, however, varies. While parental death is more detrimental for children's schooling in some cases (Case et al. 2004), maternal death is observed to have greater impact in others (Gertler et al., 2004); and still no systematic relationship is observed in some studies (Lloyd and Blanc, 1996).

Pertinent to the fact that parents give much value to the welfare of their entire family than individual welfare and the non-existence of formal social security scheme during the old age that force parents to count on their children for the support at later ages, the human capital model is argued to be very important in developing countries (Morduch, 2000). This theoretical basis is used to assess the parent-related characteristics that determine children's schooling in Kenya (Buchmann, 2000), Indonesia (Gertler et al., 2004), India (Ota and Moffatt, 2007), Philippines (DeGraff et al., 1996), Ghana (Gage, 2005), Nigeria (Akpotu et al., 2007), and Albania (Picard and Wolff, 2008). Since all the human capital development related factors mentioned above are highly interdependent and influence the decision of parents to send their children to school, the simultaneous consideration of all predictors is believed to provide a holistic picture of the determinants of children's school enrollment in Ethiopia. The inconclusive argument of the relationship between household's demographic and socio-economic characteristics and chances of children's schooling also calls for testing the hypotheses in the Ethiopian context where child labor is required for household economies and family size is large due to high fertility rate.

Data and methods

The data used for this study is obtained from the Ethiopian Demographic and Health Survey (EDHS) conducted in 2005. It is a nationally representative household survey that collects data on demographic and socioeconomic characteristics of households in many developing countries including Ethiopia. The current enrollment status of primary school age children (i.e. 7 – 14 years) is used as a dependent variable. The independent variables considered in the analysis include age and sex of a child, sex of household head, educational level of household head, socio economic status of the household, number of primary school age competing siblings in the same household, parental survivorship status, region, and rural/urban place of residence.

Since data on income or consumption were not collected, ownership of various assets and household characteristics are used as proxy indicator of household's wealth or socio-economic status. From the household's report, six variables (namely source of drinking water, main roof and floor materials, ownership of working radio, type of toilet facility, and whether a household has separate room used as a kitchen) were used to determine the status of a household. The responses of households for these six questions were aggregated into an index to measure their respective socio-economic status, which is assumed to be a good proxy indicator of household wealth (Filmer and Pritchett, 1999; Rose and Al-Samarrai, 2001; UNESCO, 2005).

Descriptive statistics are used to indicate the patterns and levels of children's enrollment by different socio-economic and demographic characteristics, whilst binary logistic regression model is applied to examine the effect of these variables on children's school enrollment. Due to small number of cases included in Afar, Gambella, Benishangul Gumuz and Harari regions and the dominance of urban residents in Addis Ababa and Dire Dawa city administrations, only five regions (Oromia, Amhara, SNNP, Tigray, and Somali) that comprise over 80% of the Ethiopian population (CSA, 2010) are included in the analysis. Consequently, we believe that results of this study will presumably reflect the socio-economic and demographic determinants of primary school enrollment in Ethiopia.

Results

Despite improved access to primary schools (Ministry of Education, 2005), substantial number of children were not going to school. According to the results of household data collected during the 2005 EDHS, slightly more than half (53.5%) of the school age children were not enrolled to school (Table 1, Panel I). Among those enrolled, only 2.3% dropped out of school as current primary attendance rate is 44.2% (Table 1, Panel II and III). This, however, does not guarantee that every child enrolled to primary school was consistently attending classes as readmission to the system is not controlled. Either due to late entrance to the school system or failure in educational achievement, progression to second cycle of the primary school (i.e. grade 5-8) is very low. Only three-fifth (60.2%) of children in the 11-14 age groups was observed to ever attend schooling. Moreover, the data reveal that only 17.4% of the children in the upper primary school age have completed grade 4 in accordance with their age indicating that either children are enrolled to school at later ages, dropout of school shortly, or repeat classes besides never been to school at all.

Age of child

Models fitted to show both gross and net effects of children's age on school enrolment showed that as age of a child increases, the likelihood of enrollment to primary school significantly increases among children in the lower primary age group (i.e. 7-10) irrespective of sex. But the effect is getting diminished and insignificant among those in the upper primary age group (i.e. 11-14 years). This may partly be due to the fact that parents decide to send their children to school at later ages when the older ones start to support the family in various forms which in turn reduces parental expectations from those attending schools. Such late enrollment to school, nonetheless, contributes to the high wastage of human capital particularly in developing countries where the increase in the value of a child's time with age would result in considerable

loss of wealth (Fentiman et al., 1999). Besides, late enrollment of children to school increases the likelihood that they will drop out before completion (UNESCO, 2005). Specifically, late enrollment is very costly for girls as they are more likely to be withdrawn from school when they reach puberty due to early marriage and fear of premarital pregnancy (Rose and Al-Samarrai, 2001). Their attendance of lower grade does not favor their stay in the school given a higher risk of premarital pregnancy and loss of virginity by then.

Table 1: Percentage distribution of children enrollment in primary school by background characteristics and age group

Variables	Classifications	7-14				11-14		
		N	Never Enrolled	Drop outs	Currently Enrolled	N	Ever attended	Completed grade 4
			I	II	III	IV	V	VI
Sex of child	Male	5512	52.5	2.5	44.9	2417	62.8	18.8
	Female	5130	54.5	2.1	43.5	2275	57.4	16.0
Sex of HHH	Male	8703	54.2	2.1	43.6	3763	59.5	16.7
	Female	1939	50.1	3.0	46.8	929	62.9	20.5
Educational level of HHH	Illiterate	7220	58.8	2.2	38.9	3462	54.1	13.0
	Primary	2462	42.3	2.6	55.1	1011	75.5	23.5
	Secondary	439	21.9	2.1	76.1	210	87.1	60.3
Socio-economic status	Poor	7737	61.0	2.1	37.9	3351	53.1	11.2
	Medium	2431	39.5	3.0	57.5	1101	75.8	27.5
	Rich	384	10.7	2.3	87.0	203	93.6	67.6
Number of competing sibling	None	2227	53.4	2.2	44.4	898	59.0	19.2
	One	3487	51.2	2.2	46.6	1483	61.6	16.5
	Two	3131	52.2	2.7	45.2	1453	62.1	17.6
	Three and more	1797	60.3	1.9	37.7	858	55.7	17.0
Parental survival	Both alive	9112	53.6	2.2	44.2	3861	61.0	17.6
	Mother died	422	53.6	2.4	44.1	220	55.5	14.8
	Father died	888	52.3	3.0	44.7	483	58.0	17.7
	Both died	166	51.2	3.0	45.8	101	53.5	18.6
Place of residence	Urban	928	21.7	2.4	76.0	467	87.2	54.5
	Rural	9714	56.5	2.3	41.2	4225	57.2	13.4
Region	Tigray	1513	46.5	3.0	50.4	679	61.9	20.8
	Amhara	2355	45.1	2.0	52.9	1081	63.8	20.8
	Oromia	2845	49.0	2.7	48.3	1259	67.3	18.8
	Somali	1230	83.5	1.1	15.4	496	23.4	7.7
	SNNP	2699	55.7	2.3	42.0	1177	63.8	15.1
Total		**10642**	**53.5**	**2.3**	**44.2**	**4692**	**60.2**	**17.4**

Source: Computed by authors

Sex of child

Though considerable variation is not observed by sex of children, the percentage of males who attended schooling and completed grade 4 is slightly higher than females. The percentage of female children currently enrolled to lower level of primary school is 43.5 whilst the figure is 45% for males. Similar trend is also observed among those aged 11 to 14. There is no

statistically significant difference in enrollment to primary school among female children of lower primary age group though the chances of enrollment significantly reduces by 19% for females of upper primary age group compared to males in the same group. This lower school enrollment of females to upper primary school could be attributable to excessive domestic responsibilities, getting prepared for marriage than attending schools, and migration in search of wage employment (Fentiman et al., 1999). A study conducted on the relationship between household constraints on children's schooling showed that there were significant differences in the burden of work on girls compared to boys in Ethiopia (Rose and Al-Samarrai, 2001). While boys usually work on the farm, girls are engaged predominantly in domestic activities. Therefore, as these domestic chores are indispensible for the wellbeing of the entire family, it is possible to argue that high opportunity costs of girl's education result in lower enrollment rate.

Sex of household head

Pertinent to more investment on child schooling by mothers than fathers (Gertler et al., 2004), enrollment rate is higher among children living in female headed households than male headed. While half of the children living in female-headed households were not enrolled to school, the figure is 54% for children living in male-headed households. As shown in Table 1 panel III, the percentage of children enrolled to lower level primary school is slightly higher (47%) among those living in female headed households than the male headed counterparts (44%). Although the proportion of children who completed grade four is higher (20.5%) among female headed households, dropout rates is also higher (3.0%) slightly more than the national average (2.3%) and those living in male headed households (2.1%) (Table 1 panel II). In all of the models fitted to assess the effect of sex of household head on children's schooling, female headed households are observed to send their children to school more often than those households headed by males. For instance, the chance of school enrollment among children living in female headed households increases by at least 21% ($p<0.01$) for children in the lower primary school age, whereas the effect goes to the extent of 57% ($p<0.001$) higher among those attending the upper primary school compared to those residing in male headed households.

Number of competing siblings

Number of competing siblings has shown slight variation in attending primary schools though the pattern was inconsistent with regard to completion of grade 4 at least by age 11. With three or more number of competing siblings in a household, however, the percentage of never-enrolled children is the highest and current and ever school attendances are the lowest. Similarly, slight variation in current school enrollment is observed among children living in Amhara (52.9%), Tigray (50.4%), Oromia (48.3%) and SNNP (42.0%) regions though the prevalence is considerably lower in Somali region (15.4). Similarly, enrollment to primary school and completion of grade 4 is the lowest in Somali region among children of upper primary age group.

Contrary to the hypothesis which indicates that increase in the number of siblings reduces children's schooling, the increase in the number of competing school age siblings has not shown consistent negative effect. Before controlling for the effects of other variables, an

increase in the number of competing siblings seems to decrease the chances of enrollment in primary school (Table 2 panel I). The effect is in the expected direction among children of early primary school age and males though it does not follow the same pattern for females. Among children of lower primary school age, the presence of two competing siblings reduces the likelihood of current school attendance by 16% whereas the presence of three and more siblings decreases by 30% ($p<0.001$). As opposed to this, the chances of enrollment in primary school have been significantly increased with increase in the number of competing siblings among children of upper primary school age. At this age, compared to children with no competing sibling, the chances of current school attendance significantly increase by 26%, 34%, and 55% when the number of competing siblings correspondingly increases to one, two, and three and more, respectively.

Parental survivorship

The distribution of school age children by parental survival status does not show consistent pattern. Accordingly, insignificant variation in current school attendance was observed between those children whose both parents survived or either of them died at the time of the survey. Ever school attendance, however, is relatively higher for those children whose both parents survived (Table 1, Panel V). On the contrary, for children whose both parents were not alive at the time of the survey, never enrollment is relatively lower (51.2%) while current school attendance (45.8%) and grade 4 completion rate (18.6%) are higher.

Similarly, results of multivariate analysis have not shown consistent effect of parental survivorship on enrollment of children to primary school. When the effects of other variables are kept constant, parental survivorship status has shown statistically significant differences in models fitted for children of upper primary school age (11-14 years), females and both sexes but children of lower primary school age (7-10 years). Chances of enrollment are significantly lower at least by 27% ($p<0.001$) among children who lost their mothers in all but children of lower primary age group. Death of father does not have statistically significant effect on males and children of early primary age group. However, death of father and both parents is observed to suppress the chances of school enrollment among females and children of upper primary school age. The multivariate analysis clearly shows that chances of school enrollment is lower among females, children of both sexes, and children of upper primary age group as a result of mother's death than fathers.

Household economic status

Substantial variation in children's primary school enrollment is observed by socio-economic status of respective households. Nearly 9 out 10 (87%) of the primary school age children living in economically better off households were currently enrolled to school while only 37.9% and 57.5% are respectively enrolled among households belonging to the poor and medium socio-economic status (Table 1 panel III). Similarly, the proportion of children who completed grade 4 is the highest (67.6%) among the economically better off households while it is the least (11.2%) among the poor (Table 1 panel VI). Ever enrollment to primary school is also the lowest (53.1%) for children living in poor households compared to 93.6% of those living in economically better off households (Table 1 panel V).

Table 2: Logistic regression results on children's current school attendance by sex and age group of children, EDHS 2005

Variables		Gross Effect		Both Sexes		Male		Female		7-10		11-14	
		I		II		III		IV		V		VI	
		SE	*Exp(B)*	*SE*	*Exp(B)*	*SE*	*Exp(B)*	*SE*	*Exp(B)*	*SE*	*Exp(B)*	*SE*	*Exp(B)*
Age	Age	0.01	1.28***	.08	4.36***	0.11	3.61***	0.12	5.56***	0.42	11.67***	0.65	2.59
	Age square			.01	.094***	0.01	0.95***	0.01	0.93***	0.02	0.89***	0.03	0.97
Sex of child	Female	0.03	0.93*	.04	.090***					0.05	0.98	0.05	0.81***
	Male (ref)												
Sex of HHH	Female	0.04	1.11*	0.06	1.36***	0.08	1.35***	0.08	1.37***	0.08	1.21**	0.08	1.57***
	Male												
Educational level of HHH	Illiterate (ref)				1.00								
	Primary	0.04	1.69***	0.04	1.74***	0.06	1.90***	0.06	1.57***	0.06	1.74***	0.07	1.74***
	Secondary	0.09	4.90***	0.12	2.67***	0.16	3.54***	0.16	1.95***	0.15	3.11***	0.19	2.29***
Socioeconomic status	Poor	0.04	0.51***	0.04	0.61***	0.06	0.67***	0.06	0.54***	0.06	0.62***	0.06	0.57***
	Medium (ref)				1.00								
	Rich	0.14	5.89***	0.17	2.14***	0.23	2.08***	0.26	2.29***	0.21	2.41***	0.29	1.94*
Number of competing sibling	None (ref)												
	One	0.04	1.13**	0.05	1.11**	0.07	1.17**	0.07	1.04	0.07	1.02	0.07	1.26**
	Two	0.04	1.05	0.05	1.02	0.07	1.06	0.07	097	0.07	0.84†	0.08	1.34***
	Three and more	0.05	0.91†	0.06	1.03	0.08	0.97	0.09	1.09	0.09	0.70***	0.09	1.55***
Parental survival	Both alive (ref)												
	Mother died	0.06	0.99	0.07	0.71***	0.10	0.73***	0.10	0.67***	0.11	0.76*	0.09	0.66***
	Father died	0.08	0.90	0.09	0.77***	0.12	0.96	0.13	0.59***	0.13	0.97	0.12	0.66***
	Both died	0.13	0.92	0.15	0.52***	0.22	0.53***	0.21	0.51***	0.24	0.84	0.19	0.41***
Place of residence	Rural (ref)												
	Urban	0.08	6.39***	0.10	3.54***	0.15	3.68***	0.14	3.41***	0.13	3.69***	0.17	3.31***
Region	Tigray	0.07	1.19**	0.07	1.23***	0.10	1.01	0.11	1.53***	0.09	1.67***	0.11	0.86
	Amhara	0.04	1.22***	0.05	1.48***	0.06	1.13†	0.07	1.99***	0.06	1.83***	0.07	1.18**
	Oromia (ref)												
	Somali	0.10	0.19***	0.12	0.16***	0.15	0.17***	0.18	0.15***	0.17	0.19***	0.16	0.13***
	SNNP	0.04	0.74***	0.05	0.69***	0.06	0.77***	0.07	0.61***	0.07	0.56***	0.07	0.85*
Constant				0.43	.001***	0.59	0.01***	0.63	0.01***	1.78	0.00***	4.02	0.003
Number of cases		10620		10513		5437		5076		5879		4634	
-2 Log likelihood				19268.027		9945.617		9201.282		10150.709		8907.262	

ref – reference category

*** P< .001 ** P< .01 * P< .05 †P< .1

Controlling for the effects of other variables, socioeconomic status of a household, which is used to capture the impact of resource constraint on children's schooling, has shown a direct and significant effect on the chances of enrollment to primary school. Male children from rich households have 1.1 times higher chances of school enrollment as compared to those living in medium socio-economic status. The effect is also 1.3 times higher for females. Thus, low socio-economic status of households seems to adversely affect female children's chances of school enrollment than males. The likelihood of current school enrollment decreases by 46% ($P < 0.001$) among females living in poor households while the chance of school enrollment is reduced by 33% ($p< 0.001$) among males living in same household (Table 2 panel III and IV).

Education of household head

Three-fifth (59%) of children living in households headed by those who could not read and write were never enrolled to school. Ever school attendance is 54% for this group along with only 13% of successful completion of grade 4 (Table 1 panel V and VI). When the head's educational level increases to secondary and above, ever school attendance mounts to 87% and grade 4 completion increases to 60%. Holding other variables constant, a strong statistically significant positive relationship is observed between chances of school enrollment and educational level of household heads. For school age children of both sexes, and children in lower and upper primary school ages, the likelihood of current school enrollment increases by at least 57% ($p<0.001$) when the head has primary level education compared to heads having no education; and the effect is respectively 1.7, 2.1, and 1.3 times higher for household heads having secondary education and above when compared to the illiterates (Table 2 panel II, V, VI). The benefit of male and female children has also increased as the level of household head's education increases though the chance of school enrollment is relatively lower among females (Table 2 panel III and IV).

Region and place of residence

Probably due to physical proximity, never enrollment is low (22%) in urban as compared to 57% in rural areas (Table 1 panel I). Following similar trends, 87.2% of those aged 11 to 14 years ever attended schooling in urban areas while only 57% of those from rural areas did so (Table 1 panel V). On the other hand, 55% of the children living in urban areas have completed grade 4 while only 13% of those living in rural areas have managed to achieve such level of education. Results of multivariate analysis also revealed that children residing in urban areas have at least 2.3 times ($p< 0.001$) higher chances of enrollment to primary school when compared to those living in rural areas (Table 2). The low likelihood of schooling for children from rural areas could partly be related to the relatively longer distance from schools, high opportunity cost of children's schooling, lower parental perception and value of children's education.

Statistically significant variation in primary school enrollment is also observed by regions. Compared to children residing in Oromia region, a sub-nation with the largest population size, those residing in Somali and SNNP regions have statistically significantly lower chances of enrollment in schools while the reverse is true among those living in Amhara and Tigray regions. Different pattern is, however, observed among children of Tigray region in upper primary age group where the chances of enrollment to primary school are lower though not statistically significant (Table 2). The very lower chance of enrollment of children to primary school in

Somali region is partly attributable to the pastoral mode of life and little value given to education.

Discussion

The future development prospect of a given country in general and the quality of individuals' life in particular seems to be determined by educational attainment, which is one of the basic indicators of human capital (Burney and Irfan, 1995; Pal, 2004; Iram et al., 2008). Available evidences show that children of well educated, economically better-off parents and residing in urban areas have more chances of attending schooling than their counterparts (UNESCO, 2005). Other things remain constant, economic capacity to afford costs of schooling, knowledge about benefits of education and proximity to schools seem to determine chances of enrollment among children of school age in Ethiopia. Although the Government of Ethiopia has been intensively working to increase access to primary education in all parts of the country, a lot of children have never been to school and those enrolled are not fully retained in the school system. Socio-economic, demographic and cultural factors appear still to play significant roles in determining the chances of school enrollment among children of primary school age in Ethiopia.

Female headed household heads contribute more to the attainment of children's education: Educational level of parents or household heads is supposed to determine the participation of children in schooling (UNESCO, 2005). Consistent with other finding (Rose and Al-Samarrai, 2001), the results of this study reveal that female household heads favor the education of either sex of children nearly equally besides sending their children to school more often than those households headed by males. This indicates that female household heads are more likely to invest resources (time, money, and emotional support) in children's schooling (Lloyd and Blanc, 1996) with the presumption that educated children are less likely to become poor adults in addition to securing their own old-age support (Pereznieto and Jones 2006). The result is consistent with the findings of the analysis made in seven sub-Saharan Africa countries and India that indicate wider chances of school enrolment among children residing in female-headed households (Lloyd and Blanc 1996; UNESCO, 2005).

Positive relationship between educational attainment of household head and children's school enrollment: The positive relationship between chances of school enrollment and educational level of household heads implies that the taste for child schooling and the capacity to supervise success in children's schooling is partly a function of parent's education. According to Hamid (1993), Burney and Irfan (1995), Sengupta and Guha (2002) and Pal (2004), parental education affects children's schooling through its positive relationship with income and positive attitude of parents towards schooling. Educated parents mainly support schooling of their children since they can easily recognize the long term benefits of education and obtain high level of satisfaction from their children who acquire better education (Pereznieto and Jones, 2006). Educated parents often neglect traditional values that undermine the academic potential of girls and the belief that girl's education is not directly beneficial to parents (Rose and Al-Samarrai, 2001). As argued by UNESCO (2005), the positive and statistically significant relationship between educational level of household heads and children's education clearly indicates the intergenerational effect of investment in education. Educated parents, even if they have constraint of resources, are more likely to have the perception of higher return from schooling that encourage their children not only to enroll but also progress to higher grades (Pal, 2004).

***Children's school enrollment is partly a function of household wealth*:** Children born to better off households are observed having higher chances of enrollment in primary school. Moreover, they are exposed to timely enrollment to school, lower risk of drop-out, and higher chances of progression to higher grades. Possibilities of hiring labor to undertake domestic chores and other household activities such as farming and running family business might be a possible explanation for giving more chances to children's education. Unlike this, the poor may keep their children out of school either to make use of their labor and get them employed somewhere to generate additional income to support the family as their immediate family needs take precedence over the expected benefits of education in the future (Sengupta and Guha, 2002). The strong relationship between low household income and poor nutritional status may also force children either not to be enrolled to school or to drop-out of school shortly after admission. Results of this study is also consistent with findings obtained in Ghana (Fentiman et al. 1999) that showed that poor parents could not afford to send their children to school due to economic reasons. Being dependent on child labor to contribute to household income, poor households have shown the tendency of sending their children to school during the first few years of schooling but withdraw them from school when they become mature and physically capable to support household economy. Similar to the results obtained by Rose and Al-Samarrai (2001), the findings of this study have also demonstrated that when parents perceive opportunity costs of sending all children to school due to income/ labor contribution foregone as a result of their school attendance, they usually make selection between them (Rose and Al-Samarrai, 2001). Females, who are perceived to have lower academic potency and returns to education, are thus victimized. Among these households, young sons are also observed going to school late to minimize the perceived opportunity costs.

Parental survivorship particularly that of mothers appears to have noticeable effect on children's school enrollment: The educational effects of loss of both or either of the parents on children's schooling can be seen from two perspectives. First, although the effect cannot be generalized, the low school enrollment of children who lost their parents can be attributed to poverty (Ainsworth and Filmer, 2002). The death of a parent who immensely contributes to household income often results in resource scarcity that urges children to engage in income generating activities to support themselves or other family members. Such participation in the labor force, however, is at the expense of school attendance. Secondly, death of father and mother in most of the cases force children to live with distant relatives who want them contribute labor to the household than attending school. Whilst analyzing the relationship between parental death, poverty and school enrollment, Case and Colleagues (2004), for instance, arrived at the conclusion that school enrollment of orphans in Africa is highly dependent on the closeness of biological ties between a child and the relatives which governs the altruistic behavior of the later. In both cases, loss of parents affects children's education through diminution of financial resources and parental involvement, change in the preference of a household for the quality of children, psychological costs associated with death of a parent, increase in opportunity cost of child's time to care for patient parent or replace the deceased in different economic activities (Ainsworth et al. 2005; Kobiané et al., 2005).

Owing to the tendency of mothers to invest more on children than fathers, Gertler and Colleagues (2004) argued that death of mothers highly affects investment in children's education than that of fathers. They generally found out that loss of a parent, particularly a mother, forces eldest daughters to drop out of school than sons when they have younger siblings due to reasons

associated with taking the responsibilities of looking after the young and household works. The adverse effect of parental/maternal death on girl's education is, however, more severe as girls need emotional and social support to pursue their education under the custody of parents. The fact that males are traditionally perceived to be more important to support surviving parents in old age or believed to have higher return to education is also another factor to suppress girl's education when resources are scarce due to parental loss. The culturally ascribed role of females to look after younger children increases the opportunity cost of female's education and reduces their enrollment upon mother's death. In households that lost either of the parents, sisters with many brothers are also less likely to be enrolled in school as they are expected to carry the burden at household level.

Competition among school age siblings does not show consistent effect: As observed in the results of multivariate analyses, the increase in the number of competing siblings decreases the likelihood of school enrollment among lower primary school age (7-10 years) but increases the chances of school enrollment in the upper primary school ages (11-14 years). Similar to the suggestion made by Marteleto (2010), the former indicates that large number of siblings or close spacing among siblings dilutes parental resources in terms of their time, attention, and money available per child. This indicates that with increase in the number of siblings, parents are supposed to give less support and consideration to the learning opportunities and outcomes of their children. In this respect, parents often decide to allocate resources only to those who have the highest perceived rate of potential returns. Similarly, Ota and Moffatt (2007) argue that the competition between siblings for resources is based on gender differences. According to them, daughters in general and elder sisters in particular are victims of resource constraints as priority is often given to sons. This is because of the fact that boys compete among themselves while girls compete first with brothers and then with sisters. Far beyond this, the responsibility of girls' to care for younger siblings also reduces their enrollment to school (Sengupta and Guha, 2002). It is thus possible to argue that if a given child's ability to contribute to the wealth of a family is important to determine his/her chances of schooling, siblings living in large household would be under greater competition to gain the decision of parental investment for schooling.

Contrary to what is stated above, the chances of enrollment have been significantly increased with the increase in the number of competing siblings among children of upper primary school age. Similar study by Rose and Al-Samarri (2001) in Ethiopia also found that both boys and girls are more likely to attend and complete schools when the number of children in the household is larger. The positive relationship between school enrolment and number of competing children is also documented in India (UNESCO, 2005) and Brazil (Marteleto, 2010). The increase in possibilities of school attendance among large number of competing siblings may be attributed to the spread of household works among many children who would discharge their responsibilities without necessarily affecting their school time. In addition, engagement in resource generating activities by some of the siblings may free others and thus reduce the opportunity cost of their enrollment to school.

***Enrollment rate is the highest among children living in urban areas though slight variation is observed by region*:** The lower chance of school enrollment in rural areas of the country is a function, among other things, of the lowest value given to education and the means of living in rural settings. Rural parents in general tend to outweigh the direct and indirect foregone earnings that results from sending children to school. Besides, the labor intensive agricultural activities in

rural areas increase the opportunity costs of children's education. Hence, rural parents usually prefer the involvement of their male children in various productive activities to schooling as the former has an immediate economic response compared to the later. Similarly, in rural Ethiopia where most of the couples engage in agricultural activities, females in the upper age group are less likely to be enrolled to school as they are expected to take care of babies besides undertaking domestic chores. The regional disparity in current school attendance is also partly related to socio-cultural settings of the regions. For instance, Somali region is dominantly inhabited by pastoralists whose mode of life is highly vulnerable to the external environment that reduces the chances of school enrollment of children in the region as opposed to others.

Conclusions

This study attempts to assess parent and children related factors that influence chances of children's enrollment to primary school. Major findings of the study imply that sex and educational level of household head, socio-economic status of households and parental survivorship, particularly that of mothers, and urban-rural place of residence are strong predictors of children's schooling. Despite the altruistic nature of parents for their children, financial and human capital seems to affect the chances of sending children to school. Parents earning little income have the tendency of engaging their children in various income generating activities to augment household income than assisting them acquiring knowledge. Late enrollment of children to school and low enrollment of females in upper age are also signals of economic and cultural differences in perceiving the benefits of children's schooling. The increase in the chances of school enrollment with corresponding increase in the number of competing siblings is also implying that parents are still in need of child labor to involve in various activities – children are not free to join schools as recommended for the attainment of UPE. The gender disparity in school enrollment at upper primary school age is also indicating the need to work more to create opportunities for girls to enroll and stay longer in the school system.

The problem of not getting access to education due to any of the factors explained (parent's education, socio-economic status, parental survivorship, place of residence, etc) disproportionately affects female children due to various cultural and socioeconomic factors that reinforce the gender-based discrimination in parental investment on children's education. On the basis of empirical findings that mothers favor children's education better than fathers, addressing the gender gap in enrollment speeds-up the achievement of UPE. It also builds the human capital needs of the country through the intergenerational effect of education. As there is more opportunity costs of schooling for male and female children living in poor households, enhancing the economic wellbeing of the poor could significantly increase their children's participation in schooling. Enhancing school enrolment among children of the poor in turn reduces the proportion of the poor who often fail to respond to the attainment of UPE in 2015.

References

Ainsworth, M., Beegle, K. and Koda, G. 2005. The Impact of Adult Mortality and Parental Deaths on Primary Schooling in North-Western Tanzania. *Journal of Development Studies*, 41(3): 412-439

Ainsworth, M. and Filmer, D. 2002. Poverty, AIDS and Children's Schooling: A Targeting Dilemma. Policy Research Working Paper 2885. World Bank, Washington, DC

Akpotu, N. E., Omotor, D. G. and Onoyase, D. 2007. Family Size and Parents' Socio-economic Variables as Predictors of Investment in Children Education in South-West Nigeria. *Stud. Home Comm. Sci.*, 1(2): 127-132

Amdissa Teshome 2008. A Review of Education Policy, Strategies and Programs, in Taye Assefa (ed). Digest of Ethiopia's National Policies, Strategies and Programs. Forum for Social Studies, Addis Ababa, Ethiopia.

Axinn, W. G. 1993. "The Effects of Children's Schooling on Fertility Limitation." *Population Studies,* 47: 481-493.

Blake, J. 1985. Number of Siblings and Educational Mobility. *American Sociological Review*, 50(1): 84-94

Becker, G. and Tomes, N. 1986. Human Capital and the Rise and Fall of Families. *Journal of Labor Economics*, 4(3): S1-S39

Bongaarts, J. 2003. Completing the Fertility Transition in the Developing World: The Role of Educational Differences and Fertility Preferences. *Population Studies,* 57: 321-335

Buchmann, C. 2000. Family Structure, Parental Perceptions, and Child Labor in Kenya: What Factors Determine Who is Enrolled in School? *Social Forces,* 78:1349 – 1378

Burney, N. A. and Irfan, M. 1995. Determinants of Child School Enrollment: Evidence from LDCs Using Choice –Theoretic Approach. *International Journal of Social Economics,* 22: 24 – 40

Case, A., Paxson, C. and Ableidinger, J. 2004. Orphans in Africa: Parental Death, Poverty, and School Enrollment. *Demography,* 41(3): 483-508

Chernichovsky D. 1985. Socioeconomic and Demographic Aspects of School Enrollment and Attendance in Rural Botswana. *Economic Development and Cultural Change,* 33:319–332

Central Statistical Agency 2010. The 2007 Population and Housing Census of Ethiopia, Statistical Report. Office of the Population and Housing Census Commission, Addis Ababa.

DeGraff, D., Bilsborrow, R. and Herrin, A. 1996. Children's Education in the Philippines: Does High Fertility Matter? *Population Research and Policy Review*, 15(3): 219-247

Federal Democratic Republic Government of Ethiopia 1994. Education and Training Policy. St. George Printing Press, Addis Ababa.

Fentiman, A., Hall, A. and Bundy, D. 1999. School Enrollment Patterns in Rural Ghana: A Comparative Study of the Impact of Location, Gender, Age and Health on Children's Access to Basic Schooling. *Comparative Education,* 35(3): 331-349

Filmer, D. and Pritchett, L. 1999. The Effect of Household Wealth on Educational Attainment: Evidence from 35 Countries. *Population and Development Review,* 25(1): 85-120

Gage, A. 2005. The Interrelationship between Fosterage, Schooling, and Children's Labor Force Participation in Ghana. *Population Research and Policy Review,* 24(5): 431-466

Gertler, P., Levine, D. I. and Ames, M. 2004. Schooling and Parental Death. *The Review of Economics and Statistics,* 86(1): 211-225

Gomes M. 1984. Family Size and Educational Attainment in Kenya. *Population and Development Review*, 10:647–60

Hamid, S. 1993. A Micro Analysis of Demand Side Determinants of Schooling in Urban Pakistan. *The Pakistan Development Review,* 32 (4): 713-723

Iram, N., Hussain, Z., Anwar, S., Hussain, I., Akram, W. 2008. Determinants of Child School Choice in Punjab, Policy Implications. *European Journal of Scientific Research,* 23: 285-293.

Kobiané, J., Calvés, A. and Marcoux, R. 2005. Parental Death and Children's Schooling in Burkina Faso. *Comparative Education Review,* 49(4): 468-489

Kravdal, O. 2002. Education and Fertility in Sub-Saharan Africa: Individual and Community Effects. *Demography,* 39(2): 233-250

Lasonen, J., Kemppainen, R. and Raheem, K. 2005. Education and Training in Ethiopia: An Evaluation of Approaching EFA Goals. Institute for Educational Research Working Papers 23

Lloyd, C. B. and A. K. Blanc. 1996. Children's Schooling in sub-Saharan Africa: The Role of Fathers, Mothers, and Others. *Population and Development Review,* 22: 265-298

Marteleto, L. 2010. Family Size and Schooling throughout the Demographic Transition: Evidence from Brazil. *Demographic Research,* 23(15): 421-444

Ministry of Education 2010. Education Statistics, Annual Abstracts 2009/10. Addis Ababa, Ethiopia.

Ministry of Education 2005. Education Sector Development Program III: 2005/06-2010/11, Program Action Plan. Addis Ababa.

MoFED and UN Country Team. 2004. *Millennium Development Goals Report: Challenges and Prospects for Ethiopia*. Vol. 1, Addis Ababa.

Morduch, J. 2000. Sibling Rivalry in Africa. *The American Economic Review* 90(2): 405-409

Ota, M. and Moffatt, P. 2007. The Within-household Schooling Decision: a Study of Children in Rural Andhra Pradesh. *Journal of Population Economics*, 20(1): 223-239

Pal, S. 2004. Child Schooling in Peru: Evidence from a Sequential Analysis of School Progression. *Journal of Population Economics,* 17(4): 657-680

Pereznieto, P. and Jones, N. 2006. Educational choices in Ethiopia: What determines whether poor children go to school? *Young Lives Policy Brief 2: 1-12.*

Picard, N. and Wolf, F. 2008. Measuring Educational Inequalities: a Method and an Application to Albania. *Journal of Population Economics* DOI 10.1007/s00148-008-0201-z

Riyami, A. Afifi, M, and Mabry, R. 2004. Women's Autonomy, Education and Employment in Oman and Their Influence on Contraceptive Use. *Reproductive Health Matters,* 12: 144-154

Rose, P. and Al-Samarrai, S. 2001. Household Constraints on Schooling by Gender: Empirical Evidence from Ethiopia. *Comparative Education Review*, 45(1): 36 – 63

Sengupta, P. and Guha, J. 2002. Enrollment, Dropout and Grade Completion of Girl Children in West Bengal. *Economic and Political Weekly*, 37(17): 1621-1637

Shreeniwas S. 1997. Family Size, Sex Composition and Children's Education: Ethnic Differentials over Development in Peninsular Malaysia. *Population Studies,* 51:139–51.

UNESCO 2011. The Hidden Crisis: Armed Conflict and Education. EFA Global Monitoring Report 2011. UNESCO Publishing, Paris, France.

_____ 2005. Children out of School: Measuring Exclusion from Primary Education. UNESCO Institute for Statistics, Montreal, Canada.

World Bank 2005. Education in Ethiopia: Strengthening the Foundation for Sustainable Progress. World Bank Country Study, Washington, DC, USA