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Children's educational completion rates and dropouts in the context of Ethiopia's national poverty reduction strategy

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Abstract

Using a young Lives project data², a combination of quantitative and qualitative method was used to analyse the determinants of school completion/dropout of children from primary education. A Cox box proportional hazard model was used analyse the survival of children in primary education. The findings have important implications for the formulation and revising Ethiopian Poverty Reduction Strategy Paper.

While the policy focus of the 1996-initiated ESDP and the SDPRP (2002-5) on increasing educational access for all has been broadly successful, children from poor and/or highly indebted families still face significant constraints because they have to contribute to household survival through paid and unpaid work. It is therefore imperative to increase efforts to improve the livelihood options of the poor, including greater income generation opportunities, particularly in rural areas and for women. However, such strategies need to be child sensitive. For instance, income generating opportunities for women should simultaneously be accompanied by *community childcare systems* in order to prevent older children from shouldering their mother's childcare burden.

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² Young Lives is an international study of childhood poverty that follows us 12 children in four countries namely Ethiopia, India, Vietnam and Peru (for details of the young Lives look at www.younglives.org.uk)

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JEL Classification: A2; D1; J2;

1. Introduction

The major development objectives of the Ethiopian government are to reduce poverty and improve primary school enrolment (GoE, 2002). However, to date education performance indicators show that only access-related targets (gross enrolment of 65 per cent by 2004/05) have been achieved. Gross and net primary enrolment rates increased from 45 and 21 per cent in 1995/96 to 61 and 34 per cent in 1999/00 and to 74 and 38 per cent in 2004 (Ministry of Finance and Economic Development (MoFED, 2005). However, primary school dropout rates in 1999/00 almost doubled in 2003/04 from 9 per cent to 19 per cent. Although this figure declined again to 12 per cent in 2004/05, it fell well short of the 2004/5 target of 4.2 per cent. According to recent report by the Ministry of Education (Moe, 2010), the primary school (grade 1-8) dropout went up to 12.4 in 2006/07 and 14.6% in 2007/09 while primary completion rate have stagnated around 44 from 2006/07 to 2008/09 indicating that higher primary school dropout and lower completion rate are still conspicuous problems of the Ethiopian Education system.

Literatures indicate that school completion plays a crucial role in shaping a child's future economic opportunities and social destiny. Moreover, it also has wider implications for a country's human capital development objectives (Vitaro *et al.*, 1999; Prevatt and Kelly, 2003). Grade repetition and school dropouts are major sources of inefficiency in any education sector (Hanushek and Lavy, 1994). This is of particular concern given that the literature from developing countries suggests that dropouts are generally higher in the first year of primary education because problems experienced during a child's preschool years will be reflected in the first grade (Bustillo, 1989; World Bank, 1998). Research strongly supports the view that dropping out is a dynamic developmental process that begins before children enter elementary school, and is linked at least in part to parental expectations about education (Jimerson *et al.*, 2000). Because of its wider implications, it is important to study the determinants of school dropouts at the household-, community-, regional- and national levels in order to devise appropriate corrective measures.

To our knowledge, there are no country-level studies that examine the determinants of dropout rates or assess the impact of the new Ethiopian educational policy on education outcomes. In order to address this lacuna, this paper addresses the following specific research questions:

- 1 What is the relative importance of individual child, family and school characteristics in determining grade completion and dropouts in primary school?
- 2 To what extent are the components of the Education Sector Development

- Programme (SDPRP) consistent with the determinants of children's primary school completion rates identified in this paper?
- 3 What policy implications are raised with a view to contributing to debates around the revised SDPRP (2006-10)?

The paper uses quantitative and qualitative techniques to analyse school completion/dropout rates using used Young Lives survey data children and their households collected by the Ethiopian *Young Lives* Project in 2002. The quantitative data were collected from 20 sentinel sites in five regions in 2002: Addis Ababa, Oromia, Tigray, Amhara and SNNP, which together comprise the majority of the Ethiopian population (96 per cent). Forty per cent of the children were from urban areas and the remaining 60 per cent from rural areas. Qualitative data was collected in 2005 from five of the 20 sites.

The paper is organised as follows: Section summarizes the reviews of literature. Description of data and model used is provided in section 3. Section 4 presents the quantitative and qualitative research results. Summary of the findings and concludes with policy implications for the second phase of the Ethiopian poverty reduction strategy is provided in section 5.

2. Literature review on primary completion rate and dropout rates

Review of literature indicates that dropout of children from school depends on a number of factors including child specific characterises, household composition, parents education, community characteristics in which the child is living, and policy factors.

A child's age, gender, IQ and cognitive skills, popularity and peer relations, academic achievement, nutritional and health status are the main characteristics highlighted in the empirical literature on primary completion and dropout rates (Hanushek and Lavy, 1994; Jimerson *et al.*, 2000; Farmer *et al.*, 2003). **Age** is relevant because it is related to learning abilities, and whether or not a child starts his/her education on time or over-age. It is a good predictor of education attainment (Holmes, 2003).

The **gender** of a child is important for several reasons. Households commonly prefer to invest in boys' rather than girls' education. The main reason for this gender discrimination is the low perceived returns to schooling for girls because they usually leave their natal home when they marry. Parents' concerns for girls' safety at school – and while travelling between home and school – can also lead to the forced withdrawal of girls or to them dropping out voluntarily when they reach puberty (Oxaal, 1997).

The **innate learning abilities** of a child are also important because they increase the productivity of their investment in their offspring's education. For example, Jimerson *et al.* (2000) found that children with lower IQs and poor academic achievements were more likely to dropout of high school than their more academically gifted counterparts.

Similarly, higher achievements and cognitive skill were found to reduce the likelihood of dropping out in Egypt (Hanushek and Lavy, 1994).

The **nutritional and health status** of children was also found to be a strong predictor of school attendance (and in turn school performance) (Silverstein *et al.*, 2001).³ Jamison (1985) observed a strong negative relationship between a poor nutritional condition (measured by low height-for-age and weight-for-age) and children's grade completion rates in China. One standard deviation reduction in height-for-age of a child was associated with a retardation of one-third of a year of schooling, which could be due to delayed enrolment or grade repetition. Similarly, poor school attendance and low achievement of students were significantly associated with under-nutrition and hunger in the Philippines (Glewwe *et al.*, 2001, cited in Mukudi, 2003), Chile (Ivanovic *et al.*, 1996, cited in Mukudi, 2003), and Kenya (Mukudi, 2003).

Income, assets and family structure are the main household characteristics identified in the literature that impact on school completion rates. Household **wealth** clearly determines a household's ability to invest in the education of the child. The likelihood of children dropping out of school depends on the level of opportunity costs incurred by parents by them being in school (Appleton, 1991, cited in Bredie and Beeharry, 1998). Children with greater opportunities to earn income are likely to be taken out of school and involved in work if parents need additional income (Hanushek and Lavy, 1994).

Household structure is important because household resources are needed to pay for the education of children. In the Ethiopian context, for example, Woldehanna *et al.* (2005) observed a negative relationship between birth order and schooling, suggesting that younger children may be paying for the education of the older ones. In addition, it has been observed that female-headed households, and households where mothers have more decision-making power, tend to make decisions in favour of child schooling. When female decision-making power is combined with higher maternal education levels, children are more likely to be enrolled (Holmes, 2003; Kabeer, 2003). The distribution of decision-making power within the household is, therefore, important in determining children's enrolment patterns.

The findings on **parental education** are mixed. First, children whose parents are educated are more likely to learn because they live in an environment which is usually more intellectually stimulating. Secondly, parents who are more educated, may value education more than less educated parents which, in turn, influences the chances of a child of being enrolled and progressing in school. However, in addition to parental education, other factors such as resource availability and high returns to schooling are also important in explaining children's school enrolment. For example, Hanushek and

³ We do not include this variable in our regression model as these data were not available for all the children in the sample (7-17 years). However, nutritional concerns did emerge in some regions in the qualitative research.

Lavy (1994) found that the impact of parental education on the probability of dropouts in developing countries was not significant (Hanushek and Lavy, 1994).

The **education of other household members**, besides the parents, also matters in determining final decisions about children's education. Desforges and Abouchaar, (2003).concluded that parental involvement in children's education has a powerful impact on their attainment and adjustment in education. Similarly, Escobal *et al.* (2005), in the case of Peru, found that the education level of female adults in the family (not just the caregivers) was positively associated with children's educational outcomes. In addition, **parental aspirations** are important, because parents may want their children to achieve high levels of education, independent of any economic return. Parents may believe that education has a value in itself, as is the case for health (Alderman and King, 1998).

The most important school characteristics are the costs to households, the distance from a child's home and the quality of the school. **School fees and other schooling-related costs** (like uniforms, books and stationery) are obviously crucial in determining the returns to schooling (Brown and Park, 2002). **Distance to school** is also important because long distances increase the opportunity costs of attending school by reducing the potential number of hours of work a child might do; it also potentially reduces a child's ability to learn if s/he is tired after a long walk to school (Tilak, 1989; Glewwe, 1999).

The **quality of education** is important because returns to schooling depend on the child's acquisition of basic skills like reading, writing and arithmetic. If the household perceives that the school cannot provide children with such basic skills, it may decide that an investment in education is not worth the small return (World Bank, 2004). Very poor school quality may thus discourage households from educating their children, and encourage them to allow their children to work instead. School quality variables include: the number of schools available in the community, the level of education of the teachers, the pupil/teacher ratio, and the availability of books, desks, blackboards, water and toilets. For example, Hanushek and Lavy (1994) found that in Egypt, school quality had an important influence on students' dropout decisions. Students attending higher quality schools tend to stay in school longer and complete higher grades.

Government policies may affect completion rates by influencing both the demand for, and supply of, education. Key policies may include: starting age regulations, legislation to make school compulsory, education sector funding, curriculum development, school timetabling, grade promotion policies (Lillard and Decicca, 2001) and teacher training (World Bank, 2004).

Neighbourhood characteristics are an important element of the community context which affects dropouts (Crowder and South, 2003). Crowder and South found higher dropouts as the concentration of poverty and socio-economic distress in a neighbourhood increased, although these results were conditioned by such factors as

Still in school	82.85	88.49	74.8	82.01	83.65	87.8	77.39	70
Dropped out	17.15	11.51	25.2	17.99	16.35	12.2	22.61	30

Source: *Young Lives study*

Sample children were also asked when they first started school. Thirty-four per cent of children said they did not know when they started school. However, of those who did know, the largest proportion (40 per cent) said they started school at the age of seven, and 27.34 per cent started at the age of six. Only a very small proportion of children started school at the age of three (0.45 per cent) and 4.71 per cent at the age of four. The gender differences in school starting age are negligible. The proportion of rural children who started school at the age of eight (one year later than the official starting age of seven) is twice that of urban children. Only 5 per cent of rural children started school at the age of five; the corresponding figure for urban children is 14.4 per cent. Table 4.4 describes school starting age by sex and location.

Table 2: Dropout by Region (percentage)

	Addis Ababa	Amhara	Oromia	SNNP	Tigray	Total
Still in School	68.76	89.18	83.31	80.07	92.92	82.85
Dropped out	31.24	10.82	16.69	19.93	7.08	17.15

Source: *Young Lives study*

Table 3: School Starting Age by Sex and Location (percentage)

Age	Girl	Boys	Rural	Urban	Total
2	0	0.5	0.22	0.27	0.25
3	0.6	0.3	0	0.81	0.45
4	4.47	4.96	1.22	7.55	4.71
5	9.04	11.51	5.2	14.39	10.27
6	25.92	28.77	20.71	32.73	27.34
7	40.71	39.38	48.73	33	40.05
8	19.27	14.58	23.92	11.24	16.92
Total	100	100	100	100	100

Source: *Young Lives study*

Description of the model. We used a Cox proportional hazard model to analyse the determinants of school attainment. We could have used a censored ordered probit model devised by Lillard and King (quoted in Glewwe, 1999; Holmes, 2003; World Bank, 2004) to identify the determinants of school completion. However, the use of censored ordered probit models to analyse school attainment of children assumes that a child currently enrolled will achieve at least the grade level in which the child is currently. This is too restrictive an assumption, especially in a situation where there is a significant dropout rate. The alternative is to use a Cox proportional hazard model to

analyse children's school attainment or dropouts (Cox and Oakes, 1984). Hazard models account for the dependence of current enrolment on past enrolment decisions, and handle censored students (i.e. children enrolled at the time of the survey). The Cox hazard model does not require a parametric specification of the baseline hazard function and thus allows the baseline hazard rate for each community to vary (Cox and Oakes, 1984; Brown and Park, 2002). Therefore, we used a Cox proportional hazard model to analyse the determinants of school attainment and completion rates. We estimated a hazard model of dropping out of school, conditional on current enrolment of children in school. We analysed the determinants of school attainment using data on the 3,074 eight-year-old children and their families included in our sample.

In our analyses, we estimated different Cox regressions. The model estimates a hazard model for dropping out of school conditional on current enrolment among children from the total sample (Brown and Park, 2003)⁴. The Cox proportional hazard model provides estimates of hazard ratio which is interpreted as a risk multiplier. For example, a hazard ratio of 1.5 means that a child is 1.5 times more likely to drop out if the independent variable increases by one unit. Hence, hazard ratio greater than one corresponds to positive coefficient and hazard ratio less than one, correspond to negative coefficient. The Cox model also, by definition, assumes that the hazard ratio is proportional over time. Hence, it is necessary to evaluate the validity of the assumptions.

We also estimated separate hazard models for rural and urban children, as well as for girls and boys. Prior to making these estimations, we conducted the following tests: first, we tested whether the survival function for both sexes is the same as for rural and urban children. The graphical assessment also shows that the assumption of the Cox proportional hazard model has not been violated. The Log-rank test for equality of survivor functions between the sexes cannot reject the null hypothesis, but it rejects the equality of the survival function between the rural and urban child. On the other hand, the test for whether the proportional hazard assumption holds for our model indicates that the global test rejects the proportional hazard assumption, but that the individual covariate test result does not reject the assumption. Moreover, our conditional index result shows that multicollinearity is not a problem in our dataset since we obtained a conditional index of 20 when we exclude age squared of a child. When a child's age squared is included, the conditional index was calculated to be 51, which indicates that the multicollinearity problem is very serious (Belsley *et al.*, 1980).

In addition to the Cox proportional hazard estimation, we also estimated an ordered probit model for years of schooling in order to compare the results. In the ordered probit model estimation, the outcome represents increasing years of completed schooling achieved by the child. Table 5 presents the results from the Cox proportional hazard

⁴ Hazard models account for the dependence of current enrolment on past enrolment decisions and handle students currently enrolled at the time of the survey as 'right censored'. For example, if a student is currently enrolled, we do not know whether s/he will drop out in the future before completion of primary school. In econometrics, accounting for this uncertainty is termed 'right censored'.

models of the likelihood of a child dropping out from school at each level estimated from the total sample. The table shows hazard ratios and the estimated coefficients for the hazard model, as well as the estimated coefficients of the ordered probit model. The results of the Cox regressions for girls and boys, as well as for rural and urban children, are presented in Appendix. The following discussion is based on the Cox regression estimation made on the total sample but, whenever necessary, we also include the results of the ordered probit and from separate Cox regression for both sexes and for urban and rural children. The descriptive statistics for the variables included in the regressions are shown Table 4. In all regressions, we included dummies for regions to control for unobservable factors, including the cultural and geographical characteristics of each region and any variation in education policies, as regional governments are responsible for the organisation and support of the education system in their region.

4. Results and discussion

This section weaves together the results of the multivariate and qualitative analyses of the determinants of primary school attainment or dropout to provide as comprehensive picture as possible. Descriptive statistics of variables used in the regression and result of the survival analysis are presented in Tables 4 and 5. Separate regression results for rural and urban areas and for male and female headed households are given in Table A1. And Table A2 in the Appendix.

Table 4: Summary statistics of variables included in Cox regression

Variables	No. of observations	Mean	Standard deviation	Minimum	Maximum
Age	3078	15.7755	6.83236	5	30
Age squared	3078	295.5325	244.3307	25	900
Wealth index	3074	0.183112	0.160973	0.005051	0.766234
Dummy for urban residence	3074	0.412817	0.492421	0	1
Mother's years of schooling	3074	0.562134	1.024692	0	5
Father's years of schooling	3074	0.814574	1.260466	0	5
Cognitive social capital	3074	1.897202	0.329441	0	2
Absolute structural social capital	3074	1.649967	1.235046	0	7
Number of organisations from which one gets social support	3074	2.373455	2.620185	0	12
Citizenship	3074	0.529928	0.499185	0	1
Dummy for debt	3078	0.361274	0.480448	0	1
Dummy for Amhara region	3074	0.159401	0.36611	0	1
Dummy for Oromia region	3074	0.200716	0.400601	0	1
Dummy for SNNP region	3074	0.292128	0.454815	0	1
Dummy for Tigray region	3074	0.190306	0.392606	0	1

Dummy for child work	3074	0.08946	0.285453	0	1
Dummy for bad events	3074	0.778139	0.415566	0	1
Dummy for male household head	3074	0.817176	0.386585	0	1
Dummy for land ownership	3074	0.590111	0.491893	0	1
Dummy for livestock ownership	3074	0.729994	0.444035	0	1
Distance to public or private school in km	3074	2.329234	2.794606	0.5	9.166667
Birth order	3078	3.877843	2.011671	1	12
Male HH members over 15 years old	3074	1.708198	1.122682	0	5
Female HH members over 15 years old	3074	1.72121	0.959661	0	6
Male HH members between 1 and 5 years old	3074	0.486988	0.659847	0	3
Male HH members between 5 and 15 years old	3074	0.990241	0.918357	0	4
Female HH members between 1 and 5 years old	3074	0.440468	0.615878	0	3
Female HH members between 5 and 15 years old	3074	1.1311	0.968788	0	6
Dummy for male child	3074	0.510085	0.49998	0	1

Table 5: Determinants of dropouts using full sample (Censored Cox Regression of dropout)

	(1)	(2)
	Hazard ratio	Coefficient
Dummy for Amhara Region	0.594*** (3.71)	-0.521*** (3.71)
Dummy for Oromia Region	1.009 (0.08)	0.009 (0.08)
Dummy for SNNP Region	1.020 (0.20)	0.019 (0.20)
Dummy for Tigray Region	0.699*** (2.82)	-0.357*** (2.82)
Dummy for urban residence	0.874 (0.98)	-0.135 (0.98)
Wealth index consumer durable	0.423*** (2.70)	-0.860*** (2.70)
Male dummy 1 if male and 0 if female	0.847*** (3.27)	-0.166*** (3.27)
Age of a child	1.016*** (5.34)	0.016*** (5.34)
HH Size below 5 years old	1.207*** (6.05)	0.188*** (6.05)
HH Size between the ages of 5 and 15	0.891*** (5.11)	-0.115*** (5.11)
HH Size above the age of 15	0.905*** (4.64)	-0.099*** (4.64)
Grades completed by fathers	0.971*** (3.38)	-0.030*** (3.38)
Grades completed by mothers	0.973*** (2.75)	-0.027*** (2.75)
Dummy for male HH head	1.054 (0.65)	0.052 (0.65)
Number of events that decreases the HH welfare	0.975* (1.83)	-0.025* (1.83)
Cognitive Social Capital	1.014 (0.42)	0.014 (0.42)
Absolute structural social capital	1.001 (0.03)	0.001 (0.03)
# of organisations providing social support	1.010 (0.71)	0.009 (0.71)
Citizenship social capital	0.946* (1.71)	-0.055* (1.71)
Dummy for debt	1.166*** (2.88)	0.154*** (2.88)
Dummy for HH owns or rents land	1.168 (1.43)	0.156 (1.43)
Dummy for ownership of livestock	1.059 (0.83)	0.057 (0.83)
Mean distance (in kilometre) to public or private primary schools	1.042*** (2.66)	0.041*** (2.66)
Policy dummy 1 if child was in school before 1997	0.259*** (24.30)	-1.350*** (24.30)
Observations	3074	3074

*Robust z statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%*

Rural / urban and regional differences

The variable dummy for urban residency was found to have a negative effect on dropout rates, indicating that urban children are less likely to drop out of school compared to rural children. This result is statistically significant when the estimation is disaggregated by regions and it holds true for all regions indicating that much still needs to be done to decrease the probability of rural children dropping out of school – both in terms of improving the availability and quality of schools as well as reducing pressures on children to contribute to labour activities. The effect of urban residency was the same for boys and girls' school attendance has increased significantly in recent years (from 17% in 1995/96 to 63% in 2004/05 (MoE, 2005), there is still a marked gender gap in urban and rural areas (Welfare Monitoring Survey (CSA, 2005) indicated that net enrolment rate is 33% for rural areas and 77 for urban areas).

Turning to regional differences, the result of the Cox regression on the total sample indicated that children in the Amhara and Tigray regions are less likely to drop out of school. This result is consistent with the results obtained from the qualitative survey in the two regions, which indicate that in Amhara the regional government uses enforcement mechanisms to promote school attendance (e.g. by depriving households of government social services if they do not send their school-aged children to school). In Tigray, parents reported sending their school age children to school as they have become convinced that schooling is an investment in their future livelihood.

Child characteristics

Only two child-specific characteristics emerged as important determinants of school attainment: age and gender. Children's **age** has a significant and positive effect on the probability of a child dropping out of school. Older children are more at risk of dropping out of school and are less likely to attain more years of schooling compared to their younger counterparts. Our qualitative findings further suggest that if children attend school when they are relatively old (for their grade), it is because parents are less financially capable and/or willing to support their children's education. For example, a father in Tigray noted that older children in poor households typically have a responsibility to support their brothers' and sisters' school attendance. Moreover, even if such children did attend school, they would be more likely to be withdrawn in the case of economic pressures than younger siblings because of their ability to contribute more to household economic production.

Our Cox regression results found that the variable for the child's **gender** had a significant effect on primary school dropouts, with boys less likely to drop out than girls. Our qualitative results strongly suggested that this gender difference is attributable to traditional distinctions in the way households and communities value girls' and boys'

education. Because boys are viewed as future breadwinners not only for their own future children, but also to support their parents in old age, boys' education is valued over that of girls whose primary role is regarded as wives and mothers to support their husbands' family.

Similarly, a female student noted that people's reactions to girls' education, especially when it involves travelling to the nearby town or staying there, is discouraging as educating females is often considered "*as a futile exercise or worthless*". Nevertheless, it is important to point out that while our quantitative data were collected in 2002, the qualitative data from 2005 suggest that important changes are happening largely as a result of new legal and policy developments designed to advance gender equality. Perhaps, most significant among these is the Family Law reform of 2001 (implemented in 2002) which banned marriage under the age of 18. Traditionally, parents have been eager to marry off their female children early, not only for economic reasons but also for the sake of family pride associated with female chastity. Because girls are commonly subject to sexual assault, abduction and rape in public spaces, parents preferred to have their daughters drop out of school early and get married, in order to protect the family honour.

While our Cox regression result and descriptive analysis (using *Young Lives* data collected in 2002) show that dropout rates are higher among girls than boys in primary education, our qualitative assessment (conducted in 2005) and national data (CSA, 2005) found that dropouts from primary school are higher among boys than among girls due to greater pressures to be involved in productive work to support the family economy. Because of gender discriminatory labour markets, higher remuneration for boys and a traditional gender division of labour where boys are more involved in agricultural than domestic work (although not exclusively), there are increasingly greater incentives for parents to take their sons, rather than daughters, out of school.

Family characteristics

Parental education, household composition, household wealth and exposure to shocks, as well as maternal social capital, all emerged as important family-level determinants of school attainment.

Parental education

The Cox regression results indicated that the variable "years of schooling" of both parents significantly and negatively affects the probability of their children dropping out of school: children of educated parents are more likely to stay in school than their counterparts. However, if we disaggregate the estimation by children's gender and by rural / urban location, higher levels of maternal education only have an impact on rural children and girls, whereas fathers' educational levels are important regardless of location and the sex of the child. Disaggregating the estimation by female- and male-headed households shows that children from both male- and female-headed households are

equally less likely to drop out from school when the mothers' education level increases. Some respondents in our qualitative interviews noted that the correlation between parental education and lower dropout rates was because educated parents were more supportive of education and gave children more time to study, and because of the linkages between education and wealth.

Interestingly, however, overall our qualitative research suggested that parental commitment to their children's education was at least as significant as parental educational achievement in promoting school attainment.

Reasons behind parental commitment to education varied. They included a sense of economic necessity and security in old age, pressure from local authorities, a desire to provide their children with opportunities that the parents were denied and a sense of moral responsibility.

For many parents, there are important linkages between education, morality and personal development. Parent's commitment to education is also related to a sense of moral responsibility: that allowing children to go to school is a parental duty and is the most valuable inheritance a child can receive.

Family composition

The Cox regression indicated that the likelihood of a child dropping out of school is significantly and negatively associated with the number of older siblings in the household (above 5 years of age)⁵ and the number of household members over 15 years of age. This suggests that older siblings and adult members substitute for each other's household labour or provide complementary support through cost savings and/or improved learning. However, the effect of older siblings is not statistically significant for children from female-headed households and for urban areas. Conversely, a child's likelihood of dropping out of school is significantly and positively associated with the number of children under five years old in the household, suggesting that older children may be required to take care of children and be under pressure to contribute to household income, thus, increasing the likelihood of children dropping out of school. In the qualitative research, parents talked about sending some children to work in order to meet household needs and support the education of other siblings.

Household wealth

Household wealth is included in our regression as a proxy for a household's poverty status. The results indicated that children of wealthier households are less likely to drop out of school than their counterparts from poorer households. Disaggregated estimates also showed that the wealth effect is significant for both boys and girls and urban and rural children. Conversely, the dummy for debt was significant and positive, indicating a greater probability of a child from a credit-constrained household dropping

⁵ Similar result is obtained when we use birth order (see Table A3 in the Appendix).

out of school than their counterparts.

In general, the qualitative findings were consistent with the quantitative results and support the “poverty hypothesis”. Economic constraints frequently emerged as an important barrier to school attainment. The impact of economic constraints is not always immediate but cumulative, and can eventually lead to children dropping out.

Similarly, seasonal demands for child labour have an impact on school attendance. This is especially true during harvest time when there is a considerable spike in dropouts, particularly among boys, that may be either temporary or permanent.

Dummies for land and animal ownership were found to have positive but insignificant effects on school dropouts in all Cox regression results, except for female-headed households and land ownership in rural areas. In other words, the effect of land ownership has significant and positive effects on children’s school dropout rates – but only for children from rural areas and from female-headed households where there is higher demand for child labour. This is linked to greater pressures on the household for labour to complete all necessary agricultural work.

The number of negative shocks experienced by a household was found to have a significant and negative effect on child dropouts, which appears counter intuitive. One possibility is that the occurrence of shocks is linked to the receipt of food or other types of aid. However, the qualitative research indicated that children had been forced to drop out of school as a coping mechanism in the face of frequent droughts and economic shocks.

Social capital

Social capital variables emerged as having a mixed effect on the duration of schooling in the regression analyses. While the impact of cognitive social capital (feelings of trust and belonging to one’s community) and structural social capital (membership of social organisations) were found to be insignificant overall, citizenship (involvement in collective action to address a social problem) was found to reduce the likelihood both overall and in urban sites of children dropping out of school.

Community and school factors

The regression results found that school proximity and the educational policy changes since 1996 have had a significant impact on school completion rates, while the qualitative results suggest that policy shifts in the SDPRP and ESDP II have also had an impact.

The probability of a child dropping out of school increases as the distance to the nearest private or public school increases. The risks of sexual assault and violence en route to school were also mentioned by a large number of respondents in the qualitative research as a key reason for withdrawing their daughters from school after the first primary cycle.

Turning to policy changes, a dummy variable for policy change revealed that

children enrolled after 1996 are less likely to drop out than children enrolled before 1996. The same effect was found in separate estimates for boys and girls. The qualitative results confirmed this overall positive trend but because the research took place over two years later, it was able to reveal more of the impacts of policy changes since the second ESDP in 2002. In particular, the importance of affirmative action measures to increase girls' enrolment and work towards the Millennium Development Goal (MDG) 3 on gender equality and MDG 2 on universal education for all school children were highlighted, as were the effects of the community mobilisation efforts to increase school enrolment and stem dropouts. In other words, efforts to address gender equality in the education sector are not just a matter of political rhetoric, but have been translated into comparatively successful and innovative programmes at the grassroots level. The community empowerment and participation program encouraged parents to contribute money to buy school facilities.

5. Summary, conclusions and policy implications

Our findings have important implications for the formulation and revising Ethiopian Poverty Reduction Strategy Paper.

While the policy focus of the 1996-initiated ESDP and the SDPRP (2002-5) on increasing educational access for all has been broadly successful, children from poor and/or highly indebted families still face significant constraints because they have to contribute to household survival through paid and unpaid work. It is therefore imperative to increase efforts to improve the livelihood options of the poor, including greater income generation opportunities, particularly in rural areas and for women.

However, such strategies need to be child-sensitive. For instance, income-generating opportunities for women should simultaneously be accompanied by *community childcare systems* in order to prevent older children from shouldering their mother's childcare burden. If *credit programmes* are encouraging the purchase of livestock, community cattle-keeping mechanisms need to be encouraged to reduce pressures on children to drop out of school to attend to additional household livestock. Other policy solutions could include the introduction of targeted *conditional cash transfer programmes* that enable poor households to send their children to school by offsetting the costs involved.

Proposals to replace the *shift system* with a full-day school system need to take into account the demands of seasonal agriculture. Moreover, there is still much scope for *expanding the availability* of schools to poor and isolated communities.

Boys are already performing better than girls at the age of eight, suggesting that the current concern about girls' education is well-placed, and that existing programmes need to be evaluated, and then expanded or intensified. The SDPRP only explicitly mentions measures to address girls' low enrolment rates at the secondary, and not the primary, school level, and does not include any specific targets related to gender equity in

its poverty reduction target indicators. It will be important for the second round of the SDPRP to incorporate gender-specific target indicators at all school levels. Given that girls' attendance was significantly influenced by safety concerns concerted measures are clearly needed to reduce their vulnerability in unsupervised public spaces. The widely reported positive impact on girls' education of the Family Law ban on early marriage and initiatives to tighten the implementation of the anti-sexual violence regulations suggest that these efforts should be continued and related laws rendered consistent.

Improving educational enrolment now will have a positive spill-over effect on subsequent generations. Adult education programmes should also be considered as part of a comprehensive approach to achieving universal primary education for all by 2015.

The government and donors alike need to be cautious about romanticising the notion of "community empowerment and participation", especially when it is often used as a euphemism for monetary contributions, and could lead to civic resentment towards education and increasing dropout rates over time. While communities may be able to subsidise the cost of new school infrastructure by contributing their labour and local materials, funds for purchasing books and other educational materials should be provided by government and donors.

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Table A1: Determinants of dropout (censored Cox regression) by rural/urban location

	(1)	(2)	(3)	(4)
	Hazard ratio for rural	Coefficient for rural	Hazard ratio for urban	Coefficient for urban
Dummy for Amhara region	0.611*** (3.06)	-0.492*** (3.06)	0.794 (1.01)	-0.230 (1.01)
Dummy for Oromi region	1.003 (0.03)	0.003 (0.03)	1.158 (0.97)	0.147 (0.97)
Dummy for Tigray region	0.677*** (3.03)	-0.391*** (3.03)		
Wealth index	0.405* (1.79)	-0.905* (1.79)	0.386*** (2.64)	-0.952*** (2.64)
Male dummy (1 if male; 0 if female)	0.885** (2.19)	-0.122** (2.19)	0.803** (2.47)	-0.220** (2.47)
Age of child	1.006** (2.05)	0.006** (2.05)	1.064*** (5.91)	0.062*** (5.91)
HH size under 5 years old	1.094*** (2.77)	0.090*** (2.77)	1.394*** (5.97)	0.332*** (5.97)
HH size between the ages of 5 and 15 years	0.933*** (2.74)	-0.069*** (2.74)	0.898*** (2.73)	-0.108*** (2.73)
HH size over the age of 15 years	0.866*** (5.56)	-0.144*** (5.56)	0.971 (1.06)	-0.030 (1.06)
Grades completed by the father	0.984 (1.36)	-0.016 (1.36)	0.950*** (4.02)	-0.051*** (4.02)
Grades completed by the mother	0.961** (2.40)	-0.040** (2.40)	0.981 (1.49)	-0.020 (1.49)
Dummy for male HH head	0.946 (0.60)	-0.056 (0.60)	1.201 (1.50)	0.183 (1.50)
Number of events that decrease HH welfare	0.977 (1.57)	-0.023 (1.57)	0.996 (0.14)	-0.004 (0.14)
Cognitive social capital	1.007 (0.17)	0.007 (0.17)	1.024 (0.54)	0.024 (0.54)
Absolute structural social capital	1.076*** (3.03)	0.073*** (3.03)	0.862*** (3.16)	-0.149*** (3.16)
Number of organisations from which one gets social support	0.983 (1.16)	-0.017 (1.16)	1.053* (1.71)	0.052* (1.71)
Citizenship	0.988 (0.35)	-0.012 (0.35)	0.854*** (2.67)	-0.158*** (2.67)
Dummy for debt	1.186*** (3.04)	0.170*** (3.04)	1.242** (1.98)	0.217** (1.98)
Dummy for HH owns or rents land	1.264* (1.93)	0.234* (1.93)	1.097 (0.43)	0.092 (0.43)
Dummy for livestock ownership	1.089 (0.89)	0.085 (0.89)	0.999 (0.02)	-0.001 (0.02)
Mean distance (km) to public and private primary schools	1.031* (1.71)	0.030* (1.71)	0.820*** (3.42)	-0.199*** (3.42)
Policy dummy: 1 if child was in school before 1997	0.125*** (28.13)	-2.078*** (28.13)	0.891 (0.89)	-0.115 (0.89)
Dummy for SNNP region			0.986 (0.14)	-0.014 (0.14)
	Observations = 1805 Wald Chi2 = 1414.65 Prob>Chi2 = 0.00		Observations = 1269 Wald Chi2 = 242.91 Prob>Chi2 = 0.00	

Robust z statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

Table A2: Determinants of dropout (censored Cox regression) by male- and female-headed households (HHH)

	(1)	(2)	(3)	(4)
	Hazard ratio for Male HHH	Coefficient for Male HHH	Hazard ratio for female HHH	Coefficient for female HHH
Dummy for Amhara region	0.516*** (3.91)	-0.661*** (3.91)	0.675 (1.43)	-0.393 (1.43)
Dummy for Oromi region	0.937 (0.50)	-0.065 (0.50)	0.915 (0.37)	-0.089 (0.37)
Dummy for SNNP region	1.016 (0.14)	0.016 (0.14)	1.010 (0.05)	0.010 (0.05)
Dummy for Tigray region	0.595*** (3.44)	-0.518*** (3.44)	0.756 (1.11)	-0.280 (1.11)
Dummy for urban residence	0.814 (1.22)	-0.206 (1.22)	0.781 (1.12)	-0.247 (1.12)
Wealth index	0.774 (0.73)	-0.257 (0.73)	0.110*** (3.22)	-2.210*** (3.22)
Male dummy (1 if male; 0 if female)	0.861*** (2.72)	-0.150*** (2.72)	0.828 (1.46)	-0.189 (1.46)
Age of child	1.014*** (4.32)	0.014*** (4.32)	1.037*** (3.96)	0.037*** (3.96)
HH size under 5 years old	1.190*** (5.15)	0.174*** (5.15)	1.257** (2.56)	0.229** (2.56)
HH size between the ages of 5 and 15 years	0.892*** (4.69)	-0.115*** (4.69)	0.921 (1.41)	-0.082 (1.41)
HH size over the age of 15 years	0.884*** (5.09)	-0.123*** (5.09)	0.969 (0.70)	-0.032 (0.70)
Grades completed by the father	0.963*** (3.95)	-0.038*** (3.95)		
Grades completed by the mother	0.971** (2.52)	-0.030** (2.52)	0.965* (1.66)	-0.035* (1.66)
Number of events that decrease HH welfare	0.996 (0.24)	-0.004 (0.24)	0.916** (2.46)	-0.087** (2.46)
Cognitive social capital	0.984 (0.42)	-0.016 (0.42)	1.074 (0.96)	0.071 (0.96)
Absolute structural social capital	1.015 (0.58)	0.015 (0.58)	0.946 (0.91)	-0.055 (0.91)
Number of organisations from which one gets social support	1.010 (0.67)	0.009 (0.67)	1.004 (0.11)	0.004 (0.11)
Citizenship	0.942* (1.67)	-0.060* (1.67)	0.941 (0.80)	-0.061 (0.80)
Dummy for debt	1.135** (2.18)	0.127** (2.18)	1.325** (2.09)	0.281** (2.09)
Dummy for HH owns or rents land	1.140 (0.99)	0.131 (0.99)	1.363* (1.73)	0.310* (1.73)
Dummy for livestock ownership	1.051 (0.58)	0.050 (0.58)	1.221 (1.61)	0.200 (1.61)
Mean distance (km) to public and private primary schools	1.054*** (3.09)	0.052*** (3.09)	1.006 (0.15)	0.006 (0.15)
Policy dummy: 1 if child was in school before 1997	0.230*** (24.04)	-1.469*** (24.04)	0.436*** (5.82)	-0.831*** (5.82)
	Observations = 2512 Wald Chi2(23) = 1269.37 Prob > Chi2 = 0.00		Observations = 562 Wald Chi2(23) = 266.97 Prob > Chi2 = 0.00	

Robust z statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

Table A3: Determinants of dropout (censored Cox regression) to see the effect of birth order

	(1)	(2)
	Hazard ratio	Coefficient
Dummy for Amhara region	0.600*** (3.65)	-0.511*** (3.65)
Dummy for Oromiaregion	1.016 (0.14)	0.015 (0.14)
Dummy for SNNP region	1.041 (0.40)	0.040 (0.40)
Dummy for Tigray region	0.708*** (2.72)	-0.345*** (2.72)
Dummy for urban residence	0.897 (0.79)	-0.109 (0.79)
Wealth index	0.407*** (2.81)	-0.900*** (2.81)
Male dummy (1 if male; 0 if female)	0.860*** (2.93)	-0.150*** (2.93)
Age of child	1.028*** (6.27)	0.027*** (6.27)
Birth order	0.914*** (3.11)	-0.090*** (3.11)
HH size under 5 years old	1.230*** (6.66)	0.207*** (6.66)
HH size between the ages of 5 and 15 years	0.950* (1.81)	-0.051* (1.81)
HH size over the age of 15 years	0.937*** (2.85)	-0.066*** (2.85)
Grades completed by the father	0.972*** (3.27)	-0.029*** (3.27)
Grades completed by the mother	0.971*** (2.98)	-0.030*** (2.98)
Dummy for male HH head	1.033 (0.40)	0.032 (0.40)
Number of events that decrease HH welfare	0.975* (1.89)	-0.026* (1.89)
Cognitive social capital	1.017 (0.52)	0.017 (0.52)
Absolute structural social capital	1.001 (0.05)	0.001 (0.05)
Number of organisations from which one gets social support	1.008 (0.62)	0.008 (0.62)
Citizenship	0.951 (1.56)	-0.050 (1.56)
Dummy for debt	1.173*** (2.98)	0.159*** (2.98)
Dummy for HH owns or rents land	1.159 (1.37)	0.148 (1.37)
Dummy for livestock ownership	1.064 (0.90)	0.062 (0.90)
Mean distance (km) to public and private primary schools	1.043*** (2.78)	0.042*** (2.78)
Policy dummy: 1 if child was in school before 1997	0.257*** (24.57)	-1.359*** (24.57)
Observations = 3074 Wald Chi2(25) = 1382.47 Prob>Chi2 = 0.00		

Robust z statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%