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# **Are Work and Schooling Complementary or Competitive for Children in Rural Ethiopia? A Mixed-methods Study**

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# Abstract

In asking whether working makes it more difficult for developing-world children to participate in school, many economists focus only on whether children have enough time for both activities. I argue that whether work and schooling can be combined depends not only on the time each activity takes, but also on the characteristics of each activity. Qualitative research in one village suggests that six features of rural schools and of work make work and school more competitive: high schooling costs, less flexibility to local work patterns and the effects of illness, work that is scarce, work that cannot be divided into small chunks, more tiring work, and the fact that chores and study are both done in the home. In exploratory quantitative research on data from 13 villages, there is some correlation between proxies for the first four characteristics and decisions about children's schooling and work. Findings suggest some policy recommendations. Subsidy of school materials might reduce drop-out among children who cannot afford them, and reduce absenteeism among children who work to pay for materials. Improved healthcare might reduce drop-out among sick children and absenteeism among children caring for sick parents. Making formal school calendars, timetables and attendance requirements more flexible to working children's lives may result in improvements in enrolment and attendance.

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## About Young Lives

Young Lives is an international study of childhood poverty, following the lives of 12,000 children in 4 countries (Ethiopia, India, Peru and Vietnam) over 15 years. [www.younglives.org.uk](http://www.younglives.org.uk)

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# 1. Introduction

In Ethiopia, most children work and attend school. The most recent Ethiopia Labour Force Survey (conducted in 2001) showed that 52 per cent of rural children of primary school age combined paid or subsistence work with schooling (Guarcello and Rosati 2007: 5).<sup>1</sup> For policies to cater for these children, it is important to understand when children's work is competitive with education and when it is complementary to it (cf. Boyden et al. 1998: 251). If work and school are complementary, children can participate in each activity at different times of day. At best, engaging in work makes it more possible to engage in school, or vice versa. In contrast, activities can compete: for example, working may make it impossible, or more difficult, for children to attend school, or prevent them from benefiting fully from it.

Anthropology and childhood studies have used qualitative methods to uncover characteristics that make work and school complementary or competitive, which have been largely ignored in economics and in quantitative survey work. I draw on literature from these disciplines and on my own qualitative research in a Young Lives survey village to question the exclusive focus of the models used by many economists on the hours taken by activities. I argue that whether work and schooling are complementary or competitive depends not only on the time each activity takes, but also on the characteristics of the activity.

I present qualitative evidence that suggests that two features of rural schools – high schooling costs and less flexibility to local work patterns and the effects of illness – and four work-related features – work which is scarce, less divisible work, more tiring work, and the fact that chores and study are both done in the home – make work and school more competitive. With variables from the Young Lives survey<sup>2</sup> as proxies for these characteristics, I then undertake exploratory quantitative analysis across all 13 rural survey sites. Some correlation between these proxies and decisions about children's schooling and work suggests that the characteristics of activities are generally relevant to whether work and schooling compete or can be easily combined. I do not aim to demonstrate causal relationships with quantitative analysis. I merely suggest that the association between the characteristics of activities and children's time allocation choices found in one village in qualitative work is also found across 13 different villages and a larger sample of children.

I do not examine who makes decisions about children's time allocation.<sup>3</sup> I limit conclusions to children aged between 13 and 14. I examine only children in rural areas, because the characteristics of work done by children are very different in rural and urban areas (Poluha 2007).

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1 Earlier analysis, on the 1993, 1994 and 1995 Ethiopian Rural Household Surveys, generates a similar statistic Assefa Admassie and Arjun Singh Bedi, 'Attending School: Two R's and Child Work in Rural Ethiopia', *Institute of Social Studies (The Hague) Working Paper* (387; The Hague: Institute of Social Studies, 2003), 1-50, J. Cockburn and B. Dostie, 'Child Work and Schooling: The Role of Household Asset Profiles and Poverty in Rural Ethiopia', *Journal of African Economics*, 16/4 (2007), 519-63..

2 Young Lives is a longitudinal study of child poverty in four developing countries ([www.younglives.org.uk](http://www.younglives.org.uk)). More information is given about the data used for this paper in Section 5.

3 I discuss this issue using the same data in Orkin Kate Orkin, "'See First, Think Later, Then Test": How Children's Perspectives Can Improve Economic Research', *European Journal of Development Research*, 23/5 (2011b), 774-91.. Most economic models assume that parents make decisions about children's time allocation. According to this data, this was often the case, but some children negotiate over time allocation decisions or make them independently of their parents.

## 2. Definitions of work and school

The legislators who developed international legislation on child work excluded chores and childcare from definitions of work because they were not viewed as ‘economic activity’ (Hagemann et al. 2006). Many developing-country governments based their legislation on international definitions. Exclusion of ‘domestic’ activities from the definition of work has been widely criticised, notably by feminist analysts (Fishburne Collier and Yanagisako 1987: 20; Moore 1988), because it underestimates the amount of work done by female children (D. Levison and Moe 1998). In this paper, I group tasks done by children into paid work, subsistence work, chores and caring for household members. I consider all of these tasks as ‘work’.

There is debate about how to differentiate light work, which is argued to be harmless or beneficial to children, from harmful work, which can expose children to health hazards or be too onerous (Lieten 2000). In addition to not being harmful, light work must not affect children’s health and development or ‘prejudice their attendance at school ... or their capacity to benefit from the instruction received’, according to the ILO Convention concerning minimum age for admission to employment, 1973 (No. 138) (International Labour Organisation 1973: 4).

I discuss tasks done by rural Ethiopian children aged between 13 and 14. Most tasks would probably be classified as light work, which is permitted for children over 12 by Article 7 of Convention No. 138. I investigated under which circumstances light work competes with schooling.

I only examine the relationship between participation in work and ‘schooling participation’. Schooling participation refers to the decision about whether children enrol in school, attend school and attend all of the school day. I do not consider children’s accumulation of human capital (Cunha and Heckman 2006): the grades children pass at school, the levels of competence they attain in literacy and mathematics and the skills they learn.

## 3. Economic models of children’s work

Earlier economic literature tends to assume that work and school are mutually exclusive: children either attend school all day or work full time for pay (Psacharopoulos 1997; Ray 2003). A group of studies on cross-sectional data finds that years of completed schooling were lower for working children (Psacharopoulos 1997; Ray 2003). A more recent strand of research argues that it is artificial to isolate the effect of work on school. Whether a child enrolls in school, whether they work, and how much leisure they have is a single, jointly determined allocation of the time and budget available to the household (Edmonds 2008).

This paper draws on economic models from this more recent strand of literature. Cigno and Rosati (2005) nest two widely used models of child time allocation (Baland and Robinson

2000; Basu and Van 1998) within a general model. In this model, families choose the child's activities to optimise household utility, trading off between the child's current income and future returns to their education. Choices are constrained across time periods by the household budget and the amount of time in a child's day. Depending on which constraints are binding, children either work full time, combine work with school, attend school full time, or do nothing. Based on this model or variants of it, economists have examined why households allocate children's time to particular activities. Empirical papers examine how changes in cost of schooling (Ravallion and Wodon 2000), household shocks (Beegle et al. 2006), and household composition (Fafchamps and Wahba 2006) affect child time allocation.

These models treat the household budget as the binding constraint on decision-making. However, the models have in common another constraint: the number of hours in a day. Some authors argue that the time constraint should be adjusted to capture that particular activities take a fixed amount of time (Ravallion and Wodon 2000: C163); for example, the model could specify that children attending school can only take on part-time work (de Janvry et al. 2006: 353). But even with these adjustments, when they set up the time constraint in this way, as is common practice in this literature, economists assume that the amount of time activities take is the only influence on the extent to which children can both work and attend school.

No models found in my literature search consider characteristics of work and school. There is limited recognition that different tasks have different characteristics. Studies find strong heterogeneity in determinants of time allocation across genders (Admassie and Bedi 2003; Cockburn and Dostie 2007) and ages (Duryea et al. 2007; Wahba 2006) but do not discuss reasons for it. One plausible reason is gender and age differentiation in the characteristics of children's tasks. Schools are also assumed to be similar: most studies assume all schools occupy the whole day, except de Janvry et al. (2006), who assume schools teach half the day.

## 4. Insights from anthropology and childhood studies on children's work

Researchers in sociology, anthropology, and childhood studies are critical of the view that work and schooling are mutually exclusive, arguing that this perspective is rooted in culturally specific notions of childhood as a time for leisure and learning (Boyden et al. 1998: 246-47). Research uses children's descriptions of how they balance work and schooling to elucidate characteristics that make the activities complementary or competitive. Shorter school days when schools teach in shifts enable children to work and go to school (Nieuwenhuys 1994), and work enables schooling when children's wages pay for schooling expenses (Schiefelbein 1997). Work may teach skills, and should be considered part of 'education' (M. Bourdillon et al. 2010: 94-105).

However, work can disrupt schooling (Boyden et al. 1998: 249). Children may be too tired to concentrate in class or do homework. School may be scheduled at times of day difficult for working children and children may be punished for arriving at school late (Nieuwenhuys

1994: 70). If children miss classes or days because of work, they may fall behind and become discouraged (Boyden et al. 1998: 256). If they start school late because they have been working, they may be embarrassed and frustrated by being older than their classmates (Boyden et al. 1998: 256).

## 5. Qualitative methodology

I use survey data collected by Young Lives, in collaboration with the Ethiopian Development Research Institute, on approximately 1,000 children in the Older Cohort of children tracked by the survey. They and their caregivers were surveyed in 2002–3, when the children were around 8 years old, and again between October 2006 and April 2007. In this paper I analyse data on the 625 Young Lives children, 302 girls and 323 boys, who live in rural sites.

For qualitative data, I conducted a case study of children's time allocation in Leki, a rural Young Lives site, between July and September 2008.<sup>4</sup> This was one and a half years after the Round 2 survey; so the children were between 13 and 14 years old. To choose the site, I followed Ragin (1992) and Yin (2003), who argue that it is possible to make a theoretical argument about a phenomenon from a single case if there is logic to the case selection. One example of such logic is to select an 'extreme case' of a phenomenon that displays the characteristics of that phenomenon particularly vividly. I selected Leki because it had the highest percentage – 51 per cent – of children doing paid work among the rural sites in the sample. Across all the Young Lives rural sites, an average of 10.6 per cent of children were involved in paid work.

I selected 24 of the 49 Young Lives children in Leki for focus groups based on their gender, working status, and schooling status. Table 1 shows the composition of the qualitative sample. There were six children in each of four focus groups. Girls and boys were separated, but each group had a mix of children who were in and out of school, were in different grades at school and participated in different types of work. Each child participated in two focus group activities. One activity (from Woodhead 1998) asked children to rank activities they did according to various criteria, such as which activities were the best paid, the most fun or the most tiring. The second activity was based on exercises in the Young Lives qualitative component (Camfield et al. 2009). Children drew a child of their own age and gender doing well at school, a child doing badly at school, or a child who had dropped out. They then described their picture to the group.

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<sup>4</sup> All names of children and villages have been changed, in order to preserve their anonymity.

**Table 1.** *Composition of sample for qualitative work in Leki, July–September 2008*

	Participated in paid and/or subsistence work and chores		Participated only in chores	
	Focus groups only	Focus groups and interviews	Focus groups only	Focus groups and interviews
<b>Girls</b>				
Grade 5–7	2	1	0	3
Grade 1–4	1	1	0	2
Dropped out	0	2	0*	0*
<b>Subtotal</b>	<b>3</b>	<b>4</b>	<b>0</b>	<b>5</b>
<b>Boys</b>				
Grade 5–7	1	1	1	2
Grade 1–4	2	2	0	1
Dropped out	0	2	0*	0*
<b>Subtotal</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>3</b>
<b>Total</b>	<b>6</b>	<b>9</b>	<b>1</b>	<b>8</b>

\*There were no girls or boys who had dropped out of school and were only involved in chores among the 49 children in the Young Lives sample in Leki.

When the focus groups' activities had been carried out, I selected 17 of the 24 children for semi-structured interviews. There were still one or more children in nearly all categories (although none of the children who had dropped out of school participated only in chores). I focused on children whose experiences were most relevant to hypotheses emerging as important in the research. I used the same process to select ten of the 17 for follow-up interviews, home observations and interviews with children's mothers. We also interviewed two female teachers, two male community leaders, and three male farm managers.

I worked with research assistants, two male and one female. Most children were interviewed by research assistants of the same gender. The two girls who were interviewed by male interviewers were markedly more reserved. Interviews and focus groups were recorded, transcribed and translated into English.

## 6. Use of mixed methods

Data collection and analysis were sequential and iterative: findings from one method of analysis suggested issues for investigation by the alternative method in the next stage (Greene et al. 1989: 259). I had conducted some quantitative analysis before fieldwork. This suggested qualitative work should focus on rural areas, where children's work was more prevalent, and suggested the particular case study village, where involvement in paid work was highest. It also enabled the selection of respondents and suggested themes for interviews and child-specific questions. Initial qualitative analysis based on field notes encouraged me to reshape my research questions and generated the conceptual framework of the characteristics of work and school. I applied this framework in the third stage, a detailed quantitative analysis, and the fourth stage, detailed qualitative analysis of transcripts using Atlas. Finally, the combination suggested questions for further surveys.

In qualitative work, children and parents described a variety of characteristics of work and school which influenced their decisions about children's time. I drew on their accounts to

develop theoretical propositions about which characteristics of work and schooling affect the allocation of children's time. Bina Agarwal, an economist, calls the process of drawing on qualitative work to develop economic theory 'analytical description', describing it as 'a formulation that seeks to comprehensively spell out both qualitative and quantitative factors that might impinge on outcomes, without being pre-constrained by the structure that formal modelling imposes, or by data limitations' (Agarwal 1997: 6).

She argues that 'analytical descriptions' are useful when the factors being considered are not captured adequately in economic models. She and other economists (Basu 2006; Folbre 1984) have used insights from qualitative work to improve models of intra-household bargaining. I describe the use of 'analytical description' further in Orkin (2011b).

## 7. Children's work and school in Leki: qualitative evidence

Leki is a lakeside village of 2,835 people and 410 households, four hours' drive from Addis Ababa and two hours' walk from the nearest town. Forty-four of the 49 children in the Young Lives Older Cohort sample in Leki are from the Oromo ethnic group, while four are from ethnic minorities. Twelve are Muslim and 37 are Orthodox Christians.

Leki has a health post, a primary school, a church and a mosque. The village was constructed as part of a government villagisation process in the 1970s, so houses are clustered together along dirt roads close to village facilities, and almost all children live close to the school. In 2006, 49 per cent of the 49 households in the Young Lives Older Cohort could access electricity, and all could access communal water pumps. The nearby town had a secondary school, three primary schools and a clinic.

In 2008, 285 households owned land, on which they grew maize, wheat and *teff* (a cereal that is made into *enjera*, the staple flatbread). Most households owned goats and roughly half owned cattle. Because of the lake, land around Leki is ideal for irrigated agriculture. In 2002, the first of five commercial farms growing vegetables for export was established. An NGO also recruited 99 farmers from Leki to form irrigation co-operatives. In addition to growing grains, these farmers could grow and sell a second harvest of vegetables.

### 7.1 Paid work

Vegetable farming was labour-intensive. Children worked unpaid for their families if their families owned irrigated land. Both commercial vegetable farmers and families with irrigated land often hired children as casual labourers for transplanting and harvesting. Even children whose families had irrigated land worked for pay. The duration, intensity, and flexibility of work varied between employers.

On both family and commercial farms, a rate was paid for a piece of work. On commercial farms, pieces were sized such that they took a woman or child roughly a day to complete. Girls described planting seedlings:

Children wake up early in the morning to start their work. They are given 20 rows to put onion seeds. They prepare openings and put the seeds in each opening [and] cover them with soil. It takes a day to complete the 20 rows. This may keep students from going to school (Girls Group Two, 15 August 2008).

Children were expected to finish a piece of work in one day, or else they were not paid. Fourteen of the 17 children interviewed said they would not leave work to go to school if they had not finished work. Ganat, a girl, said, 'If we fail to finish the work we are assigned to, the organisation does not allow us to go home. Sometimes they beat us and instruct us to finish the work.' In contrast, on family-owned farms, 'If you fail to finish, you come back to doing it the next time.' One boy preferred to work for individual farmers because 'you can earn whatever you do, half day or full day'. The system on commercial farms prevented work from being divided into small chunks of time, which made work particularly competitive with schooling.

Work on commercial vegetable farms was particularly tiring. Girls said planting onions was their most tiring activity: 'You do it stooped over so you feel pain in your back' (Girls Group One, 13 August 2008). Some boys said, 'Paid work has a huge impact. It is heavy and beyond our capacity' (Boys Group Two, 24 August 2008). Dasse, a boy, said, 'The work on commercial farms is difficult, and you can't take a break, you have to work all ten hours in the sun. But with the individual farms you can take breaks and go home earlier.'

Performing tiring work made it difficult to participate fully in school: 'Whenever we go to school after doing heavy tasks, we cannot easily follow the lecture in the class' (Boys Group One, 22 August 2008). Children also struggled to do homework: Senayit, a girl, said, 'When I come home from work, I feel tired and fail to do assignments.' A boy said, 'If we have to work on the farm weeding, we go to bed early so that we may wake up in the night to study. We ask our parents to wake us up.' One of the teachers agreed: working children 'come without doing their homework. ... When we ask their friends after class, they tell us that the student was working on some vegetable farm the previous day.'

Many children used their wages to buy school materials, which made work and schooling complementary. The school at Leki did not charge fees or require uniforms. However, children had to buy exercise books, stationery and adequate clothes and shoes. Two children interviewed had dropped out of school because their parents could not afford these things. They worked and saved money and returned to school the next year. Children from poorer families struggled most to pay for schooling: 'Children whose parents don't have land and are economically poor need to do paid work to survive and to attend school' (Boys Group Two, 24 August 2008).

However, work was scarce: the boys said, 'We cannot get the job opportunity even when we want to do it.' The foreman at one vegetable farm reported that children begged to work there. The scarcity of jobs meant children missed school if it conflicted with work (Girls Group Two, 15 August 2008). Teachers sometimes allowed children to leave school early for paid work. One of the boys said, 'If we get one [a job], we work. We ask teachers for permission and go to work. The teachers may ask us to bring them some onions and we do accordingly.' But children who were often absent without permission were 'fired' by their teachers (Girls Group One, 13 August 2008).

Children who needed to work worried about finding jobs, which in turn affected their concentration at school. Senayit was due to start Grade 5 in the 2008/9 school year. Her parents were both seriously ill. She worked on vegetable farms at weekends and sometimes before or after school in order to buy pens, exercise books, coffee and food for her family.

She said, 'I think about my payments while I am in class or studying; this definitely affects my learning.' Beletu, another girl, described a child doing badly at school: 'She cannot study because she has to worry about many things. ... She has to look for a job.'

Boys could also earn money catching fish from the lake. Fishing paid less well than working on vegetable farms. However, it was available year-round, and was particularly profitable during March and April: during Lent, Orthodox Christian families do not eat meat. Boys rowed boats to deeper water in the middle of the lake to set their nets. Once there, it made sense for them to wait there for the day, so they missed school. They were not able to study, as they watched their nets constantly to catch fish with another, smaller net before they wriggled out. Girls didn't fish because it was argued that they were not strong enough to row boats.

## 7.2 Work in family enterprises

Most children whose families owned land helped their families to farm. Boys assisted with weeding, ploughing, guarding crops, harvesting, and building fences and barns. Girls assisted with harvesting and sowing seed. Work for families could be divided into small chunks of time, which made it less competitive with schooling than work for pay: 'Concerning the household work ... parents don't refuse to send you to school though you don't finish the work. You can finish the work after school. That is not the case with the paid work' (Boys Group Two, 24 August 2008).

Children started herding goats at around the age of 5. From the age of 7, boys herded cattle. Grazing land was two hours' walk from the village. In dry weather, cattle were taken further away to graze, which took the whole day (Boys Group Two, 25 August 2008). However, if grazing was plentiful, herding took place after school. Children could study while herding: one boy said, 'When my father tells me to look after the cattle, I feel happy because I can read my books.'

Children with few siblings missed school more often to help their families. One boy, Ramato, had no brothers, so his father often needed him on the farm and would tell him to get permission from his teacher to miss school. Ramato was unhappy about these absences: 'If I miss a class and friends tell me that they learned many things and took some homework, I really feel upset, since I lose marks.' Such children also enrolled at a later age: Dasse, a boy from one of the richer families in the village, was already 'a little grown-up' by the time he started school at 9. He said, 'There was no one to look after the herd, and I was doing that.' When his younger sisters were old enough, they took over herding and he went to school.

## 7.3 Work in the home

Both girls and boys fetched water from the pump and collected firewood. In addition, girls cleaned the house, went to market, washed clothes and made *enjera* (flatbread) and *wot* (sauce). Girls said they did more work than boys. One girl, Ganat, said, 'Boys work for longer hours than girls in paid work. But girls must also do household chores when they come home.'

Tasks that children said were bad for schooling needed a long and continuous block of time and could not be balanced with studying. These tended to be assigned to girls:

Girls are mostly busy and consequently get weak in their education. The boys may take their exercise books when they go to herd cattle. But if girls try to study while they bake *enjera*, they may forget and the food may burn (Girls Group Two, 24 August 2008).

Another girl agreed, saying, 'Making *enjera* has a lot of processes. It requires collecting firewood, mixing the flour with water and a lot more processes all at once.' Similarly, collecting firewood required travelling to the forest some way from the village. Fetching water, however, was quick and could take place before or after school (Girls Group One, 12 August 2008).

Girls struggled to study at home, because they could be asked to work at any time: Senayit said, 'If they order me to work, I work. I cannot disobey them.' When asked how parents should support their children's education, she said, 'Parents should give ample time to their children to read books and prepare themselves for the next class.' Boys felt more in control of their time: 'They [teachers] teach us to use our time economically and finish the work we need to do so that we have time for study' (Boys Group Two, 25 August 2008).

Girls were also responsible for caring for sick family members. A girls' group described girls doing badly at school: 'They engage in paid work. When their mothers are sick they say, 'I have to work and with the money I have to buy medicine'' (Girls Group Two, 14 August 2008). Boys said of girls, 'If her mother is sick, she focuses on work, quitting her education' (Boys Group Two, 24 August 2008). If women were ill, girls took on all their domestic chores. Senayit, whose mother was sick, said:

When she was healthy, she did all household tasks and cooked my meal. I used to come from school and eat. But now I work all chores without anyone's assistance. I collect firewood, clean the house, make coffee, fetch water, go to market and bake bread.

## 7.4 The school

In 2006, nearly all children in the Young Lives Older Cohort sample in Leki (96 per cent) were enrolled in school. Many children had started school after the age of 7, the compulsory age of enrolment, because their parents could not pay schooling costs or needed them for work. Teachers at Leki School reported high rates of drop-out. They said that by the middle of the 2007 school year, roughly half of the children who had enrolled in Grades 1 and 2 at the beginning of the year had dropped out.

Socio-economic constraints were a major reason for drop-out. One teacher said, 'The produce from last year gradually depletes in the second semester. Sometimes students come without eating their breakfast; this makes them weak and hopeless, and they quit.' Another teacher agreed, 'The children do paid jobs to get money; they become very money-enthusiastic and their parents do not push them to go to school as they value the daily money the children earn. There could be lack of food, exercise books, and clothing.' In both cases, children often returned to school the year after dropping out and had to repeat the year. They thus progressed slowly through grades.

The school operated in only one shift, from 8am until 12.15pm. If only school hours are considered, schooling was compatible with some work. Even so, some children attended irregularly, or came in the morning and left after the 10am break. They often missed school to work. Senayit said this affected her results: 'I was absent many days. I cannot tell you how many days ... If we support ourselves by working as daily labourers, we may lose the lessons the other students have been taught ... and score less in tests.' Children also missed school if they were late because of work. The school had a guard, who often shut the gate against latecomers. Senayit said, 'Teachers close the gate against us so that we cannot disturb the class. We kill two or more periods just wandering in the fields. Sometimes teachers beat us, ... order us to collect rubbish and clean the compound.'

Schooling was structured to accommodate children's work to some extent. The Leki school management committee, in consultation with farmers, adjusted the school calendar and moved the times of the school day according to the cycle of subsistence activities. In October, there was a two-week break so children could help with harvesting, and when school resumed it was moved from morning to afternoon. In November, school was moved back to the morning. In April, school was moved back to the afternoon because of tilling.

During the period before Easter, when the price of fish was high, boys in Leki could earn money from fishing and therefore missed school more than girls. Teachers made an informal arrangement with boys and 'told them to come to school at 9am after they have finished fishing. ... It is better to come late than to quit school.'

However, the school calendar did not change around the vegetable harvests, when many poorer children worked on vegetable farms. Moreover, the school was not as flexible as parents and children would have liked it to be. The chairperson of the village governing committee said parents had asked the school to teach in two shifts, so that they did not have to send all their children to school at the same time, but the school had not complied.

The school was also sometimes inflexible in accommodating children who were seriously ill or who were caring for sick parents. This is described further in Orkin (2011a). The school did not allow two of the children interviewed who were sick and missed school for one or two months to return to school the same year, because they had missed too much work. Instead, they were asked to repeat the grade the following year. Teachers also did not make allowances for children (usually girls) who were caring for sick family members. If children were late for school, they were prevented from entering the compound. If they were often absent, they were asked to repeat the grade the next year. Two of the children interviewed who were caring for their sick parents had dropped out for a year. One had returned to school but one had not, although she hoped to return the following year.

## 8. Descriptive statistics

In Tables 2, 3, 4, 5, 6, and 7, I explore which of the patterns of time allocation described in qualitative work in Leki were present across the sample of 625 rural children in 13 villages in four regions of Ethiopia. In some respects, Leki was an exceptional case. In particular, there were more opportunities for children to work for pay than in other rural Young Lives sites. Absence from school was higher in Leki than in other sites, and children progressed through fewer grades in the four years between 2002 and 2006. However, in other respects, children's activities and schooling participation across all 13 sites were relatively similar to those in Leki, suggesting many conclusions from qualitative research can be generalised to other Young Lives sites.

The Young Lives survey was conducted in the four 'established' regions – Amhara, Oromia, Tigray and the Southern Nations, Nationalities and People's (SNNP) Region – and Addis Ababa. Ninety-six per cent of the Ethiopian population lived in these regions in 2002 (Woldehanna et al. 2008). Young Lives did not survey children in the four 'emerging' regions, Afar, Somali, Benishangul Gumuz and Gambella, where some of the population is nomadic, or in the cities of Harar and Dire Dawa.

In the five Young Lives survey regions, 20 districts were chosen to capture a mix of ethnic groups and rural and urban areas and to oversample food-insecure sites. One village was

randomly selected in each district. Within each village, households were randomly sampled with replacement until 50 households with one child aged 8 were identified. Round 1 of the quantitative survey took place in 2002 and Round 2 in 2006. Because sampling was random within villages, one can draw conclusions from survey data about children in the Young Lives sample and similar villages.

Table 2 describes the outcome variables used in regression analysis. Children are defined as participating in a type of work – paid work, subsistence work, chores or caring for others – if they allocated more than an hour on a typical day to it. Variables measuring children’s schooling participation reflect whether a child is struggling to participate in school. There are four school outcome variables: if the child had never enrolled; had enrolled at some stage but had dropped out by 2006; was enrolled in 2006 but attended irregularly; and was enrolled in 2006 but had progressed zero, one or two grades between 2002 and 2006.

**Table 2.** *Definitions of outcome variables*

Variable	Definition
Paid work	Child spent some time on an average day on activities for pay outside the household or for someone not in the household*
Subsistence work	Child spent some time on an average day on tasks on family farm, herding or other family business
Chores	Child spent more than two hours on an average day on domestic tasks (fetching water, firewood, cleaning, cooking, washing, shopping)
Caring for others	Child spent some time on an average day on care for others (younger siblings, ill household members)
Never enrolled	Child had never enrolled in school
Dropped out	Child had been enrolled prior to 2006 but was not enrolled in 2006
Enrolled but attending poorly	Child was enrolled for the 2006/7 school year but missed more than 15 days of school in the 2005/6 school year
Enrolled but completed <2 grades	Child was enrolled in 2006 but had only progressed 0, 1 or 2 grades in the previous 4 years

\*32 children were also coded as doing paid work if they had done paid work in the last 12 months but did not say they did any hours of paid work on a typical day.

Table 3 shows the percentage of children who spent more than one hour on a typical day on a series of activities. Children could participate in more than one activity. The first three columns show survey data collected in 2006 across 13 Young Lives rural sites. The next column shows the same data, but only for the 49 Young Lives children in Leki. In Leki, 47 per cent of children participated in paid work, probably because there were job opportunities on commercial farms. The next-highest level of participation in paid work was in a village where 18 per cent of children worked for pay, and across all 13 sites, only 11 per cent of children participated in paid work. This was possibly because no other villages were close to large commercial farms. It was not due to lack of access to irrigation: nine of the 13 Young Lives villages had access to some irrigation in 2006 and 30 per cent of Young Lives families across all 13 sites had access to irrigation, compared to 29 per cent of families in Leki.

However, commercial agriculture is becoming more widespread in Ethiopia (Byerlee et al. 2007), so patterns in Leki may increasingly spread to other rural communities. My research draws similar conclusions to other research in Ethiopia with children working for pay. In Gedeo, a coffee- and fruit-growing area, children pick, sort and sell coffee and fruit (Abebe 2007; Abebe and Kjørholt 2008). Here, too, school calendars are not compatible with involvement in coffee production, and children recognise that work conflicts with schooling.

Otherwise, children's time allocation in Leki was similar to the rest of the sample. As shown in Table 3, a majority of children were involved in chores and in subsistence work. There was strong gender differentiation in work. Much higher proportions of 12-year-old girls than boys cared for others and did more than two hours of chores; while much higher proportions of boys than girls did paid and subsistence work (t-tests on comparisons of means for all comparisons mentioned are significant at the 1 per cent level). Widespread involvement in subsistence work and chores and division of tasks by gender is also noted in qualitative research by Poluha (2007) and Abebe and Kjørholt (2008). However, in my qualitative work children described boys doing domestic work and girls herding, indicating that gender differentiation of tasks adapted to household needs.

**Table 3.** *Typical tasks by gender in 2006%*

Variable	In all 13 sites (n=625)			In Leki (n=49)
	Girls	Boys	Girls and boys	Girls and boys
<b>On a typical day, % of children who spent some time on:</b>				
Caring for others	45.70	29.10	37.12	46.94
Chores	97.03	77.26	86.86	97.96
Chores (of more than two hours)	62.25	26.32	43.68	38.78
Paid work	6.62	14.24	10.56	51.02
Subsistence work	44.70	78.02	61.92	48.98

Table 4 shows the amount of time children spent on various tasks. Means for paid work are biased downwards, because many children did not do paid work. If one calculates the mean number of hours of paid work within only the sample of children who did some paid work, girls did an average of 2.40 hours and boys an average of 2.11 hours on a typical day. On average, girls and boys reported similar amounts of time in work in total: girls spent 5.36 hours on the average day on all four types of tasks, compared to 5.26 hours for boys. In focus groups and interviews, girls reported that they worked more than boys. They may have struggled to count time spent on domestic work, which involves fragmented periods of time.

**Table 4.** *Means of hours spent on activities on a typical day by gender in 2006*

Variable	In all 13 sites in 2006 (n=625)			In Leki in 2006 (n=49)
	Girls	Boys	Girls and boys	Girls and boys
Caring for others	0.84	0.72	0.46	0.64
Chores	3.08	2.39	1.69	2.36
Paid work	0.16	1.08	0.30	0.23
Subsistence work	1.28	1.22	2.79	2.06
All types of work	5.36	5.26	5.31	5.42
School	5.21	4.27	4.99	5.10

On average, children in Young Lives sites spent five hours a day in school. Most rural schools in Ethiopia teach two shifts of children for half a day each because of shortages of teachers or because parents want the children to be available to work part time.

Table 5 describes children's schooling participation. Enrolment was high: 93 per cent of children across all 13 sites and 97 per cent of children in Leki were enrolled in 2006. Very few children had never enrolled. This reflects recent dramatic improvements in Ethiopian children's access to primary education as a result of the abolition of fees, large-scale school-

building and local government campaigns to get children enrolled (Engel 2010: 3). Differences in enrolment rates between boys and girls were not statistically significant. A relatively small proportion of children had dropped out of school in both Leki and the broader sample. Across all 13 villages, boys were more likely to have dropped out than girls (the difference is significant at the 5 per cent level).

Absenteeism in Leki was more severe than in the broader sample: 16 per cent of Leki children were enrolled but not attending regularly, compared to only 5 per cent across all 13 sites (the difference is significant at the 5 per cent level). In all villages, data probably underestimate rates of absence because it was collected from caregivers.

**Table 5.** *Schooling participation by gender in 2006 (%)*

Variable	In all 13 sites (n=625)			In Leki (n=49)
	Girls	Boys	Girls and boys	Girls and boys
Never enrolled	2.98	4.95	4.00	0.00
Dropped out	1.99	4.33	3.20	4.08
Enrolled in 2006 and missed more than 15 days of school in 2005/6	5.30	5.57	5.44	16.33
Enrolled in 2006 and missed less than 15 days of school in 2005/6	89.73	85.15	87.36	79.59
<b>Total %</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

The final variable measuring schooling participation is children's progression through grades. In Ethiopia, children progress through the first four grades if they attend school and complete the necessary assignments (see Orkin (2011a) for more detail on this policy). In Leki, many children interviewed in qualitative work started school at 7, when enrolment becomes compulsory, but were in grades much lower than they could be at age 12. Slow progression occurred because children dropped out for one or more years of school and then returned, or because children had to repeat grades because they were absent too often in a particular year.

Table 6 examines the number of grades a child progressed between the first round of survey data collection, between October and December 2002, and the second round, between October and December 2006. Children with smooth school trajectories would have progressed four grades in this period. Across all 13 sites, only 24 per cent of children did this. At the other extreme, 9 per cent of children in the sample were in school for some period between 2002 and 2006 but did not pass a single grade. There was no statistically significant difference in the progression of boys and girls. Children in Leki progressed more slowly through grades than children in other sites ( $p=0.017$  on the chi-squared test).

**Table 6.** *Grade progression by gender in 2006 (%)*

Variable		In all 13 sites (n=625)			In Leki (n=49)
		Girls	Boys	Girls and boys	Girls and boys
Progressed 0 grades	Never enrolled	2.98	4.95	4.00	0.00
	Dropped out	1.99	4.33	3.20	4.08
	Still enrolled	12.23	8.79	9.15	20.41
Progressed 1 grade		12.21	18.07	15.22	24.49
Progressed 2 grades		18.15	16.82	17.47	16.33
Progressed 3 grades		29.70	25.23	27.40	28.57
Progressed 4 grades		25.41	21.81	23.56	6.12
<b>Total (%)</b>		<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

Finally, Table 7 shows children’s combinations of activities. Only 5 per cent of children in the sample went to school and did less than two hours of chores or caring. Most children – 51 per cent across the 13 sites – were at school and involved in subsistence work. As in previous tables, the combination of activities that children did varied significantly by gender on a chi-squared test ( $p=0.00$ ).

**Table 7.** 12-year-old children’s combination of activities, Ethiopia 2006

Variable	In all 13 sites (n=625)			In Leki (n=49)
	Girls	Boys	Girls and boys	Girls and boys
% not in school	4.97	9.29	7.20	4.08
% in school and doing paid work*	6.62	11.46	9.12	46.94
% in school and doing subsistence work and more than two hours of chores/care	26.16	18.27	22.08	10.20
% in school and doing subsistence work but less than two hours of chores/care	12.58	43.65	28.64	14.29
% in school and doing no subsistence work but more than two hours of chores/care	46.36	10.22	27.68	18.37
% in school and doing no subsistence work and less than two hours of chores/care	3.31	7.12	5.28	6.12

\*They may also have spent time on other types of tasks.

## 9. Regression analysis

The regression analysis explores whether there was any relationship between the characteristics of activities children were involved in and children’s time allocation to work and school. The Young Lives survey does not capture information on characteristics of work and school, so I used the insights of qualitative work to select proxies for children undertaking work or attending a school with particular characteristics, with some but limited success. If one of these proxies for a characteristic of work or school correlated with children attending school less and working more, I concluded that that characteristic made work and school competitive.

I used an econometric specification based on Cigno and Rosati’s (2005) theoretical model, which assumes that only hours constrain how much work children do. I use a standard latent variable model which predicts the probability of a dichotomous outcome (Wooldridge 2002). Outcome variables are dummies equal to one if child  $i$  in community  $j$  allocated more than an hour on a typical day to the activity.

$$Activity_{ij}^* = \beta X_i + \gamma H_i + v_i \text{ where } v_i = c_j + \varepsilon_{ij}$$

$$Activity_{ij} = 1 \text{ if } Activity_{ij}^* > 0$$

$$Activity_{ij} = 0 \text{ otherwise}$$

$X_i$  is a vector of child characteristics and  $H_i$  is a vector of household characteristics.  $v_i$  is a composite error term made up of  $c_j$ , a village fixed effect on each child, and  $\varepsilon_{ij}$ , a child/household unobservable, which is assumed to have a standard normal distribution.

I examined the eight outcome variables defined in Table 2 using independent probit equations. The specification assumes it is not possible to distinguish factors which influence

the decision to do different types of work from the decision to enrol in and attend school. The same regressors are therefore used in all regressions. Using independent equations assumes that error terms do not correlate across equations. Table 8 defines the control variables and Table 9 gives their means and standard deviations.

**Table 8.** *Control variables*

<b>Child variables</b>	<b>Variable name</b>	<b>Notes</b>
Standardised height-for-age	Height-for-age	<i>A child's z-score is the number of standard deviations the child's height-for-age is below or above the mean value (WHO Expert Committee on Physical Status 1995).</i>
Child not of the same ethnic group as the dominant group in the site	Minority ethnic group	
Gender (=1 if male)	Male	
<b>Household variables</b>		
Child is grandchild, sibling, stepchild or other relative of the household head, not the biological child	Not biological child	
Number of children under 5 in the household	Children under 5	
Number of children between 5e and 16 in the household	Children 6 to 16	
Number of adults in the household	Adults	
Birth order (Eldest child is the base category)	Middle child, youngest child	
Mother's education (=0 if mother not present or dead)	Mother's education	<i>Adult literacy classes are counted as one year of education.</i>
Father's education (=0 if mother not present or dead)	Father's education	
Log durables per capita	Log durables p/c	
Log herd value per capita	Log herd value p/c	
Household plot size (hectares) (=0 if no land)	Land size	<i>Conversion ratios from local units are from the Ethiopian Rural Household Survey (Dercon 1996).</i>
Household access to irrigation (=0 if household has no land or non-irrigated land)	Household irrigation	
Household could not raise 150 birr in one week (=0 if household could easily or probably raise 150B)	Credit-constrained	
<b>Illness variables</b>		
Death of parent between 2002 and 2006	Parental death between 2002 and 2006	<i>Values of 0, 1 or 2. 1 is allocated if father dies and 1 if mother dies.</i>
Percentage of household members sick for more than 30 days in 2005/6	Percentage ill household members in 2005/6	<i>Ethiopia uses the Ge'ez calendar, so 'the last year' refers to September 2005–September 2006.</i>
Days of child illness in 2005/6	Days of child illness in 2005/6	<i>The question asks for the number of days when the child was unable to do his/her ordinary activities because of illness.</i>

**Table 9.** *Descriptive statistics for control variables in 2006*

Variable	Mean	Standard deviation
Standardised height-for-age z-score	-1.48	1.22
Boys	0.52	0.50
Children from a minority ethnic group in the village	0.08	0.27
Children who are not biological child of household head	0.11	0.31
Children who are the eldest child	0.22	0.42
Children who are a middle child	0.61	0.48
Children who are the youngest child	0.17	0.37
Number of children in the household under 5	0.72	0.77
Number of children in household between 5 and 16	2.89	1.09
Number of adults in the household	3.22	1.44
Mother's education	1.25	2.46
Father's education	2.41	3.21
Household durables per capita (2006 prices)	698.65	7,439.29
Log household durables per capita (2006 prices)	4.19	1.85
Household herd value per capita (2006 prices)	856.46	4,132.93
Log household herd value per capita (2006 prices)	5.24	2.66
Households owning some land	0.94	0.25
Size of household plot (hectares)	1.23	0.98
Households with access to irrigation	0.30	0.46
Household could not raise 150 birr in a week	0.33	0.47
Death of parent between 2002 and 2006	0.14	0.37
Percentage of household members sick for more than 30 days in 2005/6	0.19	0.18
Days of child illness in 2005/6	13.71	38.44

I used village-level fixed effects to control for omitted village-level variables, such as health centres or schools (children within each village live relatively close together); costs of school materials such as uniforms and books; and availability of amenities in the village, such as roads.

I did not use a school fixed effect as this is not possible with the data available. However, because all sites are rural, the majority of children in each site attended the nearest village primary school. Even if children in a village attended more than one school, schools were probably of roughly similar quality. No children in the rural Young Lives sample attended private schools.

I did not use household fixed effects as there were only two rounds of data. Coefficients estimated using fixed effects would be consistent but standard errors would be inflated. Omitted variable bias due to child and household characteristics is highly likely. So I merely note when correlation is present and do not attribute causality to relationships.<sup>5</sup>

5 It is not possible to test whether shocks are exogenous. However, following Beegle et al. Kathleen Beegle, Rajeev H. Dehejia, and Roberta Gatti, 'Child Labor and Agricultural Shocks', *Journal of Development Economics*, 81/1 (2006), 80-96 at 84., I tested whether health shocks could be predicted and were persistent see Kate Orkin, 'If God Wills...Next Year I Will Send Her Back to School': The Effects of Child and Parental Illness on School Participation in Rural Ethiopia', *CREATE Pathways to Access Monographs*, 60 (2011a), 1-50.. I found that shocks were not predicted by observable variables, except for household landholding. Beegle et al. argue that this suggests that shocks were largely idiosyncratic and unrelated to unobservable characteristics. I also found that most health shocks were transitory: households which experienced shocks were not more likely to experience future shocks, except in the case of death. Households were thus unlikely to anticipate shocks and change behaviour to compensate for future income losses.

All coefficients are reported as marginal effects. The marginal effect of an independent variable is the partial change in the probability of a child doing an activity if there is a one unit change in the variable, conditional on all other independent variables being constant at their mean in the sample. For binary independent variables, the discrete change is calculated.<sup>6</sup>

My qualitative research suggests various characteristics of work and school that make them complementary or competitive. These describe the situation in Leki, but also provide expectations which can be tested in quantitative research through proxy variables. Table 10 shows probit regressions describing factors influencing the amount of time children spend working. Table 11 shows regressions describing children's participation in schooling.

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6 One can compare the magnitude of marginal effects within tables, but not between tables: the magnitude of the marginal effect depends on the values of other regression coefficients and the mean value of the other independent variables.

**Table 10.** *Probit regressions (marginal effects): children's involvement in different activities in 2006*

	<b>Paid</b>	<b>Subsistence</b>	<b>Chores (&gt;2 hours)</b>	<b>Care</b>
Height-for-age	0.00353 (0.361)	0.00346 (0.886)	0.0260 (0.129)	0.0108 (0.649)
Male	0.0281*** (0.000947)	0.500*** (0)	-0.412*** (0)	-0.188*** (0.00381)
Minority ethnic group	-0.00735 (0.157)	0.0149 (0.918)	0.0608 (0.446)	0.0250 (0.772)
Not biological child	0.0332 (0.192)	0.161* (0.0630)	0.0253 (0.760)	0.00108 (0.989)
Middle child	0.0189 (0.121)	0.107 (0.201)	0.0166 (0.852)	-0.00925 (0.861)
Youngest child	0.0139 (0.432)	0.116 (0.280)	-0.0497 (0.533)	-0.0994 (0.250)
Children under 5	-0.00613 (0.236)	0.0226 (0.557)	-0.0482 (0.312)	0.251*** (1.36e-08)
Children 6 to 16	-0.00252 (0.615)	0.0272 (0.267)	-0.0329 (0.289)	0.0168 (0.456)
Adults	0.00349 (0.303)	-0.0394 (0.169)	-0.00177 (0.910)	-0.00200 (0.930)
Mother's education	-0.00346*** (0.000328)	-0.0340** (0.0329)	0.00228 (0.878)	-0.00589 (0.579)
Father's education	-0.00128 (0.249)	-0.00223 (0.790)	0.0110 (0.265)	-0.000304 (0.969)
Log durables p/c	-0.00335* (0.200)	0.0206 (0.421)	-0.0402*** (0.00542)	-0.0230 (0.227)
Log herd value p/c	0.000216 (0.873)	0.108*** (0)	-0.0190* (0.0872)	-0.0112 (0.232)
Land size	0.00295 (0.610)	-0.107*** (0.000472)	0.0538 (0.129)	0.00616 (0.737)
Household irrigation	0.00780 (0.524)	-0.0106 (0.878)	-0.0168 (0.807)	0.0602* (0.0890)
Credit- constrained	0.0385*** (0.00101)	-0.00808 (0.834)	0.112* (0.0834)	0.0556 (0.286)
Parental death between 2002 and 2006	0.00356 (0.685)	0.0572 (0.522)	0.0210 (0.708)	-0.0109 (0.876)
Percentage ill household members in 2005/6	0.0409* (0.0592)	-0.159 (0.468)	0.109 (0.325)	0.147 (0.381)
Days of child illness in 2005/6	2.83e-05 (0.759)	-0.000187 (0.661)	-0.00154*** (0.00247)	0.00138** (0.0110)
Observations	625	625	625	625
Pseudo R-squared	0.327	0.420	0.209	0.227
% correctly predicted	89.90	82.05	72.92	75.64

Notes:

Robust p-values in parentheses: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Marginal effects calculated at the mean of independent variables with standard errors corrected for clustering

**Table 11.** *Probit regressions (marginal effects): children's participation in schooling in 2006*

	Never enrolled	Dropped out	Enrolled but missed more than 15 days	Enrolled but completed <2 grades
Height-for-age	-1.82e-05** (0.0159)	-4.10e-07 (0.218)	0.000386* (0.0975)	-0.119*** (9.32e-07)
Male	1.99e-05 (0.373)	9.19e-07 (0.176)	0.000352 (0.703)	0.0990* (0.0861)
Minority ethnic group	0.00254*** (0.000313)	-3.98e-07 (0.481)	-0.000273 (0.509)	-0.0707 (0.570)
Not biological child	0.000541*** (0.00487)	6.71e-05** (0.0435)	0.000673 (0.673)	0.0841 (0.410)
Middle child	4.79e-05** (0.0415)	1.83e-06* (0.0599)	0.00128 (0.244)	0.127 (0.107)
Youngest child	3.49e-05 (0.335)	8.45e-07 (0.723)	0.000455 (0.682)	-0.0823 (0.160)
Children under 5	8.16e-06 (0.302)	3.26e-07 (0.369)	0.000337 (0.537)	0.0158 (0.716)
Children 6 to 16	-1.12e-05 (0.284)	-3.22e-07 (0.174)	-0.000145 (0.648)	-0.0776*** (0.000269)
Adults	9.88e-06 (0.271)	2.96e-07 (0.405)	0.000124 (0.664)	-0.0115 (0.361)
Mother's education	-3.14e-06 (0.322)	-6.01e-07** (0.0131)	-0.000143 (0.438)	-0.0265*** (0.00416)
Father's education	7.32e-07 (0.858)	3.22e-08 (0.790)	1.29e-05 (0.943)	-0.0103 (0.364)
Log durables p/c	1.84e-06 (0.725)	-5.86e-07** (0.0416)	1.13e-05 (0.939)	0.0129 (0.366)
Log herd value p/c	-4.82e-06 (0.186)	1.52e-07 (0.312)	0.000146 (0.487)	-0.00675 (0.569)
Land size	1.28e-06 (0.921)	3.29e-07 (0.286)	-0.00138** (0.0123)	0.00365 (0.908)
Household irrigation	-3.13e-05** (0.0172)	-1.71e-06** (0.0500)	0.000389 (0.797)	-0.109* (0.0593)
Household could not raise 150 birr in a week	8.08e-05*** (0.00321)	1.72e-05** (0.0143)	-0.000579 (0.248)	0.0485 (0.324)
Parental death between 2002 and 2006	-1.11e-05 (0.254)	-6.39e-07 (0.132)	-0.000524 (0.609)	0.0535 (0.257)
Percentage ill household members in 2005/6	4.31e-05 (0.421)	3.79e-06 (0.102)	0.00519** (0.0174)	0.186* (0.0647)
Days of child illness in 2005/6	-1.39e-06*** (0.00705)	1.38e-09 (0.749)	-9.11e-06 (0.241)	-0.000199 (0.818)
Observations	625	625	625	625
Pseudo R-squared	0.325	0.526	0.195	0.256
% correctly predicted	95.83	97.60	94.71	73.08

Notes:

Robust p-values in parentheses: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Marginal effects calculated at the mean of independent variables with standard errors corrected for clustering

## 9.1 Gender and work

Results relating to gender were similar across qualitative and quantitative work. In qualitative research, I found that younger boys and girls did similar work – herding smaller animals, fetching water and wood, and looking after siblings – but when children were 13, tasks were clearly divided by gender. Quantitative research supported these conclusions. When children were 13, boys were more likely to engage in paid and subsistence work and less likely to engage in chores and caring for others.

In qualitative research, children, parents and teachers did not highlight any particular differences in school enrolment between boys and girls, although girls complained they found it difficult to find time to study. In regression analysis, there was no gender-based difference in the likelihood of boys and girls never enrolling, dropping out or missing school (I had found differences in drop-out between boys and girls in descriptive statistics, but these disappeared once other factors were controlled for). Boys were slightly more likely (at the 10 per cent level) to have only progressed zero, one or two grades in four years. The only explanation for this from qualitative work was that boys tended to be absent more often than girls when their families needed them for subsistence work.

## 9.2 Schooling costs

In qualitative research, I found that schooling costs were a barrier to enrolment. Some children said they had dropped out of school for a year because they could not afford school materials. Children used their wages to pay for their school materials, which made work and schooling complementary. However, children involved in certain types of paid work were more likely to miss school, so working to pay for schooling could compete with attending school.

All the children in the survey sample attended government schools like the school at Leki, which did not charge fees. However, families paid for books, pens and clothing, and made ‘contributions’ for new facilities, hiring guards or paying extra teachers. I do not examine variation in schooling costs between children, because regressions compared children in the same village so schooling costs would be very similar. Instead, I investigated three variables measuring households’ ability to pay schooling costs. I found that children in wealthier families (measured by household durables) were less likely to have dropped out and were less likely to work for pay (at the 10 per cent level). Likewise, as the size of family landholdings increased, children were less likely to be attending irregularly. Children whose households had irrigated land (and tended to be better off) were less likely to have never enrolled, to have dropped out or to have progressed slowly through grades (at the 10 per cent level).

Children from wealthier families were also less likely to work for their households: in households with more durables, children were less likely to do more than two hours of chores, and in households with larger landholdings children were less likely to do subsistence work. This might reflect that wealthier households could hire workers. It is possible that having a smaller load of subsistence work and chores meant children from wealthier families attended more regularly and progressed more quickly.

## 9.3 Scarce work and families facing credit constraints

Children from families burdened by illness and extreme poverty said they had to find work to pay schooling costs and buy clothes and food. They said that work was often scarce, so

when they found paid jobs they would take them and miss school. In contrast, richer children sometimes did paid work, but not if it affected schooling. Poorer families faced immediate credit constraints: they did not have the small amounts of money needed for immediate expenses.

The proxy used in quantitative research is whether the child's family would be unable to raise 150 birr (£0.36 approximately) in a week. Each regression already controls for household wealth. Therefore, the variable which captures how credit-constrained families are isolates the effect of being immediately credit-constrained from the more general effect of having low levels of wealth. As expected, children from credit-constrained families were likelier to take on paid work. It was also more likely that they had never enrolled and that they had dropped out. In qualitative work, children also said that worrying about finding work also led to lack of concentration in class and while studying, but this was difficult to capture using available data.

#### 9.4 Inflexible schooling

Qualitative research showed that the formal schooling system was somewhat flexible to certain types of work but less flexible regarding lateness or children caring for ill household members. School flexibility to work is difficult to quantify directly with 2006 quantitative data, although it was a focus of school-based data collection in 2010.<sup>7</sup> I therefore only examined the effect of child and family illness on children's schooling. The proxies used are not ideal, and better analysis will be possible using school-based data.

The first proxy for school flexibility to illness was the number of days children had been ill in 2005. If schools were flexible, children who had been sick might have been less likely to attend regularly, but they should not have been more likely to have dropped out.

Using these proxies, schools across the sample appeared to be more flexible than the school at Leki. Children who had been ill were no more likely to be absent often or to have dropped out. However, the proxy is somewhat imperfect. Illness and attendance are measured in the same school year (2005/6) but drop-out is measured in the following school year. So schools could have forced sick children to stop school for a year because of illness in 2005/6, but if they had returned by 2006/7 this would not be picked up with the measures used here.

The second proxy for school flexibility to illness is the percentage of household members who had been ill for more than 30 days in the previous year. The proxy is crude: regressions already control for differences in family wealth that may result from illness in the household, but there may be other effects of household illness on school participation not related to school flexibility. Children whose households were burdened by illness were somewhat more likely to work for pay, possibly to pay for medicine and augment family income, as raised in qualitative work. They were more likely to be attending irregularly and somewhat more likely to progress slowly through school.

#### 9.5 Indivisible work

In qualitative research, children indicated that piece-work tasks on commercial farms, herding, fishing, collecting firewood, and making *enjera* were difficult to balance with school attendance and studying. They could not be divided into small chunks of time or combined with other activities. This finding proved difficult to test in quantitative research.

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<sup>7</sup> In 2010, Young Lives conducted a survey of 120 of the schools attended by Young Lives children.

Herding was competitive with schooling when cattle had to be taken far away from home, so in quantitative analysis, I examined children whose families had larger herds. There was strong probability that these children would do subsistence work, but they were not more likely to miss school. On average, herding and schooling were complementary.

The second proxy examined was whether irrigation was available in the research site (results are not shown here). In qualitative work, irrigated agriculture increased opportunities for indivisible paid work. I used a variety of village-level variables as an imperfect substitute for village fixed effects. As expected, availability of irrigation in the area increased the probability that children participated in paid work. However, irrigation in the site unexpectedly increased the probability that children attended school. Perhaps children were using money earned in agriculture to subsidise their schooling costs. Alternatively, in other sites, work in irrigation agriculture may have been divisible and complementary to school attendance.

## **9.6 Tiring work and the fact that chores and study are both done in the home**

Qualitative research found that tiring work prevented concentration during school and decreased the amount of time spent studying. Lack of quantitative data on the nature of work prevented examination of tiring work, but the variable has been included in Round 3 of the survey.

Girls also mentioned that they struggled to study and do homework at home because they were often interrupted and asked to do household chores or care for children or family members. Unfortunately there were no quantitative data on where children studied, so this relationship could not be examined.

# 10. Conclusion

Across qualitative and quantitative research, a picture emerges of characteristics of work and schooling that make these activities competitive. Qualitative evidence suggests that two features of rural schools – high schooling costs and less flexibility to local work patterns and the effects of illness – and four work-related features – work which is scarce, less divisible work, more tiring work, and the fact that chores and study are both done in the home – make work and school more competitive. In quantitative research, there is some correlation between proxies for four characteristics – high schooling costs, flexibility to the effects of illness, work being scarce and less divisible work – and decisions about children's schooling and work. This suggests that the characteristics of activities are generally relevant to whether work and schooling compete or can be combined. Findings, although preliminary, suggest directions for further research.

The most obvious extension of analysis is to construct a formal economic model that treats the characteristics of school and work as constraints on the allocation of children's time, rather than only examining the amount of time activities take. For example, additional constraints could be added to reflect the capacity of a child to engage in tiring work. The micro foundations of the household decision could be modelled to include the labour intensity or indivisibility of work. Rather than modelling child schooling and child work as 'consumption choices', work and school could be seen as (complementary or competitive) inputs into the production of lifetime income or utility, with competitiveness implying a concave (rather than

convex) relationship between the two. This would allow us to better conceptualise behaviour and create a bridge to the vast literature on returns to schooling.

Secondly, further research could attempt to capture the negotiation process between children and adults and between children within a household. As stated in the introduction, I assume that decisions about children's time allocation are made by the household head. However, qualitative research, described further in Orkin (2011b), suggests that in some families, children had some freedom to take decisions about their time allocation or to disagree with their parents' decisions, while in others, children obeyed parents' orders. This bargaining process could be captured in a principal-agent model, where negotiation between parent and child is more strategic than is usually assumed, and the rewards of different types of work may result in very different 'contractual' decisions over times spent in work and school. Some researchers have already examined the effect of women's (Basu 2006) and children's (Moehling 2005) bargaining power in the household on their consumption. There may be some potential to examine how children's bargaining power affects their time allocation rather than their consumption.

Finally, my research suggests further focus on the characteristics of schooling that enable children to combine work with school, and to participate in school more generally. Other literature on access to education shows, as my findings suggest, that reductions in the direct and opportunity costs of schooling improve participation in school (for example, Ravallion and Wodon (2000) on enrolment subsidies, Evans et al. (2008) on school uniforms and Vermeersch and Kremer (2005) on school meals).

However, qualitative research also demonstrated that the structure of schooling – the length of the school day, whether school was in the morning or afternoon and whether school closed for harvest and planting – and regulations around participation – how long children could be absent for, whether they had help to catch up missed work and how strict teachers were about punctuality – also influenced children's participation. This raises questions which have largely not been examined in economic literature. Which aspects of school structure and regulation affect participation the most? Why do schools decide on policies: do they act in the interests of children, teachers or district authorities? Do teachers comply with school regulations?

Findings also suggest tentative policy recommendations. Firstly, when the poorest families have limited resources for schooling, there are many basic barriers to children's access to education. The cost of books and stationery prevents very poor children enrolling, or requires them to work for pay to support their schooling, which can then result in them missing school. Simple interventions, such as provision of school materials, might reduce drop-out, reduce absenteeism because of work and prevent children worrying about finding work. NGOs already run such interventions in urban Young Lives sites in Ethiopia, but fewer NGOs operate in rural areas.

In similar vein, better access to healthcare for parents and children would reduce drop-out among ill children and absenteeism among children caring for sick parents. School feeding schemes might encourage attendance and improve concentration for children who battle with hunger. Such schemes could target the poorest children at times of year when food scarcity is at its worst.

Secondly, making schools more flexible to working children's lives may result in improvements in enrolment and attendance, as has been noted elsewhere (M. F. C. Bourdillon et al. 2009; Boyden et al. 1998). However, qualitative (Delap and Seel 2004) and quantitative (Sud 2008) research has often focussed on non-formal education alternatives for

working children. My qualitative research suggests that minor adjustments to existing schooling systems, such as synchronising school and agricultural calendars, possibly by giving schools more control over when holidays are scheduled, or shortening school days but lengthening the school year, would help children combine school with work.

Importantly, initiatives that attempt to make schools more flexible to working children should consider work in the home as well as subsistence work and work for pay. Feminist economists have long argued that failing to define chores and caring as work denigrates the contribution of girls (and women) to families (Agarwal 1997; Deborah Levison 2000). The school in Leki overlooked the effects of chores and caring on girls' schooling, although it structured the school calendar around fishing and subsistence agriculture. However, qualitative research shows that some chores and caring can be as competitive with schooling as paid and subsistence work. Interventions to reduce the effect of work on school should also consider these types of work. For example, schools could provide space where girls could study after school so that they do not have to study at home, where there is pressure to do chores.

Finally, requirements for regular attendance may be unrealistic in very poor contexts. As a result of universal primary education, more difficult-to-reach children – children in rural areas, from poor families or from communities where education is less valued – are now able to access formal schooling. But the same factors that previously excluded them from school may now result in them struggling to attend regularly. Children may be under pressure from their families to work for pay or for their households or to care for sick family members. They may also be more likely to be ill themselves.

Regular attendance is important for children to learn. But if schools enforce attendance requirements rigidly, many children may have to drop out for the remainder of the year and repeat the grade the next year. Repetition is an inefficient use of limited resources, and there is a risk that such children do not re-enrol. Even if they do, they will be over-age and may be discouraged by falling behind their peers.

Instead, schooling could be structured to cater more easily for substantial numbers of children being absent for long periods. Schools could provide extra tutorials. Learning materials could be designed to allow literate children to catch up more easily on their own. Although this would be more challenging, governments could structure curricula in modules rather than years and use multi-grade methods of assessment, where a number of grades are taught in one classroom, so children can be at different levels in different subjects. This would accommodate children who had missed a lot of school and might pass some subjects while repeating others.

Making schools more flexible to working children and absent children would require additional training for teachers and principals. It is possible that penalties for absenteeism are being instituted because teachers and principals assume that absenteeism reflects an unwillingness to participate in school or a lack of awareness of the benefits of education, rather than necessity. Altering such preconceptions would be an important first step in structuring schools to prevent work and schooling from competing.

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**Young Lives is an innovative long-term international research project investigating the changing nature of childhood poverty.**

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- improve understanding of the causes and consequences of childhood poverty and to examine how policies affect children's well-being
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