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Know Your Place: Ethiopian Children's Contributions to the Household Economy

Abstract

Analysis of quantitative and qualitative data on a pro-poor sample of Ethiopian children provides a more nuanced understanding of the role of children in the household economy. Children's work is largely shaped by age and gender, however; our results reveal considerable flexibility within these same structures according to household composition, birth order and sibling composition. We find that exceptions (whereby girls or boys are undertaking work normally associated with the other sex or another household member) are affected by household composition, but driven by intergenerational interdependence. Further, these exceptions are not random; children's work is affected less by poverty than by dynamic household circumstances. Given changes in the composition of poor households and absence of adequate social safety nets in a context of high risk and uncertainty, interdependence serves as protective mechanism for poor households.

Keywords: Ethiopia, children's work, interdependence, gender, intra-household distribution, household economy.

1. Introduction

This paper examines the varied and evolving roles of children's work within the household economy in Ethiopia. We iterate quantitative and qualitative methods to more fully understand the evolution of intra-household work allocation in response to shocks, and inter-generational relationships concerning work performed by girls and boys as part of their own households. The findings are also salient for understanding how households, including child members, are adjusting their roles and responsibilities in response to the changes taking place across rural and urban Ethiopia over this time period, in particular agricultural growth, the expansion of schooling and introduction of the national safety net programme (PSNP). We answer two research questions: 1) What factors shape work roles within the household and how do household members value children's contributions, and 2) How do intrahousehold dynamics, or ongoing changes in household circumstances, affect girls' and boys' work roles?

We first briefly review relevant literature in the context of our contribution, which combines qualitative and quantitative analysis, something that has been overlooked in studies of children's roles within households, having been implemented more frequently in analyses of poverty. We incorporate an analysis of both the external context of the household as part of a changing

community, and children as interdependent members of the household (rather than dependents). We then discuss the data and methodology, and present our findings around four themes in order to answer our research questions: children's contributions (understood both quantitatively in terms of time use, and qualitatively in terms of the value placed on the work); composition of the household and interdependence; dynamic determinants of work (or changes in circumstances) and how these affect children. The final section draws together the findings and concludes. Of note to the reader, we use the term 'children's work' when discussing the activities of the girls and boys in our sample. This accounts for all unpaid and paid work, including unpaid domestic/productive work often described as 'chores' or 'tasks', that may release other members of the household for paid work.

2. Literature review

There are fairly large but quite separate bodies of literature on children's work in several academic disciplines. Pertinent to our study in the economics literature are several papers that have investigated the intra-household allocation of work; we build on studies by Emerson and Souza (2008), Edmonds (2006) and Ejrnaes and Portner (2004). These have found birth order and gender impacts on work. Although not specifically focusing on household composition, other economic studies of children's work have also found significant gender, age and birth order effects in their samples, for example Fafchamps and Wahba (2006).

Ethnographic research conducted across a range of contexts (see for example, the work of Punch (2001, 2002) for Bolivia, and Katz (2004) for Sudan) also examine the intra-household division of labour and show the importance of gender and age in understanding work roles. Qualitative

research further shows interdependence within households between children and adult members (Heissler, 2012; Powell et al. 2008; Katz 2004; Punch 2002). With regard to the forms this relationship of interdependence takes, Punch (2002) finds that this concept is relative and negotiated.

Our study builds on this line of research and combines it with the quantitative approach. In particular we focus on the fact that childhood circumstances are not static (not just because of the aging process), especially in a country such as Ethiopia, which has a high level of risk and uncertainty (Boyden 2009; Pankhurst and Tiumelissan 2012), so children's work requirements and roles in the family are continuously adapting.

Ethiopia has one of the highest proportions of working children in Africa (Andvig 2001; Bass 2004), and contributing to the family through work for one's own household (mostly unpaid) is established as a long-standing feature of most Ethiopian childhoods. Guarcello et al. (2006) note that half of all 5–14 year olds work. These authors find that agriculture is the most common work activity for children, nine in ten working for their own household.[1]

Other studies find that roles are broadly determined by gender and age, but also by location (rural or urban), season, ethnicity, religion, education, and class (see for example, Poluha 2007), Abebe 2008) and the intra-household factors of sibling composition, birth order and household composition (Abebe 2007, Abebe and Kjørholt 2009). Cockburn (2002) found that Ethiopian children made considerable contributions to their households through paid and unpaid labour (around 5 per cent of total income, per child). In a sample of 10–19 year old rural girls and boys in the Amhara region, most spent over 30 hours per week doing unpaid work for the household (Erulkar et al. 2004). The division of labour was noticeably gendered: girls did primarily

domestic work within the household and boys tended to do herding or farming. Admassie (2003) found that female children participated more in domestic work and boys' participation was higher in farm work such as ploughing, harvesting and looking after livestock. This finding is echoed by Bevan and Pankhurst (2007) who find that, although boys and girls start working from similarly young ages, work becomes increasingly gendered as they grow up. Findings from qualitative research reveal the type, nature and intensity of work in the Ethiopian context are also shaped by the intra-household factors of sibling composition, birth order and household composition (Abebe 2007, 2009). Abebe (2009) also writes that rural older boys in poor households assist their parents in agricultural work and have more social responsibilities than physically weaker or younger siblings, who are sent to school.

Contributing to one's household is an important part of what it means to show respect to one's parents and elders (Poluha 2007; Nurye 2007; Abebe and Kjørholt 2009; Camfield and Tafere 2009). Furthermore, work is associated with the child's position in the household and wider community. For example, among the Gamo in southern Ethiopia, the social status of the child is closely associated with the work he or she does, and it varies according to gender and life stage (Liebel 2004). Nurye (2007: 3–4) writes that in Ethiopia: 'Cultural practice and the family set-up emphasise interdependence more than autonomy, affiliation rather than individual cooperation.' Children are not equal partners in this relationship, however. Abebe and Kjørholt (2009) describe this relationship between children and their parents as comprising a form of 'intra-household social contract' that is mostly controlled by adults but with adults' control declining as children become more competent and experienced (which is often associated with age). Woldehanna et al. (2005) found that increased demand for labour in the household is frequently met by children, particularly boys, with girls commonly substituting for their mothers.

Children's work is also shaped by wider socio-political and economic factors such as the change in the global price of coffee (Abebe 2007, 2009), changing agricultural practices (Admassie and Bedi, 2008) and the national Productive Safety Net Programme (Woldehanna, 2009; Hoddinott et al, 2009).

While attention in the current literature is drawn to the importance of children's work for the household economy, there is also a need to explore how forces of change and evolving social developments affect the intra-household division of labour. Research presented above hints that not all children – including those within the same household – are affected equally, and our paper develops this underexplored line of research.

The next section describes the methodology (including sampling frame) from which the findings for this paper have been drawn.

3. Research sample and methodology

Our research focuses on a cohort of children born in 1994–95 from the Young Lives Survey[2] who live in 20 sentinel sites (rural and urban across five regions: Addis Ababa, Amhara, Tigray, Oromo and Southern Nations, Nationalities and Peoples (SNNP)).[3] The sites cover a mix of regions to cover the main geographical, religious and ethnic diversity of the country, as well as to account for rural/urban differences and varying levels of socio-economic development in the population (Tafere and Abebe 2008).

3.1 Methods and research ethics

The quantitative data contain information on 997 children interviewed in the second round panel survey in 2006.[4] Overall, the sample is pro-poor, and sentinel site selection was purposive. Household selection within the sentinel site was random, and a careful analysis of the distribution of child characteristics included in the sample suggests that the data cover a wide variety of children that are broadly similar to Demographic and Health Surveys (DHS), which are nationally representative data sets (Outes-Leon and Sanchez 2008). The authors show that rural Young Lives sites have better access to facilities, for example, 35 per cent of Young Lives rural households have access to protected sources of drinking water compared with 16 per cent in rural DHS households. In urban areas, the figures are reversed (90% DHS, 83% Young Lives). However, Young Lives households are poorer in terms of wealth than DHS households and are less likely to own a house (66% vs 83%), land (60% vs 89%), or livestock (65% vs 80%), have less cattle and live in houses with fewer rooms (1.49 vs 1.78). Therefore, while not suited for simple monitoring of child outcome indicators (as the mean characteristics may be different), the authors conclude that the Young Lives sample is an appropriate and valuable instrument for analysing correlates and causal relations. In terms of school enrolment, at age 7-8 in the first round of the survey (2001), the enrolment rate was 66%, but increased significantly to 94% by the time of the 2006 survey (used in this analysis). This enrolment rate is relatively high in the rural area compared to nationally representative figures: the Welfare Monitoring Survey for 2011 shows enrolment rates of 11-13 year olds of 93.1% in urban and 72.3% in rural areas (source: author calculations from raw data). Rolleston and James (2011) note that the high enrolment rates for this sample may mask a lack of progress in grades and/or learning, for example only 55% of the children in this sample could write a sentence without difficulty or error.

Detailed information was also collected from caregivers on households' socioeconomic status (for example, income, consumption and assets), the education of household members, and adults' and children's time use. Questions were also administered directly to the sample children, including on their time use.[5] In further quantitative analysis, we compare the cohort children with their siblings and thus expand the sample to 2,736 children in the 997 households. We can only do a subset of the analysis on the siblings since we do not have full information on them.

Data in the qualitative sub-sample derive from the first round of qualitative research that was undertaken in 2007. Six girls and boys, aged between 11 and 13 years old, from five of the 20 sentinel sites participated, thereby making the overall sample 30 children (15 girls and 15 boys) with an additional 30 parents or primary caregivers. The five sites chosen for the qualitative sub-sample cover a mix of regions to ensure the main geographical, religious and ethnic diversity of the country was represented as well as to account for rural/urban differences and varying levels of socio-economic development in the population. Of important note, the qualitative sub-sample included more orphans than the full sample on average: only 15 out of 30 of the child participants in the qualitative study live with both their parents.[6] The remaining 15 are living with a surviving parent (5), living with a single parent (5) or living with another relative (5). We bear this in mind when making broader inferences.

The qualitative site in Addis Ababa, Bertukan[7], is a densely populated urban area. Opportunities for work comprise street vending of fruit and vegetables, renting of houses for storage, and carrying goods for cash. The population is ethnically and religiously diverse, yet the Amhara ethnic group and Orthodox Christians comprise the bulk of the population. Tach-Meret, in the Amhara region, is a rural food-insecure community situated on the outskirts of a town. The

population is primarily Orthodox Christians and their livelihoods primarily comprise farming. Zeytuni, a drought-prone rural area in Tigray, is relatively remote, and the population is mainly Orthodox Christians. The population in Leki, in the Oromo site, is mainly Orthodox Christians and the main economic activities are agriculture, fishing and handicrafts. Leki is a drought-prone rural area. The site in the Southern Ethiopian Nationalities, Nations and Peoples Administrative Region (SNNP) Leku, is the capital city as well as being a fast growing business and tourist town. The area is densely populated, with high household overcrowding and ongoing migration from surrounding rural areas. The population is mixed: primarily from the Wolayta and Sidama ethnic group, who are Protestant or Orthodox Christians.

We analyse the individual interviews and diaries of children (children's daily activities recorded by the child for seven consecutive dates over a 24 hour period from the time the child wakes-up until he or she goes to bed) and individual discussions with the children's parents/caregivers.[8] Ethical concerns informed all stages of the research process (both quantitative and qualitative).[9] To protect the identity of respondents, pseudonyms are used for the specific sites and individual children. For this reason, apart from the site-specific background information provided above, no map has been provided.

4. Analysis

4.1 Work activities and time use of cohort children: quantification and value

We utilise information on all activities undertaken by children that contribute to the household's economic life. First we have the parent/caregiver's reported time use of the child on a range of activities on a 'typical day' last week (not including weekends or holidays). The activities (including sleep and play) are constrained to add up to 24 hours. Second, we have the child's

own report on their activities during a 'typical day' (in the same format as asked to the parent/caregiver above). We triangulate this with the diary entries from qualitative work. Participation rates are presented in Table One. As revealed, the vast majority are in school and also work for the household. Only three percent of children do not do any work at all (paid or unpaid, including domestic work). Around half of children are working for the family farm or business. The proportion of children in paid work is quite low, under five percent. The quantitative data do not allow for multitasking, however in the quantitative scripts it is clear that children often multitask, for example by working and simultaneously looking after younger siblings.

Table 1 about here

The bottom rows show the 30 children from the qualitative subsample only. The proportion doing any work at all is very similar, the main differences from the full sample being that they are more likely to participate in paid work, and slightly less likely to go to school, which is expected as the sub-sample was purposively selected among the more disadvantaged from the full sample.

Table 2 shows hours worked by the children, as reported by themselves, and by their caregiver. P-values of a paired t-test on the difference between both are shown in brackets.

Table 2 about here

An important finding is that children's own reports of their activities are very similar to those provided by their parents/caregivers. We found that that none of the averages given by children for separate work tasks are statistically different from the caregiver estimates. This finding is also supported by the diary entries of the qualitative sub-sample. Hours of school and hours of

total work combined are statistically different, by 0.1 hour, or six minutes overall, a fairly small difference (whereby caregivers report higher hours in school and lower hours in total on work than do children).

Complementing the findings from the quantitative data, in the qualitative findings (captured in the interviews and triangulated with data from the diary entries), the responsibilities children have to the household are noted by parents/caregivers and children alike. The diary of Sefinesh, a 13 year old girl from Tach-Meret is shown below.

Diary entry of Sefinesh (Tach-Meret):

Time range	Actual time (from-to)	Activities (give details of what you did yesterday)
Waking up		
Between waking up and breakfast	6:00-7:00 am 7:00-7:30 am 7:30-7:35 am	-fetched water -prepared breakfast -ate breakfast
Between breakfast and lunch	7:45-12:15 pm 12:15-1:00 pm 1:00-1:30 pm	-went to school and returned home -cooked stew -ate lunch[10]
Between lunch and dinner	2:00-5:00pm 5:00-6:00 pm 6:00-8:30 pm 8:30 –9:00 pm	-looked after cattle -washed clothes -cooked stew for dinner and did other household chores -ate dinner
Between dinner and bedtime	9:00-9:20pm	-went to bed

Source: Diary entry of Sefinesh dated 12 October 2007.

Sefinesh lives with her maternal grandparents because her mother works as a maid in Addis Ababa.[11] In an interview that took place with Sefinesh's grandmother shortly after she recorded her diary[12], her grandmother noted that in addition to doing all the household work and herding,

she also takes care of her blind grandfather. According to the grandmother, "…she has no spare time, she is busy doing all the works [sic] in the house and in the field and [is] also going to school."

In some households, particularly those with elderly parents/caregivers or with only one parent, adults are heavily reliant on the work contributions – unpaid and paid – made by the children. This is also illustrated through an interview with the father of Defar (a 13 year old boy from Tach-Meret), whose parents are elderly and physically less strong, which reveals how much the household relies on Defar's contributions to its economy:

Interviewer: You did not want him to go to school.

Defar's father: What can I do? At a village meeting they told me to do so. But who can keep the cattle for me, who can bring water? And [who can] split wood for his mother?

Interviewer: What kinds of work does he do?

Father: Everything.

Interviewer: Everything?

Father: Cattle keeper.

Interviewer: Eh?

Father: He can work as a cattle keeper, wood splitter, and water bringer and he can work at anything.

Defar's father's acknowledges his son's work for the household and its important contribution. Findings from both the descriptive and qualitative data corroborate this finding from the sub-sample that parents/caregivers are aware of and acknowledge children's work.

To explore how this may vary across gender, in Table 3 we break down the activities undertaken by gender and by school attendance:

Table 3 about here

The total average time that children work (around four and a half hours per day according to the full data set), shows little difference between boys and girls. However, work activities differ substantially across gender. Girls spend more than three hours per day on domestic work compared to just under two hours for boys. However, boys spend two hours on unpaid work for the family farm or enterprise whereas girls spend just under an hour on such work.

We split the sample into those who are in school and those who are not, and find that children not going to school spend more time working, especially on unpaid economic activities. Calculating average hours over the whole sample includes children who work zero hours in that particular type of work, so we compute the averages for only those who work in the activity. This shows up most clearly for the paid work, in which only a small percentage are engaged. Those children who participate in paid work spend an average of 4.3 hours per day on it, with boys working an hour more per day than girls. Girls work an hour more per day on domestic work. Overall we find that there is no significant gender difference in terms of *total* hours spent working.

4.2 Composition matters: siblings, and intra-household interdependence

Having established that children's daily activities include work for the household and that it is recognized by parents and children alike, we now explore what characteristics shape work roles within the household.

Findings from the qualitative interviews confirm that children's work is not only accepted as

part of the household economy, but also that sibling composition and age matter. While participation in formal school may complicate this responsibility, as it is understood by all within the household that the work must get done, adjustments are made to complete the work while also making school participation possible. This is illustrated in the following interaction with Kassaye (a 12 year old boy from Tach-Meret):

Interviewer: You all work together, helping each other?

Kassaye: Yes.

Interviewer: Is there anyone who does not go to school in your house?

Kassaye: Yes, it is only the little baby. I love him.

Interviewer: But you all are students?

Kassaye: Yes.

Interviewer: Do your parents treat you all equally?

Kassaye: What do you mean by treating you all equally?

Interviewer: I mean do they give more attention to you or to some other one?

Kassaye: How could they do that? We all work to our capacities and eat only to our capabilities.

With the exception of the "baby", all the remaining children in Kassaye's household combine school with various types of unpaid work for the household. According to Kassaye, none is favored over the other; indeed Kassaye is perplexed by the question about being treated equally by his parents or being the object of extra attention as his response suggests that this contribution is expected of them.

The interview extract and evidence on caregivers' acknowledgement of child contributions together suggest that intra-household relations are best characterized by *interdependence* between children and adults, depending on age and ability, considering the needs of the household and obligations to the family. It further suggests the dynamism of roles based on composition and age of members (including an important role of siblings) that requires further exploration. We also delve further into dynamic factors such as shocks that may interact with composition to shape work patterns.

As established in the literature, responsibilities within the household in Ethiopia change with age and gender. Our results show broadly similar findings, though our analysis in the next section takes this further, showing how unexpected events can change the status quo significantly. The Young Lives survey includes a small amount of information on the siblings of cohort children, including age, gender and time use. We are thus able to complement the cohort findings with an enlarged sample of 2487 children aged 5-15 years. In Table 4 below we split the sample into 'younger' children (aged 5–10 years) and 'older' (aged 11–15). The proportion of children working on the family farm or business is very similar between both age groups. Older children are more likely to be undertaking domestic work; in fact the vast majority does some. Almost no younger children are reported to be involved in paid work, compared to just under five per cent of the older children.

Table 4 about here

Children with lower birth order work longer hours (Table 5). Birth order is correlated with age, but there is quite a lot of spread: by construction of the dataset[13] the youngest first-born child is

11 (and the oldest 15, again by construction of the dataset), but we have children aged 5–15 in all the other birth order categories.

Table 5 about here

We conducted some t-tests on whether the oldest child works longer hours (shown in Table 5), and found that the oldest girl works significantly longer than her younger sisters (by almost an hour per day), but the oldest boy does not work longer than his brothers. Oldest girls also work longer hours than oldest (and other) boys (again by almost an hour).

Having data on hours worked by cohort children and siblings means that we can make convincing comparisons *between* children of each household, using a restricted set of variables.[14] We isolate only the age, birth order and gender of the child, holding all household characteristics constant. Table A1 (see Annex) shows descriptive statistics for the sample of the siblings used in the analysis. We combine paid work and unpaid work for the family farm or business into 'economic activities', as is common in the economics literature. We calculate separately 'domestic work' as discussed in the data section.

Table A2 (Annex) presents within-household regressions[15] that compare the 2,487 siblings in 997 households. The results show a clear progression of hours worked increasing in all activities with age.[16] We find that pooling all work, girls do not work significantly different hours to boys. However, as seen in the descriptive statistics, girls work significantly longer on domestic work, and boys work more hours on the family farm or business, or in paid work (so-called 'economic work').[17] We included a set of birth order dummies and find no significant differences for the oldest child; however, the coefficient for the oldest girl is significantly higher (by approximately half an hour per day at the mean). Given that a comparison within the household necessarily means that there is likely a high correlation between birth order and age (which may be less the

case in a cross-section, for example), we estimated the regressions omitting age. Here we find strong birth order effects – disentangling this is actually more difficult using the within-household approach so later we test this using the 997 cohort children only. We separated the sample into urban and rural, and did not find any difference in the estimates.[18] The 'oldest girl' effect remains when we include a full set of age dummies in order to allow a flexible structure in the progression of work responsibilities.

As revealed from the qualitative interviews, for those children in the sub-sample with siblings, daily life involves dividing up the work amongst themselves. For example, Ayu[19] (a girl from Leki), does some paid work as a daily labourer in order to support her family and to pay towards some of her school costs (her clothes and school materials). Although she explains that the work can be difficult and time-consuming, she has not yet had to miss school because her older sister helps her juggle responsibilities. Similarly, since starting school, Defar has made the following adjustments to his work schedule in order to go to school, and this has been negotiated with his younger brother (and presumably his parents):

> *Interviewer: Is there any change in your life within the past six months? Did you get in a school?*
>
> *Defar: Yes, I did.*
>
> *Interviewer: That is a change. What is the difference between going and not going to school?*
>
> *Defar: I used to be with the cattle. But since I got in a school, I go and learn until five o'clock and after that come home and feed the cattle.*
>
> *Interviewer: Who replaced your job at home?*

Defar: My brother.

Interviewer: Is your shift different from your brother's?

Defar: Yes.

Having established quantitatively and qualitatively that, in addition to age and gender, sibling composition matters and shapes the household economy, including in the context of children's increased participation in schooling, we next explore how dynamic household characteristics affect girls' and boys' work roles.

4.3 Dynamic determinants of children's work

As noted earlier, our qualitative analysis deepens insights into how adults and children experience and value children's contributions to the household. We complement this with quantitative analysis across the whole cohort, including multiple factors that may influence working patterns, and establishing which factors are significant across the whole sample.

Building on the above findings that gender, broad age divisions and presence of siblings shape work responsibilities, and increasingly so with the age of the child, findings from in-depth discussions with children show that their work is also affected by the dynamic composition of the household. In particular, whilst gender, age and sibling composition are important in shaping children's work roles, these roles are not necessarily fixed. The physical presence of parents (or absence due to orphanhood or migration for to work) and the health status (particularly due to illness or old age) of parents, caregivers and other members of the household also affect children's work.

For example, Afework (an 11 year old from Bertukan) is an orphan. Both his parents are dead and he has two older brothers and a sister. He explained his responsibilities, from whom he learned how to perform them and what he liked and why:

> *I have responsibilities in the home/household to make the bed, and help my older brother and wash the dishes. My sister taught me while she was here. But now she is in Beirut [Lebanon]. My older brother also shows me. I do these things in order to help at home and to keep my home clean.*[20] *I like making the bed because I enjoy it. I like washing the dishes least because I don't know how to do it perfectly.*

In Afework's case, the composition of his household, combined with birth order and sibling composition, affects the intra-household allocation of work. This example also shows the importance of and relationship with siblings. From Afework's transcript, it appears that he feels a sense of accomplishment in contributing to the household, including through the collaboration he has with his siblings to support the household economy. Unlike some children in the sample who dislike taking on work associated with the other age/gender, Afework appears atypical in this regard. Nevertheless, this flexibility of roles –crossing age and gender boundaries – presumably increases efficiency and effectiveness of completing the necessary activities required for the household to function. Also revealed through this example of a younger sibling in the qualitative cohort, is the importance of having older siblings for teaching work and life skills that may be crucial for when girls and boys eventually enter the labour market.

Another example is provided by Sefinesh (whose diary was shown in section 3 above). She comments to the interviewer that she has a heavy workload because her grandparents are elderly

and physically weak, and she has no other siblings with whom she can share the domestic work. As a result, she cleans the household, prepares coffee and looks after the animals on the farm. Sefinesh's diary showed that she spends almost nine out of more than 15 hours of her waking day doing various types of work for the household and farm.

Of all the work she does, looking after the cattle is most disliked because she does it routinely (there is no one else in the household with whom she can trade) and she finds it boring.[21] She added that her peers do not have this view because they are supported by their siblings to look after the cattle. She furthermore commented that her grandparents used to own a lot of cattle, but because they could not find workers to look after them, and because Sefinesh was not physically able to do all of it by herself, they were forced to sell most of them, leading to more serious economic hardship and food shortages for the household. Hence household composition, and sibling composition interacts with the domestic lifecycle of the household (in this example, the aged grandparents) to determine children's workload *and* the type of work they do.

To explore the issue across the whole sample of the cohort children, we conducted a regression analysis of children's hours spent working. We included household size, composition, and wealth. To explore dynamic issues we also include a set of shocks that may adversely affect household welfare, such as illness of the mother and/or the father, number of other ill household members, shocks to crops and livestock, theft and other shocks.[22]

Table A4 in the Appendix shows the results of the analysis. We do not find significant gender differences in total hours worked. However, we do find that being the oldest girl in the household increases the amount of time spent on work overall, holding other things constant, by around half an hour per day.[23] Having one's mother present in the household significantly reduces the

number of hours worked of all children, by just under half an hour per day (or conversely, the death or absence of the mother increases the amount of work that children must do). Whether or not a father is present does not appear to make a significant difference in terms of hours worked overall.[24] The precision on parental illness is fairly low, but it appears that girls may work more when their mother is ill (significant only at 88%, p=0.12). Girls also appear to work less on economic work when their father is ill. Also not reported here, the community fixed effects are extremely significant and explain quite a large proportion of the variation in hours worked.[25] In Ethiopia, rural children tend to work far more than those in urban areas. None of the other household composition variables are significant, except having a younger brother, which increases hours worked on household tasks (which include child care), and possibly being substituted for economic work.

Adverse shocks that change households circumstances are quantitatively more important than the gender and birth order/composition variables. Whereas the oldest girl works around half an hour more per day, a shock such as illness, death or livestock death could increase hours worked of any child by almost twice as much. Deaths in the household (that occurred in the past three years) increase hours worked overall by a significant amount, driven by increases in economic work. It also appears that livestock shocks (such as illness or death of the animal) increase hours worked, possibly due to time spent tending to sick animals. The magnitude of both of these is around 45 minutes per day, other things constant. Of note, none of the variables we tried to include as proxy for household wealth were significant.[26]

Complementing these findings, the qualitative data suggest that children's work also shows some flexibility in gendered tasks, depending on dynamic circumstances, which is also revealed in the following example.

Defar (introduced earlier) is the eldest of three children. He has a younger brother and sister. Nevertheless, because his sister is too little (she is five years old), when his mother is busy with other work, Defar has to do the cooking which he dislikes and is embarrassed to do because he regards it as women's work. As the following diary entry also shows, he strongly dislikes fetching water, which he also believes is women's work. Hence, not having an older sister or one who is close in age, and having siblings who are at that point in time too young to take on heavy work - results in Defar having to take on tasks normally associated with females:

Diary entry of Defar (Tach-Meret):

Time range	**Actual time (from-to)**	**Activities (give details of what you did yesterday)**	**Which activity did you like? Which did not like? Why?**
Waking up	6:00am	-I got up	
Between waking up and breakfast	6:00am 7:00am 8:00am	-I cut grass for the cattle and carried it back home to feed them -I fetched water -I had my break fast	[in an earlier entry he said he enjoys cutting the grass] I hate fetching water, it is a women's job
Between breakfast and lunch	9:00am	-I took the cattle to the field, and I remained there to herd the cattle	[in an earlier entry, he mentioned that he hates herding because it is boring]
Between lunch and dinner	7:00pm	-I had no lunch, I didn't come home for lunch because the place I went to for herding was far -I came back home	
Between dinner and bedtime	8:00pm	-I had my dinner with my mother and brother	
During the night	9:00pm	-I slept	

Source: Diary entry of Defar dated 15 November 2007

In summary, discussions with the children confirm our quantitative findings that changing household circumstances, including illness and death, which affect household composition, shape girls' and boys' contributions. Further, when these tasks do not conform to gender norms, they are not necessarily enjoyed (as in the example of Sefinesh and Defar), however; as they are required for the functioning of the household economy, they are completed.

Given the possibility of significant differences between genders, in Table A5 we present the quantitative results for boys and girls separately. Oldest girls work more than their sisters on domestic tasks, and overall. Girls also work more (overall, and on domestic tasks when their mothers are ill), and boys work more on domestic tasks when their fathers are ill. Boys appear to work less in larger households. Interestingly, girls work more if they have sisters, and if they have younger brothers. Both boys and girls seem to be affected by adverse events overall, but boys work more when the household has more livestock (which is consistent with the gender norms, for example of boys herding outlined in the literature review).

Including the hours worked of other siblings weakens the findings slightly (given that these would be highly correlated with household characteristics) but does not alter the main results. We also ran the same regressions using the self-reported hours worked and found strikingly similar results (presented in Table A6, and confirming the discussion of the descriptive statistics above, that adults and children made similar reports of hours worked). The main difference is that it appears girls work more on household tasks overall, and the 'oldest girl' effect is less pronounced (significant at 12 per cent only for overall work, but significant at 5 per cent for economic work).

6. Conclusions

This paper has investigated the role that Ethiopian children play in the household economy. An iterative analysis of quantitative and qualitative information establishes that work is a central feature of the lives of girls and boys in our sample and that this work is essential to the household economy, including in the context of girls' and boys' increased participation in schooling. Intra-household relations are best described qualitatively as interdependent, though we do not test this formally in an economic model, the similar quantitative result on hours worked and the interviews with adults are very supportive of the conclusion.

While almost all the children in the sample studied are 'poor' and are working, the findings establish that household poverty is insufficient to understand how work within households is allocated and how workloads respond to changes in household circumstances. Although the household division of labour is broadly shaped by gender and age, our findings show quantitatively and qualitatively that the dynamic role of household composition, birth order and sibling composition determine *which* children do *which* type of work. By virtue of these characteristics, some girls or boys have heavier burdens than do other members of the household. Our findings also point to the important role of siblings, which has tended to be overlooked in studies of children and work: we find the oldest girls in the household often have higher workloads than their brothers and their younger sisters. Yet, when examining children's working lives in more detail through qualitative methods, we confirm the contribution of siblings for teaching pro-social skills, including through the collaboration that helps children have the flexibility in working hours to meet both household and schooling obligations.

Additionally, we find greater flexibility and dynamism as regards gender and age within the household division of labour than may otherwise be assumed, for example some of the orphaned children in the qualitative sample take on more work in the absence of their parents or siblings. We also find from the qualitative sub-sample a contradiction with some types of work: most children taking on work roles outside their gender norms are uncomfortable with them, although they perform them as part of the duty they have to the household. Illness and other factors can lead to temporary changes in children's responsibilities, and children often substitute labour for adults. This finding is particularly important in the design of social protection programs that have a labour requirement, such as the Productive Safety Net Program (PSNP) in Ethiopia. Our findings show the need for greater nuance in understandings of children and work in Ethiopia, and increased attention to household and sibling composition in shaping household interdependence. Finally, the importance of integrating research methods to gain a more complete picture of children's experiences cannot be overemphasised. Quantitative methods can show broad patterns of children's time use and its responsiveness to external and internal factors, but qualitative analysis allows us to better understand the experiences of children and their likely reactions to changes in intra- and extra-household circumstances and policy interventions.

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Tables

Table 1 Participation rates for school and work activities in a 'typical day'

	School	Domestic Tasks	Family farm/business	Paid work	Any work	N
Caregiver reported	94.4	88.2	45.0	3.8	96.9	980
Child's self reported	94.1	89.5	45.0	4.5	97.2	980
Qualitative sub-sample						
Caregiver reported	*90.0*	*83.3*	*36.7*	*10.0*	*96.7*	*30*
Child's self reported	*86.7*	*83.3*	*40.0*	*6.7*	*96.7*	*30*

Source: Young Lives data.

Table 2: Children's hours of work in a 'typical day'

	School	Domestic Tasks	Family farm/business	Paid work	All work	N
Caregiver reported	5.59	2.78	1.43	0.14	4.36	980
Child's self reported	5.42	2.84	1.47	0.15	4.46	980
P-value of difference	0.00*	0.26	0.22	0.63	0.03*	980

Notes: *significant at 5%.

Table 3: Hours spent per day on work activities: by gender and school

	Domestic Tasks	Family farm/business	Paid work	Any work
Boys	2.1	2.0	0.2	4.3
Girls	3.5	0.8	0.1	4.4
In school	2.7	1.3	0.1	4.1
Not in school	4.3	4.3	0.8	9.3
Those working more than 1 hour per day on the activity				
All	3.2	3.2	3.8	4.5
Boys	2.6	3.5	4.0	4.5
Girls	3.7	2.5	3.5	4.5

Notes: Sample of 980 Young Lives children aged 11–12 years, self reported. Definitions of work in text.

Table 4: Children (aged 5-15 years old) engaging in various activities, including work (%)

	School	Domestic Tasks	Family farm/business	Paid work	Any work
All	79.9	75.3	42.7	3.1	86.3
Boys	77.9	66.4	54.4	3.8	84.3
Girls	82.0	84.3	30.7	2.4	88.4
Age 5-10	*62.9*	*61.7*	*41.6*	*0.8*	*75.0*
Age 11-15	*91.1*	*84.3*	*43.4*	*4.6*	*93.8*

Notes: Percentages are of children whose caregiver reported that they spent one or more hours on the tasks on a typical day in the past week. N=980.

Table 5: Hours worked by birth order

Birth order	**Hours worked**
Oldest	4.47
Second	4.26
Third	4.19
Fourth	4.05
Fifth or higher	3.86

	Oldest	**Others**
Girl	4.82***	4.03
Boy	4.08	4.05

Note: *** significant at 1%. Average hours worked on a typical day, as reported by caregiver, all children (n=2485).

T-test of oldest girl hours worked vs. other girls significant at 1%, as well as T-test of oldest boy vs. oldest girl.

Appendix: Additional Tables

Table A1: Descriptive statistics for all children, including siblings

Variable	Mean	Std. Dev.	Obs.
Dependent variables – caregiver report			
Hours worked (typical day)	4.11	2.64	2487
Hours on domestic work (typical day)	2.50	2.07	2487
Hours economic work (typical day)	1.61	2.20	2487
Age	10.58	2.65	2487
Girl	0.49	0.50	2487
Oldest child	0.14	0.35	2487
Second oldest	0.17	0.38	2487
Third oldest	0.20	0.40	2487
Fourth oldest	0.18	0.38	2487
Fifth or more	0.31	0.46	2487

Notes: Includes all Young Lives cohort children and their siblings.

Table A2: Comparison between siblings of gender, age and birth order effects

	All work	Economic Work	Household Domestic work	All work	Economic Work	Household Domestic work
	(1)	(2)	(3)	(4)	(5)	(6)
Age	0.919***	0.432**	0.382***			
	(0.19)	(0.19)	(0.084			
Age squared	0.0326***	-0.0186**	0.0104**			
	(0.009)	(0.009)	(0.004)			
First born	-0.00125	0.176	0.0653	2.758***	0.725*	1.938***
	(0.6)	(0.58)	(0.44)	(0.562)	(0.420)	(0.321)
Second born	0.0915	0.292	0.088	2.185***	0.727**	1.492***
	(0.42)	(0.29)	(0.31)	(0.552)	(0.347)	(0.198)
Third born	0.315	0.335	0.155	1.749***	0.624**	1.125***
	(0.33)	(0.26)	(0.2)	(0.401)	(0.280)	(0.171)
Fourth born	-0.0176	0.0263	0.149	0.851**	0.201	0.736***
	(0.25)	(0.3)	(0.19)	(0.336)	(0.334)	(0.144)
Girl	0.0257	-1.519***	1.090***	0.0301	1.520***	1.094***
	(0.3)	(0.26)	(0.18)	(0.261)	(0.253)	(0.197)
First-born girl	0.528*	0.133	0.305	0.478*	0.133	0.264
	(0.28)	(0.48)	(0.26)	(0.261)	(0.469)	(0.278)
Second-born girl	0.411	-0.055	0.339	0.469	-0.0332	0.367
	(0.35)	(0.29)	(0.2)	(0.316)	(0.286)	(0.219)
Third-born girl	-0.0297	(0.24	0.149	-0.0251	-0.241	0.155
	(0.28)	(0.26)	(0.22)	(0.280)	(0.258)	(0.230)
Fourth-born girl	0.152	0.262	-0.142	0.0762	0.225	-0.174
	(0.31)	(0.31)	(0.28)	(0.314)	(0.318)	(0.272)
Constant	-1.914*	-0.151	1.561***	2.753***	1.974***	0.447***
	(0.94)	(0.92)	(0.45)	(0.314)	(0.199)	(0.140)
Observations	**2487**	**2487**	**2487**	**2487**	**2487**	**2487**
R-squared	**0.64**	**0.63**	**0.65**	**0.62**	**0.63**	**0.64**

Notes: Dependent variables are hours worked on a typical day as defined in the text. Household fixed-effects estimates (STATA areg). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table A3: Descriptive statistics: Young Lives cohort children

Variable	Mean	Std. Dev.	Obs.
Dependent variables – caregiver report			
Hours worked (typical day)	4.17	2.02	863
Hours on domestic work (typical day)	2.68	1.77	863
Hours economic work (typical day)	1.49	1.83	863
Hours worked (typical week)	23.64	14.07	862
Hours on domestic work (typical week)	15.06	12.80	862
Hours economic work (typical week)	8.87	8.62	862
Child-reported hours			
Hours worked (typical day)	4.27	2.15	861
Hours on domestic work (typical day)	2.75	1.81	862
Hours economic work (typical day)	1.53	1.91	861
Control Variables			
Girl	0.49	0.50	863
Age (years)	11.56	0.50	863
Dummy: oldest	0.25	0.43	863
Ill in past 4 weeks	0.30	0.46	863
Mother in household	0.86	0.34	863
Mother ill	0.32	0.47	863
Father in household	0.71	0.45	863
Father ill	0.25	0.43	863
Household size	6.59	2.03	863
Disabled	0.01	0.14	863
Dummy: any sisters	0.81	0.40	863
Dummy: any brothers	0.82	0.38	863
Dummy: younger sisters	0.57	0.50	863
Dummy: younger brothers	0.59	0.49	863
Theft occurred	0.13	0.34	863
Loss of job/enterprise	0.10	0.30	863
Other household members ill	0.62	1.01	863
Crop shock	0.36	0.48	863
Death of household member	0.07	0.26	863
Livestock shock	0.04	0.19	863
Livestock assets	8.02	1.60	863
Teacher is unfriendly to caregiver	0.13	0.34	863
Ln household consumption per cap.	2.25	1.21	863

Table A4: Young Lives children determinants of hours worked on a 'typical day'

	All work	Household work	Economic work
Girl	0.201	1.392***	-1.191***
	(0.17)	(0.00)	(0.15)
Oldest	-0.065	0.143	-0.208
	(0.23)	(0.2)	(0.21)
Oldest*girl	0.513*	0.157	0.357
	(0.28)	(0.23)	(0.24
Mother present	-0.466**	-0.168	-0.298*
	(0.2)	(0.18)	(0.18)
Mother ill	-0.0678	0.0807	-0.149
	(0.17)	(0.16)	(0.16)
Girl*Mother ill	0.39	0.136	0.254
	(0.25)	(0.23)	(0.23)
Father present	0.0898	-0.165	0.255*
	(0.17)	(0.16)	(0.15)
Father ill	0.253	0.268	-0.0146
	(0.18)	(0.16)	(0.19)
Girl* Father ill	-0.359	0.0647	-0.423*
	(0.28)	(0.26)	(0.24)
Has younger sister	0.123	0.131	-0.00812
	(0.15)	(0.13)	(0.14)
Has younger brother	0.0913	0.335**	-0.244*
	(0.16)	(0.14)	(0.14)
Economic shock	-0.119	0.147	-0.266*
	(0.2)	(0.18)	(0.16)
Household member ill	-0.0523	-0.0644	0.0121
	(0.058)	(0.052)	(0.061)
Household death	0.692***	0.278	0.415*
	(0.23)	(0.22)	(0.21)
Livestock shock	0.739**	0.635**	0.104
	(0.29)	(0.28)	(0.27)
Unhappy with teacher	0.586***	0.536***	0.0492
	(0.17)	(0.18)	(0.16)
Constant	-0.478	-0.207	-0.272
	(1.77)	(1.58)	(1.71)
Observations	863	863	863
R-squared	0.38	0.35	0.41

Notes: OLS estimates. Caregiver reported hours. Significance levels as above. Included but not reported: community fixed effects, household size, presence of sisters/brothers, ethnicity, literacy of mother/father, wealth.

Table A5: Boys and girls separate hours worked on a 'typical day'

	(1)	(2)	(3)	(4)	(5)	(6)
	-------Boys Only ------			-------Girls Only ------		
	All work	Domestic work	Ec work	All work	Domestic work	Ec work
Oldest	-0.218	0.0940	-0.312	0.679***	0.570**	0.108
	(0.222)	(0.229)	(0.378)	(0.225)	(0.258)	(0.185)
Ill past 4 weeks	-0.361	-0.0743	-0.287	0.00130	0.136	-0.134
	(0.270)	(0.219)	(0.260)	(0.235)	(0.180)	(0.143)
Mother present	-1.312	-0.439*	-0.873	-0.187	-0.0216	-0.166
	(0.774)	(0.226)	(0.828)	(0.253)	(0.265)	(0.143)
Mother ill	0.313	0.272	0.0411	0.418*	0.388*	0.0299
	(0.215)	(0.218)	(0.281)	(0.216)	(0.221)	(0.212)
Father present	-0.0826	-0.102	0.0192	-0.262	-0.485**	0.223
	(0.402)	(0.184)	(0.329)	(0.244)	(0.223)	(0.158)
Father ill	0.282	0.260*	0.0220	0.0495	0.324	-0.275
	(0.256)	(0.147)	(0.242)	(0.281)	(0.208)	(0.196)
HH size	-0.0461	-0.122*	0.0759	-0.0139	0.00833	-0.0222
	(0.136)	(0.0650)	(0.134)	(0.0832)	(0.0705)	(0.0455)
Any sister	0.628	0.307	0.321	0.625**	0.178	0.447**
	(0.666)	(0.220)	(0.501)	(0.298)	(0.317)	(0.193)
Any Brother	0.329	-0.235	0.564	-0.253	-0.162	-0.0919
	(0.473)	(0.312)	(0.431)	(0.299)	(0.226)	(0.243)
Has younger sister	0.304	0.174	0.131	0.196	0.259	-0.0632
	(0.258)	(0.123)	(0.236)	(0.285)	(0.309)	(0.183)
Has younger brother	0.0345	0.234	-0.200	0.927***	0.736***	0.192
	(0.301)	(0.218)	(0.253)	(0.234)	(0.168)	(0.199)
Theft	-0.0579	-0.0736	0.0156	0.0349	0.0768	-0.0419
	(0.321)	(0.171)	(0.259)	(0.280)	(0.240)	(0.172)
Economic shock	-1.055**	0.00967	-1.064**	-0.0716	0.0886	-0.160
	(0.391)	(0.251)	(0.392)	(0.457)	(0.303)	(0.264)
HH member ill	0.0604	-0.0579	0.118	0.0537	0.0656	-0.0119
	(0.146)	(0.0814)	(0.116)	(0.150)	(0.135)	(0.0821)
Crop shock	0.778*	-0.153	0.931**	0.698**	-0.0157	0.714***
	(0.405)	(0.206)	(0.351)	(0.275)	(0.247)	(0.243)
HH death	1.387***	0.517	0.870***	-0.107	-0.461*	0.354
	(0.415)	(0.344)	(0.287)	(0.321)	(0.248)	(0.264)
Livestock	1.461***	0.510*	0.951**	0.545	0.102	0.443
	(0.458)	(0.290)	(0.440)	(0.464)	(0.478)	(0.453)
Constant	3.685	4.181**	-0.496	2.314	0.638	1.676
	(2.273)	(1.867)	(2.300)	(2.181)	(2.214)	(1.993)
Observations	498	498	498	476	476	476
R-squared	0.146	0.056	0.147	0.123	0.088	0.084

Table A6 : Young Lives children self-reported hours worked on 'typical day'

	All work	HH Work	Economic work
Girl	0.447**	1.681***	-1.230***
	-0.18	-0.15	-0.16
Oldest	0.142	0.233	-0.101
	-0.24	-0.19	-0.21
Oldest*Girl	0.467	0.0274	0.468*
	-0.3	-0.23	-0.26
Mother present	-0.273	0.018	-0.282
	-0.23	-0.19	-0.2
Mother ill	0.248	0.238	0.00562
	-0.2	-0.17	-0.18
Girl*Mother ill	0.0795	-0.11	0.201
	-0.28	-0.24	-0.25
Father present	0.15	-0.0881	0.244
	-0.18	-0.15	-0.17
Father ill	0.136	0.294*	-0.165
	-0.21	-0.17	-0.19
Girl* Father ill	-0.435	-0.215	-0.242
	-0.31	-0.27	-0.25
Has younger sister	0.0831	0.0161	0.0681
	-0.16	-0.14	-0.14
Has younger brother	-0.0983	0.147	-0.252*
	-0.17	-0.15	-0.15
Economic shock	-0.12	0.336*	0.459***
	-0.2	-0.17	-0.15
HH member ill	-0.0869	-0.115*	0.0219
	-0.074	-0.067	-0.067
HH death	0.789***	0.535**	0.225
	-0.27	-0.23	-0.24
Crop shock	-0.225	-0.187	-0.0548
	-0.17	-0.14	-0.15
Livestock shock	0.458	0.387	0.08
	-0.3	-0.25	-0.27
Unhappy with teacher	0.516***	0.585***	-0.0134
	-0.2	-0.19	-0.17
Constant	-0.999	0.503	-1.718
	-1.93	-1.83	-1.82
Observations	**862**	**863**	**862**
R-squared	**0.36**	**0.34**	**0.39**

Notes as above. Child self-reported hours as dependent variable.

Endnotes

[1] Government departments and international organisations tend to adopt a fairly narrow definition of child labour. Of note, this does not include work on doing domestic tasks.

[2] Young Lives is a 17-year study of childhood poverty in Ethiopia, India, Vietnam and Peru, funded by the UK Department for International Development (DFID). The full text of all Young Lives publications and more information is available on www.younglives.org.uk.

[3] We note that the survey does not cover the pastoralist regions of Afar or Somaliland.

[4] See Outes-Leon and Sanchez (2008) who describe the sampling strategy in detail. Overall, the sample is pro-poor, and sentinel site selection was purposive. Household selection within the sentinel site was random, and a careful analysis of the distribution of child characteristics included in the sample suggests that the data cover a wide variety of children that is broadly similar to nationally representative data sets. Therefore, while not suited for simple monitoring of child outcome indicators (as the mean characteristics will be different), the Young Lives sample is an appropriate and valuable instrument for analysing correlates and causal relations. Further, we note that the survey does not cover the pastoralist regions of Afar or Somaliland.

[5] Round 1 started with 1000 children, but by Round 2 the sample had reduced slightly to 977 due to attrition. However, bias from this small attrition has been analysed and is likely to be insignificant (Outes-Leon and Dercon 2008).

[6] Recall that the qualitative sample was over-sampled for risk, which included for orphans missing one or more parent.

[7] To protect the identity of respondents, pseudonyms are used for the specific sites and names of individual children.

[8] For details of the methods, data management and other issues see Tafere and Abebe 2008.

[9] For a detailed discussion of the research ethics, methods and training of the research team, including issues arising over the course of the longitudinal research, and ongoing informed consent, see Morrow (2009). Particularly concerning the use of qualitative methods in the Young Lives qualitative sample in Ethiopia, see Tekola et al. (2009) and Tafere and Abebe (2008).

[10] We have re-checked the files and cannot find an entry for Sefinesh for the period 1:30- 2:00 pm.

[11] Sefinesh has never known her father because her mother left him when Sefinesh was still a baby.

[12] The interview took place on 14 October 2007 with Sefinesh's grandmother.

[13] Recall that the sample is a cohort and was sampled using households with a child aged 7–8 years in 2002. Therefore the oldest child in the household cannot by definition be younger than the YL older cohort child (unless an older child returned from migration; however this appears not to have happened in our sample.

[14] In economics terminology: we employ household fixed-effects estimates.

[15] Heckman style estimation would be preferable but we were unable to find a variable to predict participation that did not affect hours worked.

[16] In fact, the effect is quadratic (i.e. the rate of increase in hours worked declines as children get older).

[17] The term is used in many economics papers alsos, for example in the World Bank's World Development Indicators. See www.worldbank.org/data for more details.

[18] Though the estimates on the oldest girl lose precision due to the smaller sample size.

[19] As mentioned in the methodology section, in this paper, pseudonyms are used..

[20] Of note, this shows that parents/caregivers are not the only ones in the household who teach children how to work: siblings also teach each other important skills.

[21] Of note, cattle herding is a type of work usually associated with boys.

[22] We use ordinary-least-squares regression with community fixed effects (to control for unobserved heterogeneity between the diverse communities). Descriptive statistics for the variables are shown in Table A3 of the Appendix.

[23] Recall that all of the children are of a similar age, born within a year of each other, but there is variation in their birth order.

[24] A puzzling result seems that a father being present increases the number of hours worked on economic activity.

[25] Splitting the sample into rural and urban shows slight differences (in particular the age gradient is steeper in rural areas, and the shocks are more pertinent), but also reduces precision of the estimates.

[26] Cognisant of endogeneity problems, nevertheless we tried various wealth measures such as the wealth index, value of assets, per capita expenditure and ownership of various assets. None were significant.