Access to Product Markets and Child Labour: Survey Evidence from Rural Uganda

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Preliminary draft. Not for citation

Abstract

The study analyses the relationship between access to rural product markets and the extent and nature of child labour. It is built on the view that if physical markets can shape rural development through, for instance, influencing prices, household production decisions and employment, the associated activity growth could increase child labour. Using household survey data from Uganda, I find that children increase time in domestic work when local product markets are distant, while their time in economic activity declines. A similar pattern is observed for the incidence of child labour. The likelihood of child labour in domestic activity increases for each extra hour of travel to the market, while child labour in economic activity declines. This could reflect the possibility that households may switch child work from market-oriented activities to domestic work when they are remotely located from markets. This study contributes to the literature on child labour in two dimensions. First, the findings confirm those of earlier cross-country studies that access to product markets increase the extent of child labour in economic work Second, they demonstrate that the effect of the markets varies, depending on the nature of the work the children are engaged in, and their age.

Key words: child labour, market access, Uganda,

JEL classifications; J22, J82, O12

1. Introduction

This paper analyses the relationship between market access and child labour. In particular, I investigate the extent to which proximity to product markets influences child participation in domestic and economic activity. According to the 2009 estimates of the International Labour Organisation, about 215 million children in the world are engaged in child labour (ILO, 2010). The practice is prevalent in developing countries, with the highest number in Asia (113.6 million), followed by Africa (65.1 million). There is considerable evidence that this widespread practice is one of the greatest threats to sustainable development owing to its short-term effects on the schooling and health of the children (UCW, 2008; UNICEF, 2009), and the long-term impact on adult employment, income, health, and education (Ilahi et al., 2001; Gtustafsson-Wright and Pyne, 2002; Betcherman et al., 2004), among other known drivers of development.

In rural areas where agriculture is the mainstay, children have been widely used to supplement adult labour in a variety of tasks, depending on the season. In locations close to urban areas, they have been increasingly involved in a range of economic activities such as the sale of household products and working for a wage (Fafchamp and Wahba, 2006). Although child work in developing countries is culturally regarded as an acceptable aspect of transition to adulthood, certain conditions could push children to work beyond the Pareto efficient level. For instance, insufficient labour in the household may induce households to supplement adult time with child work (Rosenzweug and Evernson, 1977; Murphy and Tamura, 1990). Shortage of adult labour, or the desire for households to increase labour supply in certain activities could in part stem from activities that increase income generation, causing the demand for labour to rise. For instance, markets could be functioning well, such that households may highly value child time in the production of goods for the market, or use children as substitutes for adults (Ranjan, 2011). Market opportunities may thus affect the extent of child labour by influencing production decisions and labour allocation in households.

While the effect of market access on households is receiving increasing attention[1], its link to child labour has only been remotely addressed. A few studies on child labour have rather emphasised the effect of access to international markets (Ranjan, 2001; Jafarey, 2002). The major contribution child labour literature at the micro level is a study by Fafchamp and Wahba (2006) that proxies market access with closeness to urban centres. Much as proximity to urban locations could relate to market orientation, certain markets, for instance, product markets have also been seen to prevail in locations that are distant from urban centres (Afeichena and Ogunkola, 2000; Udosen and Adams, 2009; Eff and Jensen, 2007). Afeichena and Ogunkola argue that rural product markets of whatever form are vital for development. Thus, focusing on how close households are to urban areas is likely only to be partly informative, if relevant markets exist also in rural areas. Secondly, urban locations may capture other characteristics, such as education, health and credit facilities, such that the effect of physical markets on labour may be complex to isolate.

Using a household survey for Uganda, this paper empirically tests whether access to local product markets has a bearing on the intensity of child work and child labour.[2] Focusing on different product market types in rural areas, I hypothesise that distant markets might restrict households to subsistence production, which demands less child time. Put differently, proximity to product markets might be detrimental to children by increasing competition for the time they could have spent on activities that are vital for their development.

This paper contributes to the literature on child labour in two dimensions. First, they confirm the results of early studies that access to product markets affects child labour and the intensity of child time in production. Second, they demonstrate that the effect of markets vary, depending on the nature of child work, and age.

I find that the intensity of child work in domestic activity, measured in hours of work, regardless of child labour status increases when daily consumer markets that have

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[1] See, for instance, Minten, 1999 on productivity; Fally et al. 2010 on wages; Dercon and Hoddinott, 2005 on household welfare

[2] I distinguish these two concepts in section 4.

limited assortments, and local periodic markets are distant from the village. On the other hand, their time spent in economic activity declines with travel time to these markets. A similar pattern is observed for the incidence of child labour. The likelihood of child labour in domestic activity increases for an extra hour of travel to the market. On the other hand, child labour in economic activity declines. This could be a reflection of the possibility that households may switch child work from market-oriented activities to domestic work, when they are remotely positioned. This result mirrors the findings in literature (Fafchamp and Farhad, 2003) that isolation from markets may keep households in a cycle of subsistence production which is less demanding in terms of household labour. It is also worth noting that the effect of market access is more pronounced for older children, but the burden seems to be highly borne by girls, both overall, and along the age continuum. Policy wise, these results point to the view that, much as access to markets is vital to household livelihood overall, they can be detrimental to children, as households may value child time in economic activity. Designing interventions for households to tap from market opportunities should go hand-in-hand with putting in place mechanisms that can ensure that the impact on children's welfare is minimised. Programmes could for instance focus on interventions that may increase the opportunity cost of sending children to work, from the household's point of view.

The structure of the paper is as follows. The next section discusses the literature on market access and child labour. Section 3 provides an overview of the child labour situation in Uganda. Section 4 introduces the data and descriptive evidence. Section 5 discusses the model of child labour and market access. In section 6, I present the regression results, and discuss the results and conclusions in the last section.

2. Literature review

2.1. Access to markets and child labour

Product markets have been regarded as essential for economic development. Development partners are increasingly advocating investment that ensures that communities have access to markets in order to stimulate productivity and improve household welfare. Market access enhances productivity in many ways: households can reliably sell more output at competitive prices, which may induce them to invest in profitable activities. Markets are also associated with increases in wages, both in the agricultural and in non-agricultural sectors. For households that supply labour, an increase in wages stimulates growth in income (Ijaimi, 1994; Dercon and Hoddinott, 2005). Households are also able to access productive inputs at affordable prices, resulting in intensification of input use, which may increase technical efficiency (Bagamba, 2007).

There is substantial evidence that households with access to markets are more likely to increase participation in non-farm activities (Fafchamp and Forhad, 2003; Fafchamp and Shilpi, 2003; Hou, 2011b). However, Barrett et al. (2007) argue that this shift doesn't necessarily imply that households will move out of farming. The variation in prices and differences among households could result in variability in farm and non-farm activities, thus creating differences in portfolio choices. Yao (2003) notes that for some households, markets may instead facilitate diversification within agriculture. On the other hand, isolated households may not interact with the market, but instead continue to engage in subsistence production (Fafchamp and Forhad, 2003). Fafchamp and Shilpi (2005) find that households closer to urban locations reduce time spent on household chores, indicating a shift towards the market.

Benefits from market access could vary across households, due to the different levels of endowment. While better-off households might find it easier to diversify into farm or non-farm activities, poorer households may instead be pushed into unskilled off-farm labour activities (Barrett and Valdivia, 2007). Households that access improved product markets are also better placed to put their hitherto under-utilized resources to use. Alternatively, they could re-allocate available resources to engage in market-oriented

activities (Dercon and Hoddinott, 2005; UNCTAD, 2008). For poor and labour-constrained households, children could be a potential resource.

The decision to involve children in work may not always be a desired option, given the evidence that parents care about their children's welfare (Basu and Van, 1998). Ideally, they would prefer to postpone the involvement of children in work against children's future earnings. However, individuals possess different levels of ability. For each level, there exists an income threshold, such that parents who fall below a certain threshold may have limited options for keeping their children out of work (Ranjan, 2001). This may be partly compounded by insufficient labour within the household to perform necessary tasks (Nugent, 1985; Wolpin, 1984). Such a scenario could cause households to highly value child time spent in production to an extent that is Pareto inferior to what they would have chosen if labour was sufficient.

Child work can take one of two forms. Some households highly value child time spent in domestic activities such as childcare, collecting wood or cooking, where it may complement or replace adult labour. Alternatively, children may be called upon to contribute to household labour in profitable tasks to meet demand that arise from market access. Fafchamp and Wahba (2006) find that access to markets, proxied by closeness to urban locations induces households to engage children in economic activities, particularly wage employment. If households were in the position to hire labour, the effect of activity growth on child labour would be lessened. However Leinyuy (2008) goes further in arguing that family enterprises finding it difficult to hire labour may end up employing their children when market conditions improve, in order to meet the resulting increase in demand.

Child labour can persist if there exist markets for products that children participate in producing. Considering this notion at the international level, Ranjan (2001) advocates limiting access to markets for such products through trade sanctions, while Grossman and Michaelis (2007) suggest firm-specific tariff rates. The idea is that a decline in output for such products could reduce the demand for children's time, since they become less competitive. On the other hand, studies against sanctions posit that such action could lower the wages that working children obtain, exerting further income constraint on poor

households (Jafarey, 2002; Edmonds and Pavcnik, 2005). This could even induce households to increase child labour. This argument concurs with Basu and Van (1998), who contend that just as higher wages could motivate households to withdraw children from school, low wages could leave poor households with limited alternatives to child labour. A cross country study by Cigno et al. (2002) does not find any evidence of an increase in child labour with trade openness. Instead, openness is seen to reduce child labour.

It is evident from the literature that markets play an important role in influencing household behaviour regarding work allocation to children. However, while it sheds light on the effect on children with respect to trade openness, there are limited accounts describing how child labour is affected by local market conditions. For rural households in developing countries, local markets are vital for livelihoods, and may matter more than international markets, if the transactions in the domestic market are significant.

2.2. Defining child labour

Efforts to eliminate child labour have largely been hindered by the absence of a clear definition of the concept. As a result, studies have generated various statistics using different definitions. The ILO has been at the forefront of the campaign to develop a universally accepted definition. The first ILO convention of 1919 set the minimum age at 14 years for children working in an industrial setting. Over time, the definition has been revisited to cover a wide spectrum of activities and settings. For instance, the 1973 ILO convention (138) provides the most comprehensive and authoritative international standards on a minimum age for admission to employment or work (ILO, 1973). Governments are tasked to design policies to eliminate child labour. The convention requires countries to set a minimum age for entry into employment or work. The basic yardstick is that the minimum age should not be lower than the age of completion of compulsory schooling in the respective countries. As a result, different countries have specified their own minimum age, depending on their internal social and economic structures.

A more comprehensive approach was reached in the UN Convention on the Rights of the Child (CRC) in 1979. Child labour was defined based on how activities, regardless of their nature, affect the welfare of the child. In 1999, the ILO adopted this principle through Convention 182 on the worst forms of child labour (ILO, 1999). Activities prohibited under this framework include those that amount to slavery; prostitution and pornography; illicit activities such as drug trafficking; or work that is likely to affect the health or morals of the child. Taken in their totality, these conventions imply that work should not be hazardous to the child's health or physical, mental, moral, or social development. The challenge with these provisions is the difficulty of differentiating between the various forms of child work.

Currently the ILO's Statistical Information and Monitoring Program on Child Labour (SIMPOC) defines children as labourers if: they are aged 12 years and engaged in economic activities for a least one hour a week, aged 12-14, and engaged in these activities for at least 14 hours per week, aged 15-17 years and engaged in economic activities for at least 43 hours per week, or below 18 and involved in work that is regarded as hazardous (IPEC, 2002). These definitions pay less attention to domestic work. Exclusion of domestic activities and therefore their exemption from regulation could result in social exploitation if this impedes the right to leisure or schooling. It may also lead to significant gender bias, since girls participate more in household chores than boys do (Guarcello et al., 2006; Lyon and Valdivia, 2010). The one-hour threshold for children below 12 years could also be questioned. One hour in a reference week, which converts to an average of about 9 minutes per day, may be very low to categorise a child as a labourer, if such activities are not hazardous.

The United Nations Children's Fund (UNICEF) expanded the ILO definition by including a 28-hour threshold for domestic work. This approach has been mostly followed by research under the Understanding Child Work (UCW) programme (see, for instance, Guarcello and Lyon, 2004; Guarcell, 2004; Gibbons et al., 2005). Following this expansion, a child is a labourer if it is aged below 12 and engaged in economic activities for at least one hour, or at least 28 hours in chores, or aged 12-14 and performed economic

work for at least 14 hours, or chores for at least 28 hours during the last week, or aged 15-17 and worked for 43 hours, or engaged in hazardous activities.

The difficulty with reconciling the two definitions is how to categorise the status of children in cases of variants of thresholds. For instance, using this definition, it is practically difficult to categorise a 12-to-14-year-old child who performed economic activities for 10 hours (below the 14 hour ILO threshold) and domestic work for 20 hours (below the 28 hour UNICEF threshold), which, when combined could constitute child labour. Another shortcoming is that the 28-hour threshold is imposed as a "one size fits all" for the 5-14 year age category, irrespective of the differences in the children's capacities.

The struggle to eliminate child labour could remain a challenge if definitional disparities continue to exist. In spite of their shortcomings, the UNICEF thresholds are an important contribution to the development the definition of child labour, given the impact that domestic work can have on children's development.

3. Child labour in Uganda

Child labour is a common phenomenon in Uganda. In 2001 the country registered a total of 2.7 economically active children, with more than half aged 10-14 years, and one third below 10 years (IPEC and UBoS, 2001). By 2005, 3.8 million children (32%) were working, of whom 1.7 million (16%) were classified as child labourers, in both domestic and economic activities (ILO, 2007). In 2009, the number of children engaged in economic activities alone rose to 2.7 million (25.4%), with the highest proportion (34.4%) being children aged 5-11 (UBoS, 2010). The latest interagency report on child labour (UCW, 2010) indicates that the proportion of child labourers in the country is one of the highest in Sub Saharan Africa.

The incidence of child labour has been compounded by a number of factors. One such factor has been the HIV/AIDS pandemic that left behind millions of orphans (UBoS, 2003; UCW, 2010). The prolonged armed conflict in the northern region of the country, chronic poverty, and cultural practices that result in girls seeking employment in urban areas and boys working in household farms and enterprises, have also contributed to the

high proportion of child labourers (Ssewanyana, 2009; IPEC and UBoS, 2001; United Nations, 2005). In 2005 the Ministry of Finance (MFPED, 2005) also cited as important drivers, the inadequacy of schools, parents valuing children's remunerative work above school as a way of preparing them for adulthood, and children's own desire to earn their own income. Studies on the nature and prevalence of child labour in the country have identified rural areas as hotspots. The school drop-out rate in rural areas has been found to be high partly because children are required in help in farming to supplement household income and money for school fees (IPEC and UBoS, 2011). Reports by Kyomuhendo et al. (2004) and the ECLT foundation (2007) indicate that a large number of child labourers are engaged in economic activity such tobacco and coffee production because of active product markets in rural areas.

Uganda is a signatory to various United Nations conventions to eliminate child labour (Government of Uganda, 2006). The Government has designed several institutions and policies to reduce the phenomenon. Provisions were made in the Employment Decree of 1975, the 1995 Constitution, and the Children's Statute of 1996, prohibiting child labour. The task of eliminating child labour has been placed under the mandate of the Child Labour Unit of the Ministry of Gender, Labour and Social Development. Within the policy framework, children are allowed to perform certain duties at home as they progress to adulthood. Light work such as cooking, fetching firewood, fetching water are permitted for children if these tasks are in line with their capacity, and do not pose a threat to their health or interfere with their right to education. The Government prohibits all economic tasks for children below 11 years, while these are acceptable for older children as long as they are not exploitative, hazardous and fall in line with the recommended hours for children in certain age categories. However, it is clear that despite national efforts, child labour remains widespread in the country.

3.1. Rural markets in Uganda

Markets in rural areas exist in different categories. One category comprises of markets that operate on a daily basis. These are usually very small and sparsely distributed outlets that sell a limited assortment of products. Closely related to these, Nkonya, (2002) identified primary fixed traders, who operate in fixed business locations that act as drop-off points for suppliers and pick-up points for customers from mostly urban locations. These may at times travel to producers to make purchases. This evidence supports the view that as long as rural markets are linked to urban markets, they are vital for household livelihoods. Nkonya also identified primary non-fixed traders, who do not have permanent business locations, and do not pay trade licenses. Another key category is periodic markets. These operate at specific intervals, such as weekly or monthly. They involve individuals from within the district or from distant locations who purchase or sell agricultural products, inputs, and a variety of household items at a designated location. These markets often operate in the open air or in temporary structures.

Cooperatives were very active before the mid-1990s, and usually involved transactions in crops such as coffee, cotton and tobacco. With liberalisation, they became less competitive and gave way to traders (Fafchamps and Hill, 2005; Hill et al, 2008). The idea of liberalizing this market was to encourage the development of the private sector to ease access to agricultural inputs, and encourage better product prices and commercialization. However, this form of market remained operational in the eastern parts of the country where coffee production required such markets. Tobacco growing in western and West Nile parts of the country has also seen the persistence of arrangements commensurate with cooperative markets, where farmers sell output to the company and expect payments at a later date. In recent years, the realization that the private sector was not effective enough to link farmers to markets has encouraged the Government to promote the development of formal and informal groups such as village associations and farmers' groups, to undertake the collective sale of outputs and the purchase of inputs (Hill et al, 2008).

It is imperative to note that these markets differ in the volume and frequency of their transactions. Rural markets that operate daily have a limited volume of transactions

compared to periodic markets and cooperatives. While the latter operate during specific agricultural seasons (say harvest time), they are characterized by large transactions. A common feature of rural markets is that they are often associated with high transaction costs (Gollin, and Rogerson, 2010).

4. Data description

The data used in this study come from the Uganda National Household Survey (2005/06). The survey was collected by the Uganda Bureau of Statistics (UBoS, 2006) using a stratified two-stage sampling design. The first stage involved establishing Enumeration Areas, using the 2002 population and housing census framework. The Enumeration Areas were delineated based on the population size of each region. However the number was increased in the northern region to allow for attrition that could result from insecurity, and to account for the population in internally displaced persons' camps. The second stage involved obtaining a simple random sample of 10 households in each Enumeration Area.

In this paper, I make use of the socioeconomic module, which covered 42,268 individuals in 7,426 households. The module provides detailed information on household and individual characteristics. I also use the community module, which was administered in 760 Enumeration Areas. The module has community-level information about access to social and economic infrastructure.

In the socioeconomic module, one can tell the types of activities that each individual aged 5 years and above was engaged in during the 7 days preceding the survey, and the number of hours worked in respective activities on each of those days[3]. The sample for

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[3] Questions on hours spent in household chores include: (a) During the past 7 days how many hours (including travel time) did you spend: fetching water for the household? (b) fetching firewood for the household? (c) cooking for the household? (d) taking care of children and the elderly? For economic activity, questions include: During the past 7 days, have you worked: (a) for pay for an enterprise or someone who is not a member of your household at least for one hour in any day? (b) on land owned or occupied by a member of your household either in cultivating crops or in farming tasks, or have you cared for livestock belonging to a member of your household or fishing for at least one hour in any day? (c) on your own account or in a business enterprise belonging to you or someone in

this study is restricted to children aged 5-14 years (10,474 observations in 5,257 households) drawn from the rural population. I chose this age category for comparability with other studies that use an age 14 cut-off (Whetten et al. 2011; Dehija and Gatti, 2002; Rosati, and Rossi, 2001). I dropped the urban sample because of the observation that child labour has been largely regarded as a rural phenomenon in Uganda (UCW, 2008; Kyomuhendo et al, 2004; ECLT foundation, 2007). Second, as noted earlier, access to markets in urban locations could be capturing access to other facilities instead. Third, over 80% of the children in the survey were drawn from rural areas.

I construct two sets of variables reflecting child work. The first category are dummy variables indicating whether one is a child labourer. Given that combining both domestic and economic work is methodologically challenging (see section 2.2), I analyse these activities separately. One variable is a dummy for child labour in economic activity, reflecting the ILO definition (described in section 2.2). For domestic work I consider a 28-hour threshold, such that a child is in labour if it is aged 5-14 and worked for at least 28 hours of domestic work. I do not explore the debate regarding the validity of work thresholds, but use the thresholds as institutionally defined. I also construct three continuous variables for hours of child work. These are total hours, hours in domestic activity, and hours in economic activity. Here, I do not consider the thresholds above. Instead, I focus on the intensity of child work in respective activities. It is important to note that increase in work intensity does not necessarily imply child labour. Child labour will exist if in part, hours of work exceed the threshold for acceptable work.

The key explanatory variables are proxies for access to product markets. I focus on three types of markets. One category is the *limited consumer market*, comprising of a cluster of shops selling a limited number of commodities or services, and often operating on a daily basis. The second type is the *periodic local market*, held at fixed locations and fixed intervals, where producers, traders, and buyers from the vicinity and from distant places converge and make transactions. Third, is the *local cooperative market.* This is

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your household, for at least one hour in any day? How many hours did you work (in each activity) on each day.

defined in the survey as consisting of official cooperatives registered under the Co-operative Societies Act. They could also be established informally, consisting of a group of households or individuals that unite to buy or sell outputs and perform related activities jointly. The challenge with the dataset is that it does not provide travel times to the market for each household in the sample. Analysis therefore cannot capture the variation in market access across households in each village. Nonetheless, this shortcoming may not be substantial, given that villages tend to be small in geographic coverage.

I also include a number of controls used in most of the empirical studies in the literature on child labour. The child's age, gender and whether the mother lives in the household are used to control for child characteristics. Dependence ratio, and the age and gender of the head of the household are included to control for household demographic characteristics. To avoid endogeneity problems, I do not directly control for income because the survey does not explicitly distinguish household earnings that are independent of the children's contribution. Instead, I proxy for household income with a set of variables. In particular, I include the number of members having a higher education (above secondary schooling), and the proportion of adult male and female wage earners. I include the value of household assets, including land. A dummy for ownership of a non-farm enterprise by at least one member of the household, and that for participation in agricultural activities for the household are constructed to reflect activity status.

At the community level, I construct a dummy variable for the presence of a primary school in the village. I focus on primary schools because the sample belongs to the primary-school age category. The presence of an education facility could provide for schooling as a substitute to child work (Berman, 2008).

To ensure that the market access indicator represents physical markets as much as possible, I control for other variables that might confound the effect of product markets. One of these factors is population density. It is likely that children in more densely populated locations may find more labour opportunities (Fafchamp and Wahba, 2006). Other variables include the distance to the nearest town and the travel time to the nearest all-weather road (in minutes). I also consider regional fixed effects (dummies for the

central, eastern, northern and western regions), as well as the month of the interview, in order to control for seasonality in child work.

4.1. Descriptive evidence

The descriptive statistics in table 1 show that overall, more child labourers were involved in economic activity (e.g. working on the farm, in the household's business or market activities outside the household) than in domestic work (such as childcare, fetching water, fetching fuel wood for the household). In domestic work, the difference between these activities is highly marked, with girls bearing the largest burden (16% as opposed to 9.5% for boys), while the proportion of boys is higher than of girls in economic activity (25% compared to 21% for girls). This pattern is evident across all ages (figure 1).

The child labour gap in domestic work between boys and girls widens with children's ages (figure 2). The burden borne by girls in domestic work is also reflected in hours of work (table 2). While boys on average work 2 hours more than girls in economic activities, girls work 3 hours more in domestic work. Considering the total hours worked, girls on average work for 13 hours a week while boys spend 10 hours; and the gap increases with age. The intensity of work (measured by the hours of work), irrespective of activity, is higher for girls (figure 3). Although boys work more than girls in economic activities (figure 4), for almost all ages, the difference is smaller than that between boys and girls in domestic work (figure 5), indicating that the burden of work is placed more on girls on average. Note that the reliability of responses to questions on domestic work depends on how well they were administered. Although the questionnaire explicitly defines the activities for domestic work, bias could arise if some of the resources extracted were used for the production of goods, in which case a separate analysis of participation in economic activities would lead to an underestimation of results.

The average age of the children in the sample is 9 years. This age corresponds to the third year of primary schooling in Uganda. 25% of the children live in households headed by women. This average is consistent across gender and location, although it is higher by 1% for the girls' sample. 14% of the children reside in households with at least one member owning a non-agricultural enterprise. For rural households, this is a sizeable

15

estimate, reflecting the potential of the off-farm sector for supporting household livelihoods. However, the farming sector remains substantially significant, with almost 70% of the children living in a household with at least one member engaged in farming. In the event that child labour is evident in economic activities, it is highly likely to be in farming. Indeed, 89% of the children in economically-driven child labour are involved in farming.

Limited consumer markets are closer than other markets. The average travel time to this type of market is one hour, compared to two hours for periodic local markets, and four hours for local cooperatives. This is because the other markets are relatively few. Table 4 provides sample means for children in different activities and travel times to markets. Except for travel time to cooperatives, most children engaged in economic activities, both in terms of thresholds of work and intensity were located close to markets. On the contrary, children residing further away from markets seemed to work more in domestic activities, and this proportion is higher for girls.

5. Methodology

I first regress the probability of being in child labour (y_i; domestic activity, economic activity) on the household's self-reported travel time to the market (*Market*), and a vector (X_i) of child, household, and community-level controls. This is expressed as:

$$y_i^* = \beta_o + \beta_{1i} X_i + \beta_{2i} Market_i + u_i \tag{1}$$

Where y_i^* is a latent variable, such that; $y_i = 1$ if $y_i^* > 0$ and $y_i = 0$ if $y_i^* \leq 0$. The use of travel time to the market as a proxy is less prone to errors than estimation of distance. For example, a kilometre traveled from a household located at a hilly terrain may represent significantly greater time costs than the same distance traveled in the plains.

Normally, households could choose to live in areas where returns are higher, in this case, locations served with markets. This could render the measures of market access susceptible to endogeneity. However, rural households in Uganda are less mobile within their localities. Traditional mechanisms of owning land render relocation less feasible

within rural areas. For instance, households tend to live on ancestral land, owned through inheritance or clan system (Tukahirwa, 2002; Doss et al., 2011). 97.12% of the sample of children lives on ancestral land. This scenario provides a unique advantage to address the possibility of endogeneity of household location decisions. Additionally, controlling for a number of observable household socio-economic controls, and controls for access to other facilities could clear any non-random assignment of households to different travel times to markets. Kondylisc(2010) uses this approach to study the effect of proximity to school on child labour in Tanzania.

Second, I regress the hours of child work (H_i; total hours, hours in domestic activity, hours in economic activity) on the same set of variables and specifications. Since the OLS model would produce biased and inconsistent estimates due to the presence of zero hours (in this case, 22.3%), a host of studies have preferred the Tobit model (Tobin, 1958). However, the relevance of the Tobit model has been disputed by a growing body of literature. In addition to its susceptibility to the violation of the homoscedasticity and normality assumptions, it treats all zero values as an outcome of a corner solution. Although some zeros represent a corner solution for children who will never work, this is not applicable for children who would have worked if, for instance, work opportunities existed. In another strand of the literature (Moffatt, 2005; Chiwaula, 2007; Sinning, 2007; Keelan et al., 2008), the double-hurdle model, originally formulated by Cragg (1971) has been estimated as a generalization of the Tobit model. In this framework, observing positive hours of work requires passing two hurdles: first, the participation hurdle (observing positive hours), then the work intensity hurdle (hours of child work). The first stage is modeled as:

$$W_i^* = Z_i\alpha + v_i \tag{2}$$

Where W_i^* is a the latent describing the decision to participate, such that $W = 1$ if $H_i > 0$ and $W = 0$ if $H_i \leq 0$. Z_i is a vector of explanatory variables, α is a vector of parameters, and v_i is the error term assumed to be normally distributed. In the second stage, the following model of work intensity is estimated:

$$H_i^* = \beta_o + \beta_1 X + \beta_2 Market + \varepsilon_i \tag{3}$$

Where $H_i = 0$ if $H_i^* \leq 0$, and $H_i = H_i^*$ if $H_i^* > 0$. X is a vector of explanatory variables. The error term (ε_i) follows a bivariate normal distribution. Note that v_i and ε_i are assumed to be independent, leading to an *independent double hurdle model*. Unlike other two-step models, which often require exclusion restrictions, the presence of a continuous dependent variable in this type of model renders exclusion restrictions irrelevant (Blundell and Meghir, 1987).

Because normality is assumed for such models, an inverse hyperbolic sin (IHS) transformation of H_i is often applied (Sinning, 2007; Keelan et al., 2008; Chiwaula, 2010). This is continuously defined over positive, zero and negative values. This transformation is defined by:

$$T(H_i) = \log(\gamma H_i + (\gamma^2 H_i^2 + 1)^{1/2} / \gamma \tag{4}$$

Where γ is an additional parameter that controls for kurtosis. The variance of ε_i is assumed to vary across observations, in order to take heteroscedasticity into account.

6. **Empirical results**

In the rest of this section, I present a number of regressions of child labor and work intensity on travel time to different markets. Regression results are reported in tables 5-18. Each column represents a different specification. The dependent variable is either the indicator of child labour, or the hours of child work. Each specification controls for a separate measure of access to product markets, to avoid colinearity[4]. All specifications control for regional fixed variables and take account of potential seasonality in child work. Standard errors are clustered at enumeration area level.

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[4] For some cases, it is likely that these markets are positioned in the same area, resulting in more or less that same travel times.

6.1. The incidence of child labour

Tables 4 and 5 present probit estimates for the incidence of child labour. Regarding participation in domestic activity (table 4), an increase in the travel time to the nearest limited consumer market increases the incidence of child labour for girls, but has no effect on boys. While the effect of this type of market is insignificant for boys in domestic work, the market seems to matter more for them with regard to economic activity (table 5). The further away this type of market is from the household, in terms of travel time, the less likely the boys will be in child labour, with regard to economic activity.

Travel time to periodic markets appears to influence strongly child labour across genders. Distant periodic markets result in increase in the likelihood of child labour for both boys and girls in domestic activity. The corresponding marginal effects for boys and girls, respectively, are 0.04 and 0.03, for each extra hour traveled to this type of market. Results also indicate a decline in the probability of both boys and girls engaging in economic work, with marginal effects of 0.13 and 0.07, respectively. A larger marginal effect for boys may reflect their stronger participation than girls in these activities. Access to local cooperatives doesn't appear to significantly affect child labour in either form of activity.

From these results, it is possible to speculate that distant markets may increase the disincentive to engage in economic activity, thus making it less viable to involve children in this type of work. This may induce households to switch child labour from economic activities, to domestic tasks. This finding supports the literature that argues that households in locations remote from markets may be grounded in subsistence production.

Child and household-level controls are in line with the child labour literature. The incidence of child labour in both categories of work increases significantly with child age across gender. This is particularly strong for economic activities. Results for age squared reveal an inverted U relationship with child age and work. The presence of the mother strongly reduces the likelihood of child labour in domestic activities. There is evidence in the literature that mothers are altruistic towards their children (Liu et al., 2000). It is likely that they would be more likely to postpone activities that would jeopardise child welfare.

The probability of child labour in economic activity increases for children residing in households with a high dependence ratio. A higher number of dependents could increase the demand for childcare time within the household, as well as for replacement of the elderly (above 64 years) in economic activities. In the case of this survey, the finding is likely to apply mostly to young dependents, given that the elderly constitute only 2.49% of the members in the sampled households. The incidence of child labour in domestic activity is low for both boys and girls living in households with older heads. In the survey, families headed by older individuals are larger. Larger household size comes with a larger pool of household labour, such that adult labour is adequate, or work among children is less intense when distributed among members. This also has implications for intra-household labour dynamics. In the model for economic activity, the variable is only significant for girls.

Proxies for household income and human capital exhibit varied effects on child labour. A larger number of members with an education level above secondary is strongly associated with a decrease in the incidence of child labour for girls in domestic activities, but is not significant in other specifications. The decline in the incidence of child labour in this category is plausible, given that adult education may increase employment prospects and postpone child involvement in detrimental work.

Not surprising also is that the incidence of child labour in economic activities is high for boys, if they live in households that engage in farming activities. This effect is statistically significant at the 5% level, with a marginal effect of 0.06. I find an equally strong and positive effect (at the 5% level) on boys, if at least one member of the household owns a non-farm enterprise. A possible explanation could be that children are needed to supplement adult labour in economic activities.

Among the community-level variables, high population density is associated with an increase in child labour in domestic work for both boys and girls, and economic work for boys. A large population may increase demand for products, thereby inducing households to highly value child time in production. Travel time to the nearest road is only significant for boys in the model for domestic activity.

6.2. Hours of child work

Results for child hours of work are presented for three categories. In the first, I model total hours of work. I then separately estimate hours of domestic work and economic work. For all specifications, the Likelihood Ratio tests (table 6) reject the null hypotheses that the Tobit model is correctly specified, suggesting that the double hurdle model is a better representation of the data generating process. Therefore, in what follows, I focus my results on the double hurdle model.

In table 7, results appear to show that the hours of child work for both boys and girls increase with the travel to the limited consumer market. Similar effects are evident for domestic activity across gender (table 8). The intensity of economic activity declines with the travel time to this market, particularly for boys (table 9). As noted earlier, distant markets may free up time for children who would have engaged in economic activity, thereby increasing the supply of time for domestic activities.

Just like in the probit model, the periodic market has a significant effect on work intensity. An increase in the travel time to the market increases the hours of child work and the hours in domestic work across gender. However, children work less in economic activity when these markets are distant. It appears that the increase in the hours of child work is largely ascribable to domestic activity, such that the decline in economic activities may not be sufficient to counter an increase in hours of work. The specification for cooperative markets appears to be insignificant.

Results for other controls are also important for work intensity. Age is strongly significant across gender. Children whose mothers reside in the household work few hours. The presence of more dependents induces households to increase child work time overall. A higher proportion of trained adults and household involvement in non-agricultural enterprises are associated with reduced time spent by girls in domestic activities, and reductions for both boys and girls in economic activities. Community-level variables show up strongly in all models. In particular, children spend less time in domestic work when a school is available in the community, reflecting competition for child time between work and schooling.

6.3. Robustness checks

The preceding results apply to all the children in the sample across the age groups. However, it is likely that markets can affect children differently along the age continuum. To elucidate the age dimension, tables 11 and 12 present estimates of the probit and double hurdle models respectively. I exclude the specification for cooperative markets since they appeared to be insignificant in the preceding regressions. The probit results in table 10 indicate that the effect of limited consumer and periodic markets on domestic work starts taking effect at the age of 12 for boys, while the effect on girls means that they become engaged in labour as early as age 6. This further confirms gender bias in domestic work. The effect of limited consumer markets on child labour in economic activities is significant for boys from the age of 13. This may reflect the possibility that economic work is more demanding in terms of physical effort.

In table 11, results show similar patterns for child hours of work. The total intensity of work for boys increases with the travel time to limited consumer market, starting at age 13. However, for domestic activities, markets are significant for boys starting as early as 9 years of age. For girls, the results show that travel time to consumer markets has a significant effect for domestic work, even when the children are younger. Disaggregation for local periodic markets also reveals significant results for older children. Thus, while isolation from markets increases time in domestic work for boys when they are still young, they enter the child labour category at a later age, contrary to girls who work more intensely quite early.

As an additional check for robustness, I use self-reported distance (in kilometres) to the market. These results are shown in tables 12 and 13. In spite of the susceptibility of this measure to measurement error, the findings turn out to be largely consistent with travel time, except for the probit model of domestic activity.

In tables 14 and 15, I proxy market access with actual physical location of the market. In this case, I construct three dummy variables indicating whether the market is positioned: in the village or in the nearby village, at the nearest trading center, or at the district town or beyond. The results appeared to be consistent only for the periodic market. While this approach could in some way reflect proximity to markets, results cannot be

22

relied upon because the measure is less definite. For instance, a market located close to the nearest trading center can be distant for households in certain villages. The trading center might also be located in the same village.

Cooperative markets have appeared insignificant across specifications; I explore this variable further by estimating separate regressions for the western Uganda, eastern Uganda and West Nile districts. As noted earlier, tobacco production is a vibrant activity in western Uganda and West Nile areas, while in the east, the Busoga sub region is active in coffee production. For these locations, given that markets that operate in the form of cooperatives are key players in the purchase of produce in these areas, it is of concern that results based on these locations may show a different picture. Controlling for other potential drivers of child work, I actually find that, while these markets do not matter for the full sample, for these locations, they appear to significantly influence child labour and hours of work in most specifications (tables 16 and 17).

7. Discussion and conclusions

This paper analyses how access to markets affects the incidence of child labour and the intensity of child work. The major contribution to the child labour literature is that I empirically study how actual product markets relate to child involvement in domestic and economic activities.

Using data from rural Uganda, collected in 2005, and focusing on children aged 5-14, I find that overall, the intensity of child work increases when households are distant, either from small but more frequent markets, and periodic markets that sell a wide range of products. This intensity of work seems to be driven overly by increase in domestic activity, rather than the observed decline in economic activity, when travel time to these markets increases. Consistent with work intensity, longer travel time to the market acts to increase the likelihood of child labour in domestic activity, almost across gender, while child labour in economic work declines. Girls are also observed to work at an earlier age than boys.

One key lesson that shows up in the data is that, when households are exposed to market opportunities, they can be induced to utilize the available resources, one of which

is children. When households are isolated, child time is instead switched from economic to domestic production.

It would have been worthwhile investigating how markets would influence both the work and schooling decisions. The challenge is that the data only provide information on whether a child attends school. It is not possible to tell whether the child went to school during the week preceding the survey, and the weekly hours of schooling. It would have been possible to expound further on why domestic work increases for distant markets. It could be that domestic work and schooling increase with a decline in time spent on economic activities. If this were to hold, then, in the absence of schooling, the increase in time allocated to domestic work would have been stronger.

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Figure 1. Proportion of child labourers in economic work
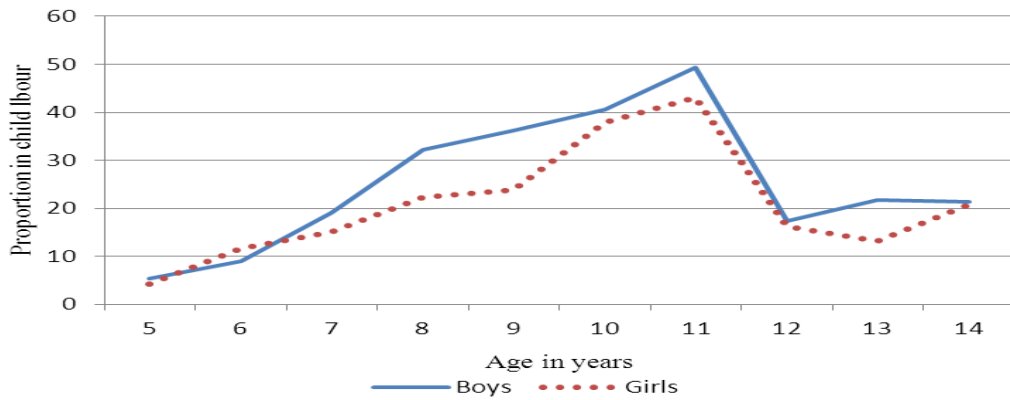
Figure 2. Proportion of child labourers in domestic work
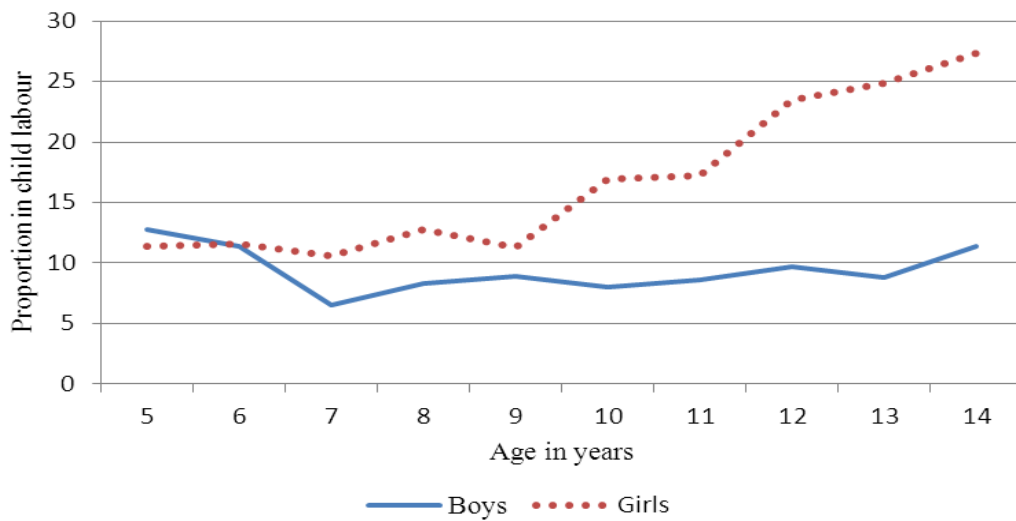
Figure 3. Total hours of child work
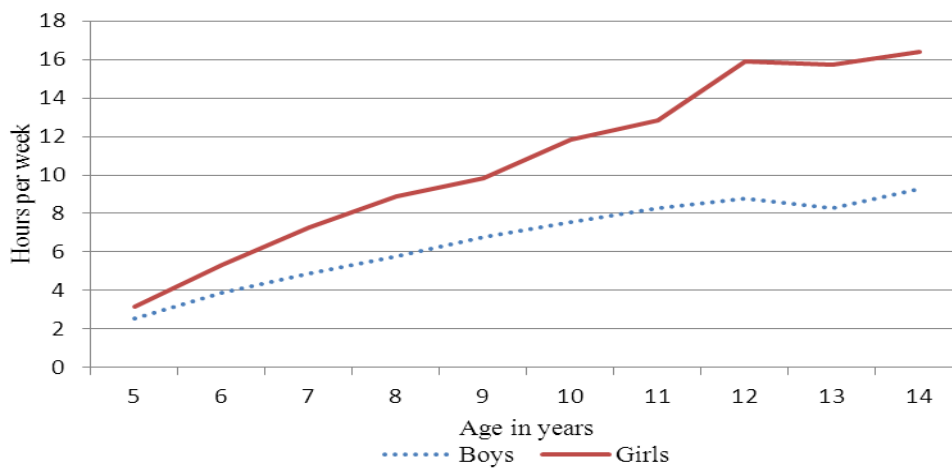
Figure 4. Child hours in economic work
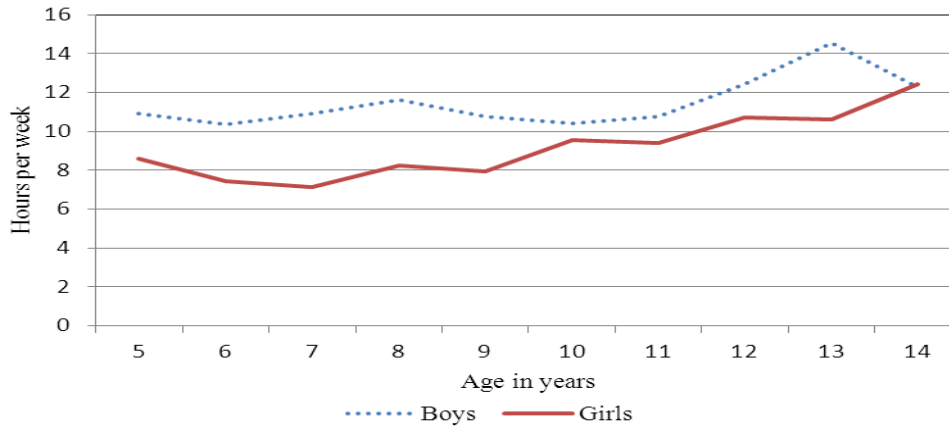
Figure 5. Child hours in domestic work
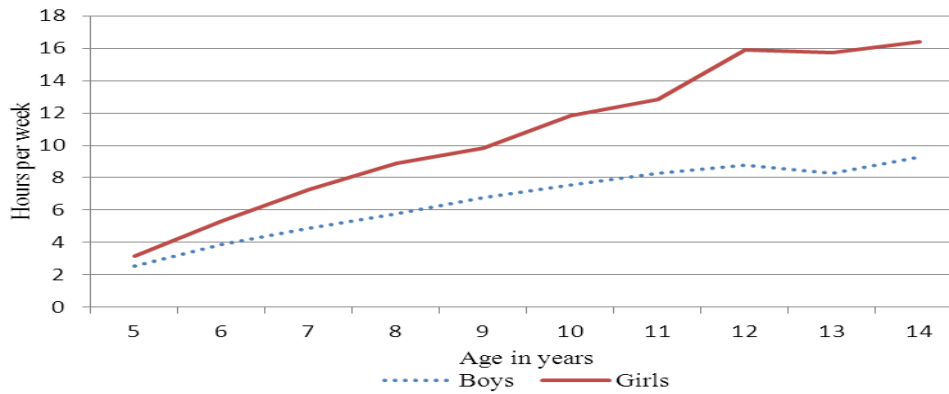
Table 1. Proportion of children working

	Domestic	Economic
	%	%
Boys	9.48	24.65
Girls	16.40	21.26
All	12.93	22.96

Weighted statistics for rural children between 5-14 years.

Table 2. Descriptive statistics

Variable	All		Boys		Girls	
	Mean	*S.D*	*Mean*	*S.D*	*Mean*	*S.D*
Child characteristics						
Child's age	9.29	2.88	9.30	2.88	9.27	2.89
Child is female (Yes=1, No=0)	0.50	0.50				
Mother lives in the household (Yes=1, No=0)	0.70	0.46	0.71	0.45	0.69	0.46
Household characteristics						
Dependence ratio[5]	0.60	0.15	0.60	0.15	0.60	0.15
Age of the head in years	44.86	13.59	45.26	13.63	44.46	13.54
Head is female ((Yes=1, No=0)	0.25	0.44	0.25	0.43	0.26	0.44
Prop. adults with schooling>secondary	0.17	0.52	0.17	0.51	0.17	0.52
Hh involved in farming (Yes=1, No=0)	0.67	0.47	0.67	0.47	0.67	0.47
Hh has non-farm enterprise (Yes=1, No=0)	0.14	0.35	0.14	0.35	0.14	0.34
Prop. of adult female wage earners	0.06	0.26	0.05	0.25	0.06	0.27
Prop. of adult male wage earners	0.16	0.42	0.15	0.40	0.17	0.44
Total value of assets (000 Ug. Shs)	7074	31600	6882	30100	6868	31100
Community-level characteristics						
Primary school in the village (Yes=1, No=0)	0.40	0.49	0.39	0.49	0.41	0.49
Population density	370.71	509.30	362.68	470.39	378.81	545.62
Distance to town (km)	2.04	0.03	2.04	0.04	2.04	0.04
Tr. Time to all-weather road (minutes)	7.45	0.21	7.45	0.21	7.45	0.21
Hours of child work						
Total hours of child work	11.83	13.49	10.41	12.64	13.27	14.15
Hours in domestic work	8.46	10.20	6.51	8.30	10.44	11.47
Hours in economic work	10.92	11.67	11.88	13.07	9.84	9.73
Travel times to markets						
Most limited consumer market (hours)	1.23	0.17	1.24	0.17	1.23	0.16
Most periodic local market (hours)	2.48	0.64	2.48	0.64	2.49	0.64
Local cooperative market (hours)	4.16	0.91	4.14	0.91	4.14	0.92

Note: statistics based on rural children aged 5-17

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[5] Proportion of individuals aged below 18 and above 64 years in the household.

Table 3. Travel time to markets and child labour

Market proxy	Economic activity			Domestic activity		
	Both	Boys	Girls	Both	Boys	Girls
Proportion in child labour						
Travel time to Limited consumer market						
<2 hours	20.96	22.61	19.29	12.68	10	15.37
2_5	20.51	21.75	19.32	12.71	8.03	17.15
>5	16.16	17.24	15.13	13.76	9.49	17.87
Travel time to periodic market						
<2 hours	21.34	26.46	15.32	12.62	9.01	16.19
2_5	20.99	22.8	19.65	13.51	11.5	11.51
>5	19.96	21.28	18.65	15.49	11.3	19.82
Travel time to cooperative market						
	19.69	23.1	16.29	14.69	10.02	19.34
	24.0	25.41	22.41	13.15	0.89	17.55
	22.82	24.29	21.33	12.5	0.99	15.12
Intensity (Hours) of work						
Travel time to limited consumer market						
<2 hours	11.11	12.03	10.04	7.94	6.16	9.72
2_5	11.47	13.49	10.37	8.54	6.55	10.48
>5	10.0	9.95	10.06	7.93	5.55	10.24
Travel time to periodic market						
<2 hours	12.52	14.03	9.74	7.9	6.02	9.74
2_5	10.78	11.52	9.97	8.06	6.15	9.92
>5	8.52	9.07	11.45	9.75	8.15	11.45
Travel time to cooperative market						
<2 hours	9.48	9.45	9.42	9.10	7.02	11.22
2_5	9.98	10.54	9.35	8.68	6.53	10.87
>5	11.86	13.31	10.26	8.19	6.38	10.00

Table 4. Probit regression for domestic activity (Marginal effects)

	Boys			Girls		
	(i)	*(ii)*	*(ii)*	*(i)*	*(ii)*	*(ii)*
CHILD CHARACTERISTICS						
Child's age	0.034***	0.035***	0.035***	0.037**	0.034*	0.035**
	(0.010)	(0.010)	(0.010)	(0.013)	(0.013)	(0.013)
Age Squared	-0.002**	-0.002**	-0.002**	-0.003***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Mother lives in the household	-0.062***	-0.062***	-0.062***	-0.091***	-0.090***	-0.089***
	(0.011)	(0.011)	(0.011)	(0.013)	(0.013)	(0.013)
HOUSEHOLD CHARACTERISTICS						
Dependence ratio	0.036	0.042	0.042	0.080*	0.082*	0.087*
	(0.032)	(0.032)	(0.032)	(0.040)	(0.040)	(0.040)
Age of the head in years	-0.001*	-0.001*	-0.001*	-0.001**	-0.001*	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Head is female	-0.001	-0.001	-0.001	-0.008	-0.012	-0.010
	(0.009)	(0.009)	(0.009)	(0.012)	(0.012)	(0.012)
Prop.of adults above sec. sch	-0.011	-0.012	-0.012	-0.030**	-0.034**	-0.032**
	(0.009)	(0.009)	(0.009)	(0.011)	(0.011)	(0.011)
Hh involved in farming	-0.008	-0.007	-0.007	-0.006	-0.003	-0.004
	(0.012)	(0.012)	(0.012)	(0.015)	(0.015)	(0.015)
Hh has non-farm enterprises	0.016	0.017	0.017	0.008	0.011	0.012
	(0.016)	(0.016)	(0.016)	(0.020)	(0.020)	(0.020)
Prop. female wage earners	-0.077	-0.071	-0.071	0.092	0.094	0.096
	(0.113)	(0.113)	(0.113)	(0.119)	(0.119)	(0.119)
Prop. male wage earners	0.115	0.123	0.125	0.203*	0.203*	0.206*
	(0.073)	(0.072)	(0.072)	(0.092)	(0.092)	(0.092)
Value of assets	0.017	0.021	0.022	-0.182	-0.165	-0.157
	(0.079)	(0.078)	(0.079)	(0.101)	(0.101)	(0.102)
COMMUNITY-LEVEL VARIABLES						
School in the village	-0.019*	-0.019*	-0.019*	-0.009	-0.005	-0.005
	(0.008)	(0.008)	(0.008)	(0.011)	(0.011)	(0.011)
Population density	-0.014**	-0.014**	-0.014**	-0.011	-0.015*	-0.014*
	(0.005)	(0.005)	(0.005)	(0.007)	(0.007)	(0.007)
Distance to town	0.113	0.100	0.101	0.281	0.248	0.285
	(0.154)	(0.154)	(0.154)	(0.201)	(0.200)	(0.201)
Time to all-weather road	0.039*	0.039*	0.038	0.027	0.027	0.016
	(0.019)	(0.019)	(0.019)	(0.025)	(0.025)	(0.026)
Time to limited cons. market	0.220			0.075***		
	(0.529)			(0.018)		
Time to periodic market		0.043***			0.033**	
		(0.013)			(0.010)	
Time to cooperative market			-0.047			0.224
			(0.572)			(0.748)
District fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month of survey	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	4787	4834	4828	4730	4786	4779
Wald chi2	132.7	131.4	130.9	290.0	287.1	285.6
Rquared	0.0434	0.0423	0.0422	0.0732	0.0724	0.0713

Table 5. Probit regression for economic activity (Marginal effects)

	Boys			Girls		
	(i)	*(ii)*	*(ii)*	*(i)*	*(ii)*	*(ii)*
CHILD CHARACTERISTICS						
Child's age	0.324***	0.325***	0.325***	0.283***	0.285***	0.285***
	(0.018)	(0.018)	(0.018)	(0.016)	(0.016)	(0.016)
Age Squared	-0.016***	-0.016***	-0.016***	-0.014***	-0.014***	-0.014***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Mother lives in the household	0.002	0.003	0.004	0.008	0.006	0.007
	(0.014)	(0.014)	(0.014)	(0.013)	(0.013)	(0.013)
HOUSEHOLD CHARACTERISTICS						
Dependence ratio	0.163***	0.160***	0.159***	0.064	0.068	0.065
	(0.047)	(0.047)	(0.047)	(0.044)	(0.044)	(0.044)
Age of the head in years	-0.001	-0.001	-0.001	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Head is female	0.034*	0.033*	0.032*	0.023	0.025	0.024
	(0.015)	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)
Prop.of adults above sec. sch	-0.004	-0.004	-0.003	-0.016	-0.013	-0.016
	(0.013)	(0.012)	(0.012)	(0.011)	(0.011)	(0.011)
Hh involved in farming	0.055**	0.056**	0.056**	0.026	0.023	0.025
	(0.018)	(0.018)	(0.018)	(0.016)	(0.016)	(0.016)
Hh has non-farm enterprises	0.053*	0.052*	0.052*	0.028	0.027	0.027
	(0.026)	(0.026)	(0.026)	(0.023)	(0.023)	(0.023)
Prop. female wage earners	-0.645*	-0.651*	-0.653*	-0.219	-0.219	-0.209
	(0.325)	(0.321)	(0.324)	(0.166)	(0.166)	(0.166)
Prop. male wage earners	-0.215	-0.216	-0.216	0.088	0.095	0.095
	(0.131)	(0.129)	(0.129)	(0.109)	(0.109)	(0.109)
Value of assets	0.627***	0.617***	0.619***	0.379***	0.385***	0.381***
	(0.125)	(0.125)	(0.125)	(0.113)	(0.112)	(0.112)
COMMUNITY-LEVEL VARIABLES						
School in the village	-0.022	-0.024	-0.023	0.004	0.003	0.003
	(0.013)	(0.012)	(0.012)	(0.012)	(0.011)	(0.011)
Population density	-0.028***	-0.027***	-0.027***	-0.008	-0.007	-0.008
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)
Distance to town	-0.302	-0.296	-0.313	-0.187	-0.176	-0.215
	(0.248)	(0.248)	(0.249)	(0.229)	(0.229)	(0.229)
Time to all-weather road	0.007	0.016	0.023	0.047	0.037	0.051
	(0.030)	(0.030)	(0.031)	(0.028)	(0.028)	(0.029)
Time to limited cons. market	-0.049*			1.006		
	(0.024)			(0.818)		
Time to periodic market		-0.131***			-0.076**	
		(0.017)			(0.025)	
Time to cooperative market			-0.911			-0.206
			(0.880)			(0.805)
District fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month of survey	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	4787	4834	4828	4730	4786	4779
Wald chi2	536.0	544.2	542.6	538.9	542.7	539.1
Rquared	0.124	0.125	0.125	0.133	0.133	0.133

Standard errors in parenthesis, * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6. Likelihood Ratio test statistics

Model		Test statistic	P-value
Total hours			
	Boys	4825.646	0.000
	Girls	5418.737	0.000
Domestic activity			
	Boys	4986.265	0.000
	Girls	5723.576	0.000
Economic activity			
	Boys	9551.336	0.000
	Girls	9560.11	0.000

Table 7. Cragg's double hurdle model of total hours of child work (marginal effects)

	Boys			Girls		
	(i)	*(ii)*	*(iii)*	*(i)*	*(ii)*	*(iii)*
CHILD CHARACTERISTICS						
Child's age	0.281***	0.271***	0.271***	0.223***	0.226***	0.225***
	(0.048)	(0.048)	(0.048)	(0.045)	(0.045)	(0.045)
	-0.008***	-0.008**	-0.008**	-0.003	-0.003	-0.003
Age Squared	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	-0.090*	-0.089*	-0.089*	-0.113**	-0.113**	-0.110**
Mother lives in the household	(0.038)	(0.037)	(0.037)	(0.035)	(0.035)	(0.035)
HOUSEHOLD CHARACTERISTICS						
Dependence ratio	0.368**	0.386**	0.385**	0.272*	0.296*	0.298*
	(0.120)	(0.120)	(0.120)	(0.120)	(0.120)	(0.120)
Age of the head in years	-0.002	-0.002	-0.002	-0.002	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Head is female	-0.036	-0.046	-0.046	-0.002	-0.006	-0.005
	(0.040)	(0.039)	(0.039)	(0.038)	(0.038)	(0.038)
Prop.of adults above sec. sch	-0.021	-0.023	-0.022	-0.074*	-0.076*	-0.079*
	(0.039)	(0.039)	(0.039)	(0.037)	(0.037)	(0.037)
Hh involved in farming	0.024	0.029	0.029	0.016	0.020	0.022
	(0.049)	(0.048)	(0.049)	(0.046)	(0.046)	(0.046)
Hh has non-farm enterprises	0.093	0.095	0.095	-0.011	-0.004	-0.005
	(0.065)	(0.065)	(0.065)	(0.061)	(0.061)	(0.061)
Prop. female wage earners	0.752	0.751	0.754	0.084	0.045	0.090
	(0.520)	(0.523)	(0.522)	(0.402)	(0.401)	(0.402)
Prop. male wage earners	-0.253	-0.175	-0.189	0.607	0.624*	0.616
	(0.342)	(0.334)	(0.335)	(0.317)	(0.314)	(0.315)
Value of assets	0.031	-0.014	-0.019	-1.115*	-1.157**	-1.139*
	(0.466)	(0.465)	(0.465)	(0.446)	(0.443)	(0.444)
COMMUNITY-LEVEL VARIABLES						
School in the village	-0.135***	-0.141***	-0.139***	-0.146***	-0.142***	-0.144***
	(0.034)	(0.034)	(0.034)	(0.032)	(0.032)	(0.032)
Population density	0.067**	0.066**	0.066**	0.099***	0.109***	0.100***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Distance to town	0.236	0.190	0.193	0.544	0.372	0.562
	(0.671)	(0.671)	(0.669)	(0.663)	(0.663)	(0.660)
Time to all-weather road	-0.169*	-0.146	-0.141	0.158*	0.146*	0.155
	(0.080)	(0.077)	(0.083)	(0.076)	(0.074)	(0.079)
Time to limited cons. market	0.158*			0.199*		
	(0.072)			(0.080)		
Time to periodic market		0.528***			0.417***	
		(0.070)			(0.067)	
Time to cooperative market			-0.102			-0.092
			(0.069)			(0.076)
District fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month of survey	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	4537	4583	4577	4470	4522	4516
Wald chi2	655.0	667.5	664.9	663.9	673.9	675.1

Standard errors in parenthesis, * significant at 10%; ** significant at 5%; *** significant at 1%

Table 8. Cragg's double hurdle model of hours of domestic activity (Marginal effects)

	Boys			Girls		
	(i)	*(ii)*	*(iii)*	*(i)*	*(ii)*	*(iii)*
CHILD CHARACTERISTICS						
Child's age	0.198***	0.185***	0.186***	0.158***	0.162***	0.160***
	(0.048)	(0.048)	(0.048)	(0.045)	(0.045)	(0.045)
Age Squared	-0.006*	-0.006*	-0.006*	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Mother lives in the household	-0.072	-0.074	-0.073	-0.121***	-0.119***	-0.118***
	(0.038)	(0.038)	(0.038)	(0.036)	(0.036)	(0.036)
HOUSEHOLD CHARACTERISTICS						
Dependence ratio	0.344**	0.366**	0.362**	0.170	0.186	0.196
	(0.121)	(0.121)	(0.121)	(0.119)	(0.119)	(0.119)
Age of the head in years	-0.003*	-0.003**	-0.003**	-0.004**	-0.003**	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Head is female	-0.055	-0.064	-0.064	0.000	-0.003	-0.003
	(0.040)	(0.040)	(0.040)	(0.038)	(0.037)	(0.037)
Prop.of adults above sec. sch	-0.054	-0.059	-0.058	-0.101**	-0.109**	-0.108**
	(0.039)	(0.038)	(0.039)	(0.036)	(0.036)	(0.036)
Hh involved in farming	-0.066	-0.059	-0.058	0.016	0.027	0.024
	(0.049)	(0.048)	(0.048)	(0.047)	(0.046)	(0.046)
Hh has non-farm enterprises	-0.023	-0.019	-0.018	-0.057	-0.044	-0.049
	(0.064)	(0.064)	(0.064)	(0.063)	(0.062)	(0.063)
Prop. female wage earners	0.675	0.664	0.675	0.270	0.232	0.259
	(0.544)	(0.544)	(0.544)	(0.394)	(0.393)	(0.395)
Prop. male wage earners	0.121	0.232	0.221	0.540	0.590	0.556
	(0.348)	(0.341)	(0.342)	(0.317)	(0.315)	(0.316)
Value of assets	-1.255**	-1.267**	-1.269**	-1.498***	-1.554***	-1.506***
	(0.463)	(0.464)	(0.464)	(0.443)	(0.441)	(0.443)
COMMUNITY-LEVEL VARIABLES						
School in the village	-0.123***	-0.124***	-0.123***	-0.148***	-0.144***	-0.142***
	(0.034)	(0.034)	(0.034)	(0.032)	(0.032)	(0.032)
Population density	0.038	0.042	-0.039	0.074***	0.086***	0.078***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Distance to town	2.004**	1.898**	1.920**	0.879	0.674	0.907
	(0.662)	(0.662)	(0.660)	(0.683)	(0.682)	(0.680)
Time to all-weather road	-0.228**	-0.210**	-0.195*	0.144	0.133	0.154
	(0.082)	(0.079)	(0.084)	(0.077)	(0.076)	(0.080)
Time to limited cons. market	0.054*			0.040*		
	(0.021)			(0.018)		
Time to periodic market		-0.316***			-0.236***	
		(0.075)			(0.067)	
Time to cooperative market			-0.054			0.012
			(0.066)			(0.076)
District fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month of survey	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	4515	4561	4555	4458	4510	4504
Wald chi2	564.5	575.7	572.6	638.5	649.1	650.2

Standard errors in parenthesis, * significant at 10%; ** significant at 5%; *** significant at 1%

Table 9. Cragg's double hurdle model of hours of economic activity (Marginal effects)

	Boys			Girls		
	(i)	(ii)	(iii)	(i)	(ii)	(iii)
CHILD CHARACTERISTICS						
Child's age	0.923***	0.912***	0.915***	0.997***	1.007***	1.005***
	(0.075)	(0.075)	(0.075)	(0.068)	(0.068)	(0.068)
Age Squared	-0.037***	-0.036***	-0.036***	-0.038***	-0.038***	-0.038***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
Mother lives in the household	-0.259***	-0.268***	-0.267***	-0.237***	-0.238***	-0.243***
	(0.062)	(0.062)	(0.062)	(0.057)	(0.056)	(0.056)
HOUSEHOLD CHARACTERISTICS						
Dependence ratio	0.206	0.249	0.242	0.417*	0.372	0.395*
	(0.200)	(0.199)	(0.199)	(0.191)	(0.190)	(0.191)
Age of the head in years	-0.004	-0.004*	-0.004	-0.006**	-0.006**	-0.006**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Head is female	-0.066	-0.072	-0.070	-0.002	-0.009	-0.012
	(0.065)	(0.065)	(0.065)	(0.059)	(0.058)	(0.058)
Prop.of adults above sec. sch	-0.132*	-0.139*	-0.135*	-0.303***	-0.316***	-0.305***
	(0.060)	(0.060)	(0.060)	(0.058)	(0.058)	(0.058)
Hh involved in farming	-0.079	-0.078	-0.080	-0.084	-0.072	-0.084
	(0.081)	(0.081)	(0.081)	(0.073)	(0.073)	(0.073)
Hh has non-farm enterprises	-0.088	-0.092	-0.092	-0.277**	-0.257**	-0.273**
	(0.107)	(0.106)	(0.106)	(0.098)	(0.098)	(0.098)
Prop. female wage earners	-0.521	-0.539	-0.525	-0.877	-0.843	-0.884
	(0.888)	(0.890)	(0.889)	(0.645)	(0.645)	(0.644)
Prop. male wage earners	-1.594**	-1.481*	-1.481*	-0.245	-0.187	-0.256
	(0.602)	(0.594)	(0.595)	(0.534)	(0.530)	(0.530)
Value of assets	2.182**	2.025**	2.029**	0.352	0.303	0.297
	(0.703)	(0.697)	(0.699)	(0.692)	(0.687)	(0.686)
COMMUNITY-LEVEL VARIABLES						
School in the village	-0.045	-0.062	-0.063	0.008	-0.003	-0.003
	(0.044)	(0.043)	(0.043)	(0.041)	(0.041)	(0.041)
Population density	0.021	0.001	-0.014	0.091**	0.060	0.056
	(0.031)	(0.031)	(0.031)	(0.029)	(0.033)	(0.032)
Distance to town	-2.145*	-1.992*	-2.160*	-2.518**	-2.370**	-2.398**
	(0.919)	(0.921)	(0.916)	(0.860)	(0.862)	(0.855)
Time to all-weather road	-0.068	-0.027	-0.061	0.103	0.082	0.133
	(0.095)	(0.094)	(0.103)	(0.094)	(0.092)	(0.100)
Time to limited cons. market	-0.113***			-0.206*		
	(0.019)			(0.089)		
Time to periodic market		-0.279**			-0.243*	
		(0.096)			(0.106)	
Time to cooperative market			-0.216			-0.042
			(0.114)			(0.160)
District fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month of survey	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	1576	1592	1590	1408	1425	1422
Wald Chi 2	461.2	466.1	572.3	437.2	441.2	443.1

Standard errors in parenthesis, * significant at 10%; ** significant at 5%; *** significant at 1%

Table 10. Probit regressions for different ages (Marginal effects)

	Child's age									
	5	6	7	8	9	10	11	12	13	14
	n=1254	n=1118	n=1064	n=1052	n=988	n=1116	n=954	n=1048	n=994	n=886
Effect of travel time to limited consumer market										
Domestic work(=1)										
Boys	0.0805	0.216	0.017	0.149	0.313	0.036	0.087	0.496*	0.489*	0.091
	(0.154)	(0.178)	(0.222)	(0.182)	(0.212)	(0.190)	(0.214)	(0.201)	(0.249)	(0.187)
Girls	0.299	0.420*	0.232	0.363*	-0.326	-0.227	0.155	0.393**	0.087	0.338*
	(0.159)	(0.167)	(0.188)	(0.176)	(0.188)	(0.161)	(0.163)	(0.152)	(0.151)	(0.147)
Economic work(=1)										
Boys	0.047	-0.133	-0.012	-0.139	-0.112	0.071	-0.090	-0.116	0.073*	0.015**
	(0.203)	(0.189)	(0.154)	(0.131)	(0.139)	(0.126)	(0.137)	(0.169)	(0.029)	(0.005)
Girls	0.449	0.0527	-0.186	0.162	0.054*	-0.0160	-0.185	-0.120	-0.069	-0.0545
	(0.240)	(0.171)	(0.167)	(0.151)	(0.024)	(0.133)	(0.134)	(0.160)	(0.177)	(0.165)
Effect of travel time to Periodic local market										
Domestic work (=1)										
Boys	0.009	0.093	-0.137	0.041	0.366	-0.086	-0.006	0.392*	-0.144	-0.095
	(0.149)	(0.169)	(0.202)	(0.169)	(0.217)	(0.182)	(0.206)	(0.191)	(0.174)	(0.179)
Girls	0.264	0.399*	0.029	0.295	-0.299	0.004	0.293*	0.312*	-0.129	0.035
	(0.151)	(0.178)	(0.178)	(0.178)	(0.164)	(0.153)	(0.144)	(0.134)	(0.144)	(0.144)
Economic work (=1)										
Boys	-0.183	-0.144	-0.007	-0.127	-0.208	-0.041	-0.290*	0.026	-0.002	-0.157
	(0.185)	(0.167)	(0.148)	(0.112)	(0.136)	(0.119)	(0.133)	(0.171)	(0.145)	(0.155)
Girls	0.303	-0.023	-0.017	0.243	-0.134	-0.142	-0.218	-0.041	0.054*	-0.639**
	(0.242)	(0.174)	(0.161)	(0.154)	(0.135)	(0.129)	(0.121)	(0.145)	(0.024)	(0.244)

Standard errors in parenthesis, * implies significant at 10%; ** significant at 5%; *** significant at 1%. Other variables included but not reported are: age, age squared, mother lives in the household, dependence ratio, age of the head, dummy for female head, proportion of adults above secondary schooling, household involved in farming, household has non-farm enterprise, proportion of female wage earners, proportion of male wage earners, value of assets, school available in the village, distance to nearest town, travel time to all-weather road, month of data collection, district fixed effects.

Table 11. Crag's Double hurdle model for different child ages (Marginal effects)

	Child's age									
	5	6	7	8	9	10	11	12	13	14
	n=1254	n=1118	n=1064	n=1052	n=988	n=1116	n=954	n=1048	n=994	n=886
Effect of travel time to limited consumer market										
Total hours of work										
Boys	-0.582	-1.980	-1.611	-0.341	-1.338	-0.145	-1.173	-1.326	3.421*	3.309*
	(1.401)	(1.413)	(1.429)	(1.406)	(1.501)	(1.391)	(1.489)	(1.661)	(1.543)	(1.335)
Girls	1.992	1.951	-0.0757	2.760*	-1.636	-1.519*	-0.427	4.533**	-0.915	0.583*
	(1.430)	(1.435)	(1.382)	(1.276)	(1.333)	(0.752)	(1.526)	(1.650)	(1.901)	(0.282)
Hours of domestic work										
Boys	-1.184	-1.687	2.402	-0.156	2.191*	2.046*	0.293	0.423*	0.566**	1.668
	(1.165)	(1.216)	(2.382)	(1.023)	(1.076)	(1.033)	(1.087)	(0.176)	(0.172)	(1.222)
Girls	1.510	1.616	-0.213	0.736**	-1.517	-0.412*	0.100*	3.168*	-0.836	0.539*
	(1.371)	(1.295)	(1.239)	(0.244)	(1.159)	(0.194)	(0.043)	(1.343)	(1.534)	(0.247)
Hours of Economic work										
Boys	4.645	-5.576	2.522	3.010	-1.890	-1.625	-1.793	-0.387	-3.136*	-0.585*
	(2.445)	(4.802)	(2.719)	(2.025)	(4.926)	(1.581)	(1.801)	(1.859)	(1.581)	(0.292)
Girls	2.540	0.871	-0.274	-2.185	-0.0293	-2.343	1.614	-1.285	-2.660*	-0.929
	(1.306)	(2.078)	(1.400)	(1.876)	(0.052)	(1.492)	(2.543)	(1.367)	(1.110)	(1.866)
Effect of travel time to periodic local market										
Total hours of work										
Boys	-1.658	-2.208	-1.122	-0.133	0.304	-1.396	-2.120	-1.516*	0.976	-1.290
	(1.302)	(1.272)	(1.372)	(1.209)	(1.456)	(1.313)	(1.411)	(0.752)	(1.490)	(1.592)
Girls	0.655	1.468	-1.112	3.971**	-1.606	-0.511	-2.892*	-2.494	-1.557	-1.974*
	(1.374)	(1.399)	(1.290)	(1.466)	(1.237)	(1.397)	(1.276)	(1.508)	(1.835)	(0.998)
Hours of domestic work										
Boys	-2.071	-2.080	-1.521	-0.445	0.272	1.467	1.426	2.311*	0.770	0.497*
	(1.076)	(1.095)	(1.031)	(0.879)	(1.078)	(0.928)	(1.024)	(1.120)	(0.947)	(0.220)
Girls	0.469	1.344	-1.234	2.939*	-0.985	0.676	0.757**	-1.947	1.557	0.757**
	(1.315)	(1.261)	(1.155)	(1.265)	(1.077)	(1.120)	(0.244)	(1.224)	(1.835)	(0.244)
Hours of Economic work										
Boys	-0.105	-0.163	1.065	-2.021	2.542	-0.745	-0.580*	1.437	´-0.385*	-2.165
	(0.412)	(3.825)	(2.798)	(1.751)	(1.545)	(1.655)	(0.293)	(1.925)	(0.154)	(1.351)
Girls	0.345	1.179	-0.471	-0.110	-1.531	-0.126*	0.728	-0.239	1.492	-0.807
	(1.935)	(2.480)	(1.437)	(2.013)	(1.304)	(0.049)	(1.032)	(1.233)	(1.359)	(1.867)

Standard errors in parenthesis, * implies significant at 10%; ** significant at 5%; *** significant at 1%. Other variables included but not reported are: age, age squared, mother lives in the household, dependence ratio, age of the head, dummy for female head, proportion of adults above secondary schooling, household involved in farming, household has non-farm enterprise, proportion of female wage earners, proportion of male wage earners, value of assets, school available in the village, distance to nearest town, travel time to all-weather road, month of data collection, district fixed effects.

Table 12. Probit regressions for distance to market (Marginal effects)

	Ltd consumer market	Periodic market	Cooperative market
Domestic activity			
Boys	0.118	-0.211	-0.146**
	(0.104)	(0.138)	(0.046)
Girls	0.026	-0.014	-0.029
	(0.083)	(0.087)	(0.027)
Economic activity			
Boys	0.039	-0.135*	-0.302**
	(0.049)	(0.061)	(0.093)
Girls	-0.244***	-0.076	0.152
	(0.056)	(0.047)	(0.102)

Standard errors in parenthesis, * implies significant at 10%; ** significant at 5%; *** significant at 1%. Other variables included but not reported are: age, age squared, mother lives in the household, dependence ratio, age of the head, dummy for female head, proportion of adults above secondary schooling, household involved in farming, household has non-farm enterprise, proportion of female wage earners, proportion of male wage earners, value of assets, school available in the village, distance to nearest town, travel time to all-weather road, month of data collection, district fixed effects.

Table 13. Double hurdle model for distance to market (Marginal effects)

	Ltd consumer market	Periodic market	Cooperative market
Total			
Boys	0.211*	0.141*	-0.062
	(0.087)	(0.055)	(0.072)
Girls	0.091	0.340***	0.033
	(0.118)	(0.049)	(0.043)
Domestic activity			
Boys	0.070**	0.124***	0.172*
	(0.027)	(0.024)	(0.070)
Girls	0.025	0.051**	0.113
	(0.037)	(0.016)	(0.075)
Economic activity			
Boys	-0.654***	-0.020	-0.014
	(0.039)	(0.028)	(0.048)
Girls	-0.027***	-0.066*	-0.113
	(0.002)	(0.027)	(0.059)

Standard errors in parenthesis, * implies significant at 10%; ** significant at 5%; *** significant at 1%. Other variables included but not reported are: age, age squared, mother lives in the household, dependence ratio, age of the head, dummy for female head, proportion of adults above secondary schooling, household involved in farming, household has non-farm enterprise, proportion of female wage earners, proportion of male wage earners, value of assets, school

available in the village, distance to nearest town, travel time to all-weather road, month of data collection, district fixed effects.

Table 14. Probit regressions for actual location of markets (Marginal effects)

	Dependent variables			
	Domestic activity		**Economic activity**	
Market proxies	*Boys*	*Girls*	*Boys*	*Girls*
Limited consumer market				
At the trading center	-0.010	-0.011	0.119	-0.027
	(0.016)	(0.025)	(0.066)	(0.022)
At district & beyond	-0.002	-0.026	0.046	-0.035
	(0.018)	(0.024)	(0.109)	(0.030)
Periodic market				
At the trading center	0.048**	0.011	-0.001	0.016
	(0.016)	(0.065)	(0.012)	(0.059)
At district & beyond	0.039*	0.047*	-0.021	-0.129*
	(0.019)	(0.019)	(0.020)	(0.051)
Cooperative market				
At the trading center	-0.012	-0.086	-0.055*	0.003
	(0.026)	(0.044)	(0.027)	(0.022)
At district & beyond	0.021	-0.030	-0.023	-0.053
	(0.038)	(0.051)	(0.031)	(0.039)

Reference category: market located in the village or nearby. Rows represent market proxies, Standard errors in parenthesis, * implies significant at 10%; ** significant at 5%; *** significant at 1%. Other variables included but not reported are: age, age squared, mother lives in the household, dependence ratio, age of the head, dummy for female head, proportion of adults above secondary schooling, household involved in farming, household has non-farm enterprise, proportion of female wage earners, proportion of male wage earners, value of assets, school available in the village, distance to nearest town, travel time to all-weather road, month of data collection, district fixed effects.

Table 15. Double hurdle model for actual location of the market (Marginal effects)

	Total		Hours of work Domestic activity		Economic activity	
	Boys	*Girls*	*Boy s*	*Girls*	*Boy s*	*Girls*
Limited consumer market						
At the trading center	-0.003*	0.012	-0.002**	-0.098	-0.017	-0.621
	(0.001)	(0.038)	(0.001)	(0.064)	(0.081)	(0.443)
At district & beyond	0.148	0.026	-0.028	0.051	-0.038	-0.152*
	(0.081)	(0.059)	(0.028)	(0.077)	(0.069)	(0.060)
Periodic market						
At the trading center	0.061	0.042*	-0.157**	0.040	-0.149*	0.049
	(0.046)	(0.018)	(0.052)	(0.073)	(0.059)	(0.047)
At district & beyond	0.024	0.151*	0.105	1.009*	-0.014	0.029
	(0.081)	(0.059)	(0.077)	(0.404)	(0.056)	(0.045)
Cooperative market						
At the trading center	0.252	-0.145*	0.132***	-0.035	0.139**	-0.080***
	(0.477)	(0.059)	(0.024)	(0.045)	(0.044)	(0.016)
At district & beyond	0.017	-0.024	0.026	0.013	0.011	0.115
	(0.055)	(0.081)	(0.059)	(0.060)	(0.037)	(0.089)

Reference category: market located in the village or nearby. Rows represent market proxies, Standard errors in parenthesis, * implies significant at 10%; ** significant at 5%; *** significant at 1%. Other variables included but not reported are: age, age squared, mother lives in the household, dependence ratio, age of the head, dummy for female head, proportion of adults above secondary schooling, household involved in farming, household has non-farm enterprise, proportion of female wage earners, proportion of male wage earners, value of assets, school available in the village, distance to nearest town, travel time to all-weather road, month of data collection, district fixed effects.

Table 16. Probit regressions for selected districts (marginal effects)

	Boys			Girls		
	Ltd Cons. market	*Periodic market*	*Cooperative market*	*Ltd Cons. market*	*Periodic market*	*Cooperative market*
Westnile[b]						
Domestic activity	-0.049**	10.921*	0.078***	0.124*	0.130**	1.795
	(0.018)	(4.454)	(0.022)	(0.054)	(0.040)	(3.724)
Economic activity	-1.198**	0.032	0.041*	0.263***	0.018	0.190*
	(0.397)	(0.133)	(0.018)	(0.049)	(1.993)	(0.088)
Western Uganda						
Domestic activity	-0.015	0.050***	-0.066*	0.214	-0.028	0.041*
	(0.024)	(0.015)	(0.028)	(0.167)	(0.032)	(0.018)
Economic activity	0.954	0.037	-0.127**	1.089	0.073*	-0.745
	(1.833)	(0.059)	(0.044)	(1.561)	(0.036)	(2.107)
Eastern Uganda						
Domestic activity	0.503	0.045*	-0.184	0.193*	0.054**	3.555*
	(0.930)	(0.020)	(0.207)	(0.081)	(0.017)	(1.561)
Economic activity	-0.064**	-0.090*	-0.037	0.190	0.163***	-0.020
	(0.023)	(0.037)	(0.052)	(1.597)	(0.026)	(0.054)

Standard errors in parenthesis, * implies significant at 10%; ** significant at 5%; *** significant at 1%, [b.] Westnile includes Adjumani, Arua, Nebbi district, Yumbe and Moyo districts. Other variables included but not reported are: age, age squared, mother lives in the household, dependence ratio, age of the head, dummy for female head, proportion of adults above secondary schooling, household involved in farming, household has non-farm enterprise, proportion of female wage earners, proportion of male wage earners, value of assets, school available in the village, distance to nearest town, travel time to all-weather road, month of data collection, district fixed effects.

Table 17. Double hurdle model for selected districts (marginal effects)

Dependent variable	Boys			Girls		
	Ltd Cons. market	*Periodic market*	*Cooperative market*	*Ltd Cons. market*	*Periodic market*	*Cooperative market*
Westnile[b]						
Total hours	-1.080*	0.947***	0.820*	-0.731*	0.402	0.373
	(0.516)	(0.243)	(0.344)	(0.356)	(0.429)	(0.210)
Hours in Econ. activity	-0.471*	0.947***	-6.680*	0.320	-0.680**	-0.379
	(0.217)	(0.243)	(3.144)	(0.393)	(0.243)	(0.337)
Hours in dom. activity	0.338	0.526**	0.038	-0.010	1.094***	0.021*
	(0.221)	(0.165)	(0.158)	(0.012)	(0.288)	(0.008)
Western Uganda						
Total hours	-0.737*	-0.299	0.518	-0.406**	-0.208	-0.357**
	(0.336)	(0.230)	(0.367)	(0.142)	(0.120)	(0.110)
Hours in Econ. activity	-0.365	-0.590*	-0.171*	-0.257	-0.129	-0.735
	(0.338)	(0.249)	(0.085)	(0.201)	(0.688)	(0.408)
Hours in dom. activity	0.021	0.143	-0.026*	0.283	-0.702*	1.112
	(0.159)	(0.193)	(0.011)	(0.219)	(0.323)	(1.899)
Eastern Uganda						
Total hours	0.104	0.193**	0.296*	-0.912	-0.496*	0.243
	(0.195)	(0.063)	(0.141)	(1.074)	(0.207)	(0.130)
Hours in Econ. activity	-1.487	1.692**	-0.046	0.122	-1.797	3.261**
	(1.190)	(0.653)	(0.560)	(0.403)	(1.588)	(1.259)
Hours in dom. activity	-0.231*	-0.196	0.013	0.225*	0.689***	-0.061
	(0.097)	(0.209)	(0.056)	(0.096)	(0.121)	(0.067)

Standard errors in parenthesis, * implies significant at 10%; ** significant at 5%; *** significant at 1%, [b.] Westnile includes Adjumani, Arua, Nebbi district, Yumbe and Moyo districts. Other variables included but not reported are: age, age squared, mother lives in the household, dependence ratio, age of the head, dummy for female head, proportion of adults above secondary schooling, household involved in farming, household has non-farm enterprise, proportion of female wage earners, proportion of male wage earners, value of assets, school available in the village, distance to nearest town, travel time to all-weather road, month of data collection, district fixed effects.