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Quentin Wodon, Minh Cong Nguyen & Clarence Tsimpo

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ABSTRACT

This contribution relies on four different approaches and data sources to assess and discuss the impact of child marriage on secondary school enrollment and completion in Uganda. The four data sources are: (1) qualitative evidence on differences in community and parental preferences for the education of boys and girls and on the higher likelihood of girls to drop out of school in comparison to boys; (2) reasons declared by parents as to why their children have dropped out of school; (3) reasons declared by secondary school principals as to why students drop out; and (4) econometric estimation of the impact of child marriage on secondary school enrollment and completion. Together, the four approaches provide strong evidence that child marriage reduces secondary school enrollment and completion for girls with substantial implications for agency.

KEYWORDS

Child marriage, education, out of school children, Uganda

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INTRODUCTION

Child marriage is defined internationally as a legal or customary union involving a boy or girl below 18 years of age.[1] The practice remains highly prevalent for girls today, with close to one in two girls still marrying below the age of 18 in Sub-Saharan Africa and South Asia (United Nations Population Fund [UNFPA] 2012; United Nations Children's Fund [UNICEF] 2014; Minh Cong Nguyen and Quentin Wodon 2015a). The practice has large negative impacts for education attainment and literacy (Erica Field and Attila Ambrus 2008; Uma Sarada Kambhampati 2009; Gordon Brown 2012; Nguyen and Wodon 2015b, 2015c; Alice Taylor, Giovanna Lauro, Marcio Segundo, and Margaret Greene 2015) and labor force participation, whether the causal links are direct or indirect through higher fertility (Kristin Mammen and Christina Paxson 2000; Jad Chaaban and Wendy Cunningham 2011; Stephan Klasen and Janneke Pieters 2012; Aboudrahyme Savadogo and Quentin Wodon 2015). Impacts are also

observed for voice and agency (Jeni Klugman, Lucia Hanmer, Sarah Twigg, Tazeen Hasan, Jennifer McCleary-Sills, and Julieth Santamaria 2014), violence within the household (Kristin Carbone-Lopez, Candace Kruttschnitt, and Ross Macmillan 2006; Jennifer L. Solotaroff and Rohini Prabha Pande 2014), and fertility and child mortality (Anita Raj, Niranjan Saggurti, Donta Balaiah, and Jay G. Silverman 2009; Muazzam Nasrullah, Sana Muazzam, Zulfiqar A. Bhutta, and Anita Raj 2014; Adenike O. Onagoruwa and Quentin Wodon 2015a) as well as a range of other health outcomes for the girls and their children (Eno-Obong Akpan 2003; Shelley Clark 2004; Nawal M. Nour 2009; Anita Raj, Niranjan Saggurti, Michael Winter, Alan Labonte, Michele R. Decker, Donta Balaiah, and Jay G. Silverman 2010; Yann Le Strat, Caroline Dubertret, and Bernard Le Foll 2011; Adenike O. Onagoruwa and Quentin Wodon 2015b, 2015c; see also more generally, Jennifer Parsons, Jeffrey Edmeades, Aslihan Kes, Suzanne Petroni, Maggie Sexton, and Quentin Wodon [2015] for a review of the economic impacts of child marriage).

The negative impact of child marriage on a wide range of development outcomes explains why in many countries the practice is now prohibited by law, but often with little effect. In India, marriage before the age of 18 has been illegal for about three decades, but close to half of all girls still marry before 18 (UNFPA 2012). In Nigeria, legal limitations on the age of marriage have not fundamentally altered the practice (Nkoyo Toyo 2006). Child marriage persists in part due to cultural and religious traditions (see Azeema Faizunnisa and Minhaj ul Haque [2003], for Pakistan; Regina Gemignani and Quentin Wodon [2015a, 2015b], for Burkina Faso; and more generally, Meg Greene, Arati Rao, and Stephanie Perlson [2015]). But economic and other constraints faced by households are also major reasons for girls to drop out of school and marry early (on Uganda, see Kirsten Stoebenau, Ann Warner, Jeffrey Edmeades, and Magnolia Sexton [2015]).

The issue of child marriage is crucial for the ability of girls to make choices later in life. According to Naila Kabeer (2008), a girl or woman's capacity for choice can be conceptualized as depending on three dimensions: agency (the capacity to define one's goals and act on them), resources (material, human, or social), and achievements (these affect choice because they are foundations on which future agency is built). Child marriage clearly has an impact on the resources available to girls, since girls marrying early often drop out of school, as shown in this study. Child marriage also affects achievements – with the impact on education again being an example. But, in addition, child marriage affects agency too, with girls who marry as children often having less decision-making ability in their household, even if this is not what this contribution focuses on (Klugman et al. 2014). In this study, we focus on assessing the impact of child marriage on a girl's human capital resources, but we also discuss briefly the broader

social context in which girls marry early and what this context implies for agency.

The central question considered is: what is the impact of child marriage (and to some extent early pregnancy as well) on secondary school enrollment and completion in Uganda. This impact is not straightforward to estimate because the decisions by a girl (or her parents and in some extreme cases even the community, with limited say from the girl or her parents) to marry early and possibly drop out of school as a result are jointly determined. Child marriage may be endogenous to a girl's education prospect, whatever the mechanisms affecting those prospects are. Put simply, the fact that for many girls the path is either to continue to go to school or to marry, but not both, implies that causality between marriage and schooling goes both ways.

There is also a risk of omitted variable bias. For example, poor education quality may lead to both dropout and child marriage. Cultural practices may also play a role and not be observed. If such factors lead to both child marriage and lower education attainment, there is again a risk of omitted variable bias. The impact of child marriage on attainment could be overestimated without proper controls, but what can be done depends on the data available in surveys.

This brief discussion illustrates the difficulty of estimating the impact of child marriage on schooling and why it is important to find natural experiments, or at least instrumental variables for proper estimations. In Bangladesh, Field and Ambrus (2008) found that delaying the age of marriage increases schooling and the probability of literacy. They used variation in the timing of menarche (puberty) as instrumental variable for the age at first marriage (in Bangladesh few girls marry before puberty). Unfortunately, adequate information on menarche is often not available in surveys. Demographic and Health Surveys ask about the age of marriage but not when a woman reached puberty – there is only a question about the most recent menstrual period.

Another strategy is to rely as instrumental variables on measures of child marriage at the level of the primary sampling unit (PSU) in which a girl or woman lives – contemporaneously, or in the recent past. PSU-level incidence variables are likely to affect the probability that a girl will marry early, but not (or less so) education controlling for other PSU-level determinants. Nguyen and Wodon (2015b) used this instrumentation strategy and found impacts of child marriage on education in Africa similar to the effects in Field and Ambrus (2008).

Some authors have relied on matching techniques to estimate the impact of child marriage on education (Chris Sakellariou and Fang Zheng 2014). Yet matching techniques do not correct for endogeneity and may be overestimating impacts. They also tend to treat all girls who marry early similarly independently of age at marriage.

Still other authors have relied on reasons mentioned in surveys for why children have dropped out to assess the impact of child marriage (and early pregnancy) on enrollment and education attainment. Cynthia B. Lloyd and Barbara S. Mensch (2008) find that child marriage and pregnancies account for 5 to 33 percent of dropouts, depending on the country. In Nigeria, Nguyen and Wodon (2015c) find that child marriage and pregnancies account for 15 to 20 percent of dropouts.

In this study we rely on two approaches – reasons declared for why children drop out of school and econometric estimations to assess the impact of child marriage on girls' education. The combination of approaches helps to triangulate results and ensure the analysis is robust. Uganda is an interesting case study because child marriage remains prevalent. According to the 2011 Demographic and Health Survey (DHS), 47 percent of women between ages 18 and 49 had married before the age of 18. The proportion is lower among younger age cohorts, but still close to one-third for girls below the age of 19 at the time of the survey.[2]

Four different data sources are used. First, qualitative data collected in 2011 in fourteen districts are used to provide contextual information on factors that lead girls to drop out of school and marry early – these data provide context and suggest that agency for girls is often limited in those decisions. Next, perceptions data from questions asked in two different surveys to parents and school principals are used to document perceived reasons as to why boys and girls drop out of school. Lastly, DHS data are used to assess econometrically the impact of years of child marriage on secondary school enrollment and completion. Each of these data sources has strengths and weaknesses, but together they provide complementary insights on the impact of child marriage on girls' education.

CONTEXTUAL EVIDENCE AND HETEROGENEITY BETWEEN COMMUNITIES

The core of this contribution consists in an analysis of household survey data to estimate the impact of child marriage on girls' education. But before embarking in this analysis, it is useful to understand the broader contexts in which decisions are made as to whether girls should continue their education and/or marry. In the context of this special issue on agency, this also helps to point to the fact that girls often have limited agency in matters related to the timing of their marriage, at least in some communities and under some circumstances.

In order to provide such context, qualitative data are invaluable. Therefore focus groups and key informant interviews were undertaken in fourteen districts in Uganda on the issue of girls' education (although not as directly on the role of child marriage and early pregnancies in the decision to drop out). The districts were selected to achieve geographical

representation of each of Uganda's ten subregions, with oversampling in the Central, Karamoja, and Mid-Western sub-regions which are geographic areas with a larger share of adolescents out of school. As observed by Gemignani and |Wodon (2015a, 2015b) in Burkina Faso, the relationships between child marriage, education attainment, and gender roles were not the same in all districts and communities. In some communities, support was present for girls to continue their education and not get married. In other communities, this was much less the case, so that girls' agency was severally curtailed. In addition, apart from the community from which girls originate, catastrophic events for households, such as a sickness for a parent or even death, also appear to affect disproportionately girls, again curtailing their agency.

Communities with equal support for the education of boys and girls

Consider first communities with equal support for the education of boys and girls. Support for girls education in those communities stems from the belief that, as one respondent put it, "all children are equal so all deserve an equal right to education as vital to all children in the community for the sake of self-independence in the future life." Education is seen as influencing and shaping character, which motivates parents to give equal attention to all children irrespective of their sex. This leads to the view that both girls and boys should be educated because, once a child is educated, s/he behaves in a civilized and diplomatic way. As a participant in a focus group in Soroti explained: "Education is good, and it is the responsibility of every parent to ensure both girls and boys are taken to school. It is education that empowers a person to get to his or her destination in life. Most dreams and ambitions are easier to fulfill and realize for people who are educated." Supporting equal opportunities for education between girls and boys, a village leader in Nakapiripirit district further cautioned that there are also many possible end-points to education, but parents make the unrealistic assumption that education means only studying up to university, and ignore all other openings that education can culminate into, such as technical, business and vocational sectors which can be as fulfilling and rewarding in life as having studied up to university. Discrimination between sexes of children and predetermining the direction each child's education should take is not good.

In Nakaseke district, academic performance in school was considered as decisive in the choice between a boy and a girl's continuing in school. One parent expressed preference for whoever proves a fast learner. Educating boys only was ridiculed as "old fashioned thinking," because while there is a risk that a girl will get married sooner, there is also a risk that a boy, when educated, may care more about his in-laws, leaving daughters to support their parents. A similar rationale emerged in Yumbe, where it was stated

that the decision between investing in the education of boys and girls ought to depend largely on academic performance rather than cultural values. One parent said: "For me the priority of which child remains in school follows whoever is performing better, irrespective of whether it is a boy or girl." Another rationale for giving equal emphasis to boys and girls was related to priority by age. As a parent explained, older children should get preference:

For me it is the order of birth that determines who gets priority to go to school. If I have a choice between the young and the old, I first enroll the older child, then the younger ones get the next/second opportunity. The sex of the child is for me not a consideration at all, since both boys and girls have the same potential for excelling.

Apart from calls for equality of opportunity between boys and girls in these communities, there were also cases of strong support for girls' education for a number of reasons. In Nakaseke, prioritizing girl education was seen to fortify them against the risks and uncertainties of today's volatile and fragile marriage institution. Educated girls were considered as more likely to be able to have an independent life if confronted with marriage problems. In these cases, girls were considered more vulnerable than boys without education. In Yumbe, a mother noted: "I prefer educating girls to boys. Girls are more concerned about their parents when they grow up. Boys are often more preoccupied with their wives and children." In Nakapiripirit, the education of girls was considered important for future generations, as community members explained that if you take girls to school, they will become better mothers for their own children, for example by ensuring that children are immunized and by adhering to recommended nutrition for children.

Communities without equal support for the education of boys and girls

While the above comments are encouraging for girls' education in supportive communities, in a majority of the communities visited for the qualitative fieldwork, support was expressed for investing more in the education of boys than in that of girls. In Kasese, preference for investing in the education of boys rather than girls was related to established cultural frames of considering sons as natural heirs of male parents or potential household heads in their own right, with both roles calling for their being better educated than girls. In Soroti and Kitgum, some parents preferred educating boys because girls must inevitably get married, and whatever wealth they accumulate benefits the families of the husbands they get married to, rather than the families of their own parents. By comparison, boys remain, even after marriage, within the environment of their parents and help them through life.

In Kalangala, investing in educating a girl was seen by some parents as a waste of time and money because, participants suggested, girls are diverted from education by men at an early stage before they complete their studies, so one would rather educate boys who will stay longer in school and complete at least primary school. As a female focus group participant put it:

We are faced with long distances to primary schools. Girls on their way to school meet men with money who entice our daughters with money for sex. Later some get pregnant and drop out of school. Also we have no vocational school that will train our girls after P7 and S4, so we see it as a waste of resources to educate a girl.

Another factor noted was the consequences of HIV/AIDS orphaning children and leaving them under the care of grandparents who may be overwhelmed by the responsibility. As a result, some grandparents may exhort girls to "*kula ogende ofumbirwe*," which means, "grow up and get married quickly."

In Bugiri, some members of the community visited preferred to invest in boys' education, arguing that they are able to work hard to improve on their academic performance, while girls tend to be more distracted by boys and men, sometimes having their education cut short by pregnancy. But an additional rationale was again the cultural expectation that boys have the responsibility of taking care of siblings in future, which girls are not expected to do once they get married. Location (whether in a rural or an urban setting) also has an influence on parents' decisions for their children's education. It was much more likely for rural dwellers to refuse to enroll a child in school base on the child's sex than it was for an urban dweller.

Higher vulnerability for girls

Emphasis was placed in the qualitative fieldwork on understanding factors that lead boys and girls to drop out of school. These factors are multiple. Children who start primary school late are more likely to drop out later. Many communities have few adults who completed secondary education and can serve as role models for the benefits of pursuing an education. Some children tend to be distracted away from schooling, especially in urban areas. In rural areas, lack of adequate diet and school lunches makes it difficult for some students to remain in school. The quality of learning that takes place in school is deficient, in part due to teacher absenteeism. Some children need to walk a long way to even get to the schools. And when children grow up, they often need to work or help at home. All these issues tend to be common for boys and girls, but there are also differences by gender that lead girls to drop out of school faster than boys.

Girls are more vulnerable than boys because of child marriages and the issue of bride wealth, particularly in communities where culture and

social expectations lead parents to consider it unwise to invest in a girl's education. In Karamoja especially, the poorest area of the country, daughters are seen culturally as a source of wealth for parents. In the past when there were plenty of cattle, bride wealth could be as high as 100 cows. Although this number has now been reduced considerably, girls are still a major source of wealth, and their socialization at home is toward getting married as soon as possible. The handling of puberty also makes it difficult for schools to continue to go to school – as does the division of labor in the home, according to which girls tend to do most of the household chores. In Kitgum District dropout rates are especially high, and in 2011 all eight girls enrolled in the sixth grade of a village's primary school dropped out. Five of them had become pregnant, two were married, and the last one opted out of school because all the other girls had left, which meant that she would be alone in a class with only boys.

The story of one particular girl may help in understanding why girls are at such a disadvantage, in part because of their responsibilities at home and the risk of pregnancy, whether in married life or not. Susan is now 18 years old. Her mother died. With one sister and four brothers, she lives with her father. She started school at age 6 and dropped out last year at the age of 17. She was still in primary school. She dropped out because she became pregnant. She had dropped out before in 2008, when she was in the third year of primary, to help her mother who was bed-ridden just before she died. She now works as a causal laborer in people's gardens, earning about 8,000 shillings a week. Payment is usually in cash, but at times in kind (she is then given sorghum or millet to bring back home). She uses her earnings to buy essential things for the home such as soap, salt, sugar, and food. The challenge she faces now is that she cannot work effectively, since she is pregnant and sickly. Yet, she is still supposed to look after her siblings. In her assessment, gardening is much tougher than school, but she is emphatic that "I cannot go back to school any more. I just want to take care of my young siblings and see them through primary school, and if possible up to secondary school." The type of support that could help her realize her wish of a better education for her siblings would be in terms of seed money that could help her start a small income-generating activity, again to help her siblings complete school.

DECLARED REASONS FOR DROPPING OUT OF SCHOOL

The qualitative contextual evidence provided previously suggests that girls are more likely to drop out of school early, as compared to boys – at least in some communities and under some circumstances. It also suggests that in many cases, the control that girls have on the timing of their marriage as well as their ability to continue their education is limited. But the contextual background, while providing useful insights, does not

enable us to measure with precision the extent to which child marriage and early pregnancy affect the likelihood of dropping out of school or not completing secondary education. Perceptions data on the reasons for dropping out of school declared either by parents for their children or by school principals in household surveys are a first useful approach to get a handle of the magnitude of the effects at work. Both types of perceptions data are discussed in what follows.

Perceptions of parents on reasons for dropping out

The 2012/13 Uganda National Household Survey (UNHS) asks a question about the reasons for dropping out for children who dropped out. The household head typically responds to the question. Fourteen options are provided: Completed desired schooling; Further schooling not available; Too expensive; Too far away; Had to help at home; Had to help with farm work; Had to help with family business; Poor school quality; Parents did not want; Not willing to attend further; Poor academic progress; Sickness or calamity in family; Pregnancy; and Other (specify). Note that child marriage is not asked for specifically in the household questionnaire.

Table 1 provides data on the share of children aged 12–18 who dropped out for various reasons, considering different stages of education. Consider first children who completed their primary education, but did not start lower secondary. By far, the main reason to drop out is cost, mentioned for 67 percent of boys and 54 percent of girls. The second reason mentioned most for boys is the fact that the child was not willing to continue his education (13 percent), but for girls an even more important reason for not starting secondary school was a pregnancy (17 percent). It is also clear that the issue of pregnancies is much more prevalent among children from lower quintiles of welfare than among better-off households, as well as in rural areas, as expected. Other reasons are mentioned less, but still play a role in the decisions to not enroll in secondary school.

Table 1 provides the same data for three other groups of children aged 12–18: those who started lower secondary school but did not complete the cycle and dropped out; those who completed lower secondary school but did not start upper secondary school; and those who started upper secondary school but did not complete the cycle and dropped out. Note that for that last group, sample sizes are substantially smaller, so data by subgroup must be considered with caution (data are not provided by quintiles in Table 1 at those levels due to small sample sizes for some of the quintiles that tend to make the results less robust).

Overall, while cost remains an issue throughout, the issue of pregnancy (and probably child marriage) increases in importance at higher levels of schooling, in that for girls who started lower secondary school but did not

Table 1 Reasons for children dropping out of school, parental responses, 2012–13 (%)

	Gender		*Residence area*			*Welfare quintile*					
	Boy	*Girl*	*Kamp.*	*Other urban*	*Rural*	*Q1*	*Q2*	*Q3*	*Q4*	*Q5*	*Total*
Completed primary, but did not start lower secondary											
Completed desired schooling	5.3	6.5	0.0	8.0	6.0	0.0	0.0	8.1	8.5	7.9	6.1
Too expensive	67.3	53.8	79.0	55.5	58.3	54.2	58.6	40.8	54.2	71.1	59.1
Not willing to attend further	13.2	4.8	0.0	7.8	9.0	14.5	0.0	22.1	13.3	0.0	8.1
Poor academic progress	3.3	8.3	10.7	6.0	6.0	0.0	10.7	8.4	11.0	3.4	6.3
Sickness/ calamity in family	4.9	4.7	10.3	17.5	0.0	0.0	0.0	0.0	13.0	5.2	4.8
Pregnancy	0.0	16.6	0.0	5.2	12.7	31.3	22.2	0.0	0.0	8.8	10.1
Other	6.0	5.3	0.0	0.0	8.0	0.0	8.5	20.6	0.0	3.6	5.5
Total	100	100	100	100	100	100	100	100	100	100	100
Started lower secondary but did not complete											
Completed desired schooling	3.7	3.1	0.9	3.4	3.7	2.9	2.3	3.2	5.0	3.0	3.4
Too expensive	76.3	57.3	79.1	68.1	64.3	69.0	59.8	64.7	68.0	68.6	66.6
Parents did not want	1.9	2.1	1.1	2.8	1.7	1.9	2.3	0.0	2.5	2.7	2.0
Not willing to attend further	6.0	4.9	2.6	3.4	6.8	7.1	5.5	5.1	5.5	5.0	5.4
Poor academic progress	1.2	2.5	3.3	2.5	1.3	0.0	1.5	1.6	2.4	2.3	1.8
Sickness/ calamity in family	5.5	3.9	5.0	4.9	4.6	2.4	5.3	3.0	5.0	5.9	4.7
Pregnancy	1.0	22.6	4.4	11.1	13.4	9.0	19.7	16.4	9.8	9.0	12.0
Other	4.4	3.6	3.6	3.8	4.2	7.7	3.6	6.0	1.8	3.5	4.1
Total	100	100	100	100	100	100	100	100	100	100	100
Completed lower secondary but did not start upper secondary											
Too expensive	73.2	59.6	100.0	76.3	50.0						63.6
Not willing to attend further	5.8	8.9	0.0	0.0	16.0						8.0
Sickness/calamity in family	21.0	0.0	0.0	0.0	12.3	Small samples for some quintiles					6.2

(*Continued*).

Table 1 Continued

	Gender		*Residence area*			*Welfare quintile*					
	Boy	*Girl*	*Kamp.*	*Other urban*	*Rural*	*Q1*	*Q2*	*Q3*	*Q4*	*Q5*	*Total*
Pregnancy	0.0	31.5	0.0	23.7	21.7						22.2
Total	100	100	100	100	100						100
Started upper secondary but did not complete											
Completed schooling	0.0	11.8	0.0	0.0	8.3						5.9
Too expensive	94.2	71.5	36.8	73.4	89.1						82.9
Not willing to attend further	3.2	0.0	34.3	0.0	0.0	Small samples for some quintiles					1.6
Sickness/calamity in family	0.0	4.2	0.0	8.6	0.0						2.1
Pregnancy	0.0	12.5	0.0	18.0	2.6						6.2
Other	2.6	0.0	28.9	0.0	0.0						1.3
Total	100	100	100	100	100						100

Source: Authors using 2012/13 Uganda National Household Survey (UNHS).

complete the cycle and dropped out, pregnancy was cited as the reason by 23 percent of parents. And for girls who completed lower secondary school but did not start upper secondary school, pregnancy is mentioned as the leading factor by 32 percent of parents. In the last case, for girls who started upper secondary school but did not complete the cycle and dropped out, the role of pregnancy is weaker. But these girls tend to be overwhelmingly from more privileged backgrounds where early pregnancies and child marriage play less of a role. Overall, after cost, early pregnancy appears to be the main reasons for girls to drop out, especially for girls living in rural areas and in underprivileged households.

Perceptions of principals on reasons for dropping out

A separate question was asked about the main reasons for dropouts in the Community Facility Questionnaire of a separate survey, the Uganda National Panel Survey implemented from 2009 to 2011. For questions related to education, the community questionnaire is administered to head teachers in local schools. Head teachers are first asked whether there are any pupils who left school before completing the last year of secondary school. The head teachers are then asked how many children dropped out. Finally, they are asked about the most common reason for dropouts separately for boys and girls. Fourteen potential reasons for

Table 2 Reasons for dropping out of secondary school, school principals, 2011 (%)

	Kampala	*Other towns*	*Rural*	*T1*	*T2*	*T3*	*All*
Boys							
Pregnancies	0.0	0.0	0.3	0.9	0.0	0.0	0.2
Marriages	0.0	1.1	3.3	3.5	3.0	1.8	2.5
Search for jobs	12.2	13.5	17.8	6.3	16.9	21.1	16.4
Transfer	32.3	8.5	8.8	5.1	10.8	11.6	9.9
Lack of interest	1.1	33.0	33.6	56.4	26.3	23.3	31.9
Discipline	4.9	7.1	6.9	2.6	12.0	5.6	6.9
Parental decision	30.3	0.7	1.3	0.0	1.6	4.3	2.5
Cost	10.1	19.0	15.1	11.3	15.8	18.3	15.9
Other	9.1	17.1	12.9	13.9	13.6	14.0	13.8
Total	100	100	100	100	100	100	100
Girls							
Pregnancies	12.6	46.6	39.7	47.5	43.7	34.4	40.2
Marriages	3.4	16.4	33.7	28.6	30.7	25.0	27.6
Search for jobs	0.0	1.3	1.3	0.9	0.6	1.8	1.2
Transfer	28.3	11.8	3.8	2.0	6.4	10.0	7.1
Lack of interest	6.5	3.7	4.2	7.6	2.0	4.1	4.2
Discipline	2.9	2.1	2.6	0.3	3.7	2.6	2.5
Parental decision	39.8	2.1	2.7	2.0	1.7	7.2	4.3
Cost	2.5	9.5	6.8	5.7	7.6	7.9	7.3
Other	4.0	6.5	5.2	5.4	3.6	7.0	5.6
Total	100	100	100	100	100	100	100

Source: Authors using 2011/12 UNHS.

dropping out are provided: Harassment at home; Harassment at school; Traditions/culture; Pregnancies; Marriages; Search for jobs; Orphanhood; Transfer to another school; Lack of interest by pupil; Indiscipline and expelled; Parental decision; Insecurity; Expensive/not affordable; and Other. Here (child) marriage is thus included specifically.

Table 2 provides the results about the reasons for dropping out for the 2011 survey (the results are similar for the other two years of data). Nationally for boys, lack of interest (for 31.9 percent of cases), job search (16.4 percent), and a transfer to other schools (9.9 percent) were the main reasons to drop out (or transfer to another school) before completing the secondary cycle. For girls, pregnancies and child marriage came up much more strongly than in the household questionnaire, accounting together for more than half of dropout decisions at the primary level (27.6 percent for child marriage, and 40.2 percent for pregnancies). Other

reasons mentioned include cost (7.3 percent), transfers (7.1 percent), as well as lack of interest and parental decisions (both slightly above 4 percent).

What could explain this apparent difference in results between the community and household questionnaires? One factor is probably the way in which questions are asked. In the household questionnaire, questions are asked about the reason for dropping out of school for each child. In the community module, questions are asked about the main reasons for dropping out for boys and girls overall. If, say, child marriage and early pregnancies account for 40 percent of the decisions to drop out according to head teachers, then this might still be the main reason in many schools, in which case this could be cited as the main reason by, say, two-thirds of head teachers. In other words, the estimates of the main reasons for dropping out reported in the community module may not represent estimates of the exact share of students who drop out for those reasons. In addition, in the case of the household questionnaire, reasons such as the fact that a girl did not want to pursue her education may mask the reason for this lack of interest, which could be a desire to get married. Note also that in the household questionnaire, pregnancy was included as a potential reason for dropping out, but not child marriage per se. To the extent that most of the girls who get pregnant have first become married and dropped out of school at that time, the household questionnaire by emphasizing only pregnancies may underestimate the role of child marriage apart from the direct role of pregnancies in dropping out.

While there are differences in the magnitude of the percentages observed for various factors in the reasons for dropping out in the household and community modules, with the issues of child marriage and pregnancies being emphasized more by head teachers than parents, there are commonalities in terms of differences observed between areas and by welfare level. That is, while the differences between location (Kampala, other cities, and rural areas) and regions are observed, much larger differences tend to be observed by welfare level, especially for girls and at the primary level. In the community questionnaire, four head teachers in five mentioned child marriage and pregnancies as the main reasons for dropping out not only at the secondary level, but also at the primary level for the bottom welfare tercile.

Overall, it seems fair to conclude that while it may be that the community questionnaire overemphasizes child marriage and pregnancies as reasons for dropping out given the way the question is asked, it is likely that the household questionnaire underestimates the importance of the practice of child marriage and the related issue of pregnancies as a reason to drop out. In the qualitative work that follows, which was implemented for the most part in disadvantaged areas, marriage and pregnancy also do come out as key reasons for dropping out for girls.

ECONOMETRIC ESTIMATIONS

Contextual evidence suggests that child marriage is one of the key reasons that lead girls to drop out of school or even to not enroll in secondary school in the first place. In what follows, econometric estimates of the impact of child marriage on secondary school enrollment and completion in Uganda are presented using the 2011 Uganda DHS. The approach follows previous work by Nguyen and Wodon (2015a) for Sub-Saharan Africa. The survey asks about the age at first marriage for all women ages 15–49 (this information is not available in the surveys used previously. We consider women between 25 and 34 years of age to assess the impact of child marriage on enrollment. The estimation method follows Douglas Rivers and Quang H. Vuong (1988) in order to control for the risk of endogeneity between child marriage and education enrollment and attainment. The estimation method is described in the appendix.

Table 3 provides basic data on girls and young women between the ages of 25 and 34 who did marry in the DHS sample. The table shows the share of young women who enrolled at the secondary school level as well as the share who complete secondary schooling according to whether they married as children or not, and if they did marry below the age of 18, according to the age of (first) marriage. There are large statistical differences in enrollment and the completion of secondary education according to whether a girl married as a child or not. For example, while 39.2 percent of married women ages 25–34 who did not marry as children enrolled in secondary school, the proportion is at 13.6 percent for those who married as children. Systematically, marrying earlier tends to reduce further the level of education enrollment of a girl. These differences are statistically significant (the test is provided for the sample as a whole). Similar findings are obtained for secondary school completion. When girls marry below the age of 18, the probability that they will complete secondary school is extremely low.

Do these differences still hold once controls are introduced? To answer this question we estimate a model in which the first stage regressions looks at the correlates of the years of child marriage, and the second stage looks at the impact of child marriage on secondary school enrollment and completion. The details of the model are provided in the appendix. In the first-stage regression the number of years of child marriage is estimated as a function of location of the girl (urban or rural, as well as region), orphan status, religious affiliation, ethnic group, and a number of leave-out-mean variables at the primary sampling unit level, including for child marriage at various ages both in the sample used for the estimation and for older women to capture social norms in favor or not of child marriage at the local level and other factors that may affect the decision to marry early (these are the instruments). The additional controls at the PSU level

Table 3 Basic statistics on school enrollment, education attainment, and years of child marriage

	Secondary school enrollment, women ages 25–34	*Secondary school completion, women ages 25–34*
Married after 18 years of age	0.392	0.140
	(0.014)	(0.010)
Married before 18 years of age	0.136	0.012
	(0.010)	(0.003)
Difference of means	0.257***	0.129***
(married as a child vs. not)	(0.017)	(0.010)
Married at 17	0.227	0.027
	(0.025)	(0.010)
Married at 16	0.165	0.008
	(0.021)	(0.005)
Married at 15	0.088	0.002
	(0.017)	(0.002)
Married at 14	0.086	0.025
	(0.021)	(0.012)
Married at 13	0.131	0.001
	(0.031)	(0.003)
Married at 12	0.068	–
	(0.033)	–
Number of observations	2,565	2,565

Source: Authors, using 2011 DHS data. Standard errors are in parentheses. *** indicates statistical significance at the 1 percent level.

are the leave-out-mean share of households in the PSU that belong to the bottom two quintiles of the distribution of wealth, the share of the adult population in the PSU that is not working, the share of households in the PSU that have access to electricity, that do not have a toilet, and that do have access to pipe water.

To save space, we do not present the details of the results of the first-stage regressions (they are available in the appendix), but as expected, overall the instruments – the contemporaneous leave-out-means and the past incidence of child marriage at the PSU level – are statistically significant. These variables have a strong positive impact on the likelihood that a girl will marry early. There are also substantial differences in the number of years of child marriage according to other variables, including religious affiliation, ethnicity, and wealth effects, among others.

Results from the second stage regressions are provided in Table 4. The impact of child marriage on education enrollment is large and statistically significant, and the same is observed for secondary school completion.

Table 4 Correlates of secondary school enrollment and completion

	Secondary school enrollment		*Secondary school completion*	
	Probit coefficient	*APE (average partial effect)*	*Probit coefficient*	*APE (average partial effect)*
Early marriage				
Years of early marriage	− 0.477***	− 0.153***	− 0.733***	− 0.092**
	(0.138)	(0.040)	(0.255)	(0.045)
Married at 17		− 0.135***		− 0.124**
		(0.035)		(0.055)
Married at 16		− 0.254***		-0.192**
		(0.065)		(0.087)
Married at 15		− 0.350***		− 0.220**
		(0.084)		(0.100)
Married at 14		− 0.418***		− 0.229**
		(0.093)		(0.104)
Married at 13		− 0.460***		− 0.231**
		(0.095)		(0.105)
Married at 12		− 0.483***		− 0.231**
		(0.093)		(0.105)
LOM of dependent variable	1.087***	0.240***	1.207***	0.157*
	(0.258)	(0.065)	(0.434)	(0.092)
Urban location	− 0.136	− 0.030	− 0.372**	− 0.048*
	(0.109)	(0.024)	(0.159)	(0.027)
Had first child before marriage	− 0.389**	− 0.086**	− 0.623*	− 0.081*
	(0.195)	(0.039)	(0.339)	(0.047)
Religion (Ref.: Catholic)				
Protestant	0.048	0.011	− 0.025	− 0.003
	(0.082)	(0.020)	(0.122)	(0.018)
Muslim	0.085	0.019	− 0.166	− 0.022
	(0.113)	(0.027)	(0.174)	(0.028)
Pentecostal	− 0.044	− 0.010	− 0.101	− 0.013
	(0.109)	(0.024)	(0.156)	(0.023)
Seventh-Day Adventist	0.216	0.048	0.113	0.015
	(0.185)	(0.044)	(0.263)	(0.046)
Other	0.048	0.011	− 0.274	− 0.036
	(0.306)	(0.076)	(0.396)	(0.051)
Wealth quintiles (Ref.: Q5)				
Poorest (Q1)	− 1.364***	− 0.301***	− 1.687***	− 0.220*
	(0.221)	(0.064)	(0.332)	(0.116)
Second quintile (Q2)	− 0.974***	− 0.215***	− 1.000***	− 0.130**
	(0.167)	(0.049)	(0.266)	(0.056)

(*Continued*).

Table 4 Continued

	Secondary school enrollment		*Secondary school completion*	
	Probit coefficient	*APE (average partial effect)*	*Probit coefficient*	*APE (average partial effect)*
Third quintile (Q3)	− 0.745***	− 0.164***	− 0.612***	− 0.080*
	(0.146)	(0.041)	(0.231)	(0.041)
Fourth quintile (Q4)	− 0.327**	− 0.072**	− 0.445**	− 0.058
	(0.147)	(0.036)	(0.221)	(0.039)
Ethnicity (Ref.: Lugbara)				
Bantu	0.191	0.042	− 0.265	− 0.034
	(0.151)	(0.035)	(0.239)	(0.033)
Nilotic	0.449**	0.099**	0.359	0.047
	(0.207)	(0.045)	(0.344)	(0.055)
Nilo-hamites	0.366**	0.081*	0.292	0.038
	(0.183)	(0.047)	(0.265)	(0.048)
Other	0.169	0.037	− 0.467*	− 0.061*
	(0.162)	(0.039)	(0.259)	(0.035)
PSU controls				
Leave out mean share in bottom two quintiles	− 0.118	− 0.026	− 0.215	− 0.028
	(0.220)	(0.051)	(0.325)	(0.041)
Leave out mean share of unemployment	0.401**	0.089*	− 0.121	− 0.016
	(0.202)	(0.047)	(0.310)	(0.047)
Leave out mean access rate to electricity	0.118	0.026	0.639***	0.083***
	(0.106)	(0.025)	(0.126)	(0.029)
Leave out mean share of household with a toilet	− 0.143	− 0.031	− 0.478	− 0.062**
	(0.166)	(0.040)	(0.321)	(0.030)
Leave out mean access rate to pipe water	0.070	0.015	0.083	0.011
	(0.093)	(0.020)	(0.118)	(0.018)
Residual from first stage regression	0.233*		0.312	
	(0.139)		(0.249)	
Constant	− 0.211		− 0.123	
	(0.266)		(0.413)	
Number of observations	2,565	2,565	2,565	2,565

Notes: ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Standard errors are in parentheses.
Source: Authors, using 2011 DHS data.

Estimates are provided for the impact of marrying at 17, 16, 15, 14, 13, and 12 years of age, as compared to marrying at age 18 or later. For example, in the case of enrollment, a girl who marries at 17 has a 13.5 percent lower probability of having enrolled in secondary school (this can be seen in Table 4 in the "APE" column, where APE stands for "average partial effect" as discussed in the technical appendix). Clearly, the younger a girl marries, the larger the negative effects on the probability of secondary schooling. Similar results are observed for secondary school completion, although the magnitude of the effects is smaller, essentially because fewer girls complete secondary schools as opposed to enrolling. Recall that the impacts are obtained after controlling for a range of variables, including the leave-out-mean enrollment and completion variables at the level of the PSU in which women live, which have a large positive effect on secondary school enrollment and completion, as expected.

Urban location has an effect on secondary school completion, but it is not associated with a higher probability of enrollment after controlling for wealth quintiles, which do have large impacts on both enrollment and completion. There are no statistically significant differences in education enrollment by religion after controlling for other variables, and the same is observed for completion. There are some differences in enrollment by ethnicity, but less so for completion.

Apart from child marriage, early pregnancy has a negative impact on both enrollment and completion. Most additional PSU controls are not statistically significant, with the exception of unemployment, which is associated with higher school enrollment; electricity, which is associated with higher completion; and toilets, where the effect has the opposite sign versus expectations (but there is a lot of variance in the quality of the toilets that households may have). The effect of unemployment on enrollment could be because with high unemployment in their geographic area adolescent girls have fewer opportunities to work, and thereby may remain longer in school. But it could also be related to the fact that in a typical Sub-Saharan Africa setting, unemployment is positively correlated with wealth, because those in poverty often simply cannot afford not to work (they may work in low-productivity jobs, but they have to work). The effect of electricity on completion, as a sign of wealth and access to services, is not surprising. Note that the residuals from the first stage regression turn out to not be statistically significant with the Uganda dataset,[3] and this is confirmed by tests on the quality of the instrumental variables.[4]

CONCLUSION

Almost half of girls in Sub-Saharan Africa born between 1985 and 1989 married before the age of 18. In Uganda, the proportion is now closer to one-third, but still large. It is often argued that child marriage has serious

negative impacts on the girls' education and health, as well as that of their children. Few studies provide estimates of such impacts, and when this is done, it is rare for the available data to provide ways to assess the robustness of the results through some form of triangulation of findings from different surveys and different ways to look at the potential impact of child marriage and early pregnancy on secondary school enrollment and completion.

This contribution has provided strong evidence from several different sources of data that the impact of child marriage (and early pregnancy) on secondary school enrollment and completion is likely to be large in Uganda, with many girls having limited say on this matter, at least in some communities. The fact that child marriage reduces the education attainment of the girls who marry early also has implications for agency later in life, even though this was not the focus of this particular study. While one should be careful not to generalize in a simplistic way from Uganda for Sub-Saharan Africa or developing countries as a whole, this paper and the broader literature call for stronger interventions to help girls remain in school and delay marriage.

The good news is that international experience suggests that programs encouraging continued enrollment and delayed child marriage show promise. Without providing a detailed discussion of "what works" (Anju Malhotra, Ann Warner, Allison McGonagle, and Susan Lee-Rife 2011), conditional or unconditional cash transfers may help (Sarah Baird, Craig McIntosh, and Berk Ozler 2011). The availability of secondary schools nearby and public transportation to go to schools also help (Antonio Estache and Quentin Wodon 2014), as can improvements in the quality of schooling so that the benefits for girls from enrolling are higher. Transfers conditional on not getting married may also work (Annabel S. Erulkar and Eunice Muthengi 2007, 2009; Nistha Sinha and Joanne Yoong 2009; Jeffrey Edmeades, Robin Hayes, and Gillian Gaynair 2014; Priya Nanda, Nitin Datta, Priya Das, Sneha Lamba, and David Bishai 2015). As illustrated in Burkina Faso by Gemignani and |Wodon (2015a, 2015b), child marriage is often rooted in sociocultural practices and religious beliefs, so that engaging with community and faith leaders to critically examine the causes and consequences of child marriage can build support for eliminating the practice (Quentin Wodon 2015). Broader strategies for women's empowerment also matter (Mary Hallward-Driemeier and Tazeen Hasan 2013).

Quentin Wodon
The World Bank - Education Global Practice
1818 H St., NW, Washington, DC 20433
e-mail: qwodon@worldbank.org

Minh Cong Nguyen
The World Bank – Poverty Global Practice
1818 H St., NW, Washington, DC 20433
e-mail: mnguyen3@worldbank.org

Clarence Tsimpo
The World Bank – Poverty Global Practice
1818 H St., NW, Washington, DC 20433
e-mail: ctsimponkengne @worldbank.org

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NOTES ON CONTRIBUTORS

Quentin Wodon is Lead Economist in the Education Global Practice at the World Bank, where he currently leads work on equity and inclusion in education, out-of-school children, and child marriage. He holds graduate degrees in business engineering, economics, and philosophy and PhDs in Economics and in Theology and Religious Studies.

Minh Cong Nguyen is Economist in the Poverty Global Practice at the World Bank. His research focuses on household poverty, inequality, and human development, as well as firm entry and exit, growth and productivity, using both household and enterprise surveys. He holds a PhD in Economics.

Clarence Tsimpo is Economist in the Poverty Global Practice at the World Bank. He is finalizing a PhD in Economics from the University of Montreal and has 15 years of experience in policy research and dialogue on applied development economics, with a focus on poverty and social impact analysis.

NOTES

[1] See the Convention on the Rights of the Child, the Convention on the Elimination of All forms of Discrimination against Women, the Universal Declaration of Human Rights, and resolutions of the UN Human Rights Council.

[2] On the measurement of child marriage, see Minh Cong Nguyen and Quentin Wodon (2012).

[3] In an estimation with pooled DHS data for Africa as a whole, Nguyen and Wodon (2015b) find endogeneity.

[4] For two-stage regression models where the first stage is an OLS and the second stage is a probit, we are not aware of readily available tests to assess the validity of the instruments. But we tested the validity of the instruments based on a two-stage OLS estimation. The results suggest that the number of years of child marriage is weakly endogenous (Durbin–Wu–Hausman statistics over 1, $p = 0.3$). This is also suggested by the statistical significance at 10 percent level of the residuals in the second stage regression. The joint F-test on the instrument variables is above 10, suggesting joint significance of the instruments. Stock and Yoyo's test suggests that the test statistics is much higher than the critical value (21 vs 3.8), indicating that the instruments are not weak. The over-identification test returns a Sargan–Basmann statistics at about 10, which is not statistically significant ($p = 0.4$), suggesting that we can reject the null hypothesis of over-identification of an incorrectly specified structural equation.

[5] We know to which PSU households belong, so we can compute mean values for the share of girls marrying at various ages in each PSU, both contemporaneous and in the past. The PSU leave-out-mean variables capture social norms at the PSU level as well as other factors that may affect child marriage. In order to avoid endogeneity, we compute leave-out-means for those variables, where the term leave-out-mean indicates that the PSU level variables are computed for all girls except the one considered in the regression. That is, for each girl/woman, the variables are computed among all the other girls/women living in the same PSU.

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APPENDIX: ECONOMETRIC MODEL

This Appendix explains the econometric model used for the estimates earlier based on data from the 2011 Uganda DHS, following similar work by Nguyen and Wodon (2015a) for Sub-Saharan Africa. Denote by y_1 secondary school enrollment or completion – this is a categorical variable that takes a value of one for the enrollment regression if the girl is enrolled and zero otherwise, and similarly for secondary school completion. Next, denote by y_2 the number of years of child marriage for a girl in case marriage took place before the age of 18. For a girl who married at or after 18 years of age, y_2 takes on a value of zero. If a girl marries at age 12, and if the age threshold for child marriage is set at 18, then y_2 takes a value of six, given that the girl marries six years too early, and so on.

In the estimation of the determinants of y_1, y_2 must be treated as endogenous given that education prospects influence the decision to marry early. The econometric model is as follows:

$$\begin{aligned} y_1^* &= z_1\delta_1 + \alpha_1 y_2 + u_1 \\ y_2 &= z_1\delta_{21} + z_2\delta_{22} + v_2 = z\delta_2 + v_2 \\ y_1 &= 1[y_1^* > 0] \end{aligned} \tag{1}$$

where(u_1, v_2)has a zero mean and a bivariate normal distribution, and is independent of z.

Following Rivers and Vuong (1988) we assume a homoskedastic-normal model for the reduced form for the determinants of y_2 and use OLS estimation for the first stage regression. That is, we regress y_2 on a vector of exogenous variables z_2, including instruments that affect the likelihood of being married early, but not school enrollment or completion conditional on marrying early. The instruments are the leave-out-mean contemporaneous and past incidence of child marriage in the primary sampling unit where a girl lives, as measured through the share of girls marrying at ages 12–17, as well as associated variables.[5] We use two instruments for each age of child marriage, one contemporaneous, and one based on data on child marriage for the previous decade, and all shares of girls marrying early at various ages are computed without factoring in a girl's own marriage decision (hence the use of the terminology "leave-out-mean"). The first stage regressions are provided in this appendix after this description of the model.

The second-stage regressions provided in the main text regression are probit models whereby y_1 is regressed against another set of exogenous variables z_1, which may include some but not all of the variables in z_2 as well as y_2, and the residuals $\widehat{v}_2$from the first stage regression. Denoting by $\widehat{\theta}_{\rho 1}$the coefficient of $\widehat{v}_2$and by $\tau_2^2$the error variance estimator from first step OLS regression, the coefficients $\beta_1 = (\delta_1', \alpha_1)'$ used to estimate average partial effects are obtained from the two-step estimates as follows:

$$\widehat{\beta}_1 = \widehat{\beta}_{\rho 1}/(1 + \theta_{\rho 1}^2\tau_2^2)^{1/2} \tag{2}$$

The coefficients must be adjusted because estimated coefficients from the second stage are the vector of scaled coefficients, conditional on the residual of the first stage estimation. But as noted by Rivers and Vuong (1988) the unscaled coefficients must be used to estimate average partial effects (APEs). Given the

unscaled coefficient estimates $\widehat{\delta}_1$ and $\widehat{\alpha}_1$, we report from the probit estimation average partial effects (with the above correction) for all variables in z_1 as well as the various values of y_2 with reference to the age threshold of 18. In comparison with partial effects computed at the mean of the distribution that are usually reported when estimating probit regressions, the advantage of the APEs is that they better represent the average effects over the whole distribution of a change in value for the regressors.

For a continuous variable z_{11} in z_1, if N denotes the sample size, the APE is estimated as:

$$\widehat{\delta}_{11}\left[N^{-1}\sum_{i=1}^{N}\phi(\widehat{\alpha}_1 y_{2i}+z_{1i}\widehat{\delta}_1)\right] \tag{3}$$

Note that the APE for the number of years of child marriage can be computed by treating y_2 as a continuous variable and considering small marginal changes in the number of years of child marriage. But we can also compute the APE by considering discrete changes in y_2 by one-year intervals (this is actually what we observe in the data, since we don't have information on a monthly basis). The APE for a discrete change in y_2 from $y_2^{0\prime}$to $y_2^{1\prime}$is estimated as:

$$N^{-1}\sum_{i=1}^{N}\left[\Phi(\widehat{\alpha}_1 y_2^1+z_{1i}\widehat{\delta}_1)-\Phi(\widehat{\alpha}_1 y_2^0+z_{1i}\widehat{\delta}_1)\right] \tag{4}$$

In the main text we report the APE for y_2 obtained with both the continuous and discrete approaches above. In the discrete case, we compute the APEs for changes in the value of y_2 from the child marriage age threshold of 18 years where $y_2$is equal to zero to the various observed values of y_2 from one to six years of child marriage, corresponding to a girl getting married at ages 17 to 12 years (some girls do get married before 12, but because of a smaller sample size and thereby standard error at that level, these estimates are not reported). All standard errors for the APEs are obtained through bootstrapping with 500 replications.

Appendix *Table 1*: First-stage regressions for number of years of child marriage

	Enrollment Model	*Completion Model*
Leave-out-mean dependent variable	0.721**	− 0.288
Urban	− 0.012	0.169
Has first child before marriage	− 1.311***	− 1.289***
Religion (Ref.: Catholic)		
Protestant	− 0.180**	− 0.170*
Muslim	0.287**	0.299**
Pentecostal	− 0.267**	− 0.251**
Seventh-Day Adventist	− 0.140	− 0.091
Other	− 0.401	− 0.378
Wealth Quintiles (Ref.: Q5)		
Poorest (Q1)	0.934***	0.781***
Second quintile (Q2)	0.749***	0.616***
Third quintile (Q3)	0.611***	0.488***
Fourth quintile (Q4)	0.733***	0.644***
Ethnicity (Ref.: Lugbara)		
Bantu	0.216	0.303**
Nilotic	0.608***	0.649***
Nilo-hamites	− 0.215	− 0.194
Other	0.150	0.213
Instrumental variables – Contemporaneous		
PSU leave-out-mean (share) of CM at 12	4.323***	3.935***
PSU leave-out-mean (share) of CM at 13	1.781*	1.321
PSU leave-out-mean (share) of CM at 14	1.377	1.147
PSU leave-out-mean (share) of CM at 15	1.940***	1.719***
PSU leave-out-mean (share) of CM at 16	1.040*	0.740
PSU leave-out-mean (share) of CM at 17	− 0.362	− 0.628
Instrumental variables – Previous 10 years		
PSU LOM (share) of CM at 12, previous 10 years	0.557	0.487
PSU LOM (share) of CM at 13, previous 10 years	0.089	0.126
PSU LOM (share) of CM at 14, previous 10 years	− 0.238	− 0.245
PSU LOM (share) of CM at 15, previous 10 years	0.064	0.029
PSU LOM (share) of CM at 16, previous 10 years	− 0.053	− 0.116
PSU LOM (share) of CM at 17, previous 10 years	0.355	0.321
Constant	0.249	0.554**
Number of observations	2,565	2,565

Note: ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.
Source: Authors, using 2011 DHS data.