



# Marriage Age, Social Status, and Intergenerational Effects in Uganda

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Published online: 02 December 2019  
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## Abstract

This study examines whether Ugandan women who marry at younger ages fare differently on a wide range of later-life outcomes than women who marry at later ages. Using a nationally representative data set, I identify the plausibly causal impacts of women's marriage age by using age at menarche as an instrumental variable. Results indicate that a one-year delay in marriage for Ugandan women leads to higher educational attainment (0.5–0.75 years), literacy (10 percentage points), and labor force participation (8 percentage points). I also explore intergenerational effects of later marriage and find that the children of mothers who marry later have higher BMI (0.11 kg/m<sup>2</sup>) and hemoglobin levels (0.18 g/dl), and they are also less likely to be anemic (4 percentage points). Finally, I present evidence suggesting that the observed effects might be mediated through an enhancement of women's agency within their household and positive assortative matching in the marriage market. By pointing to the beneficial consequences of delaying marriage, this research calls for concerted policy action to prevent child marriage.

**Keywords** Economic development · Marriage age · Uganda · Education · Intergenerational effects

## Introduction

Early or child marriage among girls is a common practice in large parts of the developing world, especially in South Asia (Chari et al. 2017; Jensen and Thornton 2003) and sub-Saharan Africa (SSA), and this practice significantly contributes to the entrenchment of female disadvantages in these societies. More than 37 % of marriages

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**Electronic supplementary material** The online version of this article (<https://doi.org/10.1007/s13524-019-00829-8>) contains supplementary material, which is available to authorized users.

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in SSA involve a child; in Uganda, which is the setting for the current study, 49 % and 15 % of women aged 20–49 years are married before the ages of 18 and 15 years, respectively (Uganda Bureau of Statistics and ICF International Inc. 2012).

Studies in different contexts have shown that earlier marriage among women leads to decreases in female literacy and educational attainment (Field and Ambrus 2008; Hicks and Hicks 2015; Sekhri and Debnath 2014). The lower levels of education, associated with early marriage, might have further effects on employment and wages (Joshi and Schultz 2007). In fact, Dahl (2010) found that women who marry earlier in life are 31 percentage points more likely to live in poverty when they are older. Early marriage can also have an effect on later-life outcomes for the woman and her postmarital household through her preferences and bargaining power (Banerji et al. 2017; Chari et al. 2017; Christiaensen and Alderman 2004; Glewwe 1999). Such outcomes might be partly due to marriage market sorting on the kind of spouses (and households) that younger brides marry, which might be worse than the average (Anderson 2007; Becker 1973).

Early marriage also poses large health risks to women and their children. Women who marry younger are less likely to control fertility to avoid unwanted and terminated pregnancies (Raj et al. 2009). Early female marriage is also likely to be associated with early childbearing, which leads to a higher risk of maternal mortality and other pregnancy-related complications, such as maternal anemia and preterm labor (Clark et al. 2006; Nour 2006). These complications have negative consequences for the health of both the mother and the child (Goli et al. 2015; Steer 2000; Stoltzfus et al. 2004). The intergenerational impacts might be mediated by women's bargaining power and their preferences regarding investment in children's human capital (Beegle et al. 2001; Majlesi 2016).

In this study, I explore the negative effects of early marriage among Ugandan women and their children. In the main analysis, marriage age is conceptualized as a continuous variable where lower values imply marriage at a younger age. In a robustness check, I verify whether the results are sensitive to alternative measures of early marriage. Because various factors—such as customs, beliefs, and household characteristics—could shape the age at which a woman gets married and also influence other circumstances of her life, marriage age is likely to be endogenous. I use an instrumental variable (IV) strategy to estimate the impacts of the timing of marriage for women. I use age at menarche to instrument for age of marriage, which was first used by Field and Ambrus (2008). Given that in many developing-country contexts, such as in Uganda, girls are married only after they reach puberty, the onset of menarche is a binding constraint for the marriage of girls in these regions. I would thus expect marriage age to be strongly correlated with menarche age, with the relationship being positively signed. I show that such an association exists between the instrument and marriage age for the sample I examine. Furthermore, I argue that because menarche is largely biologically determined (Adair 2001; Jahanfar et al. 2013), it is plausibly exogenous and affects later-life outcomes only through its impact on marriage age. However, in my empirical strategy, I account for other factors that may affect menarche age (e.g., early-life socioeconomic and nutrition inputs, shocks in infancy, and altitude) or that may be affected by it (e.g., age at first sex). The effects that I find remain robust to controlling for these additional factors.

I focus on four main categories of outcomes: schooling, work, health behaviors, and child health, with the last category capturing the intergenerational effects of marriage age. The results suggest that early marriage leads to lower female educational attainment, literacy, and labor force participation. Women who marry earlier also demonstrate poorer health behaviors related to the use of contraceptives, antenatal care (ANC), and age at first birth. I find that children born to women who marry young have lower body mass index (BMI) and hemoglobin levels and are at a higher risk of anemia compared with children of women who marry at older ages. I find no effects of marriage age on height-for-age  $z$  score and weight-for-age  $z$  score. In exploring the mechanisms through which the observed effects could have been mediated, apart from enhanced educational levels, I find evidence for the possible role of two other factors: (1) greater female decision-making power and (2) positive assortative matching in the marriage market (i.e., women who marry later tend to attract better-quality spouses).

My results are robust to various checks. First, although I measure marriage age as a continuous variable for my main analysis, the results hold when I define early marriage to apply to those marrying below different age thresholds (18, 16, or 14 years). In another robustness check, I use the method proposed by Conley et al. (2012) to demonstrate that the coefficient estimates that I identify persist when I relax *the exclusion restriction of an IV strategy*, under which age at menarche is expected to shape the outcome(s) of interest only through marriage age and not through any other confounders. Analogous to this, I convey the stability of the results to increases in potential biases due to unobservable factors, following Oster (2014). Results remain unchanged when I use a probit model instead of the linear probability model (LPM) that I use for the main analysis.

This work adds to the literature by estimating the impacts of early marriage among women in Uganda, a context in which this topic has not been explored before with rigorous empirical methods. Because child marriage is still widely practiced in Uganda, this is an important setting for studying the topic. The current analysis also adds to the literature that examines the long-term consequences of early female marriage—for example, on outcomes such as postmarriage labor force participation and decision-making power. In addition, this is one of the few studies to explore the intergenerational health impacts of early marriage (Chari et al. 2017). Finally, this article makes a valuable empirical contribution by demonstrating the external validity of an econometric methodology previously used mostly in South Asian countries (Field and Ambrus 2008; Sekhri and Debnath 2014).

## Study Context: Uganda

Uganda is a low-income country with a per capita gross domestic product (GDP) of around US\$1,300 (in purchasing power parity (PPP) terms; 2010 data)<sup>1</sup> and an economy that is primarily agrarian. Uganda fares poorly in terms of health: life expectancy at birth is 57 years, and the infant mortality rate is high at 61 per 1,000 live births. Uganda's 2015 human development index (HDI) value (a measure that

<sup>1</sup> Data were retrieved from <https://data.worldbank.org/country/Uganda>.

reflects life expectancy, educational status, and income) ranked it as 163rd in a list of 188 countries, making it one of the poorest performers worldwide. The HDI is often calculated separately for the female and male populations of a country. The ratio of these two figures (female HDI / male HDI), termed the Gender Development Index (GDI), is used to garner a sense of the prevalence of gender disparities in human capital accumulation. Given that a GDI value of less than 1 implies gender inequality (skewed against women), Uganda's GDI of 0.878 demonstrates how poorly the country fares on gender issues. The country's GDI is close to the average for all countries in sub-Saharan Africa but is below that of countries such as Tanzania and Madagascar. Female adolescents in Uganda fare particularly poorly.

Data from the 2011–2012 DHS report suggest that the dropout rate from secondary schools is significantly larger for girls than for boys; and although primary school completion rate for boys (68 %) is not very different from that of girls (66 %), a large disparity exists in the secondary school completion rate for boys (52 %) compared with girls (24 %).

The gender divide in Uganda is evident when examining marriage patterns. In 2011, the median age at marriage was 22.3 years for men but around 18 years for women. Although only 9 % of men were married by age 18, nearly 49 % of women were married by that age (UBOS and ICF International Inc. 2012). A study by Jain and Kurz (2007) ranked Uganda 9th among the top 20 hotspot countries for child marriage. A 2013 study ranked Uganda as 16th among the 25 countries with the highest rates of early marriages, with 46 % and 16 % of girls married below the ages of 18 and 15 years, respectively (UNICEF 2015; World Vision 2008).

The Constitution of Uganda stipulates age 18 as the minimum legal age for marriage for both boys and girls. Despite this provision, child marriage persists among many ethnic and tribal groups. Rubin et al. (2009) discussed why the practice is common in Uganda. First, given that premarital pregnancy is viewed as a shameful and stigmatizing event in Uganda, parents are likely to view early marriage among girls to be a way of reducing the chance of pregnancies outside wedlock and thus protect family dignity. Second, impoverished households that are large might have an incentive to marry girls off at an early age because of the common custom of bride price, in which the household of the groom gives the household of the bride a relatively large amount of money at the time of the wedding (Lubaale 2013; Rubin et al. 2009).

## Data

For this analysis, I use data from the Uganda Demographic and Health Survey (UDHS) conducted in 2001.<sup>2</sup> The DHS are nationally representative surveys that collect information on a wide range of population and health indicators. I focus on the module administered to women between ages 15 and 49, which covered topics such as household characteristics, schooling, labor force participation, fertility, infant and reproductive health, and antenatal and postnatal care. This section of the survey

<sup>2</sup> Although more recent rounds of data are available for Uganda, I use this data set because this is the only DHS data set from Uganda that has information on the age of menarche.

contains one of the key variables around which I set up my empirical strategy: the age of menarche onset. I restrict my sample to all the female respondents who had data available on this variable. Later, I describe the outcomes that I examine for the women in my sample. In addition, I also focus on health outcomes for children aged 0–5 who were born to these women. In the online data appendix, I explain in more detail the data construction and the sample used in the analysis.

## Key Variables

The DHS contain data on several outcomes that might be impacted by a woman's marriage age: educational attainment, labor market participation, and health knowledge. To measure literacy, I create a categorical variable that takes a value of 1 if a woman is fully literate (able to read and write in her native language) and 0 otherwise. The DHS enumerators were trained to judge a woman's literacy levels based on her ability to read sentences printed on cards. I use a continuous variable for educational attainment that equals the woman's highest grade attained (in years). Woman's labor force participation is a dummy variable equal to 1 if she reports being part of the labor force at the time of the survey. In examining health practices, I use indicator variables for contraceptive use and for ANC. I also examine effects of marriage age on the woman's age at first childbirth.

The intergenerational health outcomes that I probe are height (measured in terms of height-for-age  $z$  score), weight (weight-for-age  $z$  scores), and BMI (measured in kg/m<sup>2</sup>). I construct  $z$  scores for height and weight based on standard World Health Organization (WHO) definitions. I also examine children's blood hemoglobin levels using absolute hemoglobin values and indicator variables that capture whether children are anemic (below 11 g/dl) or severely anemic (below 7 g/dl), per WHO (2011) guidelines on anemia detection.

To identify the factors that might mediate the relationships I observe between women's marriage age and their later-life outcomes, I investigate the role of marriage quality and women's decision-making power in their postmarriage household. I define marriage quality using three measures: (1) spousal education, (2) spousal education gap, and (3) spousal age gap. I create a variable for spousal education (measured in years of education), which is akin to the educational attainment variable for women. The well-being effects stemming from the human capital of the husband and wife would further be reinforced by the positive synergy that is likely to result if the marital relationship were equitable (Engle 1997; Schultz 1990). Although having more educated spouses might be considered desirable, an increase in the education of a spouse relative to that of the woman could have a countervailing negative effect. I measure the potential for such an effect using a spousal education gap variable, which takes a value equal to the difference in the educational attainment of a woman and her husband. Analogously, a high age difference between a woman and her spouse could skew the balance of power in the household in the favor of the husband. To probe whether this is the case, I construct an age gap variable (Basu and Koolwal 2005; Mahmud et al. 2012).

The DHS asks female respondents a range of questions about their role in decision-making on the following topics: own health care, children's health care, large household purchases, daily purchases, visits to family and friends, and items cooked in the

household. The survey allows for several responses in order to capture different levels of involvement in these decisions.<sup>3</sup> I create categorical variables for each decision area that take a value of 1 if the woman reports making a particular decision individually, given that this indicates full female autonomy.

## Empirical Strategy

Using ordinary least squares (OLS) to examine the relationship between women's marriage age and an outcome, such as educational attainment, would likely produce biased results because of unobservable factors that might shape both the outcome of interest and the main explanatory variable (marriage age). For example, the traditional beliefs of a woman's natal family could have an impact on both how long she stays in school and when she gets married. Because all such potential confounders cannot be directly observed or measured, endogeneity bias tends to be unavoidable when the OLS framework is used. To overcome these issues, I use an instrumental variable (IV) strategy, treating women's age at menarche as an instrument for their age at marriage.<sup>4</sup>

### Age of Menarche as an IV

As mentioned earlier, child marriage is commonly practiced in many developing countries. Because the ability to bear children is an important part of marriage in these contexts (Anderson 2007), girls are typically married only after they have reached puberty. Thus, the age at menarche tends to be a strong determinant of female age of marriage (Field and Ambrus 2008). And because age at menarche is primarily determined by genetic factors, this variable provides the quasi-random variation in age at marriage required to uncover its causal effects on subsequently realized outcomes. I thus use age at menarche as an IV for the timing of marriage in a two-stage least squares (2SLS) estimation strategy.

The methodological approach that I use requires that the IV meet two conditions: the inclusion restriction and the exclusion restriction. First, the inclusion restriction requires that the instrument—menarche age—be a strong predictor of the potentially endogenous variable, which in my case is women's marriage age. Figure 1, which presents the relationship between these two variables, shows that the distribution of marriage age is a parallel but shifted version of the distribution of menarche age, with the peak of the former being to the right of the highest point of the latter. This kind of a relationship would arise if parents married off their daughters shortly after the onset of puberty. In

<sup>3</sup> The responses are as follows: *Respondent alone*, *Husband/partner alone*, *Respondent and husband/partner jointly*, *Someone else individually*, *Someone else and respondent jointly*, and *Not applicable*. Based on the past literature on the subject, I argue that the recorded responses to these questions are credible proxies for the different dimensions of women's bargaining power—that is, their sense of entitlement and confidence (Kabeer 1998; Taylor and Pereznieta 2014), access to economic resources within the household (Kabeer 2008), and ability to interact/socialize with people outside the household (Kabeer 2011). More recently, factor analysis has been used to create an index of female empowerment based on the responses to the different bargaining power questions in surveys such as the DHS (e.g., Cheong et al. 2017; Yount et al. 2016). I create a similar measure and check the robustness of the main results with this new variable and find qualitatively similar results.

<sup>4</sup> Age of menarche has also been used as an instrument for marriage age in many developed-country contexts. For example, see Klepinger et al. (1999), Chevalier and Viitanen (2003), and Sabia and Rees (2009, 2011).

fact, this is consistent with what I find in my data set: nearly 72 % of the women in the study sample report marrying within three years of the onset of menarche. Figure 1 also demonstrates a tight co-movement of the two measures: as age of menarche increases, so too does age of marriage.

I further examine the relationship between the ages of menarche and marriage using regression results. In Table 1, I look at the relationship between menarche age and marriage age (and other controls discussed later), which represents the first stage of the 2SLS estimation capturing the relationship between the instrument (age of menarche) and the potentially endogenous main variable of interest (marriage age). The results indicate that each year of delay in menarche increases marriage age by around 0.5 years. This relationship is statistically significant at the 1 % level and is robust to the addition of many control variables. The  $F$  statistic of the excluded regressor in the first stage is well above the critical value of 10, which is the cutoff suggested by Staiger and Stock (1997) for a weak instrument. Given the evidence from Fig. 1 and the first-stage results in Table 2, it seems more likely that menarche age meets the inclusion restriction requirement for a valid instrument.

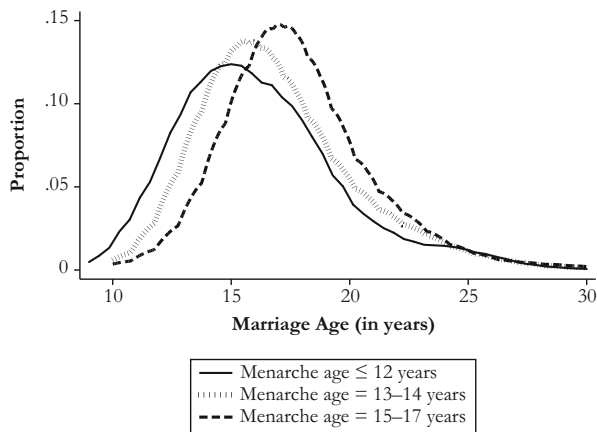
Second, age at menarche also needs to meet the exclusion restriction in order to serve as a valid instrument for marriage age. Under this restriction, the instrument can impact the outcomes of interest through no channels apart from the endogenous variable, but this condition is not directly testable (Angrist and Krueger 2001; Bound et al. 1995). Nevertheless, I argue that age of menarche is exogenous because it is biologically determined, which implies that the exclusion restriction plausibly holds in this setup. The exclusion restriction, however, can potentially be violated in various ways.

One concern is that the onset of puberty could be shaped by a woman's early-life socioeconomic and nutritional conditions, which in turn could also influence her later-life outcomes (Freedman et al. 2005). This would make the instrument of age at menarche endogenous with later-life outcomes. In fact, some studies have shown that early-life circumstances play an important role in determining menarche age<sup>5</sup> (Berkey et al. 2000; Chowdhury et al. 2000; Ellis 2004). In contrast, other evidence suggests that genetic composition at birth matters more for menarche onset than postbirth environmental factors (Adair 2001; Jahanfar et al. 2013; Sørensen et al. 2013). Along these lines, Mpora et al. (2014) found that early-life adverse events do not have a significant effect on age at menarche in Uganda, the context that I examine in this study. Given the debate that exists on this topic, it is unclear whether age of menarche can truly be considered an exogenous variable. One way I could overcome potential endogeneity in the instrument is by including measures for women's early-life conditions in my estimation models.

The ideal way to control for a woman's childhood nutritional status would be to use information from that time, but the data I use do not contain such details. Therefore, to account for the role of childhood nutrition in determining menarche age (Ellis 2004; Victora et al. 2008), I use woman's adult height as a control variable. This approach is predicated on the intuition that a woman's adult height reflects her childhood height,

<sup>5</sup> This is consistent with literature showing the negative effects of shocks in the prenatal and perinatal period (Almond and Currie 2011; Barker 1995) and in early life (Almond 2006; Dercon and Porter 2014; Fogel 1990, 1993).





**Fig. 1** Probability distributions of marriage for subpopulations divided on the basis of menarche age

which itself corresponds closely to childhood nutritional status (Martorell 1993; Martorell and Habicht 1986).

Adult height can thus be used to proxy for the different inputs women experienced during childhood. In addition, research has indicated that people with lower stature in infancy and childhood are more likely to have lower adult height (Adair 2007; Currie and Vogl 2013; Eide et al. 2005, Sørensen et al. 1999). Given that adult height is strongly correlated with childhood size and nutritional inputs in childhood, including it in my empirical model would control for the effect of childhood stature on age at menarche.

In addition, I use birth year fixed effects to control for the effect that events in infancy can have on long-term outcomes. I also include district fixed effects and cluster altitude (in meters) in my specifications to account for the potential consequences of geographical conditions (such as temperature and altitude) and other time-invariant district-level factors on the age of menarche onset (Kapoor and Kapoor 1986; Saar et al. 1988). (See Table 2 for summary statistics for variables used in the analysis by age at marriage.)

**Table 1** First-stage (FS) regressions: Dependent variable is age at first marriage

|                          | FS 1             | FS 2             | FS 3             | FS 4             |
|--------------------------|------------------|------------------|------------------|------------------|
| Menarche Age             | 0.49**<br>(0.03) | 0.48**<br>(0.04) | 0.47**<br>(0.03) | 0.45**<br>(0.03) |
| Total Observations       | 4,930            | 4,930            | 4,930            | 4,930            |
| Controls                 | No               | Yes              | Yes              | Yes              |
| Birth Year Fixed Effects | No               | No               | Yes              | Yes              |
| District Dummy Variable  | No               | No               | No               | Yes              |

*Notes:* The outcome variable is women's marriage age. The standard errors, shown in parentheses, are robust and clustered at the district level. The control variables include woman's height; woman's age at first sex (intercourse); cluster altitude (in meters); household size; wealth index; and categorical variables for the presence of multiple wives, religion, ethnicity, and living in an urban area.

\*\* $p < .01$



**Table 2** Mean comparison across marriage ages

|                      | Less Than 14 Years | 14–16 Years        | 16–18 Years        | Above 18 Years     | Full Sample        |
|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Marriage Age         | 13.18<br>(1.02)    | 15.54<br>(0.50)    | 17.47<br>(0.50)    | 21.42<br>(2.92)    | 17.37<br>(3.42)    |
| Menarche Age         | 13.71<br>(1.30)    | 14.27<br>(1.30)    | 14.64<br>(1.46)    | 14.70<br>(1.51)    | 14.40<br>(1.45)    |
| Multiple Wives       | 0.31<br>(0.46)     | 0.25<br>(0.43)     | 0.24<br>(0.43)     | 0.26<br>(0.44)     | 0.26<br>(0.44)     |
| Wealth Index         | −0.016<br>(1.03)   | −0.005<br>(1.02)   | 0.026<br>(1.02)    | −0.013<br>(0.99)   | −0.001<br>(1.01)   |
| Household Size       | 5.92<br>(3.10)     | 5.65<br>(2.78)     | 5.64<br>(2.98)     | 5.49<br>(2.97)     | 5.65<br>(2.95)     |
| Urban                | 0.23<br>(0.42)     | 0.25<br>(0.43)     | 0.27<br>(0.44)     | 0.37<br>(0.48)     | 0.29<br>(0.45)     |
| Telephone            | 0.02<br>(0.13)     | 0.03<br>(0.16)     | 0.04<br>(0.19)     | 0.08<br>(0.27)     | 0.04<br>(0.20)     |
| Altitude (in meters) | 1,278.8<br>(295.5) | 1,287.7<br>(308.1) | 1,305.4<br>(291.7) | 1,345.2<br>(340.0) | 1,307.8<br>(312.5) |
| East                 | 0.31<br>(0.46)     | 0.30<br>(0.46)     | 0.26<br>(0.44)     | 0.20<br>(0.40)     | 0.26<br>(0.44)     |
| North                | 0.16<br>(0.37)     | 0.17<br>(0.38)     | 0.13<br>(0.33)     | 0.12<br>(0.33)     | 0.14<br>(0.35)     |
| West                 | 0.23<br>(0.42)     | 0.24<br>(0.43)     | 0.29<br>(0.45)     | 0.32<br>(0.47)     | 0.27<br>(0.45)     |
| Brick House          | 0.30<br>(0.46)     | 0.31<br>(0.46)     | 0.33<br>(0.47)     | 0.41<br>(0.49)     | 0.34<br>(0.47)     |

*Notes:* This table provides summary statistics of the variables used in the analysis for the different ranges of marriage age in the sample. Standard deviations are shown in parentheses. The last column provides the summary statistics for the full sample.

Another concern that arises when using reported age at menarche stems from potential recall bias. Given that a considerable amount of time is likely to have passed from the date when a women reached menarche to the time of survey (at which respondents could be as old as 49 years), one might question the ability of women to accurately report their age at menarche onset. To get a sense of how dependable the reports of menarche are in the DHS data set that I use, I compare the mean menarche age in my sample (14.4 years) with information available from other parts of Africa. I find that the mean in my sample is broadly consistent with that of other studies that examine comparable settings—for example, 13.2 years in Mozambique (Padez 2003), 15.8 years in Kenya (Leenstra et al. 2005), 15.7 years in Ethiopia (Zegeye et al. 2009), and 13.2 years in Nigeria (Adebara and Ijaiya 2013). In addition, in the cultural context of many developing countries (such as Uganda), onset of menarche is a major

event in a woman's life, and hence respondents could be expected to remember its timing with a fair degree of accuracy (Ellis 2004; Leenstra et al. 2005).<sup>6</sup>

## Identification Strategy

As discussed earlier, I examine outcomes for women and for their children. When examining women's outcomes, I use the following specifications:

$$\text{First stage: } \text{MarriageAge}_j = \alpha_0 + \alpha_1 \text{MenarcheAge}_j + \alpha_2 \text{Controls}_j + \eta^1 \quad (1a)$$

$$\text{Second stage: } Y_j = \delta_0 + \delta_1 \text{MarriageAge}_j + \delta_2 \text{Controls}_j + \eta^2, \quad (1b)$$

where  $Y_j$  is the outcome variable for woman  $j$ ;  $\text{MarriageAge}_j$  is the age at marriage of woman  $j$ ; and  $\text{MenarcheAge}_j$  is the age at which a woman reaches menarche. **Controls** <sub>$j$</sub>  is a vector of factors at the individual, household, and community level that could potentially shape the outcome of interest, including household size; the wealth index; and categorical variables for the presence of multiple wives, religion, ethnicity, and residence in an urban area. In addition, I also include woman's height as well as fixed effects for both district and birth year to account for potential nongenetic factors associated with age of menarche. I cluster the standard errors at the district level.

The specifications that I use to analyze child-level outcomes are similar, but now each observation pertains to a child born to a woman in the main sample. I use the following approach:

$$\text{First stage: } \text{MarriageAge}_j = \alpha^c + \alpha^c \text{MenarcheAge}_j + \alpha^c \text{Controls}_{ij} + \zeta^1. \quad (2a)$$

$$\text{Second stage: } Y_{ij} = \delta^c + \delta^c \text{MarriageAge}_j + \delta^c \text{Controls}_{ij} + \zeta^2. \quad (2b)$$

In this case, the outcomes would be for child  $i$  born to woman  $j$ ;  $\text{MarriageAge}_j$  is the age at marriage of the mother of child  $i$ ; and **Controls** <sub>$ij$</sub>  include all the control variables discussed for the mother-level specification as well as child's age, mother's age at the child's birth, child's gender, and child's birth order. Again, I cluster the standard errors at the district level.

## Results

### Impact on Woman's Outcomes

I begin by examining the consequences of women's marriage age on their educational attainment. First, in Table 3 (columns 1–4), I examine this relationship with an OLS

<sup>6</sup> A related concern is that women might recall the age at which they reached menarche using the year in which they got married as a reference point. Given that marriage is another major social event in one's life, its recall is also less likely to be fraught with measurement error. Given that women in Uganda tend to get married in and around the time of puberty onset (as discussed earlier), this kind of a connection between the two events could only improve the recall of menarche onset, thus plausibly improving the accuracy of the data.

approach and find that marriage age has a positive impact on number of years of education. In other words, women who marry at a younger age appear to have lower educational attainment. The OLS estimates (columns 1–4) are likely to suffer from endogeneity bias, which can be accounted for with an IV approach. In the IV results presented in columns 5–8, the coefficients on marriage age are positive, and the magnitudes do not change much when I include additional sets of control variables in the models. These findings point to the potentially large gains in female education that can be realized by delaying marriage.

In Table 3, the coefficient on marriage age in the IV specification with all the control variables (column 8) is larger in magnitude than the corresponding OLS coefficient (column 4), which suggests that OLS regression underestimates the effect of marriage age. I observe similar trends for all the other outcome variables that I examine. The IV estimates being greater than the OLS estimates could be due to omitted variable bias. For example, families in Uganda might make decisions regarding their daughter's schooling and marriage with the goal of maximizing the bride price that they can obtain from the groom's family at the time of the wedding, although I do not observe this with the available data. Given that bride price is primarily paid for the fruits of a woman's labor and her reproductive capabilities (Anderson 2007), girls' parents might try to increase the amount they receive by keeping girls in school longer and thus enhancing girls' future labor market returns. At the same time, because bride price also depends on the virginity of the bride, parents living in relatively unsafe areas might want to have their girls married sooner rather than later. The interaction effect of the desire of parents to keep their girls in school longer but to also marry them off younger would attenuate the OLS estimates.<sup>7</sup>

Table 4 explores the effect of marriage age on other woman-level outcomes. Later marriage among women enhances the likelihood of being literate and of participating in the labor market. Specifically, a one-year delay in marriage increases the probability of being literate and of working by 10 and 8 percentage points, respectively. Subsequent columns show positive impacts of marriage age on different health behavior outcomes. For example, when women marry later, they are more likely to use contraception and obtain ANC. I find evidence for delays in childbearing due to later marriage, which indicates that policy interventions that encourage delayed marriage could be crucial for alleviating the high maternal health burdens borne by young mothers (O'Flaherty et al. 2015).

### Intergenerational Impacts

I now explore whether the timing of a woman's marriage shapes her children's health outcomes. Table 5 shows that marriage age has no effect on standardized height and weight measures of children, but the coefficients are signed as expected, with older age at marriage leading to healthier children. I do, however, find positive and statistically significant effects of later marriage on child BMI and hemoglobin level: when mothers

<sup>7</sup> The IV estimate being greater than the OLS estimate is also consistent with the theory of positive assortative matching in the marriage market (Becker 1991), which I find evidence for in my data. Positive matching implies that higher-quality grooms would be matched to women with more desirable traits, which in this case would imply higher education (stay in school) and virginity (get married sooner).

**Table 3** Impact of marriage age on highest grade attained

|                          | OLS<br>(1)       | OLS<br>(2)       | OLS<br>(3)       | OLS<br>(4)       | IV<br>(5)        | IV<br>(6)        | IV<br>(7)        | IV<br>(8)        |
|--------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Marriage Age             | 0.25**<br>(0.02) | 0.26**<br>(0.02) | 0.25**<br>(0.02) | 0.26**<br>(0.02) | 0.74**<br>(0.08) | 0.75**<br>(0.08) | 0.73**<br>(0.08) | 0.75**<br>(0.08) |
| Total Observations       | 4,912            | 4,912            | 4,912            | 4,912            | 4,912            | 4,912            | 4,912            | 4,912            |
| Controls                 | No               | Yes              | Yes              | Yes              | No               | Yes              | Yes              | Yes              |
| Birth Year Fixed Effects | No               | No               | Yes              | Yes              | No               | No               | Yes              | Yes              |
| District Dummy Variable  | No               | No               | No               | Yes              | No               | No               | Yes              | Yes              |

*Notes:* The outcome variable is women's highest grade attained. The coefficients are from the second stage of a 2SLS IV estimation; standard errors are shown in parentheses. The standard errors are robust and clustered at the district level. The control variables include woman's height; woman's age at first sex (intercourse); cluster altitude (in meters); household size; wealth index; and categorical variables for the presence of multiple wives, religion, ethnicity, and living in an urban area

\*\* $p < .01$

**Table 4** Impact of marriage age on women's later-life outcomes

|                    | Literacy         | Employed         | Contraception               | Age at First Birth | ANC Use        |
|--------------------|------------------|------------------|-----------------------------|--------------------|----------------|
| Marriage Age       | 0.10**<br>(0.01) | 0.08**<br>(0.05) | 0.02 <sup>†</sup><br>(0.01) | 1.01**<br>(0.01)   | 0.07<br>(0.07) |
| Total Observations | 4,899            | 4,920            | 4,925                       | 4,916              | 4,522          |

*Notes:* Following are the definitions of the outcome variables: Literacy (= 1 if literate), Labor (= 1 if part of the labor force), Contraception (= 1 if used contraceptives), Age at First Birth (woman's age at first birth), ANC Use (= 1 if reported using ANC). The coefficients are from the second stage of a 2SLS IV estimation. The standard errors, shown in parentheses, are robust and clustered at the district level. The control variables include woman's height; woman's age at first sex (intercourse); cluster altitude (in meters); household size; wealth index; and categorical variables for the presence of multiple wives, religion, ethnicity, and living in an urban area. All specifications also include birth year and district fixed effects.

<sup>†</sup> $p < .10$ ; \*\* $p < .01$

delay marriage by one year, their children in the future are likely to have better BMI and higher hemoglobin levels. Other results in Table 5 indicate that later marriage reduces the chances that a woman's child will be anemic (4 percentage points), but the impact on the likelihood of being severely anemic is small (0.2 percentage points) and insignificant. Overall, the results are suggestive of some intergenerational health benefits for children born to mothers who marry later in life.

## Mechanisms

The results in the previous section present a unified narrative: delayed marriage brings about better later-life outcomes for women as well as positive effects for child health. Because I find that later marriage enhances women's educational levels, many of the other benefits that I find for these women could stem directly from higher education. Other factors that are shaped by later marriage (and that could also be influenced by

**Table 5** Impact of marriage age on children's health outcomes

|                    | HFA z Score    | WFA z Score     | BMI z Score                 | Hemoglobin       | Anemic            | Severely Anemic |
|--------------------|----------------|-----------------|-----------------------------|------------------|-------------------|-----------------|
| Marriage Age       | 0.02<br>(0.06) | 0.001<br>(0.05) | 0.11 <sup>†</sup><br>(0.06) | 0.18**<br>(0.05) | -0.04**<br>(0.01) | 0.002<br>(0.01) |
| Total Observations | 4,997          | 4,982           | 4,990                       | 4,956            | 4,955             | 4,958           |

*Notes:* Following are the definitions of the outcome variables: HFA (height-for-age z score), WFA (weight-for-age z score), BMI z score, Hemoglobin levels (g/dl), Anemic (= 1 if hemoglobin below 11 g/dl), and Severely Anemic (= 1 if hemoglobin below 7 g/dl). The coefficients are from the second stage of a 2SLS IV estimation. The standard errors, shown in parentheses, are robust and clustered at the district level. The control variables include age of the child; mother's age at the child's birth; child gender and birth order of the child; woman's age at first sex (intercourse); cluster altitude (in meters); household size; wealth index; and categorical variables for the presence of multiple wives, religion, ethnicity, and living in an urban area. All specifications also include birth year and district fixed effects.

<sup>†</sup> $p < .10$ ; \*\* $p < .01$

education) could lead to improved later-life outcomes. Here I examine the role played by women's bargaining power and the nature of their marital relationship.

An increase in female autonomy could raise the well-being of women and enhance their ability to allocate more resources to their children (Ashraf et al. 2010; Aslam and Kingdon 2010; Doss 2013). Women with more agency might have more autonomy to make decisions regarding contraceptive use and might thus have lower fertility rates (Beegle et al. 2001). Because of the quantity–quality trade-offs in children (discussed first by Becker and Lewis 1973), lower fertility is likely to enhance the quality of children, potentially as a result of higher investments per child (Barber and Gertler 2010; Björkman Nyqvist and Jayachandran 2017; Carneiro et al. 2013).

Recall that I measure women's decision-making power by observing whether she self-reports being solely responsible for making decisions regarding different aspects of the household. As shown in Table 6 (columns 1–5), later marriage leads to increase in the likelihood of women being the sole decision-maker on every measured decision category: child health (4 percentage points), own health (5 percentage points), large purchases (4 percentage points), family visits (3 percentage points), and cooking food (5 percentage points). This result is consistent with the evidence from other recent analyses finding that women who marry later in life benefit from postmarital economic empowerment, have higher decision-making power, and enjoy more equitable gender relations (Crandall et al. 2016; Yount et al. 2018).

Next, I examine the potential role of spousal characteristics in mediating the observed effects of later marriage. Previous studies have found that more educated women are likely to marry higher-quality spouses (Abramitzky et al. 2011; Fafchamps and Quisumbing 2005), with *quality* being defined on many dimensions, such as education and income. I verify whether this is the case for the women in my sample who marry later and who I find are also likely to be more educated. Results in Table 6 suggest that women who marry later are matched with husbands who have higher education. Other measures of relative marriage market match quality are the differences in educational levels and age between the spouses: the lower the difference, the more equitable the marriage is likely to be. The coefficients on marriage age for both outcomes are negative and significant, thus demonstrating that the spousal education gap and the spousal age gap fall as marriage age rises. These results indicate that older brides experience improved marriage market outcomes.

## Robustness Checks

I conduct several robustness checks to demonstrate that the results from my main analysis are not sensitive to model variations, definitional adjustments, and other changes. First, I estimate probit models for the outcome variables that are binary and examine whether the results are consistent with those from the LPM model that I use for my main analysis. Results in Table 7 indicate that the sign and significance of the marriage age coefficients in the probit models are consistent with those in the main results. In addition, the marginal effects from the probit model are comparable in magnitude with the estimates identified with the LPM specification.

Second, I reestimate the specifications for all the outcomes that I examine with alternative measures for early marriage. Whereas I use a continuous measure for

**Table 6** Potential mechanisms

|                    | Child Health<br>(1) | Own Health (2) | Large Purchases<br>(3) | Visit Family<br>(4) | Cook Food<br>(5) | Spouse Education<br>(6) | Spouse Education Gap<br>(7) | Spouse Age Gap<br>(8) |
|--------------------|---------------------|----------------|------------------------|---------------------|------------------|-------------------------|-----------------------------|-----------------------|
| Marriage Age       | 0.04**<br>0.01      | 0.05**<br>0.01 | 0.04**<br>0.01         | 0.03**<br>0.01      | 0.05**<br>0.01   | 0.39**<br>0.10          | -0.35**<br>0.09             | 0.35†<br>0.19         |
| Total Observations | 4,912               | 4,912          | 4,912                  | 4,912               | 4,912            | 4,695                   | 4,695                       | 4,695                 |

*Notes:* The first five columns take a value of 1 if the woman reports making decisions about these items. Spouse Education refers to the highest grade attained by the husband, Spouse Education Gap refers to the difference in highest grade attained between the woman and her husband, and Spouse Age Gap refers to the age gap between the woman and her husband. The coefficients are from the second stage of a 2SLS IV estimation. The standard errors, shown in parentheses, are robust and clustered at the district level. The control variables include woman's height; woman's age at first sex (intercourse); cluster altitude (in meters); household size; wealth index; and categorical variables for the presence of multiple wives, religion, ethnicity, and living in an urban area. All specifications also include birth year and district fixed effects.

† $p < .10$ ; \*\* $p < .01$



**Table 7** Robustness check: Probit model

|                    | Literacy         | Labor            | Contraception   | ANC Use        | Anemic            | Severely Anemic |
|--------------------|------------------|------------------|-----------------|----------------|-------------------|-----------------|
| Marriage Age       | 0.13**<br>(0.06) | 0.12**<br>(0.05) | 0.08†<br>(0.06) | 0.11<br>(0.05) | -0.07**<br>(0.01) | 0.001<br>(0.01) |
| Total Observations | 4,901            | 4,921            | 4,924           | 4,524          | 4,955             | 4,955           |
| Marginal Effect    | 0.08**           | 0.09**           | 0.03†           | 0.08           | -0.04**           | 0.0005          |

*Notes:* The definitions of the variables are as explained in the previous tables. Each coefficient comes from a probit model in which the outcome variable is regressed on the woman's marriage age and a set of controls (discussed earlier). The standard errors, shown in parentheses, are robust and clustered at the district level. The control variables include woman's height; woman's age at first sex (intercourse); cluster altitude (in meters); household size; wealth index; and categorical variables for the presence of multiple wives, religion, ethnicity, and living in an urban area. All specifications include birth year and district fixed effects. The marginal effects are calculated at the mean value of all the covariates in the model.

† $p < .10$ ; \*\* $p < .01$

marriage age in the main analysis, I now choose three different cutoffs (18, 16, and 14 years) to create binary variables indicating early marriage. These measures consider women marrying at ages below the thresholds to have married early. A cutoff of 18 years is almost universally accepted as an appropriate minimum age for marriage and hence is a useful threshold to examine. In the Ugandan context, using cutoffs of 16 and 14 years also makes sense because almost 34 % and 18 % of the study sample marry under these respective ages. The results in Table 8 show that my results are robust to these alternative definitions of marriage age, with one exception: women identified as having married early by these categorical variables have poorer later-life outcomes and fewer children.

Third, I conduct a check to predict what would happen to the identified impact estimates if the exclusion restriction were to be violated. In this case, the exclusion

**Table 8** Robustness checks: Different definitions of marriage age

| Outcome                    | Under 18 Years | Under 16 Years | Under 14 Years |
|----------------------------|----------------|----------------|----------------|
| Education                  | -0.76**        | -0.47**        | -0.58**        |
| Labor Market Participation | -0.07          | -0.04          | -0.05          |
| Literacy                   | -0.08**        | -0.06**        | -0.07**        |
| Contraception Use          | -0.09**        | -0.12**        | -0.12**        |
| Child Hemoglobin           | -0.11**        | -0.11**        | -0.12**        |
| Child Is Anemic            | 0.06**         | 0.06**         | 0.07**         |
| Child Is Severely Anemic   | 0.04           | 0.04           | 0.03           |

*Notes:* The definitions of the variables and control variables are the same as described earlier. The three columns depict the results when the marriage age is defined to be a categorical variable taking a value of 1 if the woman got married below the age of 18, 16, and 14 years, respectively. Each entry is the coefficient of this new marriage age variable when a particular outcome of interest is chosen in the 2SLS framework used for the main set of results. These results provide a robustness check of the main results to a change in the definition of the marriage age variable.

\*\* $p < .01$

restriction requires that age of menarche affects later-life outcomes only through its impact on marriage age, and not through any other variables. Through the check, I seek to understand whether the results would hold if a nonzero direct relationship existed between the instrument and the outcomes of interest. I employ the union of confidence intervals (UCI) procedure outlined in detail by Conley et al. (2012), who relaxed the complete exogeneity assumption made in an IV setup. This method requires that the researcher specify a value for the (assumed) direct relationship between the instrument and the outcome, which the authors referred to as  $\gamma$ . The  $\gamma$  term can be thought of as a measure of the degree to which the exclusion restriction is violated. This procedure calculates the confidence interval for the coefficient of interest (marriage age) for a specified value of  $\gamma$ . If this confidence interval contains the value 0, it indicates that the coefficient is statistically indistinguishable from 0.

In assuming different values of  $\gamma$ , I start with 0 (complete exogeneity) and gradually go up to 0.25. The cutoff of 0.25 is arbitrary, but it is a fairly high number. The correlation between menarche age and any outcome of interest is not expected to be this high given the extensive set of control variables in the estimation models. Upon generating the relevant confidence intervals, I find that the study results persist for most variables.<sup>8</sup>

Because this analysis explores the impact of marriage age on a large number of outcomes, I also calculate multiple hypothesis testing adjusted  $p$  values to understand whether the results I find are spuriously significant. Given that many of my point estimates are significant and that they fit into a consistent narrative, it is unlikely that such corrections would largely change my conclusions. I present the results adjusted for multiple testing with the Romano-Wolf procedure (Romano and Wolf 2005a, 2005b, 2016) in Table 9. As shown there, only one outcome (Child BMI) that was originally significant is no longer significant after I adjust for multiple hypothesis testing. The coefficients that were not significant to begin with remain so.

As a final check, I explore whether my results might be impacted by omitted variable bias. Although I control for a large number of factors in my specifications, there may be other factors that I cannot account for that could affect the outcome.<sup>9</sup> To check for this, I employ the bounding exercise undertaken by Oster (2014).<sup>10</sup> Under this robustness check, one case would be to assume that the bias resulting from unobservable characteristics is the same size as the bias resulting from observable factors. This is an extreme assumption because it implies that the unexplained part of the regression is as large as the explained part of the regression, which is an implausible contingency given that I control for several individual, household, and community

<sup>8</sup> Although this method provides a technique to test the sensitivity of the results to violation of the exogeneity assumption, Conley et al. (2012) state that one of the caveats of this technique is that it might give a wide confidence interval, which might not be very informative. However, the wide confidence intervals actually make the test harder to pass: if the confidence intervals are larger, they are more likely to include the null result. Therefore, if the results hold for fairly large values of  $\gamma$  (which I show), they could be interpreted as being extremely robust.

<sup>9</sup> For example, we do not observe the educational/health infrastructure that women experienced when they were children, which would have an impact on their later-life outcomes.

<sup>10</sup> Under this method, Oster (2014) extends the theoretical framework proposed by Altonji et al. (2005) to connect bias on unobservable characteristics to coefficient stability. She used the movement of the  $R^2$  value with and without the controls along with the potential size of the bias of the unobservable characteristics to estimate lower bounds on the reduced form estimate.

**Table 9** Multiple hypothesis testing using Romano-Wolf

| Outcome                    | Regular $p$ Value | Adjusted $p$ Value |
|----------------------------|-------------------|--------------------|
| Education                  | **                | **                 |
| Labor Market Participation | *                 | †                  |
| Contraception Use          | †                 | †                  |
| Time to First Child        | **                | **                 |
| Age at First Birth         | **                | **                 |
| Antenatal Checkup          | NS                | NS                 |
| Child BMI                  | †                 | NS                 |
| Child Hemoglobin           | **                | *                  |
| Child Is Anemic            | **                | **                 |
| Child Is Severely Anemic   | NS                | NS                 |
| Decision: Child Health     | **                | *                  |
| Decision: Own Health       | **                | **                 |
| Decision: Large Purchases  | **                | *                  |
| Decision: Visit Family     | **                | *                  |
| Decision: Cook Food        | **                | *                  |

*Notes:* The table shows the significance level of the marriage age variable in regressions where the mentioned variables are the dependent variable. The regular  $p$  value refers to the level of significance in the main results; the adjusted  $p$  value refers to that obtained from the Romano-Wolf procedure. NS symbolizes that the coefficient on the marriage age variable is not statistically significant.

† $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$

factors in all the specifications. I find that even under such a restrictive assumption, the impact of marriage age retains the direction of the impacts identified in the main analysis and does not move toward 0 for 9 of 12 outcomes (results not shown but available from the author on request).

## Conclusion

Using a nationally representative data set from Uganda and an IV estimation strategy, I provide plausibly causal evidence for the effects of marriage age on a variety of later-life outcomes. Early marriage reduces women's educational attainment, literacy, and labor force participation. I also find that the lower the age at women's marriage, the worse their outcomes are in terms of contraceptive use, age at first birth, and use of ANC. Furthermore, I find that marriage age shapes intergenerational health outcomes: early marriage has strong negative effects on child hemoglobin levels, anemia, and BMI. Although the impacts on child height and weight are not statistically significant, the direction of effect implies that earlier marriage leads to worse child health status. In examining the potential mechanisms through which the observed effects might be mediated, I detect strong positive impacts of later marriage on women's decision-making power and status as well as evidence of positive assortative marriage market matching: women who marry later are more likely to attract higher-quality spouses.

These factors, along with the higher educational levels stemming from delayed marriage among women, might be responsible for the many positive later-life outcomes for women and the improvements to child health that I find in my analysis.

Further, this study adds to the literature by providing evidence in a context where bride price is commonly practiced. This is a valuable contribution because the bulk of the economic literature on the topic has focused on the effects of marriage age in developing countries, where the opposite practice of *dowry* (payments from the bride's family to the groom's family) is prevalent. For example, Sekhri and Debnath (2014) and Chari et al. (2017) found that marrying at an older age has positive effects on many later-life outcomes for women and their children in India, a setting where dowry is commonly practiced. Similar results have been found in other dowry contexts: Bangladesh (Field and Ambrus 2008), Egypt (Yount et al. 2018), and Kenya (Hicks and Hicks 2015).

Additionally, consistent with prior studies, I find that earlier marriage has a negative impact on a variety of later-life socioeconomic outcomes. The findings are similar in other regions where neither dowry nor bride price is widely practiced, such as the United States. Studies have found detrimental effects of child marriage on maternal education and employment as well as on maternal and child health outcomes (Dahl 2010; George and Lee 1997; Hotz et al. 1997; Hunt 2003; Overpeck et al. 1998). The fact that my results qualitatively match those found in areas with different marriage customs suggests that the negative effects of early marriage are a global phenomenon and are independent of the specific features of the marriage market. However, the exact mechanisms through which this effect operates may be more context-specific.

Despite a considerable global reduction in its prevalence over the past couple of decades, child marriage remains a major concern today. According to UNICEF (2018), nearly 650 million girls marry before age 18. Given the persistence of this problem, ending child marriage has been included as part of the United Nations Sustainable Development Goals (Goal 5.3).<sup>11</sup> Child marriage in Uganda in recent years mirrors broad global trends. The country has experienced a decline in rates of early marriage (before age 18)—from 52.8 % in 2001 to 36.5 % in 2011— but absolute levels of child marriage in the country remain high (Malé and Wodon 2016; Wodon et al. 2017). Given that Uganda's population is extremely young (with 6 in 10 younger than age 18; Sebudde et al. 2017) and that the practice of child marriage remains common, a large section of the country's population is likely to continue to experience the far-reaching harms of early marriage documented in this research. It is, thus, crucial to design policies to limit this practice in Uganda and around the world.

In policy terms, governments in developing countries can reap potentially large (and long-term) gains by taking steps to restrict child marriage practices. Various strategies for delaying marriage among young girls have been studied. One approach has been to encourage girls to stay in school by providing school vouchers or stipends. Evaluations of such programs in Colombia, Bangladesh, and Kenya (Angrist et al. 2006; Duflo et al. 2015; Hahn et al. 2018; Hong and Sarr 2012) show promising results. In a unique cash transfer experiment in Malawi, Baird et al. (2011) found that the unconditional transfers outperform the conditional ones in their effectiveness to impact early marriage and childbearing outcomes. Another strategy is to expose girls to programs and

<sup>11</sup> See <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>.

information to enhance female empowerment. For example, girls can be provided with vocational training and with information on sex, reproduction, and marriage. Such policies have been tested in Uganda (Bandiera et al. 2018), Tanzania (Buehren et al. 2017), and Bangladesh (Buchmann et al. 2018) with varying degrees of success. Over a two-year study in Uganda, Bandiera et al. (2018) found pronounced declines in early marriage (58 %) and teen pregnancy (26 %).

In 2015, Uganda instituted a National Strategy on Child Marriage (NSCM) in an attempt to end child marriage and teenage pregnancy. Because child marriage is deeply embedded in Ugandan society, the NSCM intends to use a multipronged approach to achieve its objective: improvements to the country's legal and policy framework for protecting children, expansion of education, empowerment of boys and girls through the provision of information and critical life skills, and changes to the mindset and beliefs of different communities/tribes regarding this practice. Uganda's program appears to be a holistic approach for ending child marriage, but its success will largely depend on how the plan is implemented. The results of this study suggest that if Uganda's strategy proves to be effective in reducing child marriages, the country is likely to have a more educated and empowered female population as well as healthier children in the future.

**Acknowledgments** I thank Christopher Barrett, Levon Barseghyan, Francine Blau, Averi Chakrabarti, Gary Fields, Alfonso Flores-Lagunes, David Sahn, and Joerg Stoye for their useful comments. In addition, I thank the Cornell Population Center and the Cornell Economics Department for their financial assistance. All remaining errors are my own.

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