Bride Price and the Returns to Education for Women*

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Abstract

Traditional cultural practices can play an important role in development, but can also inspire condemnation. The custom of bride price, prevalent throughout sub-Saharan Africa and in parts of Asia as a payment of the groom to the family of the bride, is one example. In this paper, we show a surprising economic consequence of this practice. We revisit one of the best-studied historical development projects, the INPRES school construction program in Indonesia, and show that previously found null results on female enrollment mask heterogeneity by bride price tradition. Ethnic groups that traditionally engage in bride price payments at marriage increased female enrollment in response to the program. Within these ethnic groups, higher female education at marriage is associated with a higher bride price payment received, providing a greater incentive for parents to invest in girls' education and take advantage of the increased supply of schools. For those girls belonging to ethnic groups that do not practice bride price, we see no increase in education following school construction. We replicate these same findings in Zambia, where we exploit a similar school expansion program that took place in the early 2000s. While there may be significant downsides to a bride price tradition, our results suggest that any change to this cultural custom should likely be considered alongside additional policies to promote female education.

1 Introduction

It has become increasingly recognized that cultural norms play an important role in economic development. We have, however, a much less clear understanding of what traditional cultural practices imply for development policy and whether the efficacy of development policies depends on the cultural traits of societies. Development policies generally have not been tailored to the

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particular cultural characteristics of a society. More recently, there has been a recognition that this one-size-fits-all strategy may not always work (World Bank, 2015).

Bride price, a transfer from the groom to the bride's family, is a traditional cultural practice prevalent in parts of Asia and throughout sub-Saharan Africa. Bride price has received condemnation worldwide (Wendo, 2004; Mujuzi, 2010) as a repugnant and negative practice, leading to calls for its abolishment.[1] In this paper, we examine the relationship between bride price and education policy, showing that the impacts of large-scale school construction programs depend critically on this cultural practice. Evidence from Indonesia in the 1970s and Zambia in the 2000s indicate that these programs were only successful at increasing the education of girls of ethnic groups that engage in this form of marriage payment. Our findings suggest that bride price customs play a critical role in encouraging parental investments in daughters in response to educational policies.

In particular, we revisit one of the best studied historical development projects, the Sekolah Dasar INPRES school building program of the 1970s in Indonesia, where 61,807 primary schools were constructed from 1974-1980. The seminal paper looking at the impacts of this project examines a sample of males only, which is in line with its objective of estimating the effect of education on wages (Duflo, 2001). In contrast, we examine the impacts of the program on girls' schooling. We first confirm that there appears to be no effect on female education, as previously shown by Breierova and Duflo (2002). We then document that this average effect masks important heterogeneity that depends on a group's specific marriage customs. A positive impact of the program on female education is only observed among girls from ethnic groups that traditionally engage in monetary bride price payments at marriage.

Our empirical analysis shows that these findings are not driven by other cultural factors that are correlated with bride price. In addition, we verify the findings in Indonesia by studying a similar school expansion program that took place in Zambia in the late 1990s and early 2000s, exploiting newly-collected data from the Zambian Ministry of Education. Zambia, like Indonesia, has societies that engage in bride price payments and others that do not. In Zambia, we observe the same patterns in the data. The school expansions had a substantially larger impact on female education among ethnic groups that engage in bride price payments at marriage. We also find that greater female educational attainment is associated with a higher bride price payment at marriage.

We then turn to auxiliary analyses to investigate the mechanisms underlying the differential effect of educational investments due to bride price customs. We show that among ethnic groups that practice bride price, the amount that the bride's family receives as a bride price payment

[1]The custom fits several core reasons why monetizing transactions involving human beings is seen as repugnant. Roth (2007) categorizes concerns about monetization into three classes: 1) concern that putting a price on things moves them into a category of impersonal objects; 2) that offering substantial monetary payments might cause individuals to engage in transactions they would not engage in otherwise, leaving them open to exploitation; and 3) that monetizing certain transactions, while not themselves morally repugnant, could leave to a slippery slope of more repugnant transactions. The first two categories are particularly well-represented in the debate on bride prices (Hague et al., 2011; Mangena and Ndlovu, 2013).

increases with the level of education of the bride. Completing primary school is associated with a 100% increase in the bride price payment, completing junior secondary is associated with a further 40% increase, and completing college with another 100% increase. These relationships are very robust and remain strong even when conditioning on a large set of observable characteristics, as well as potentially endogenous characteristics like the groom's education.

The positive association between female education and bride price payments suggests two possible explanations for the greater impacts of school construction among bride price ethnic groups. One explanation is that groups that engaged in bride price payments at marriage were more likely to take advantage of the increased supply of schools by sending their girls to school because the returns to doing so were higher. Where the bride price was practiced, increased investments in education by parents meant an increase in the amount of bride price received by parents at marriage. For societies that do not pay a bride price at marriage, or societies that pay a symbolic ("token") bride price, this additional return to parents in investments in their daughters' education does not exist. This mechanism arises if daughters cannot credibly commit to paying back their parents *ex post* for educational investments made *ex ante*. Then, the bride price provides a shorter-term and more certain monetary benefit to educating daughters. This mechanism helps to overcome the challenge of incomplete contracting (Gale and Scholz, 1994). Indeed, anthropologists have interpreted the cultural institution of bride price as a compensation to the parents for the years of investment in their daughter, the returns of which the parents themselves are unable to reap.[2] Bau (2014) examines a similar channel and shows that matrilocality has a similar effect on educational attainment of daughters. In societies where daughters live with their family after marriage, rather than with the husband's family, investment in daughters' education is higher. This is consistent with parents being able to recoup a greater return on investments in their daughter when they live with her after marriage.

A second, but related channel through which bride price could influence parental investments in daughters is in its ability to function, like other prices in the economy, as an aggregator and transmitter of information that guides economic decisions—in this case investments in human capital (Hayek, 1945).[3] If parents are uncertain about the returns to education for women, the elasticity of bride price with respect to education may serve as valuable information about the returns to education. This is particularly likely in rural areas, where traditional marriage payments

[2]The Tswana describe the bride-price as expressing gratitude to the bride's parents for the great concern devoted to the upbringing and education of their daughter, and to their great kindness in giving her to the groom in marriage (Schapera, 1938, pp. 138–139).

[3]As is well-known, for price to serve this function it requires very little information to be known by each individual: "The most significant fact about this system is the economy of knowledge with which it operates, or how little the individual participants need to know in order to be able to take the right action. In abbreviated form, by a kind of symbol, only the most essential information is passed on and passed on only to those concerned. It is more than a metaphor to describe the price system as a kind of machinery for registering change, or a system of telecommunications which enables individual producers to watch merely the movement of a few pointers, as an engineer might watch the hands of a few dials, in order to adjust their activities to changes of which they may never know more than is reflected in the price movement." (Hayek, 1945, p.526).

are common, but information about urban or formal-sector wages is difficult to observe.

These two channels may also interact: the bride price may be particularly effective at increasing female education because it simultaneously affects two margins: more precise knowledge of the returns to investments in daughters' education and ability of parents to obtain a larger portion of these returns to educational investments.

Our findings build on and advance the literature that identifies real economic effects of cultural norms (e.g. Algan and Cahuc, 2010). We show that important large-scale development policies can have very different effects on groups depending on the cultural institution of bride price.

Our findings also contribute to a better understanding of the economics of marriage payments. While dowries have received a considerable amount of attention in the economics literature (Botticini, 1999; Botticini and Siow, 2003; Anderson, 2003, 2007b), bride price payments have been the subject of fewer studies, despite the fact that it is relatively widespread (Anderson, 2007a). By exploring the link between bride price and parental investment in daughters in both Indonesia and Zambia, this paper also adds to the literature on the relationship between marriage practices (in particular, virilocality and polygny) and investments in daughters in South-East Asia (Levine and Kevane, 2003) and in Sub-Saharan Africa (Jacoby, 1995; Tertilt, 2005, 2006; Gaspart and Platteau, 2010).

While there may be significant downsides to this cultural practice, particularly if it justifies abuse or lowers bargaining power of women within marriage, our results on the benefits of bride price payments suggest that abolishing or discouraging them should likely be considered alongside additional policies to promote female education.

The remainder of the paper is structured as follows. Section 2 discusses the institutional context of bride price in Indonesia and Zambia. Section 3 presents a simple model of the relationship between bride price customs and education policy. Section 4 examines various datasets from Indonesia. Section 5 replicates the same findings for Zambia. Section 6 concludes.

2 Institutional Context

Bride price is a widespread custom throughout sub-Saharan Africa and many parts of Asia, with significant heterogeneity in how it is practiced and interpreted both within and across countries. Vroklage (1952) writes in detail on the practice of bride price in Indonesia, describing it as

> "a compensation for the expense, the care and trouble spent on the bride's upbringing. [...] It is compensation for the complete loss of a worker as a bride withdraws from her own kindred and henceforth belongs to her husband's."

He adds that the bride price is also a compensation payment for the bride's future children, who will no longer belong to her parents' family.[4] Islam is not mentioned as a potential influence of this custom. The Koran calls for bride price, which is offered to the bride and functions as divorce insurance (Kressel et al., 1977). In contrast, bride price in Indonesia is paid to the bride's parents and is linked to "adat" (traditional culture which predates conversion to Islam) rather than religion. Thus, while in Indonesia both bride price and Islam are common, Indonesian bride price customs do not stem from Islamic bride price customs.

As in much of sub-Saharan Africa, bride price (known as *lobola*) is widespread in contemporary Zambia. In the data from the Zambia Contraceptive Access Study (ZCAS, see Appendix B for a description of the data) in peri-urban Lusaka, bride price was paid in 83 percent of marriages. Bride price amounts and customs vary significantly between tribes. Our focus groups and qualitative interviews suggest that some of the variation in bride price across tribes is driven by the unit of negotiation.[5]

A lively public debate has ensued over the past decades, particularly in Africa, on the downsides of the bride price custom. The objections arise due to the commodification of human beings through a transaction, potentially leading to ill-treatment. Parents may have an incentive to "sell" their daughters early for bride price, and women may feel that they cannot leave a marriage because it would mean their parents would have to return the bride price. In Indonesia, where discussion of the downsides of bride price is less prevalent than in parts of Africa, concerns have been raised about women continually needing to "earn" their bride price through obedience to their husbands (Sitompul, 2009). This issue appears in much starker terms in policy debate in Africa: women's rights group Mifumi in Uganda states that there are cases where men say "I am beating my cows" when they hit their wives, or women being denied ownership of property, and it is noted that women may be expected to be sexually available to their husbands at any time and without protection (Eryenyu, 2014). One housewife in Tanzania described what often happens when bride price is

[4]In his qualitative research, the idea that bride price is equivalent to purchasing a woman is roundly rejected. Interviewees told him, "a bride is not a buffalo" and "a bride is not an animal." Thus, he suggests that patrilineality (when the bride's children trace their lineage through their father) is naturally associated with bride price. While he does mention that there are groups that practice matrilocality (the bride and her husband live with the bride's family after marriage) where bride price is paid to the bride's parents, he observes these customs likely originated in patrilocal societies and were then imitated by matrilocal societies. Matrilocality, which reduces the cost of monitoring and sharing goods with daughters, may also incentivize parents to invest in daughters by increasing the proportion of the returns on their investments they expect to capture. Consistent with this hypothesis, Bau (2014) finds that matrilocality is associated with greater educational investment in daughters relative to sons.

[5]For example, the Tonga people historically negotiated bride price in terms of cows and continue to negotiate in terms of cows to this day. Since cows have grown in value, Tonga bride prices are now thought to be relatively high. In his book *Traditional Marriages in Zambia: A Cultural History*, Chondoka (1988) writes that in areas where cattle were traditionally kept, marriage payments were negotiated in cattle, while in other areas they were negotiated in terms of small valuable items such as iron tools, beads, grain, bark, cloth, animal skins, and money. In Zambia, bride price also functions as a legal proof of marriage, and some churches do not consider a couple married until bride price is paid in full. Therefore, bride price is also important for inheritance and determining the lineage of any children of the marriage since, if a husband dies, it allows a wife to prove in court that they were officially married. Chondoka (1988) writes that traditionally, "marriages were all legalized on delivery of the 'main' payments" (158).

paid, saying, "Unfortunately, this is overdone by some people who end up regarding a woman as mere property." (News, ed, 2006). Citing these stories and the general temptation for parents to marry their daughters off early, many activists have called for the abolishment of bride price as key to ensuring educational attainment for young girls (Mutebi, 2014)[6].

At the same time, many have argued that bride price is a positive tradition of appreciation for women (Mugisha, 2008) that actually creates incentives to educate girls. From the same policy debate in Uganda are the voices of fathers who share their experiences of bride price negotiations, arguing that "education of the girl child should be emphasized in order to improve the family's bargaining power in so far as bride price is concerned" (Muthegheki et al., 2012). Extended focus groups run by our research team in Zambia also suggest that bride price amounts grow in education expenditures: one respondent told us that when a parent negotiates *lobola*, he or she calculates how much was spent on education. Parents are well aware of bride price as a future income stream and view it as a substitute for old age support. For example, one of our respondents told us, "A girl child is business and we all need money" and "For girl children you benefit from charging while with boys support comes from them when you old." Bride-price negotiators know well what increases price amounts; as one described in a focus group: "*lobola* is up with level of education because the family knows that the husband and his household will be beneficiaries." The relationship between education and bride price in Indonesia has led to media articles encouraging any future bride to know her own price, which increases in how learned she is (Tang, 2014).

3 Model

We present here a simple model of parental education decisions that intends to capture the impact of bride price customs on educational outcomes. In this basic framework, bride price payments reward parental investments in their daughters' human capital. When parents are altruistic, they may invest in the education of their daughter as long as she receives a return from it. However, if the daughter cannot commit to repaying them for the sunk investment, parents do not undertake the same investment that the daughter finds optimal. Bride price helps to overcome this intergenerational incomplete contracting problem by ensuring a short-term monetary return to the parents.

There are two simple but important predictions from this model: the first is that even a small amount of bride price can lead to higher education rates as long as there are households on the

[6] An alternative to banning bride price is putting limitations on the practice, such as banning refunds or limiting the amount that can be paid. Kenya's most recent set of marriage laws stipulates that a token bride price must be counted as sufficient to meet the needs of the custom (Dudley, 2014). The Zambian government has similarly spoken out to discourage families from requesting exorbitant amounts for their daughters, but this is not written into law and neither country defines what may be counted as token or exorbitant (Voice, ed, 2014). The local government in Laikipia County, Kenya have instituted a program to give cows to parents whose daughters graduate from high school

margin of making that educational investment. The second prediction is that, without strong assumptions on the nature of the preferences or of the savings technology, bride price does not have an unambiguous impact on the effects of education policy. However, we show that under mild assumptions on the distribution of the returns to education, reducing the cost of schooling has a larger effect on the enrollment rates of ethnicities that engage in bride price payments when enrollment rates are low, as we might expect in a developing country.

3.1 Setup

Parents live for two periods and receive utility from consumption through a felicity function $u(c_t)$ and through the well-being of their daughter V_i^d via an altruism parameter $\gamma \in (0,1)$.[7]

In the first period, they decide how much to consume (c_1) and whether or not to educate their daughter ($E \in \{0,1\}$) at the cost f_E. In the second period, they only decide how much to consume (c_2) and they may receive a bride price premium $BP \in \{0, \pi > 0\}$ if the daughter is educated.

The utility of the daughter $V_i^d(E)$ depends on her educational attainment. Define $\Delta V_i^d = V_i^d(1) - V_i^d(0)$ the daughter's returns to education in household i: these are both labor market and marriage market returns that are enjoyed by the daughter if she is educated. The returns are heterogeneous and randomly distributed with a continuous cdf $G(\ )$ and pdf $g(\ )$. They do not depend on the bride price custom.

Household i solves the following problem:

$$\begin{aligned} max_{E\in\{0,1\},c\geq 0} \quad & u(c_1) + \beta u(c_2) + \gamma V_i^d(E) \\ s.t. & \\ & c_1 + f_E \cdot E \leq y_1 \\ & c_2 \leq y_2 + BP \cdot E \end{aligned} \tag{1}$$

Note that there is no borrowing nor saving. We assume that $y_1 > f_E$, i.e. that the household does not need to borrow to finance the education of the daughter.

3.2 Bride price and education decision

Substituting the budget constraints in the objective function, we have that a household educates the daughter ($E_i = 1$) whenever

$$[u(y_1 - f_E) - u(y_1)] + \beta[u(y_2 + BP) - u(y_2)] + \gamma \Delta V_i^d \geq 0.$$

The household that is on the margin between making the educational investment or not, depending on the bride price custom BP and on the cost of education f_E, has returns to education

[7] $u(c_t)$ is twice-continuously differentiable, strictly increasing, strictly concave and satisfies the Inada conditions.

for the daughter equal to

$$\Delta V_*^d(BP, f_E) = -\frac{[u(y_1 - f_E) - u(y_1)] + \beta[u(y_2 + BP) - u(y_2)]}{\gamma}.$$

Household i makes the educational investment as long as the returns for its daughter are higher than the ones of the marginal household ($\Delta V_i^d \geq \Delta V_*^d(BP, f_E)$). Hence, the probability that household i educates its daughter is:

$$P(E_i = 1|BP, f_E) = P(\Delta V_i^d \geq \Delta V_*^d(BP, f_E)) = 1 - G(\Delta V_*^d(BP, f_E)).$$

Proposition 1. *The probability of education $P(E_i = 1)$ is:*
(i) decreasing in the cost of education;
(ii) higher among ethnicities that engage in bride price payments.

Proof. See Appendix A. □

Proposition 1 simply tells us that we should observe higher rates of enrollment among ethnicities that practice bride price ($BP = \pi > 0$). This result is intuitive: bride price provides an additional incentive for parents to educate their daughter, in addition to altruism.

3.3 Bride price and education policy

We now examine how a change in the cost of education f_E affects the probability of education depending on the bride price custom, in particular on whether $BP = \pi > 0$ or $BP = 0$. For this analysis, we make the simplifying assumption that the daughters' returns to education follow a probability distribution that is single peaked (examples are normal or log-normal distributions).

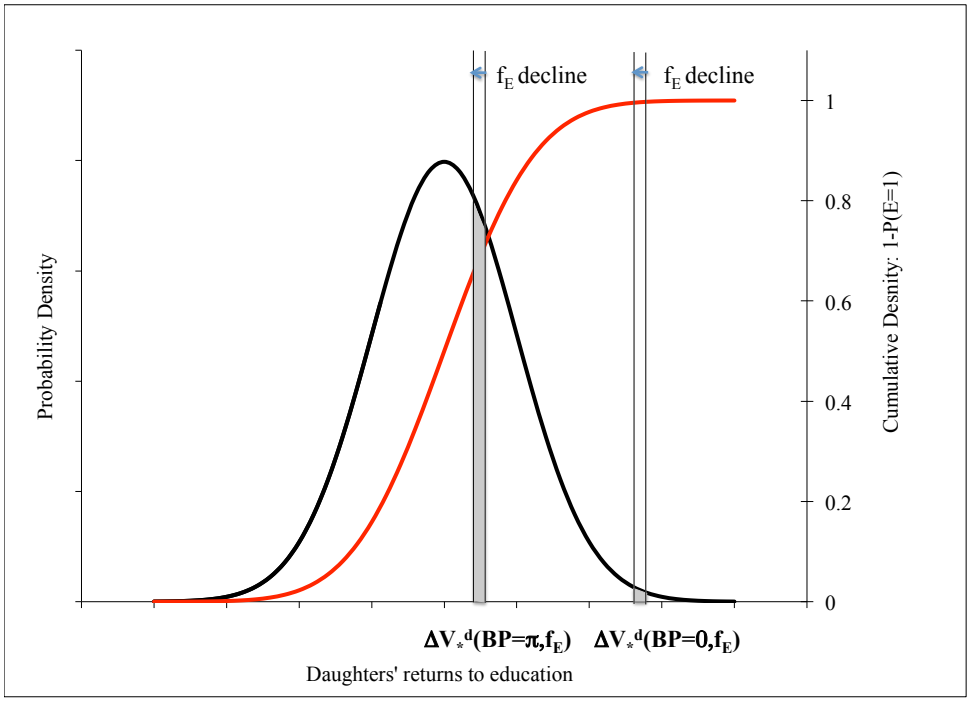
Definition 2. *Education rates are low if a girl with modal returns does not get educated.*

The above definition is somewhat loose because, if the distribution of returns is skewed to the right, the definition applies to cases in which education rates are in fact well above 50%. When the single-peaked probability distribution is symmetric (e.g. a normal distribution), definition 2 becomes more intuitive and translates into education rates that are below 50%, since mode and median then correspond.

Proposition 3. *A drop in the cost of education increases the probability of education more in ethnicities that engage in bride price payments compared to other ethnicities, if education rates are low.*

Proof. See Appendix A. □

Figure 1: Distribution of girls' returns to education and declines in the cost of education



Proposition 3 tells us that, in settings with low rates of schooling, we should observe that ethnicities which engage in bride price payments will be more responsive to changes in the cost of education. On the contrary, we should expect bride price to have the opposite effect when education rates are already high.[8]

Figure 1 provides a simple intuition for this result: when the density of the returns to education is decreasing, a decline in the cost of schooling affects the group with higher schooling rates (bride price ethnicities, in our case) more because this group has higher density on the margin of the educational investment.

Intuitively, in a society where few women are educated, the ones who are must have very high returns from education. The unimodal assumption guarantees, loosely, that there are only a few women with very high or very low returns, relative to the number of women with modal returns. A

[8]This argument is related to one put forth by Fabinger and Weyl (2013), who show that a unimodal distribution of consumer valuations leads to S-shaped demand functions. Then, the elasticity of demand with respect to a price change depends on whether such a change occurs in a part of the demand curve that is concave or convex. Becker et al. (2010) use a similar argument to explain why women's education rates have overtaken those of men in developed countries.

marginal decrease in the cost of education leads women whose returns to education were marginally below the cost of education before to become educated. If women in bride price ethnicities need slightly lower returns in order to get educated relative to women in non-bride-price ethnicities, there will be more women on the margin of responding to the policy change in bride price ethnicities since their returns are closer to the modal returns. In contrast, in a society where most women are educated, the ones who are not must have very low returns. If women in bride price ethnicities need to have even lower returns in order to not get educated relative to women in non-bride price ethnicities, fewer of them will be on the margin of responding to the policy change.

4 Evidence from Indonesia

We begin our empirical analysis by examining data from Indonesia, where bride price payments are widespread. We exploit the same quasi-experimental variation in number of schools built by birth district in Indonesia as in Duflo (2001) and study the differentials effect of school construction policy on schooling by bride price custom.

To investigate the channels by which bride price might influence the impact of education policy, we use bride price information from the Indonesia Family Life Survey (IFLS) of 2000 and 2007 and the Indonesia Intercensal Survey of 1995 to study the association between the bride's education and bride price value and the association between preferences for daughters and bride price. Overall, we document how the custom of bride price is associated with greater investments in daughters.

We use two datasets in our analysis, and link individuals to bride price customs through their ethnicity. The 2007 IFLS contains information on 27 ethnicities. The 1995 Indonesia Intercensual Survey contains finer language information, reporting 174 different languages spoken. We manually match these languages or ethnic groups in the surveys to the ethnic groups in the *Ethnographic Atlas*.[9]

Table 2 presents the distribution of cultural practices for the final 28 ethnic groups in the 1995 Intercensual Survey. Of these groups, 13 have bride price, 2 have bride service, 2 have token bride price, and 3 have gift exchange, 4 have sister or relative exchange, and 4 have nothing. Murdock (1957) provides clear definitions of these categories: bride price marriages are "marriages normally involving a material consideration of which the principal element is a substantial property payment by the groom or his relatives to the kinsmen of the bride;" token bride price marriages are "marriages normally involving only a small or symbolic bride-price as a consideration;" bride service marriages are "marriages normally involving a substantial material consideration of which the

[9]Since the categories in the *Ethnographic Atlas* are less fine than those in the survey data, the concordance matches multiple ethnic groups in the census to a single ethnic group in the *Ethnographic Atlas*, and not all ethnic groups can be matched. For instance, 6 ethnicities in the IFLS cannot be matched to the *Ethnographic Atlas*, comprising 10 percent of the sample of adults asked about their preferences over their children's genders. Similarly, 11 languages in the Indonesia Intercensal survey could not be matched to the *Ethnographic Atlas*, making up 0.43 percent of the data for which a mother tongue was listed.

principal element consists of labor or other service rendered by the groom to the bride's kinsmen;" gift exchange denotes "marriages normally involving a reciprocal exchange of gifts of substantial amount between the relatives of the bride and groom or entailing a continuing exchange of goods and services in approximately equal amounts between the groom or his kinsmen and the brides relatives;" and exchange of sister or female relatives involves "marriages normally involving a consideration in the form of a sister or other female relative of the groom given in exchange for the bride."

Figure 2 graphs the distribution of bride price payments for ethnicities that traditionally make payments at marriage using rounds 3 and 4 of the Indonesia Family Life Survey, while figure 3 graphs the distribution for all non-zero bride price payments (including ethnicities that pay token bride price). In 2000, 87 percent of marriages reported to the IFLS had a dowry or bride price and in 2007, 85 percent of marriages included a dowry or bride price.[10] Table 6 reports summary statistics for bride price marriages for rounds 3 and 4 of the Indonesia Family Life Survey.

We find that across all marriages (i.e., in the full sample), the median bride price is 5 percent of GDP per capita and the mean bride price is 35 percent of GDP per capita. Moreover, if we restrict the sample to ethnicities that we identify as having a bride price custom, the median bride price is 13 percent of GDP per capita and the mean is 57 percent.[11] Therefore, bride price payments are significant, particularly compared to a family's annual income.

4.1 Empirical Analysis

Our empirical strategy exploits variation in bride price customs across tribes. To test if bride price is related to other norms, in separate regressions, we regress an indicator variable for whether a society has a token bride price norm on indicator variables for matrilocality, plow use, female dominant agriculture, the permissiveness of female premarital sex, and polygamy in the global sample of ethnicities from the *Ethnographic Atlas*. To ensure that correlations are not driven by an "Africa effect," we control for regional fixed effects. Exempting ethnicities who practice dowry reduces some of these coefficients in magnitude, but has little effect on the correlations (only 2.61 percent of the ethnicities in the *Ethnographic Atlas* practice dowry).

Since the female agriculture variable in the *Ethnographic Atlas* contains additional information about relative female involvement in agriculture (1= males only, 2=males more, 3=differentiated but equal, 4=equal, undifferentiated, 5=females more, 6=females only), we also run an ordered logit of this variable on bride price, controlling for the area fixed effects and excluding ethnicities who

[10]The IFLS asks about dowry and bride price simultaneously and does not differentiate in their questions. However, according to the IFLS's documentation (RAND, 1999), the transaction is typically bride price except for among the matrilocal Minangkabau, who we omit from the analysis.

[11]We see little evidence of bride price inflation or deflation over time. Marriage year is negatively correlated with bride price, but this correlation is entirely driven by marriages that are reported to have occurred before 1980 (which make up 7 percent of the bride price ethnicity data), and these respondents had to recall bride prices from at least 20 years ago when they responded to the survey.

are not involved in agriculture. The coefficient from this ordered logit is .631 ($p < .01$), indicating that globally bride price is associated with greater female involvement in agriculture, although this does not appear to be the case *within* the countries we study.

4.1.1 Bride price and school construction policy

We consider the impacts of Indonesia's massive school construction program of the 1970s. In 1973, the Indonesian government launched a large-scale school construction program called the Sekolah Dasar INPRES program. Over the course of the next five years, 61,800 primary schools were constructed, leading to an increase in enrollment rates of children aged 7 to 12–from 69 percent in 1973 to 83 percent in 1978 (Duflo, 2001). According to Duflo (2001), this was equivalent to adding an average of 2 schools per 1,000 children enrolled in 1971. Duflo shows that the program causally increased years of schooling completed by male students by 0.27 years and that controlling for a concurrent program which improved sanitation and water allocation only strengthened this result.

First consider the baseline equation from Duflo (2001):

$$y_{idk} = \alpha_k + \alpha_d + \beta_1 I_k^{Post} \times Intensity_d + \sum_j \mathbf{X'}_d \mathbf{I}_k^j \mathbf{\Gamma}_j + \varepsilon_{idk} \tag{2}$$

where i indexes individuals, d district of birth, and k year of birth. y_{idk} is the dependent variable of interest; either the number of years of schooling completed by adult i or an indicator variable that equals 1 if individual i finished primary schooling. α_k and α_d denote cohort (i.e., birth-year) fixed effects and district fixed effects. I_k^{Post} is an indicator variable equal to 1 if an individual belongs to a cohort born between 1968 and 1972 (so that they would have fully experienced the intervention). The untreated cohort is born between 1950 and 1962 (and were already out of school by the time of the intervention). As in the baseline specification of Duflo (2001), partial treatment cohorts are dropped from the analysis. $Intensity_d$ is the number of schools (per 1,000 school- age children) built in birth district d during the school construction program. I_k^j is an indicator variable that equals 1 if individual i's year of birth is equal to j and 0 otherwise, and $\sum_j \mathbf{X'}_d \mathbf{I}_k^j \mathbf{\Gamma}_j$ denotes cohort fixed effects interacted with the following district-level covariates: the number of school-aged children in the district in 1971 before the school building program took place, the enrollment rate of the district in 1971, and the exposure of the district to the second largest INPRES program, a water and sanitation program.

Estimates of equation (2) are reported in columns 1–4 of table 3. In columns 1 and 2, the dependent variable is total years of schooling, while in columns 3–7 it is an indicator variable that equals one if the individual completed primary school, and zero otherwise. Columns 1 and 3 report estimates for the males only, the sample used by Duflo (2001). Columns 2 and 4 report estimates for the females sample. As shown, while one estimates strong effects of the treatment for the sample

of males, the estimated effects are much weaker, and not different from zero, when one examines the female sample.

We now show that these modest impacts mask significant heterogeneity. To do this, we estimate an extension of equation (2) that allows for a differential impact of the school construction program depending on whether an ethnic group practices the tradition of bride price payments:

$$\begin{aligned} y_{iedk} &= \beta_1 I_k^{Post} \times Intensity_d \times I_e^{NoBridePrice} + \beta_2 I_k^{Post} \times Intensity_d \times I_e^{BridePrice} \\ &+\alpha_k I_e^{NoBridePrice} + \alpha_k I_e^{BridePrice} + \alpha_e + \alpha_e I_k^{Post} + \alpha_e Intensity_d + \alpha_d I_e^{NoBridePrice} \\ &+\alpha_d I_e^{BridePrice} + I_e^{NoBridePrice} \sum_j \mathbf{X'}_d \mathbf{I}_k^j \mathbf{\Gamma}_j + I_e^{BridePrice} \sum_j \mathbf{X'}_d \mathbf{I}_k^j \mathbf{\Upsilon}_j + \varepsilon_{iedk} \end{aligned} \quad (3)$$

where all indices and variables are defined as before. Additionally, e indexes the ethnicity of individual i and $I_e^{BridePrice}$ is an indicator variable equal to 1 if ethnic group e traditionally makes non-token bride price payments at the time of marriage, and $I_e^{NoBridePrice}$ is an indicator that equals one if the group does not. The inclusion of $I_k^{Post} \times Intensity_d \times I_e^{NoBridePrice}$ and $I_k^{Post} \times Intensity_d \times I_e^{BridePrice}$ allows us to estimate the impact of school construction seperately for ethnic groups that undertake bride price payments at marriage and those that do not. Thus, β_1 and β_2 are our coefficients of interest.

The specification includes district fixed effects, but now allows the district fixed effects to vary depending on bride price customs of the ethnic group: $\alpha_d I_e^{NoBridePrice}$ and $\alpha_d I_e^{BridePrice}$. As well, these absorb the double interaction components, $Intensity_d \times I_e^{NoBridePrice}$ and $Intensity_d \times I_e^{BridePrice}$, of the triple interaction terms. We also interact the ethnicity fixed effects with the post treatment indicator variable, $\alpha_e I_k^{Post}$. These absorb the double interaction terms $I_k^{Post} \times I_e^{NoBridePrice}$ and $I_k^{Post} \times I_e^{NoBridePrice}$. Lastly, we also allow the impacts of our baseline set of district-level covariates interacted with cohort fixed effects to vary depending on whether ethnicity e practices bride price. Thus, we also control for the following interactions: $I_e^{NoBridePrice} \sum_j \mathbf{X'}_d \mathbf{I}_k^j \mathbf{\Gamma}_j$ and $I_e^{BridePrice} \sum_j \mathbf{X'}_d \mathbf{I}_k^j \mathbf{\Gamma}_j$.

The estimates of equation (3) are reported in column 5 of table 3. As shown, we find a significant differential effect of the school construction program on elementary school completion rates. For ethnic groups without bride price, school construction had no impact. For ethnic groups that practice bride price, it had a positive and significant effect. The point estimates suggest that an increase of 1 school per 1,000 school-aged children in a district increases the likelihood that a female from a bride price ethnicity will complete primary school by 2.4 percentage points. We confirm this finding by estimating equation (3) separately for girls belonging to ethnic groups with bride price (column 6) and for ethnic groups without bride price (column 7).

As a placebo test, we repeat the school construction analyses using the children aged 12–17 at the time of the school construction as the treated cohort. The placebo untreated cohort is the cohort aged 18-24. Table 4 shows that there are no significant effects on this untreated cohort.

Because the school construction program built elementary schools, we focus our analysis on the elementary school completion rates. Greater access to primary schools logically should not explain variation in years of education past elementary school. Consistent with this, we find that the results examining years of schooling are similar but less precise. In addition, we confirm our findings from the 1995 Indonesian Intercensal Survey using data from the 2010 Indonesian Census, which reports elementary school completion, but not educational attainment. One benefit of the 2010 data over the 1995 data is the much larger sample size of over 1.7 million observations. The estimates, which are reported in table 5, show results that are qualitatively similar to the estimates using the 1995 data.

4.1.2 Bride price amounts and educational attainment

We next turn to an examination of the specific mechanisms underlying the concentrated benefit of the school construction program among ethnic groups that practice bride price. To do this, we begin by examining the spouses' characteristics that are correlated with the amount of the bride price paid at the time of marriage. We do so by analyzing cross-sectional variation from two rounds of the Indonesia Family Life Survey (2000 and 2007). Table 6 provides summary statistics from rounds 3 and 4 of the Indonesia Family Life Survey.

We first estimate the following hedonic regression:

$$\begin{aligned} \ln BridePrice_{iet} &= \alpha_t + \beta_1 I(PrimarySchool)_i + \beta_2 I(Junior\ Secondary)_i + \beta_3 I(College)_i \\ &\quad + \gamma_1 MarriageAge_i + \gamma_2 MarriageAge_i^2 + \varepsilon_{iet} \end{aligned} \tag{4}$$

where i indexes married women, e ethnic groups, and t the survey year (2000 or 2007). $BridePrice_{iet}$ is the reported amount of the bride price paid at the time of marriage. $MarriageAge_i$ is the age of individual i when married, $I(PrimarySchool)_i$ is an indicator variable that equals one if individual i has completed primary school, $I(Junior\ Secondary)_i$ is an indicator variable equal to 1 if an individual has completed junior secondary school, and $I(College)_i$ is an indicator for having completed college. α_t is a survey-year fixed effect (in some specifications, we also control for ethnicity-survey-year fixed effects rather than survey-year fixed effects).

In additional regressions, we also include potentially endogenous covariates that are specific to a woman's marriage market outcomes: her husband's education, her husband's age at the time of marriage, and their household assets at the time of the survey.

Estimates of equation (4) are reported in table 8. Columns 1–3 report estimates that include the indicator variables for completion of primary school, junior secondary school, or college, separately. In column 4, the variables are included in the same regression. Columns 5–8 report the same regressions but in a specification that includes ethnicity-survey-year fixed effects rather than just

survey-year fixed effects. This captures any potential cross-ethnicity differences in norms regarding bride price amounts, income, etc. The results are very similar to those in columns 1–4.

The estimates show that more educational attainment of the bride is strongly associated with a higher bride price payment received at marriage. According to the estimates reported in column 8, completion of primary school is associated with a 97% increase in bride price payments (relative to no schooling), completion of junior secondary school is associated with an additional 37.6% increase in bride price payments, and completion of college is associated with an additional 101% increase. According to the estimates, parents of women with a college degree, on average, receive bride price payments that are 235% higher than for parents of women without completed primary education.

Table 9 reports estimates that include husband's education, husband's age (and age squared) at the time of marriage, and the value of household assets at the time of the survey. Although the estimates must be taken with the caveat that the additional covariates are potentially endogenous to our variables of interest, they are consistent with the estimates from table 8. The potentially-endogenous variables absorb part of the effect of education on bride price amount, but the relationship between a bride's educational attainment and bride price remains large, positive and statistically significant.

Overall, the estimates reported in tables 8 and 9 are consistent with a bride's education having a very large impact on the amount of bride price that the bride's parents receive at the time of marriage.

4.1.3 Bride price and school enrollment

We next turn to an examination of the relationship between an ethnic group's bride price practices and female schooling. We have shown that more educated brides receive a higher bride price. We now examine variation in schooling enrollment across ethnic groups and ask whether girls are more likely to be enrolled in school (relative to boys) in ethnic groups that engage in bride price payments at marriage.

Our estimating equation is:

$$\begin{aligned} I_{ie}^{Enrolled} &= \alpha + \beta_1 I_e^{BridePrice} + \beta_2 I_e^{BridePrice} \times I_i^{Female} \\ &\quad + \beta_3 I_e^{Matrilocal} + \beta_4 I_e^{Matrilocal} \times I_i^{Female} + \beta_5 I_e^{Agriculture} + \beta_6 I_e^{Agriculture} \times I_i^{Female} \\ &\quad + \beta_7 I_i^{Female} + \beta_8 Age_i + \beta_9 Age_i^2 + \varepsilon_{ije}. \end{aligned} \tag{5}$$

where i indexes children aged 5–22, j indexes households, and e indexes ethnicity. The sample consists of all children from the 1995 Indonesia Intercensal Survey. The dependent variable $I_{ije}^{Enrolled}$ is an indicator variable that equals one if individual i from household j and ethnicity e is enrolled in school. I_i^{Female} is an indicator variable that equals one if individual i is female; as before, $I_e^{BridePrice}$ is an indicator variable that equals one if ethnicity e traditionally engages in the practice of bride

price payments at marriage. The variable of interest is the interaction between the indicator for a bride price ethnicity and the individual being female $I_e^{BridePrice} \times I_i^{Female}$. The coefficient for the variable β_2 provides an estimate of the extent to which girls are more likely to be enrolled in school (relative to boys) in bride price ethnic groups relative to non-bride price groups.

An important concern is that an ethnic group's traditional marriage practices may be correlated with other ethnicity-level characteristics that also affect an ethnic group's education of girls relative to boys. Given this, we also include an indicator variable that equals one if an ethnic group was traditionally matrilocal $I_e^{Matrilocal}$, meaning that married couples customarily live with the bride's family rather than the groom's. As Bau (2014) shows, this custom is associated with increased female education (relative to male education). We also control for a measure of the extent to which women (relative to men) traditionally practiced agriculture, which may affect the incentives to educate daughters relative to sons. According to Boserup (1970), societies in which bride price is prevalent also tend to have more female dominated agriculture, and Giuliano (2014) confirms this empirical association using data from Murdock's *Ethnographic Atlas*. Therefore, we include an indicator variable $I_e^{Agriculture}$ that is equal to 1 if ethnicity e is reported as traditionally having most or all agricultural work done by females in the *Ethnographic Atlas*. We also include the interaction of both variables with I_i^{Female}.

Estimates of equation (5) are reported in table 10. Columns 1 and 2 report the basic relationship between the ethnicity-level covariates (not interacted with gender) and enrollment, separately for females and males. Among females (column 1), there is a positive (though insignificant) relationship between bride price practices and enrollment in school. Among males (column 2), the positive relationship is much smaller in magnitude. This difference can be seen more clearly in column 3, which reports estimates of equation (5). Here it is shown that societies that practice bride price invest more in daughters' education (relative to sons' education) than societies that do not. This result is robust to controlling for differential effects of matrilocality and traditional participation of women in agricultural activities. Interestingly, the estimates also show that, consistent with Bau (2014), matrilocal ethnic groups educate daughters more (relative to sons). They also show that ethnic groups where women traditionally participate in agriculture also educate daughters more. This may be due to the fact that traditional female participation in agriculture is associated with increased female labor force participation today (Alesina et al., 2013) and therefore with higher returns to education.

Column 4 of table 10 reports a variant of equation (5) that include ethnicity fixed effects. Because these absorb the direct effect of $I_e^{BridePrice}$, $I_e^{Matrilocal}$, and $I_e^{Agriculture}$, these variables are no longer in the equation. We are only able to estimate the interaction between these variables and I_i^{Female} i.e., the differential effect of these factors on the education of girls relative to boys. Column 5 reports the same specification, but with finer household fixed effects in place of ethnicity fixed effects. Our result of interest remains robust. Families from ethnic groups that traditionally

practice bride price payments at marriage have higher rates of female enrollment, relative to boys, than families from ethnic groups that do not.

4.1.4 Bride price and preferences for daughters

Since ethnic groups that engage in the practice of bride price receive higher payments at marriage, there is a greater monetary benefit to having a daughter. Therefore, this practice may induce a greater preference for daughters among bride-price ethnicities relative to those that do not. We test whether such a relationship exists by estimating the following equation:

$$AdditionalGirls_{iet} = \alpha_t + \beta_1 I_e^{BridePrice} + \beta_2 I_e^{Matrilocal} + \beta_3 I_e^{Agriculture} + \mathbf{X}_{it}\mathbf{\Gamma} + \varepsilon_{iet} \qquad (6)$$

where i indexes parents in rounds 3 and 4 of the Indonesia Family Life Survey, e indexes ethnic groups, and t the survey year (2000 or 2007). $AdditionalGirls_{iet}$ is the number of additional girls desired by parent i. α_t indicates fixed effects for the year of the survey. $\mathbf{X}_{it}$ indicates a vector of individual-level covariates, including: fixed effects for the number of sons (under 15) in the household; fixed effects for the number of daughters (under 15) in the household; fixed effects for the self-reported desired number of additional boys; fixed effects for the respondent's age; and a gender indicator variable. Since our outcome of interest is the effect of bride price on ideal number of daughters, we control for current number of daughters. Since additional number of daughters desired is likely a function of both total number of children desired and current number of sons, we also include fixed effects for the current number of sons and fixed effects for the number of additional sons desired.

The estimates of equation (6) are reported in table 11. The estimates show a greater self-reported desire to have more daughters, all else equal, among ethnic groups that engage in bride price payments at marriage. Consistent with the logic of Bau (2014), matrilocality is also associated with a greater preference for daughters, as is a tradition of female participation in agriculture.

5 Evidence from Zambia

Having identified important heterogeneous impacts of the 1970s Indonesian school construction project on female education, we now show that this finding is replicated in a very different context, Zambia in the late-1990s and early-2000s. There are a number of reasons that we examine Zambia. Most importantly, Zambia, like Indonesia features ethnic groups that practice bride price payments at marriage and those that do not. Also like Indonesia, there was a large school construction program in the late 1990s and early 2000s. Although the school construction occurred over a longer timespan and the process of choosing the location and timing of school construction is more opaque than in Indonesia, this episode provides variation in school construction similar to that in Indonesia. An additional benefit of Zambia is that, like Indonesia, there are sources of data that

report information on bride price payments, and their determinants. A final benefit of Zambia is that in many dimensions – culturally, economically, historically, and geographically – it is very different from Indonesia.

5.1 Empirical analysis

Table 12 shows the distribution of marriage payments across the ethnic groups from the Zambian Demographic and Health Surveys (DHS). As reported, ethnic groups either practice bride price payments, token bride price, or bride service. The Zambian DHS report 52 distance ethnic groups for the respondents. Of the 52 ethnicities, we are able to match 48 of them to 20 related and representative groups in the *Ethnographic Atlas*. The remaining four groups are very small and they comprise less than 0.01 percent of the DHS sample.

To determine whether bride price is related to other norms that may influence female education in Zambia, we examine the relationship between the presence of a bride price norm and other gender-related norms. Many norms we expect to be related to gender preferences are homogeneous across Zambian ethnic groups. The plough is not aboriginal for *any* Zambian groups and *all* groups historically practice some form of polygamy. In contrast, matrilocality is strongly negatively correlated with bride price norms ($\rho = -.792$, $p < .01$) consistent with the idea that matrilocality and bride price are substitutes. Within Zambia, there is no significant relationship between female dominance in agriculture and bride price ($\rho = -.045$), although data on gender differences in agriculture are only available for 15 of the 20 ethnic groups from the *Ethnographic Atlas*.

Since the female agriculture variable in the *Ethnographic Atlas* contains additional information about relative female involvement in agriculture (1=males only, 2=males more, 3=differentiated but equal, 4=equal, undifferentiated, 5=females more, 6=females only), we also run an ordered logit of this variable on bride price, excluding ethnicities that are not involved in agriculture. The coefficient from this ordered logit is very close to zero and not statistically different from zero. In fact, there is little variation in female agricultural involvement in Zambia. In 11 of the 15 ethnicities for which we have data, females were traditionally "more involved" in agriculture than males. Looking at the census, 91 percent of individuals belong to an ethnic group that traditionally had females that were traditionally "more involved" in agriculture than males.

5.1.1 Bride price and school construction policy

To examine the effect of a large school expansion program on enrollment by bride price customs, we use data provided by the Zambian Ministry of Education. Figure 5 graphs the number of schools built by year in Zambia between 1940 and 2013. Figure 6 reports the number of schools constructed by province. The data indicate that there was a large school construction boom between the mid-1990s and the early-2000s, a total of 5,649 schools were built between 1994 and 2007.

In replicating our findings from Indonesia in the Zambian context, we maintain specifications that are as similar as possible, given data availability, to the specifications we have used for Indonesia.

We begin by estimating a variant of equation (3) using a sample of children aged 5 to 12 available from three rounds of the DHS. The earliest round is from 1996, a time period right before the school construction episode.The second is from 2001, during the middle of the episode, and the third is from 2007, at the end of the episode. Unlike the Indonesian setting, examined by Duflo (2001), here construction occurred over a longer period of time and the strategy for building the schools was less clear. Therefore, rather than examining variation arising from the interaction between pre-treatment and post-treatment cohorts with the spatial variation in treatment intensity, in our panel setting, we estimate the relationship between the stock of schools in a district and time period and the average enrollment of children aged 5 to 12 in the same district and time period. As before, we examine differences in the impacts of boys versus girls, and for girls, we examine differences in the ethnic groups that practice bride price and those that do not.

Our estimating equation is:

$$\begin{aligned} y_{iedkt} &= \beta_1 Schools_{dt}/Area_d \times I_e^{NoBridePrice} + \beta_2 Schools_{dt}/Area_d \times I_e^{BridePrice} \\ &\quad + \alpha_k I_e^{NoBridePrice} + \alpha_k I_e^{BridePrice} + \alpha_{et} + \alpha_{ed} + \varepsilon_{iedkt} \end{aligned} \tag{7}$$

where i indexes children, e ethnic groups, d districts, k age of child at the time of the survey, and t the year of the survey (1996, 2001 or 2007). Our outcome of interest is an indicator variable that equals one if child i is enrolled in school at the time of the survey (year t): y_{iedkt}. Our measure of school construction is given by $Schools_{dt}/Area_d$, which is the number of schools in district d and year t. As before, $I_e^{BridePrice}$ is an indicator variable that equals one if ethnic group e practices bride price payments at marriage, while $I_e^{NoBridePrice}$ is an indicator variable that equals one if the ethnic group does not.

The specification also includes age fixed effects interacted with the bride price indicator variables, $\alpha_k I_e^{NoBridePrice}$ and $\alpha_k I_e^{BridePrice}$. These are the equivalent of the cohort fixed effects interacted with the bride price indicator variables in equation (3). We also include ethnicity-time period fixed effects, α_{et}, and ethnicity-district fixed effects, α_{ed}, which are the equivalent of the ethnicity fixed effects interacted with the post treatment indicator variable, and the district fixed effects interacted with the bride price indicator variables in equation (3).

Estimates of equation (7) are reported in table 14. Columns 1–3 first estimate a variant of equation (7), where we do not allow for a differential effect by bride price customs. These estimates show that a similar story emerges for Zambia as for Indonesia. Among boys and girls, there is some weak evidence that school construction increases enrollment (column 1). This effect is concentrated amongst boys (column 2) and the estimated impact for girls is very close to zero (column 3).

Column 4 reports the estimate of equation (7). As in Indonesia, the positive impacts of school

construction are concentrated among girls from ethnic groups that traditionally practice bride price payments at marriage. Columns 5 and 6 confirm this by estimating equation (7) separately for the two sets of ethnic groups.

5.1.2 Bride price amounts and educational attainment

We next investigate the relationship between the amount of bride price paid at the time of marriage and the bride's characteristics; her education in particular. To do so, we use data collected by Ashraf et al. (2013) in 2006 as part of an experimental study on family planning called the Zambia Contraceptive Access Study (ZCAS).[12]

Table 15 reports summary statistics for the key variables. Fifty five percent of wives have completed primary education, while less than 24 percent have completed junior secondary education. Educational attainment is substantially higher among husbands, with 93 percent completing primary school and 70 percent completing junior secondary school.

To assess the empirical relationship between bride price payments and educational attainment, we estimate the following hedonic regressions for individual i, belonging to ethnic group e:

$$\begin{aligned} \ln BridePrice_{ie} &= \alpha_e + \beta_1 I(Primary)_i + \beta_2 I(JuniorSecondary)_i \\ &\quad + \gamma_1 MarriageAge_i + \gamma_2 MarriageAge_i^2 + \mathbf{X}_i\mathbf{\Gamma} + \varepsilon_{ie}. \end{aligned} \tag{8}$$

where the dependent variable, $\ln BridePrice_{i.e.}$, is the natural logarithm of the amount paid at marriage the time of marriage. We measure education using an indicator variable $I(Primary)_i$ that equals one if the bride has completed primary education (and zero otherwise) and an indicator variable $I(JuniorSecondary)_i$ that equals one if the woman has completed junior secondary education. The variable $MarriageAge_i$ is the age of the bride at the time of marriage.

Estimates are reported in table 16. Columns 1–3 report estimates of equation (8) without ethnicity fixed effects, while columns 4–6 include ethnicity fixed effects. The estimates indicate that, as in Indonesia, the bride price payments received at the time of marriage increase with the education of the bride. The estimates of columns 3 and 6 suggest that having completed primary school is associated with a 27 percentage point increase in the bride price payment, while completing junior secondary school is associated with another 44 percentage point increase.

We next include a vector of potentially endogenous covariates. These include an indicator of whether the husband has completed primary school or junior secondary school, the husband's age at marriage (and age squared), an indicator variable if the couple reports that the husband is from a wealthier family than the bride's, and an indicator variable that equals one if the marriage is polygamous. The estimates are reported in table 17. Although the coefficients of the education variables, β_1 and β_2 decrease slightly, they remain positive and of a similar magnitude.

[12] See Appendix A for further details.

5.1.3 Bride price and school enrollment

To examine the relationship between bride price customs and school enrollment, we use the sample of all school-aged children (5-22) in the pooled 1996, 2001, and 2007 Zambia DHS.[13]

We estimate the following equation:

$$\begin{aligned} I_{ijet}^{Enrolled} &= \alpha_e + \alpha_t + \beta_1 I_i^{Female} + \beta_2 I_i^{Female} \times I_e^{BridePrice} \\ &\quad + \beta_3 I_i^{Female} + \mathbf{X}_{ij}\mathbf{\Gamma} + \varepsilon_{ijet} \end{aligned} \tag{9}$$

where $I_{ijet}^{Enrolled}$ is the dependent variable of interest: an indicator variable for whether an individual i from household j and ethnicity e was enrolled in school. I_i^{Female} is an indicator variable that equals one if individual i is female, and $I_e^{BridePrice}$ is an indicator variable that equals one if ethnicity e traditionally engages in the practice of bride price. The vector $\mathbf{X}_{ije}$ includes an indicator variable for whether females traditionally had a dominant role in agriculture, an indicator variable equal to one if ethnicity e was traditionally matrilocal, and an indicator variable for whether historical community size was greater than 50, and an indicator variable for their interactions with I_i^{Female}. $\mathbf{X}_{ij}$ also includes individual i's age, age squared, a gender indicator variable, and in some specifications, household fixed effects. α_e denotes ethnicity fixed effects, which absorb the direct effects of the ethnicity-specific variables $I_e^{BridePrice}$, $I_e^{Agriculture}$, and $I_e^{CommunitySize}$, and α_t denotes survey round fixed effects. The indicator variable $I_e^{Agriculture}$ equals one if, according to the *Ethnographic Atlas*, the ethnic group has "equal participation" or "female appreciably more" participation in agriculture. The remaining options present in Zambia are "missing data" and "males appreciably more." In Zambia, there is relatively little variation in agricultural practices, with 76 percent of the sample in the "female appreciably more" group. The indicator variable $I_e^{CommunitySize}$ equals one if the mean size of historical communities is greater than 50, and 0 otherwise. The relevant categories in the *Ethnographic Atlas* for Zambia are "fewer than 50," "50-99," "100-199," and "200-399." While the *Ethnographic Atlas* codes for community sizes as great as "50,000 or more," there are no matched ethnic groups in Zambia with such large historical community sizes.[14]

Estimates are reported in table 18. Columns 1 and 2 reports estimates of the relationship between bride price and enrollment for girls only and for boys only. Belonging to an ethnic group that practices bride price is associated with a 4 percentage points higher probability of enrollment among girls, but no relationship among boys. Columns 3 and 4 reports estimates of equation (9), without and with ethnicity fixed effects. The positive and significant coefficients for $I_i^{Female} \times$

[13] See Appendix A for further details.

[14] Unlike our regressions of daughter preferences and school enrollment in Indonesia, this regression includes a control for an ethnicity's historical community size from the *Ethnographic Atlas*. In Indonesia, we cannot include the community size indicator variable since community size data are missing for 32 percent of the sample. Moreover, 82 percent of the sample for which community size is not missing belongs to the same historic community size category (towns of 5,000–50,000).

$I_e^{BridePrice}$ confirms the differential relationship between bride price and school enrollment for girls relative to boys. In column 5, we replace ethnicity fixed effects with household fixed effects. The estimate of interest is very similar in this case.

5.1.4 Bride price and preferences for daughters

We next examine the relationship between bride price and parental preferences for daughters. To do so, we use data from the *Demographic and Health Survey* from 1996, 2001 and 2007. The survey contains the following question, aimed at measuring the desired fertility of parents: "How many of these children [your ideal number of children] would you like to be boys, how many would you like to be girls and for how many would the sex not matter?"[15] We assess whether parents that anticipate receiving a bride price report a higher ideal number of daughters by estimating the following equation:

$$Ideal\,Girls_{iet} = \alpha_t + \beta I_e^{BridePrice} + \mathbf{X}_{it}\mathbf{\Gamma} + \mathbf{X}_e\mathbf{\Omega} + \varepsilon_{iet} \tag{10}$$

where $i$indexes individuals, e ethnic groups, and t survey years.

The dependent variable $Ideal\,Girls_{iet}$ is the ideal number of daughters reported by the respondent. As before, $I_e^{BridePrice}$ is an indicator variable that equals one if the ethnic group has a non-token bride price, and zero otherwise. The vector of individual-level controls $\mathbf{X}_{it}$ include age fixed effects, a control for the respondent's gender, fixed effects for the respondent's current number of sons and for their current number of daughters, and fixed effects for the respondent's ideal number of total children (both genders). The vector of ethnicity-level controls $\mathbf{X}_e$ includes $I_e^{Agriculture}$ and $I_e^{CommunitySize}$. α_t denotes survey year fixed effects.

Estimates of equation (10) are reported in table 19. Parents who belong to ethnicities that practice bride price report preferring 0.135 more daughters compared to ethnicities that do not engage in the practice. This corresponds to a 6 percent increase in the preference for daughters relative to the average.

6 Conclusion

Our analysis has documented a, perhaps surprising, economic consequence of the traditional practice of bride price payments, which is prevalent in many parts of the world, including most of sub-Saharan Africa and many parts of Asia.

Revisiting one of the best studied historical development projects – the Sekolah Dasar INPRES

[15]The survey contains information about the desired fertility of both the male and the female head of the household. Mothers report a slightly higher ideal number of daughters than sons (2.267 vs. 2.151), while fathers report a slightly higher ideal number of sons than daughters (2.251 vs. 2.145). Both differences are statistically significant at the 1 percent level.

school construction program in Indonesia – we have shown that the impacts of the school-building project on female education depended critically on this cultural trait. For ethnic groups that traditionally make bride price payments at marriage, the increased supply of schools resulted in a significant increase in female education. However, for those without this custom, the increase in the number of schools had no impact on female education.

To better understand the mechanisms behind this differential effect, we then documented that for groups practicing bride price payments, higher female education at marriage is associated with a significantly higher bride price payment received. Thus, the bride price provides a greater incentive for parents to invest in girls' education, and it is these parents that are more likely to take advantage of the increased supply of schools by educating their daughters.

We also replicated these same findings in Zambia, where we exploit a similar school expansion program that took place in the early 2000s. We find effects in Zambia to be qualitatively identical to those in Indonesia. The impact of the school building program on female education is concentrated among ethnic groups that traditionally make bride price payments at the time of marriage. As in Indonesia, the value of the bride price received at marriage increases with the education of the bride.

We believe that our finding provides a number of important lessons. First, while there may be significant downsides to a bride price tradition, our results suggest that any change to this cultural custom should likely be considered alongside additional policies to promote female education. Second, our findings also highlight the importance of the cultural and social norms of a society, and how they can be critically in determining the success of large-scale development policies.

7 Tables

Table 1: Correlations Between Bride Price and Other Practices in the Ethnographic Atlas

	(1)	(2)	(3)	(4)	(5)
	Indicator variable for bride price practice				
$I(Matrilocal)_e$	-0.176***				
	(0.033)				
$I(Plow)_e$		-0.093			
		(0.060)			
$I(FemaleAgriculture)_e$			0.042		
			(0.035)		
$I(FemalePremaritalSexPermitted)_e$				0.024	
				(0.036)	
$I(Polygamy)_e$					0.197***
					(0.035)
Constant	0.545***	0.529***	0.448***	0.450***	0.349***
	(0.011)	(0.012)	(0.016)	(0.023)	(0.031)
Fixed Effects	Region	Region	Region	Region	Region
Number of observations	1,229	1,246	946	570	1,219
Adjusted R^2	0.494	0.487	0.451	0.444	0.502

Notes: This table uses data from the *Ethnographic Atlas* to regress indicator variables for bride price practice on indicator variables for the practice of other network norms. An observation is a society. Each regression includes fixed effects for the sub-continental region that a society inhabits.

Table 2: Distribution of Marriage Norms in Indonesia

	Number of ethnic groups
Bride Price	13
Bride Service	2
Token Bride Price	2
Gift Exchange	3
Exchange of Sister or Female Relative	4
Nothing	4

Notes: This table documents how many of the ethnic groups in Indonesia practice each marriage norm, according to the match between the *Ethnographic Atlas* and the 1995 Indonesian Intercensal Survey. The norms are defined as follows: (1) bride price denotes "marriages normally involving a material consideration of which the principal element is a substantial property payment by the groom or his relatives to the kinsmen of the bride," (2) bride service denotes "marriages normally involving a substantial material consideration of which the principal element consists of labor or other service rendered by the groom to the bride's kinsmen," (3) token bride price denotes "marriages normally involving only a small or symbolic bride-price as a consideration," (4) gift exchange denotes "marriages normally involving a reciprocal exchange of gifts of substantial amount between the relatives of the bride and groom or else entailing a continuing exchange of goods and services in approximately equal amounts between the groom or his kinsmen and the bride's relatives," and (5) exchange of sister or female relative denotes "marriages normally involving a consideration in the form of a sister or other female relative of the groom given in exchange for the bride" (Murdock, 1957).

Table 3: Bride Price Status and the INPRES School Expansion in the 1995 Indonesia Intercensal Data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Years of schooling		**Indicator variable for completion of primary school**				
	Males	Females	Males	Females	Females	B.P. Females	Non B.P. Females
$I_k^{Post} \times Intensity_d$	0.138***	0.041	0.012*	-0.002		0.023**	-0.001
	(0.052)	(0.052)	(0.006)	(0.007)		(0.012)	(0.010)
$I_k^{Post} \times Intensity_d \times I_e^{BridePrice}$					0.024**		
					(0.012)		
$I_k^{Post} \times Intensity_d \times I_e^{NoBridePrice}$					-0.001		
					(0.010)		
Ethnicity FEs $\times I_k^{Post}$	N	N	N	N	Y	Y	Y
Ethnicity FEs	N	N	N	N	Y	Y	Y
Ethnicity FEs $\times Intensity_d$	N	N	N	N	Y	Y	Y
District FEs $\times I_e^{BridePrice}$	N	N	N	N	Y	N	N
Duflo Controls $\times I_e^{BridePrice}$	N	N	N	N	Y	N	N
Duflo Controls	Y	Y	Y	Y	Y	Y	Y
District FEs	Y	Y	Y	Y	Y	Y	Y
Cohort FEs $\times I_e^{BridePrice}$	N	N	N	N	Y	N	N
Cohort FEs	Y	Y	Y	Y	Y	Y	Y
Number of observations	75,281	76,947	75,286	76,959	64,426	9,707	55,696
Number of clusters	258	255	258	255	239	155	217
Adjusted R^2	0.176	0.249	0.124	0.179	0.185	0.174	0.185

Notes: Education attainment data is taken from the 1995 Indonesia Intercensal Survey and merged with ethnicity level norm data from Murdock's (1967) *Ethnographic Atlas*. I_k^{Post} refers to the treated cohort, born between 1968 and 1972. The untreated cohort is born between 1950 and 1962. The treatment level is the number of schools built in a district per 1,000 people in the school-aged population. All regressions include district-of-birth fixed effects, cohort fixed effects, and the interaction of cohort fixed effects with number of school-aged children in the district in 1971, with enrollment rate in 1971 and with the regency level implementation of a water and sanitation program under INPRES. The subscript d indexes districts, i individuals, k cohorts, and e ethnic groups.

Table 4: Placebo Test of Bride Price Status and the INPRES School Expansion Results in the 1995 Indonesia Intercensal Data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Years of Schooling		**Indicator variable for completion of primary school**				
	Males	Females	Males	Females	Females	B.P. Females	Non B.P. Females
$I_k^{PlaceboPost} \times Intensity_d$	0.007	0.003	-0.004	-0.006		0.015	-0.004
	(0.040)	(0.037)	(0.006)	(0.005)		(0.014)	(0.007)
$I_k^{PlaceboPost} \times Intensity_d \times I_e^{BridePrice}$					0.015		
					(0.014)		
$I_k^{PlaceboPost} \times Intensity_d \times I_e^{NoBridePrice}$					-0.005		
					(0.007)		
Ethnicity-cohort FEs $\times Intensity_d$	N	N	N	N	Y	Y	Y
Ethnicity FEs $\times Indensity_d$	N	N	N	N	Y	Y	Y
District FEs $\times I_e^{BridePrice}$	N	N	N	N	Y	Y	Y
Duflo Controls $\times I_e^{BridePrice}$	N	N	N	N	Y	N	N
Duflo Controls Y	Y	Y	Y	Y	Y	Y	
District FEs	Y	Y	Y	Y	Y	Y	Y
Cohort FEs	Y	Y	Y	Y	Y	Y	Y
Number of observations	54,809	53,632	54,812	53,640	45,102	6,833	38,966
Number of clusters	254	247	254	247	232	140	210
Adjusted R^2	0.146	0.197	0.100	0.137	0.135	0.158	0.128

Notes: Education attainment data is taken from the 1995 Indonesia Intercensal Survey and merged with ethnicity level norm data from Murdock's (1967) *Ethnographic Atlas*. $I_k^{PlaceboPost}$ refers to the placebo treated cohort, who are aged 12-17 in 1974. The placebo untreated cohort is aged 17-24 in 1974. The treatment level is the number of schools built in a district per 1,000 people in the school-aged population. All regressions include district-of-birth fixed effects, cohort fixed effects, and the interaction of cohort fixed effects with number of school- aged children in the district in 1971, with enrollment rate in 1971 and with the regency level implementation of a water and sanitation program under INPRES. The subscript d indexes districts, i individuals, k cohorts, and e ethnic groups.

Table 5: Bride Price Status and the INPRES School Expansion in the 2010 Census Data

	(1)	(2)	(3)	(4)	(5)
	Indicator variable for completion of primary school				
	Males	Females	Females	B.P. Females	Non B.P. Females
$I_k^{Post} \times Intensity_d$	0.016*	0.011		0.017**	-0.015
	(0.009)	(0.010)		(0.008)	(0.011)
$I_k^{Post} \times Intensity_d \times I_e^{BridePrice}$			0.017**		
			(0.008)		
$I_k^{Post} \times Intensity_d \times I_e^{NoBridePrice}$			-0.015		
			(0.011)		
Ethnicity-cohort FEs $\times Intensity_d$	N	N	Y	Y	Y
Ethnicity FEs $\times Indensity_d$	N	N	Y	Y	Y
District FEs $\times I_e^{BridePrice}$	N	N	Y	Y	Y
Duflo Controls $\times I_e^{BridePrice}$	N	N	Y	N	N
Duflo Controls	Y	Y	Y	Y	Y
District FEs	Y	Y	Y	Y	Y
Cohort FEs	Y	Y	Y	Y	Y
Number of observations	1,747,727	1,700,856	1,700,436	476,176	1,224,260
Adjusted R^2	0.116	0.176	0.194	0.196	0.183
Clusters	263	263	263	263	259

Notes: Education attainment data is taken from the 2010 Indonesia Census and merged with ethnicity level norm data from Murdock's (1967) *Ethnographic Atlas*. I_k^{Post} refers to the treated cohort, born between 1968 and 1972. The untreated cohort is born between 1950 and 1962. The treatment level is the number of schools built in a district per 1,000 people in the school-aged population. All regressions include district-of-birth fixed effects, cohort fixed effects, and the interaction of cohort fixed effects with number of school-aged children in the district in 1971, with enrollment rate in 1971 and with the regency level implementation of a water and sanitation program under INPRES. The subscript d indexes districts, i individuals, k cohorts, and e ethnic groups.

Table 6: Summary Statistics From the IFLS

	(1) Mean, All	(2) SD, All	(3) N, All	(4) Mean, 2000	(5) SD, 2000	(6) N, 2000	(7) Mean, 2007	(8) SD, 2007	(9) N, 2007
				Summary Statistics for Couples with Bride Price, IFLS					
$MarriageAge_i$	22.400	6.556	5,594	21.804	6.555	2,442	22.861	6.520	3,152
$I(PrimarySchool)_i$	0.595	0.491	5,482	0.522	0.500	2,328	0.649	0.477	3,154
$I(JuniorSecondary)_i$	0.401	0.490	5,482	0.351	0.477	2,328	0.438	0.496	3,154
$I(College)_i$	0.104	0.305	5,482	0.072	0.258	2,328	0.127	0.333	3,154
$BridePrice_{iet}$	1,058,655	18,492,289	6,016	383,262	3,603,166	2,512	1,542,840	24,027,477	3,504
$Husband\ Age\ of\ Marriage_i$	26.992	7.823	5,808	26.663	7.983	2,380	27.221	7.703	3,428
$I(HusbandPrimarySchool)_i$	0.653	0.476	5,995	0.591	0.492	2,495	0.697	0.460	3,500
$I(HusbandJuniorSecondarySchool)_i$	0.495	0.500	5,995	0.442	0.497	2,495	0.533	0.499	3,500
$I(HusbandCollege)_i$	0.114	0.318	5,999	0.099	0.299	2,498	0.125	0.331	3,501
$assets_i$	-0.100	1.363	5,625	-0.058	1.374	2,380	-0.131	1.355	3,245
				Summary Statistics for Child Preferences Sample, IFLS					
$additional\ girls_{iet}$	0.831	0.988	11,773	0.820	0.822	5,021	0.840	1.095	6,752
$additional\ boys_i$	0.860	0.985	11,773	0.891	0.951	5,021	0.837	1.008	6,752
$I(BridePrice)_e$	0.245	0.430	11,773	0.226	0.418	5,021	0.258	0.438	6,752
$I(FemaleAgriculture)_e$	0.026	0.159	11,773	0.028	0.165	5,021	0.024	0.154	6,752
$I(Matrilocal)_e$	0.055	0.228	11,122	0.062	0.241	4,782	0.050	0.217	6,340
$female\ children_i$	1.369	1.739	11,773	1.502	1.486	5,021	1.270	1.900	6,752
$male\ children_i$	1.411	1.812	11,773	1.554	1.538	5,021	1.304	1.985	6,752
age_i	29.856	7.551	11,772	29.847	7.976	5,021	29.863	7.220	6,751

Notes: This table presents summary statistics for the two samples of the pooled rounds 3 and 4 of the Indonesia Family Life Survey. The first panel presents summary statistics from the sample of marriages where bride prices were paid. The second panel presents summary statistics from adult participants in the survey who were asked about their desired number of additional daughters and sons. In both cases, the first 3 columns of the table provide summary statistics for the pooled data, while the next three provide statistics from round 3 of the IFLS, and the final 3 columns provide statistics from round 4 of the IFLS.

Table 7: Summary Statistics for the 1995 Indonesia Intercensal Survey

	(1)	(2)	(3)	(4)	(5)	(6)
		Female			Male	
	Mean	SD	N	Mean	SD	N
			School Enrollment Sample			
$I(Enrolled)_i$	0.611	0.487	134,889	0.649	0.477	135,685
$I(BridePrice)_e$	0.177	0.382	103,067	0.178	0.382	103,470
$I(Matrilocal)_e$	0.055	0.229	95,652	0.056	0.229	96,126
$I(FemaleAgriculture)_e$	0.033	0.179	133,063	0.033	0.178	133,771
Age_i	13.302	5.033	134,889	13.055	4.957	135,685
			School Construction Sample			
$I(Primary)_i$	0.660	0.474	84,648	0.763	0.425	82,756
$I(Secondary)_i$	0.207	0.405	84,648	0.295	0.456	82,756
$YearsSchooling_i$	6.655	4.015	84,636	7.853	3.951	82,751
$I(BridePrice)_i$	0.152	0.359	67,022	0.150	0.357	65,291
$Intensity_d$	1.984	0.925	83,842	1.982	0.906	81,941
$I(Matrilocal)_e$	0.047	0.213	62,597	0.051	0.220	61,078
$I(FemaleAgriculture)_e$	0.028	0.165	83,612	0.026	0.160	81,727
Age_i	33.980	7.197	84,648	34.484	7.116	82,756

Notes: This table contains summary statistics for the samples of the 1995 Indonesia Intercensal Survey used in the school enrollment and school construction analyses in Indonesia. The school enrollment sample includes all school-aged children (5–22) at the time of the survey. The school construction sample includes current adults born between 1950 and 1962 and between 1968 and 1972. $Intensity_d$ is the number of schools built in a district per 1,000 people in the school-aged population. Ethnic norms are based on a match between an individual's ethnicity in the Intercensal Survey and *The Ethnographic Atlas*.

Table 8: Determinants of Bride Prices Payments in the IFLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Log Bride Price Amount							
$I(Primary)_i$	1.455***			1.044***	1.366***			0.965***
	(0.144)			(0.133)	(0.136)			(0.125)
$I(JuniorSecondary)_i$		1.321***		0.408***		1.247***		0.376***
		(0.127)		(0.108)		(0.110)		(0.086)
$I(College)_i$			1.579***	0.921***			1.601***	1.010***
			(0.098)	(0.098)			(0.086)	(0.088)
$MarriageAge_i$	0.145***	0.141***	0.169***	0.118***	0.142***	0.136***	0.156***	0.114***
	(0.016)	(0.017)	(0.019)	(0.016)	(0.016)	(0.017)	(0.014)	(0.017)
$MarriageAge_i^2$	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fixed Effects	Year	Year	Year	Year	Ethnicity by Year	Ethnicity by Year	Ethnicity by Year	Ethnicity by Year
Number of observations	5,174	5,174	5,174	5,174	5,174	5,174	5,174	5,174
Number of clusters	27	27	27	27	27	27	27	27
Adjusted R^2	0.219	0.205	0.178	0.238	0.293	0.282	0.264	0.313

Notes: Columns regress bride price payments at the time of marriage (or its measure in natural logs) on various covariates. The measures are taken from the pooled rounds 3 and 4 of the Indonesia Family Life Survey on possible determinants of dowry. According to IFLS documentation, "bride price" is given to the bride's family in most cases, excepting the Minang, which are excluded. In the original survey this is misleadingly called "dowry." Regressions include survey year fixed effects. The education of a bride is measured as either receiving greater than primary education, greater than junior secondary education, or college level education. The subscript i indexes individuals, t survey rounds, and e ethnicities. Regressions in the final three columns include ethnicity by survey round fixed effects. Standard errors are clustered at the ethnicity level.

Table 9: Determinants of Bride Prices in the IFLS, Controlling for Match Specific Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Log Bride Price Amount							
$I(Primary)_i$	1.014***			0.796***	0.915***			0.714***
	(0.115)			(0.115)	(0.103)			(0.103)
$I(JuniorSecondary)_i$		0.865***		0.394***		0.788***		0.354***
		(0.090)		(0.083)		(0.070)		(0.067)
$I(College)_i$			0.568***	0.333***			0.651***	0.439***
			(0.106)	(0.100)			(0.110)	(0.114)
$MarriageAge_i$	0.092***	0.091***	0.113***	0.081***	0.087***	0.084***	0.102***	0.075***
	(0.018)	(0.019)	(0.020)	(0.019)	(0.019)	(0.020)	(0.019)	(0.021)
$MarriageAge_i^2$	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$HusbandMarriageAge_i$	0.038	0.039	0.039*	0.038	0.043*	0.044*	0.043**	0.043*
	(0.025)	(0.024)	(0.023)	(0.025)	(0.023)	(0.023)	(0.022)	(0.023)
$HusbandMarriageAge_i^2$	-0.001*	-0.001**	-0.001**	-0.001*	-0.001*	-0.001**	-0.001**	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$I(HusbandPrimary)_i$	0.441***	0.654***	0.783***	0.451***	0.385***	0.573***	0.683***	0.395***
	(0.102)	(0.121)	(0.131)	(0.102)	(0.092)	(0.111)	(0.120)	(0.092)
$I(HusbandJuniorSecondary)_i$	0.369***	0.272***	0.463***	0.280***	0.388***	0.301***	0.465***	0.304***
	(0.079)	(0.080)	(0.083)	(0.081)	(0.067)	(0.071)	(0.065)	(0.074)
$I(HusbandCollege)_i$	0.768***	0.671***	0.666***	0.534***	0.702***	0.611***	0.543***	0.431***
	(0.083)	(0.084)	(0.100)	(0.090)	(0.085)	(0.084)	(0.109)	(0.096)
$Asset_i$	0.015	0.020	0.047	0.001	0.082***	0.085***	0.109***	0.066**
	(0.052)	(0.052)	(0.053)	(0.053)	(0.031)	(0.031)	(0.031)	(0.032)
Fixed Effects	Year	Year	Year	Year	Ethnicity by Year	Ethnicity by Year	Ethnicity by Year	Ethnicity by Year
Number of observations	4,910	4,910	4,910	4,910	4,910	4,910	4,910	4,910
Number of clusters	27	27	27	27	27	27	27	27
Adjusted R^2	0.276	0.267	0.250	0.281	0.353	0.346	0.334	0.358

Notes: Columns regress bride price payments at the time of marriage (or its measure in natural logs) on various covariates. The measures are taken from the pooled rounds 3 and 4 of the Indonesia Family Life Survey on possible determinants of dowry. According to IFLS documentation, "bride price" is given to the bride's family in most cases, excepting the Minang, which are excluded. In the original survey this is misleadingly called "dowry." Regressions include survey year fixed effects. The education of a bride is measured as either receiving greater than primary education, greater than junior secondary education, or college level education. The subscript i indexes individuals, t survey rounds, and e ethnicities. Regressions in the final three columns include ethnicity by survey round fixed effects. Standard errors are clustered at the ethnicity level.

Table 10: Bride Price and Female Enrollment in the Indonesia Intercensal Data

	(1)	(2)	(3)	(4)	(5)
	Dep var: School enrollment indicator				
	Females	Males	Both	Both	Both
$I(BridePrice)_e$	0.018	0.005	0.004		
	(0.014)	(0.012)	(0.012)		
$I(Matrilocal)_e$	-0.012	-0.025	-0.025		
	(0.037)	(0.038)	(0.038)		
$I(FemaleAgriculture)_e$	-0.031***	-0.050***	-0.051***		
	(0.011)	(0.012)	(0.012)		
$I(BridePrice)_e \times I(Female)_i$			0.016***	0.016***	0.015*
			(0.005)	(0.005)	(0.009)
$I(Matrilocal)_e \times I(Female)_i$			0.014***	0.012***	0.018**
			(0.003)	(0.003)	(0.007)
$I(FemaleAgriculture)_e \times I(Female)_i$			0.021***	0.020***	0.021**
			(0.004)	(0.003)	(0.009)
$I(Female)_i$			-0.030***	-0.030***	-0.034***
			(0.004)	(0.004)	(0.005)
Age, Age squared	Y	Y	Y	Y	Y
Language FEs	N	N	N	Y	N
Household FEs	N	N	N	N	Y
Number of observations	93,826	94,212	188,038	188,038	188,038
Number of clusters	20	19	20	20	20
Adjusted R^2	0.390	0.364	0.378	0.380	0.472

Notes: This table examines the effect of belonging to an ethnicity with a bride price norm on enrollment. Each column is a different regression specification: the first estimates the mean effect of the bride price norm on males and females; the second and third include the interaction of being female with belonging to an ethnicity with a bride price norm. All columns include controls for age and age squared. Column 2 also includes language fixed effects and column 3 also includes household fixed effects. The data are from the Indonesia 1995 Intercensal Population Survey. Ethnic norms are inferred from a match between languages in the Intercensal data and Murdock's (1967) *Ethnographic Atlas*. Standard errors are clustered at the ethnicity-gender level. e indexes ethnic groups and i individuals.

Table 11: Bride Price and Preferences for Additional Daughters in the IFLS

	Dep var: Number of additional daughters desired
$I(BridePrice)_e$	0.049**
	(0.019)
$I(FemaleAgriculture)_e$	0.086***
	(0.018)
$I(Matrilocal)_e$	0.093***
	(0.011)
$I(Female)_i$	-0.005
	(0.007)
Current number of sons FE	Y
Current number of daughters FE	Y
Desired number of sons FE	Y
Age FE	Y
Number of observations	11,121
Number of clusters	12
Adjusted R^2	0.460

Notes: This table estimates the effect of belonging to an ethnicity with a bride price norm on one's preferences for additional daughters in pooled rounds 3 and 4 of the Indonesia Family Life Survey. Ethnographic data are drawn from a match between ethnicities in the IFLS and Murdock's (1967) *Ethnographic Atlas*. The regression controls for belonging to an ethnicity with a norm of female dominant agriculture, survey year fixed effects, and variables for own age, number of additional sons wanted, and fixed effects for number of boys under 15 in the household and number of girls under 15 in the household (which proxy for current number of male and female children). Standard errors are clustered at the ethnicity level. A subscript of i indicates a variable is calculated at the individual level, and e refers to the ethnicity.

Table 12: Distribution of Marriage Norms in Zambia Pooled DHS

	Number of Ethnic Groups
Bride Price	8
Bride Service	6
Token Bride Price	7

Notes: This table documents how many of the ethnic groups in Zambia practice each marriage norm, according to the *Ethnographic Atlas*. The norms are defined as follows: (1) bride price denotes "marriages normally involving a material consideration of which the principal element is a substantial property payment by the groom or his relatives to the kinsmen of the bride," (2) bride service denotes "marriages normally involving a substantial material consideration of which the principal element consists of labor or other service rendered by the groom to the bride's kinsmen," and (3) token bride price denotes "marriages normally involving only a small or symbolic bride-price as a consideration" (Murdock, 1957).

Table 13: Summary Statistics from the 1996, 2001, and 2007 Zambia Demographic and Health Surveys

	(1) Mean	(2) SD	(3) N	(4) Mean, 1996	(5) SD, 1996	(6) N, 1996	(7) Mean, 2001	(8) SD, 2001	(9) N, 2001	(10) Mean, 2007	(11) SD, 2007	(12) N, 2007
						Child Preferences Sample						
$IdealGirls_{iet}$	2.218	1.467	34,884	2.659	1.458	9,151	2.157	2.157	13,134	1.962	1.962	12,599
$IdealBoys_{iet}$	2.191	1.444	34,884	2.635	1.457	9,151	2.019	2.019	13,134	2.049	2.049	12,599
$IdealChildren_{iet}$	5.075	2.345	34,940	5.590	2.474	9,162	4.943	4.943	13,140	4.839	4.839	12,638
$CurrentDaughters_{iet}$	1.342	1.536	37,084	1.242	1.543	9,642	1.482	1.482	14,116	1.267	1.267	13,326
$CurrentSons_{iet}$	1.320	1.522	37,084	1.215	1.545	9,642	1.478	1.478	14,116	1.228	1.228	13,326
Age_i	28.142	9.454	37,084	27.587	9.709	9,642	27.781	27.781	14,116	28.926	28.926	13,326
$I(Female)_i$	0.599	0.490	37,084	0.811	0.391	9,642	0.527	0.527	14,116	0.522	0.522	13,326
$I(BridePrice)_e$	0.287	0.452	37,084	0.288	0.453	9,642	0.285	0.285	14,116	0.287	0.287	13,326
$I(CommunitySize > 50)_e$	0.892	0.311	28,585	0.917	0.276	7,617	0.881	0.881	10,571	0.885	0.885	10,397
$I(FemaleAgriculture)_e$	0.913	0.282	31,276	0.921	0.269	8,273	0.909	0.909	11,727	0.911	0.911	11,276
						Current Enrollees Sample (Ages 5-22)						
$I(Enrolled)_{iet}$	0.531	0.499	51,614	0.452	0.498	18,102	0.502	0.500	17,620	0.651	0.477	15,892
Age_i	12.472	5.034	52,092	12.661	5.093	18,378	12.471	5.065	17,710	12.257	4.921	16,004
$Schools_{dt}/Area_d$	0.085	0.217	51,821	0.067	0.131	18,309	0.088	0.210	17,508	0.101	0.289	16,004
$I(BridePrice)_e$	0.290	0.454	46,234	0.299	0.458	16,211	0.290	0.454	15,177	0.281	0.450	14,846
$I(CommunitySize > 50)_e$	0.908	0.290	41,680	0.931	0.254	15,075	0.903	0.296	13,914	0.885	0.319	12,691
$I(FemaleAgriculture)_e$	0.794	0.405	44,821	0.800	0.400	16,030	0.755	0.430	15,134	0.830	0.376	13,657
						School Construction Sample (5-12)						
$I(Enrolled)_{iet}$	0.558	0.497	27,608	0.487	0.500	9,381	0.523	0.499	9,453	0.670	0.470	8,774
Age_i	8.418	2.275	27,716	8.408	2.291	9,468	8.393	2.275	9,470	8.455	2.259	8,778
$Schools_{dt}/Area_d$	0.081	0.211	27,590	0.065	0.129	9,442	0.088	0.210	9,370	0.091	0.272	8,778
$I(BridePrice)_e$	0.288	0.453	24,476	0.297	0.457	8,326	0.291	0.454	8,153	0.277	0.447	7,997
$I(CommunitySize > 50)_e$	0.906	0.292	22,172	0.930	0.255	7,722	0.902	0.297	7,417	0.883	0.321	7,033
$I(FemaleAgriculture)_e$	0.787	0.409	23,837	0.794	0.405	8,191	0.758	0.428	8,088	0.812	0.391	7,558

Notes: This table presents summary statistics from the 1996, 2001, and 2007 versions of the Zambia Demographic and Health Survey (DHS). The first panel presents statistics for the sample of adults surveyed about their ideal numbers of male and female children. The second panel presents statistics about the sample of school-aged children (those aged 5–22). The final panel presents statistics for the sample of children most likely to be impacted by the construction of primary schools (those aged 5–12). The first 3 columns provide summary statistics for the pooled data; the remaining columns present the summary statistics for each round of the DHS separately.

Table 14: School Construction and Enrollment in the Pooled Zambia DHS (1996, 2001, and 2007)

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: School enrollment indicator					
	All	Males	Females	Females	B.P. Females	Non B.P. Females
$Schools_{dt}/Area_d$	0.021	0.031	0.006		0.069**	-0.021
	(0.020)	(0.019)	(0.026)		(0.032)	(0.036)
$Schools_{dt}/Area_d \times I_e^{BridePrice}$				0.069**		
				(0.032)		
$Schools_{dt}/Area_d \times I_e^{NoBridePrice}$				-0.021		
				(0.036)		
Age by Bride Price FE	Y	Y	Y	Y	Y	Y
Ethnicity by Round FE	Y	Y	Y	Y	Y	Y
Ethnicity by District FE	Y	Y	Y	Y	Y	Y
Number of observations	24,273	11,996	12,277	12,277	3,514	8,763
Number of clusters	70	70	70	70	64	69
Adjusted R^2	0.399	0.403	0.392	0.393	0.434	0.377

Notes: This table examines the differential impact of school building in Zambia on bride price and non-bride price females. The sample consists of children aged 5–12 at the time of the survey in the 1996, 2001, and 2007 rounds of the DHS. The treatment variable, $Schools_{dt}$ is the number of schools built in a district d by year t (the survey round of the DHS). This is normalized by the area of the district, calculated using ArcGIS, $Area_d$. Standard errors are clustered at the district level.

Table 15: Summary Statistics for ZCAS Data

	Mean	SD	N
$\ln BridePrice_{ie}$	12.348	1.955	977
$I(Primary)_i$	0.553	0.497	1,799
$I(JuniorSecondary)_i$	0.238	0.426	1,799
$MarriageAge_i$	19.214	3.991	1,773
$I(HusbandPrimary)_i$	0.933	0.249	1,624
$I(HusbandJuniorSecondary)_i$	0.700	0.459	1,624
$HusbandMarriageAge_i$	25.231	4.983	1,555
$HusbandMarriageAge_i^2$	661	291	1,555
$I(HusbandWealthier)_i$	0.356	0.479	1,761
$I(Polygamous)_i$	0.052	0.223	1,797

Notes: This table contains summary statistics for all couples in the ZCAS data.

Table 16: Determinants of Bride Prices in the ZCAS

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Log Bride Price Amount					
$I(Primary)_i$	0.460***		0.275*	0.444***		0.266*
	(0.129)		(0.148)	(0.128)		(0.147)
$I(JuniorSecondary)_i$		0.595***	0.442***		0.579***	0.433***
		(0.131)	(0.151)		(0.133)	(0.154)
$MarriageAge_i$	0.066	0.038	0.028	0.077	0.047	0.037
	(0.095)	(0.098)	(0.097)	(0.095)	(0.098)	(0.097)
$MarriageAge_i^2$	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Ethnicity Fixed Effects	N	N	N	Y	Y	Y
Number of observations	969	969	969	965	965	965
Adjusted R^2	0.012	0.015	0.018	0.009	0.012	0.014

Notes: Columns regress the natural log of bride price payments at the time of marriage on various covariates. The measures are taken from the ZCAS. The education of a bride is measured as either receiving primary or greater education or secondary or greater education. The subscript i indexes individuals, t survey rounds, and e ethnicities. Columns 4-6 include ethnicity fixed effects. Robust standard errors are reported in parentheses.

Table 17: Determinants of Bride Prices in the ZCAS, Controlling for Match-Specific Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Log Bride Price Amount					
$I(Primary)_i$	0.342**		0.185	0.315**		0.172
	(0.149)		(0.167)	(0.148)		(0.167)
$I(JuniorSecondary)_i$		0.482***	0.394**		0.447***	0.367**
		(0.145)	(0.164)		(0.147)	(0.167)
$MarriageAge_i$	-0.107	-0.131	-0.137	-0.092	-0.116	-0.123
	(0.115)	(0.115)	(0.115)	(0.116)	(0.116)	(0.115)
$MarriageAge_i^2$	0.004	0.004	0.004	0.003	0.004	0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
$I(HusbandPrimary)_i$	0.149	0.151	0.147	0.138	0.140	0.136
	(0.379)	(0.382)	(0.381)	(0.383)	(0.385)	(0.384)
$I(HusbandJuniorSecondary)_i$	0.294	0.287	0.251	0.300	0.291	0.258
	(0.182)	(0.180)	(0.184)	(0.184)	(0.182)	(0.186)
$HusbandMarriageAge_i$	0.093	0.083	0.086	0.091	0.082	0.085
	(0.144)	(0.143)	(0.144)	(0.145)	(0.143)	(0.144)
$HusbandMarriageAge_i^2$	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
$I(HusbandFamilyWealthier)_i$	0.307**	0.298**	0.311**	0.309**	0.299**	0.311**
	(0.134)	(0.132)	(0.134)	(0.134)	(0.132)	(0.134)
$I(PolygamousMarriage)_i$	-1.110**	-1.087**	-1.083**	-1.116**	-1.091**	-1.088**
	(0.510)	(0.512)	(0.509)	(0.510)	(0.513)	(0.511)
Ethnicity FEs	N	N	N	Y	Y	Y
Number of observations	815	815	815	813	813	813
Adjusted R^2	0.032	0.037	0.037	0.027	0.031	0.031

Notes: Columns regress the natural log of bride price payments at the time of marriage on various covariates, including characteristics of the husband and the marriage. The measures are taken from the ZCAS. The education of a bride is measured as either receiving primary or greater education or secondary or greater education. The subscript i indexes individuals, t survey rounds, and e ethnicities. Columns 4–6 include ethnicity fixed effects. Robust standard errors are reported in parentheses.

Table 18: Bride Price and Enrollment in Pooled Zambia DHS Data

	(1)	(2)	(3)	(4)	(5)
	Dependent variable: School enrollment indicator				
	Female	Male	All	All	All
$I(BridePrice)_e$	0.040**	0.007	0.006		
	(0.018)	(0.028)	(0.028)		
$I(FemaleAgriculture)_e$	-0.016***	-0.029**	-0.034**		
	(0.005)	(0.014)	(0.015)		
$I(CommunitySize > 50)_e$	0.008	-0.026	-0.024		
	(0.018)	(0.030)	(0.030)		
$I(BridePrice)_e \times I(Female)_i$			0.033**	0.036***	0.040**
			(0.015)	(0.014)	(0.016)
$I(FemaleAgriculture)_e \times I(Female)_i$			0.017	0.015	0.022
			(0.012)	(0.013)	(0.016)
$I(CommunitySize > 50)_e \times I(Female)_i$			0.031*	0.028*	0.020
			(0.016)	(0.015)	(0.017)
$I(Female)_i$			-0.116***	-0.113***	-0.116***
			(0.016)	(0.017)	(0.021)
Age, Age Squared	Y	Y	Y	Y	Y
Survey Year Fixed Effects	Y	Y	Y	Y	Y
Ethnicity FE	N	N	N	Y	N
Household FE	N	N	N	N	Y
Number of observations	16,848	15,840	32,688	32,688	32,688
Number of clusters	34	34	34	34	34
Adjusted R^2	0.325	0.306	0.314	0.321	0.449

Notes: This table shows the differential effect of bride price on enrollment for males and females. The data is drawn from the Zambia DHS surveys from 2007, 2001, and 1996. Bride price, female agriculture, and community size norms come from a match between ethnicity in the DHS data and the *Ethnographic Atlas*. Standard errors are clustered at the DHS ethnicity level. The sample consists of those aged 5–22 at the time of the survey.

Table 19: Bride Price and Ideal Number of Daughters in the Pooled Zambia Data

	Dep var: Ideal number of daughters
$I(BridePrice)_e$	0.135***
	(0.046)
$I(FemaleAgriculture)_e$	0.354***
	(0.024)
$I(CommunitySize > 50)_e$	-0.001
	(0.064)
$I(Female)_i$	0.132***
	(0.028)
Survey Year Fixed Effects	Yes
Ideal Number Children Fixed Effects	Yes
Current Number Daughters Fixed Effects	Yes
Current Number Sons Fixed Effects	Yes
Current Age Fixed Effects	Yes
Number of observations	24,904
Number of clusters	35
Adjusted R^2	0.482

Notes: This table presents the relationship between bride price norms and an adult's ideal number of daughters as reported in the pooled 1996, 2001, and 2007 Zambia Demographic and Health Survey. Ethnographic data are from a match between ethnicities in the Demographic and Health Survey and Murdock's (1967) *Ethnographic Atlas*. The regression controls for belonging to an ethnicity with a norm of female dominant agriculture, survey year fixed effects, and variables for own age, ideal number of children, and fixed effects for current number of daughters and sons. Standard errors are clustered at the ethnicity level. The subscript of i indexes individuals and e ethnic groups.

8 Figures

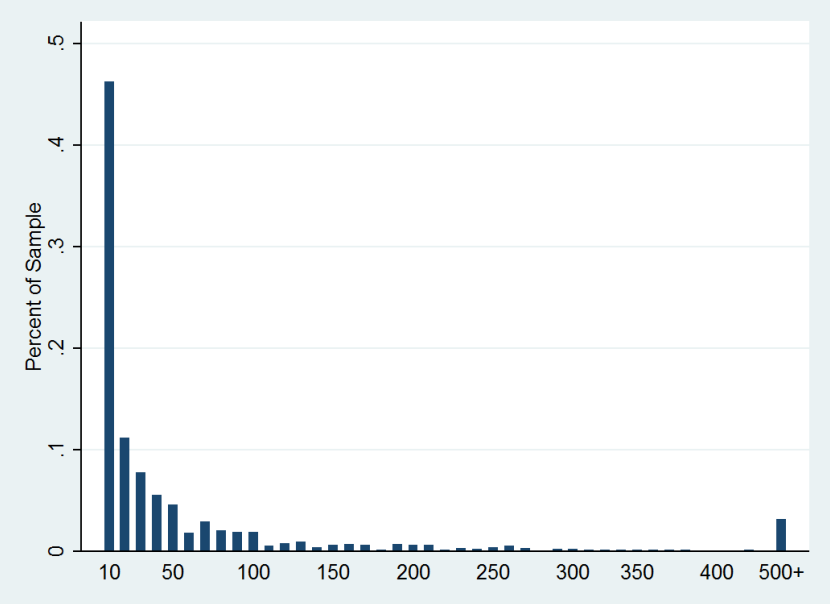


Figure 2: The distribution of bride prices as percent of GDP per capita for bride price ethnicities in the 2000 and 2007 rounds of the Indonesia Family Life Survey.

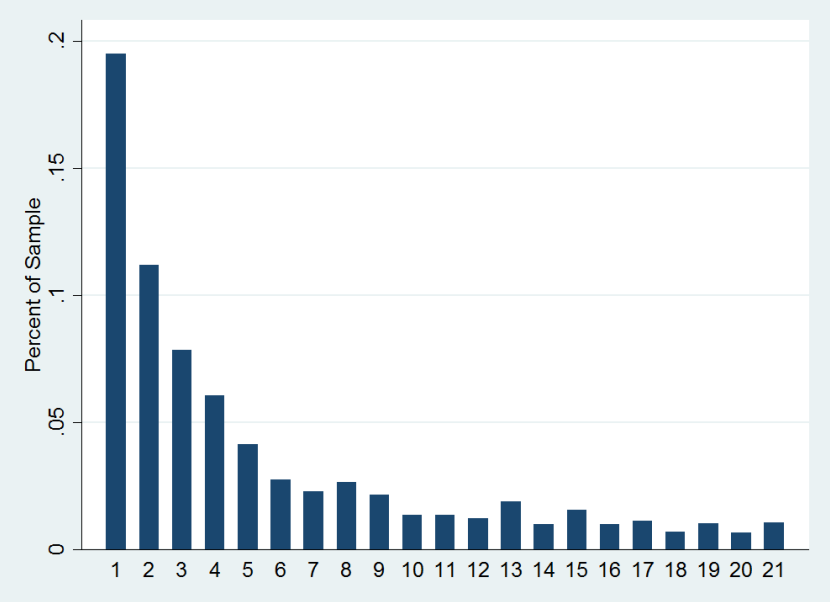


Figure 3: The distribution of bride prices greater than 0 as percent of GDP per capita in the 2000 and 2007 rounds of the Indonesia Family Life Survey.

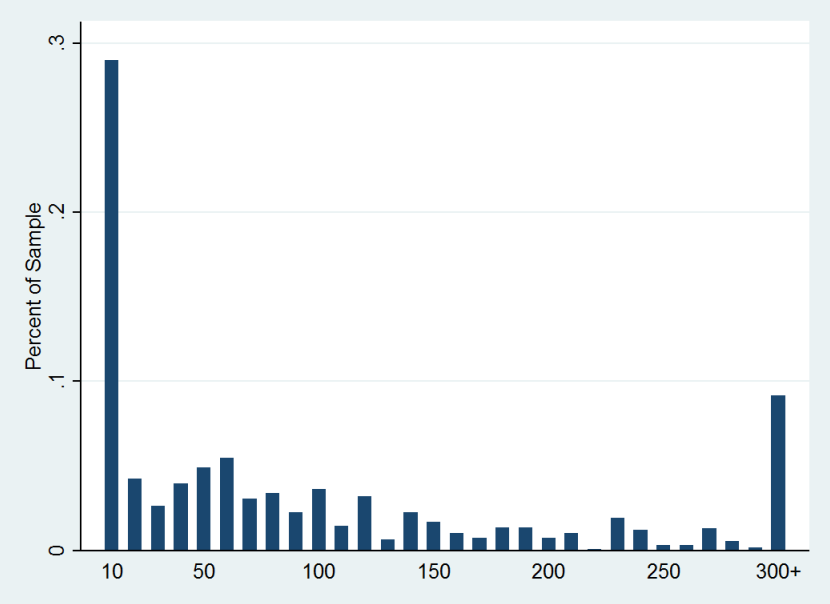


Figure 4: The distribution of all bride price amounts as a percent of GDP per capita in the ZCAS Survey.

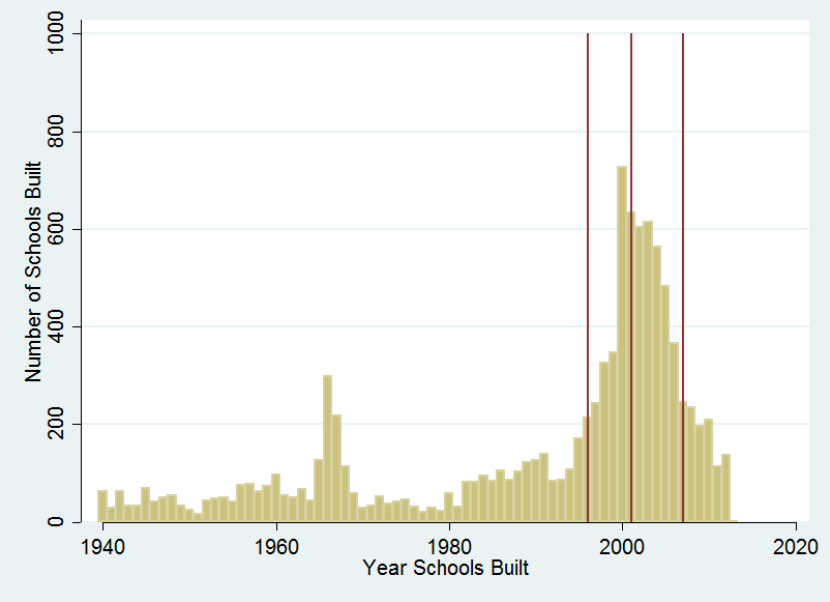


Figure 5: Number of schools constructed each year in Zambia (Ministry of Education, Government of Zambia).

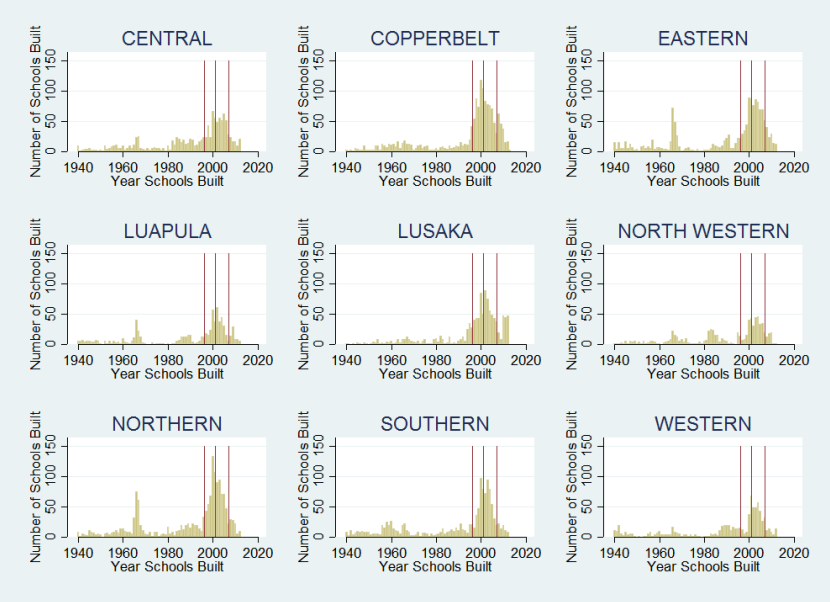


Figure 6: Number of schools constructed each year for each province in Zambia (Ministry of Education, Government of Zambia).

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Appendix A: Proofs of the propositions in section 3

Proof of proposition 1

(i) By the chain rule

$$\frac{\partial P(E_i = 1|BP, f_E)}{\partial f_E} = -G'(\Delta V_*^d(BP, f_E))\frac{\partial \Delta V_*^d(BP, f_E)}{\partial f_E} \tag{11}$$
$$= -g(\Delta V_*^d(BP, f_E))\frac{u'(y_1 - f_E)}{\gamma} < 0.$$

(ii) Since the cumulative distribution function $G(\ )$ is increasing and

$$\Delta V_*^d(BP = 0, f_E)) = -\frac{[u(y_1 - f_E) - u(y_1)]}{\gamma} > \tag{12}$$
$$\Delta V_*^d(BP = \pi, f_E)) = -\frac{[u(y_1 - f_E) - u(y_1)] + \beta[u(y_2 + \pi) - u(y_2)]}{\gamma},$$

we have that

$$P(E_i = 1|BP = \pi, f_E) - P(E_i = 1|BP = 0, f_E)$$
$$= G(\Delta V_*^d(BP = 0, f_E)) - G(\Delta V_*^d(BP = \pi, f_E)) \geq 0.$$

Proof of proposition 3

Equation 11 implies that

$$\frac{\partial P(E_i = 1|BP = k > 0, f_E)}{\partial f_E} < \frac{\partial P(E_i = 1|BP = 0, f_E)}{\partial f_E}$$

(and $|\frac{\partial P(E_i=1|BP=k>0,f_E)}{\partial f_E}| > |\frac{\partial P(E_i=1|BP=0,f_E)}{\partial f_E}|$) if and only if

$$g(\Delta V_*^d(BP = k > 0, f_E)) > g(\Delta V_*^d(BP = 0, f_E)).$$

Because of the relationship in equation 12, this then implies that the probability density function $g(\ )$ ought to be locally decreasing and hence the cumulative distribution function concave. For single-peaked distributions, the probability density function is decreasing for values of the return to schooling greater than the modal return.

9 Appendix B: Data description

9.1 Ethnographic Atlas

Ethnic norm information on bride price, bride service, matrilocality, female dominated agriculture, and community size is drawn from Murdock's (1967) the *Ethnographic Atlas*, which provides ethnographic information for 1,265 pre-industrial societies. However, survey and census data often contain ethnicities or languages associated with ethnicities that are not listed in the *Ethnographic Atlas*. To match these ethnicities/languages to societies in the *Ethnographic Atlas*, each ethnicity/language in the IFLS/Indonesia Intercensual Survey was matched to one of 7,612 language groups in the *Ethnologue: Languages of the World* (Gordon, 2005). These language groups were then matched to societies in the *Ethnographic Atlas* where information on bride price norms was non-missing.

Despite this matching procedure, the number of missing variables for historical community size variable in Indonesia is very high, which is why it is not used as a control in the following regressions. The "mode of marriage (primary)" variable in the *Ethnographic Atlas* provides information on whether the primary mode of marriage is: (1) bride price or bride wealth, (2) bride service, (3) token bride price, (4) gift exchange, (5) sister or female relative exchanged for bride, (6) absence of consideration, or (7) dowry. The bride price indicator variable was coded 1 only if bride price or bride wealth was listed as the primary mode of marriage and 0 otherwise for non-missing values. Similarly, the bride service indicator variable was coded 1 if the primary mode was listed as bride service and 0 otherwise. The "transfer of residence at marriage: after first years" variable is divided into 3 categories: (1) wife to husband's group, (2) couple to either group or neolocal, and (3) husband to wife's group. The matrilocality indicator variable was only coded 1 in the 3rd case. Finally, the female agriculture variable was coded using the "sex differences: agriculture" variable from the *Ethnographic Atlas*. This variable consists of the categories (1) males only, (2) males appreciably more, (3) differentiated but equal participation, (4) equal participation, (5) female appreciably more, (6) females only, and (7) absent or unimportant activity. The female agriculture indicator is coded as 1 for categories 5 and 6 and 0 otherwise.

Table 2 provides a break down of the customs surrounding marriage practiced by the different ethnicities the languages in the 1995 intercensual survey were matched to in the *Ethnographic Atlas*.

9.2 Indonesia

9.2.1 Indonesia Family Life Survey

The Indonesia Family Life Survey (IFLS) is an ongoing longitudinal study of households in Indonesia covering over 30,000 individuals. Data is gathered from 13 of Indonesia's 27 provinces and the study is considered representative of 83 percent of the Indonesian population. This paper

uses data from rounds 3 and 4 of the IFLS (Strauss et al. (2004), Strauss et al. (2009)), which, unlike previous rounds of the IFLS, includes questions about individuals' ethnicities. The first panel of table 6 presents summary statistics on bride price, bride education, husband education, and bride and husband age at time of marriage for approximately 2,400 marriages documented in the round 3 IFLS and 3,200 marriages in the round 4 IFLS where bride price was paid. The second panel of table 6 presents summary statistics on child preferences, bride price, and other important covariates from the sample of adult male and female individuals who were asked how many additional children of each gender they wanted.

9.2.2 Intercensal Population Survey

The Indonesia Intercensal Survey is a large-scale, nationally representative population survey of Indonesia carried out between the 1990 and 2000 censuses. It is housed by the Minnesota Population Center (1995). Importantly, it includes data on primary language spoken which can be linked to ethnicity and matched to an ethnic group's bride price norm in *The Ethnographic Atlas*. It also contains information on educational attainment, birth year, and birth district which, following Duflo (2001), can be combined with data on the number of schools built in 1974 as part of a large-scale school construction program. Table 7 presents summary statistics for the two sub-samples of this data set that we analyze in this paper. The first sample, which is used to compare the enrollment patterns of school-aged females and males in bride price and non-bride price ethnicities, consists of all individuals between the ages of 5 and 22. The second sample is used to estimate the impact of school construction for bride price and non-bride price females. As in Duflo (2001), this sample is composed of a treated group of individuals who were 2-6 at the time of school construction (1974) and an un-treated group of individuals who were 12-18 at the time of school construction.

9.3 Zambia

9.3.1 Data from the Zambia Contraceptive Access Study

Data on bride price amounts is drawn from unique survey data collected in Lusaka in 2009 as part of a 2-year experimental study on family planning (Ashraf et al., 2013). The study involved 1660 couples living in the catchment area of Chipata clinic, a poor peri-urban segment of Lusaka. As part of the follow-up data collection, female participants were asked questions individually about their educational attainment at marriage, the educational attainment of their husbands, and the amount of bride price that was paid at the time of marriage. Table 15 reports summary statistics for the the key variables: 55 percent of wives have completed primary education, while less than 24 percent have completed junior secondary education. Educational attainment is substantially higher among husbands, with 93 percent completing primary school and 70 percent completing junior secondary school.

9.3.2 Demographic and Health Survey

To study preferences for daughters versus sons, differential enrollment of daughters and sons, and the effect of school construction on enrollment, we pool the 1996, 2001, and 2007 rounds of the *Demographic and Health Survey* (DHS). Each round of the DHS is a nationally representative survey. All three rounds of the DHS contain data on the district and ethnicity of the surveyed individual, which allows the data to be combined with a district-year level school construction data set and the ethnicity-level norms data in *The Ethnographic Atlas*. Importantly for our study of the impact of bride price norms on the ideal sex composition of children, the survey contains information about the desired fertility of both the male and the female head of the household. Adult respondents answered the question "How many of these children [your ideal number of children] would you like to be boys, how many would you like to be girls and for how many would the sex not matter?" The first panel of table 13 presents summary statistics on ideal number of children and ideal sex composition. Mothers report a slightly higher ideal number of daughters than sons (2.267 vs. 2.151), while fathers report a slightly higher ideal number of sons than daughters (2.251 vs. 2.145). Both differences are statistically significant at the 1 percent level.

All three rounds of the DHS also contain current enrollment data for school-aged children. When we analyze whether daughters are more likely to be enrolled relative to their brothers in bride price versus non-bride price ethnicities, we use a sample of all school-aged children in the pooled DHS (ages 5-22). When we analyze how school construction impacts school enrollment, we limit the sample to primary-school aged children (5-12) since most new schools are primary schools. The second panel of table 13 presents summary statistics for enrollment and the pervasiveness of different ethnic norms in both samples by gender. Unsurprisingly, the first sample is older on average and is less likely to be enrolled in school.