UNITED NATIONS UNIVERSITY
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WIDER Working Paper 2021/115

Female education and marriage in Pakistan

The role of financial shocks and marital customs

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July 2021

United Nations University World Institute for Development Economics Research
wider.unu.edu

Abstract: This project aims to explore the effect of wealth shocks on education and marriage for young women in Pakistan. Financial shocks are used to estimate the probability of dropping out of education and into marriage. Using the Pakistan Rural Household Panel survey for the years 2000–10, the effects of financial shocks on the probability of dropping out of education and into marriage are estimated for boys and girls in rural areas. Second, the returns to education in the marriage market are estimated using information on marital payments of dowry and brideprice. Lastly, the intergenerational effects of women's increased bargaining power due to marital assets is estimated. The results show wealth shocks do not have a gendered effect on school dropout. Also, adverse shocks during the teenage years do not increase the probability of early marriage. However, this relationship is negative in villages where marital payments are typically higher—that is, marriage costs can delay early marriage in shock-hit households as they are more credit-constrained. Lastly, higher educated women receive more marital assets, which can contribute to increased bargaining power within the marriage. This increased bargaining power also has intergenerational effects on children's schooling.

Key words: marital payments, financial shocks, early marriage, school dropout, intergenerational effects

JEL classification: C26, I26, J16, Q54

Note: On 26 July 2021, the paper was updated with minor edits.

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This study has been prepared within the UNU-WIDER project Women's work – routes to economic and social empowerment.

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ISSN 1798-7237 ISBN 978-92-9267-055-9

https://doi.org/10.35188/UNU-WIDER/2021/055-9

Typescript prepared by Gary Smith.

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The Institute is funded through income from an endowment fund with additional contributions to its work programme from Finland, Sweden, and the United Kingdom as well as earmarked contributions for specific projects from a variety of donors.

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1 Introduction

Adolescent and child marriage is still a common practice in many countries, especially among underage girls. Worldwide, one-third of women aged 20–24 years married before turning 18 years old. This practice is particularly widespread in South Asia, where more than 50 per cent of women continue to marry before age 18, and about 20 per cent marry before age 15 (Corno and Voena 2016). In Pakistan, despite increases in girls' schooling, large numbers of women do not join the labour market and are married off at an early age. Estimates from the Demographic Health survey 2012–13 show that early marriage is especially pronounced among women living in rural Pakistan, where one in three girls is married before reaching the age of 18. The existing literature on early marriage highlights its negative consequences on physcial and socio-economic outcomes for girls. The general consensus in the literature is that child marriages are associated with lower household bargaining power, increase in physical abuse and domestic violence, and reduced schooling (Field and Ambrus 2008; Jensen and Thornton 2003).

This study attempts to investigate the impact of financial shocks on the probability of dropping out of school and into early marriage among girls of school-going age in Pakistan. Are rural households in Pakistan more likely to withdraw their daughters from school and marry them off earlier when hit by adverse income shocks, and how do marital customs effect early marriages? Corno and Voena (2016) show that early marriage of daughters can be used as a consumption-smoothing coping strategy for households that face income shocks, which can have harmful long-run welfare implications, such as worse health outcomes for mother and offspring, increased risk of spousal abuse, and reduced literacy and educational attainment.

The paper also estimates the relationship between the marriage market and education, that is, the returns to girls' education as reflected in the receipt of marital assets of dowry and brideprice. If girls are able to stay in school, does this increase in education have returns in the marriage market instead of the labour market—that is, do more educated brides receive more marital assets? In Pakistani marriage customs, women receive two types of marital assets (dowry and brideprice), and the direction of the effect of education on the amount of each asset received is ambiguous.

This paper also explores the intergenerational effects of mothers' empowerment: are more empowered mothers more likely to invest in their daughters? There is considerable evidence showing that women's bargaining power in the household leads to differential development outcomes (Ambrus et al. 2010; Breza 2005; Deere and Doss 2006; Doss 2006; Fafchamps 2002; Quisumbing 2003). Increased access to and ownership of wealth has been shown to improve intergenerational transfers, child development, and other indicators of women's autonomy (Behrman 1988; de Brauw et al. 2014). Moreover, there is also a gender differential in the outcomes of the offspring, where mothers invest more in daughters' well-being compared to fathers (Qian 2008). Previous literature on Pakistan also shows that marital assets are used as a channel through which women gain more empowerment in the household (Khan et al. 2020; Makino 2019). Using marital assets as an instrument for women's empowerment, the intergenerational effects of increased bargaining power of the mother are estimated for children's schooling and expenditure, differentiated by gender.

To summarize, the main questions addressed in this study are:

1. Are households more likely to remove daughters earlier from schools when they are hit by adverse income shocks?
2. Are households more likely to marry off daughters earlier when they are hit by adverse income shocks?
3. How do marital customs of dowry and brideprice effect child marriage in shock-hit households?
4. Do educated women receive a greater amount of marital assets?
5. Do these additional assets have any intergenerational benefits?

The paper is structured as follows. Section 2 begins by providing an overview of the marital customs of brideprice and dowry in Pakistan. Section 3 discusses the empirical strategy and the data. Section 4 discusses the empirical results, and Section 5 concludes the paper.

2 Literature review

2.1 Dowry, brideprice, and household bargaining: theory and evidence[1]

Islamic marriages conducted under Pakistani marital laws generally involve marital contracts known as *Nikahnamas*, which are somewhat similar to pre-nuptial agreements. Before the marriage is officiated, a formal contract is drawn up, which notes the consent of the couple to marry, and specifies the exact amount of *Haq-e-Mahr* (dower) to be transferred from the groom to the bride. This cannot be renegotiated after the marriage takes place, and traditionally would be maintained by the wife. However, under loose property rights, within a patriarchal society, the bride often loses control over the right of ownership of particular assets (Khan et al. 2020).

As reported in the descriptive statistics (see Table 1), the total amount of *Haq-e-Mahr* in the sample is very small, and is merely a symbolic gesture to fill out a section of the marital contract (Makino 2019). The amount of *mahr* reported is the same as in previous studies on Pakistan (Khan et al. 2020). Besides *Haq-e-Mahr*, brides also receive further transfers from the husband in the from of a customary brideprice (referred to as *Bari* in traditional terminology). Brideprice typically includes assets and items, such as furniture, jewellery, clothing, and household items, and is a much more significant transfer than the *Haq-e-Mahr* (Makino 2019). Similar to *Haq-e-Mahr*, the brideprice is also specified in the *Nikahnama* before the marriage is concluded.

Along with the practice of brideprice, the practice of dowry-giving is also prevalent in Pakistan. *Jahez* can be classified into two categories: one comprising household items such as furniture, clothing, electronics, and utensils for the bride to set up a home, and the other comprising items of higher value, such as jewellery, cash, and, depending on the bride's family financial status, vehicles and real estate (Waheed 2009). It is not required to be mentioned in the marriage contract.

The practice of dowry/brideprice is criticized in media and commonly in the economics literature due to the social and economic costs associated with it, especially those being unequally borne by the women in the relationship. However, within the economics literature that estimates the role of assets in female empowerment, such marital transfers are largely used as a proxy for bargaining power. Especially within the non-cooperative bargaining literature, these are considered as non-labour income sources, which then enter the women's individual utility function and play a role in her empowerment (Ambrus et al. 2010; Kaye et al. 2005; Mbaye and Wagner 2017). Other studies show that the practice might not necessarily

[1] This subsection relies heavily on Khan et al. (2020).

have an empowering affect, if the marital transfer is not retained by the wife (Chan and Zhang 1999). Moreover, brideprice also increases the risk of early marriages (Ashraf et al. 2016; Corno and Voena 2016).

Looking at empirical evidence from South Asia, there is a dearth of empirical work on asset transfer at marriage in Pakistan, mostly due to lack of data on intra-household asset allocation. Most of the existing studies in the South Asian context focus on India. Chan (2014) proposes that dowry has a heterogeneous nature and should be decomposed into its two components: a 'groomprice', which is not in the wife's control, and a 'bequest' dowry, which she is more likely to control. Using data from Karnataka, India, Chan (2014) finds that only a bequest dowry enhances women's status in the marital household. Jejeebhoy and Sathar (2001) find that dowry has empowering effects in only the northern parts of India. Dowry amounts seem to be negatively associated with women's decision-making power in the southern states. Bloch and Rao (2002) and Srinivasan and Bedi (2007), both using data from a few specific Indian villages, indicate that women with higher dowry amounts are less likely to suffer spousal abuse. Marital assets also seem to have heterogeneous effects on women's status in other contexts: Zhang and Chan (1999) and Brown (2009) use East Asian data sets and show that dowries have positive effects on several measures of women's welfare, while Suran et al. (2004), using data from rural Bangladesh, find a completely opposite effect. Lastly, Khan et al. (2020) find that only brideprice has a beneficial effect on women's empowerment, and only if it is retained in the long term. In sum, the relation between dowry and women's welfare remains an open empirical question because its precise nature likely varies depending on the social context.

2.2 Determinants of early marriages: why are girls married off at a young age?

The existing literature shows that cultural and social norms are the main culprits of the persistence of early marriage, although the family's economic situation can exacerbate the issue (Corno and Voena 2016). Field and Ambrus (2008) show that in the marital market, there is a preference for younger brides, as younger women are perceived to be more fertile, more likely to be sexually inexperienced, and easier to control. Turning to the economic determinants of early marriage, there is evidence that low-income households are twice as likely to practice child marriage for their daughters, compared to girls from higher-income households (World Vision 2013). Girls in these households are considered a net economic burden. Due to patrilocality, the married daughter exits her parents' household, thus reducing the number of economically inactive dependants (Chowdhury et al. 2020; Hoogeveen et al. 2011).

The tradition of making marriage payments, such as dowry and brideprice, can also be an economic driver for early marriages. In rural Pakistan, a woman receives dowry as pre-mortem inheritance from her parents at the time of her marriage. Brideprice is also traditionally paid by the groom to the bride. Existing empirical evidence shows that under both types of marital payments, it is economically lucrative for the parents to marry off their daughters early. That is, dowry increases with bride's age, while brideprice decreases.

Lastly, wealth shocks can also drive households to use early marriages of girls as a coping strategy. Corno and Voena (2016) estimate the relationship between idiosyncratic rainfall shocks and age at marriage in Tanzania, and show that negative shocks in the cluster of birth of a girl increase her probability of marriage by age 18. The authors show that, in the absence of credit markets, early marriages of daughters can act as a consumption-smoothing insurance, as a younger bride is expected to receive a larger brideprice. Lowes and Nunn (2017) do not find a correlation between bride prices and age at marriage for the Democratic Republic of Congo. Hotte and Lambert (2020) also do not find any significant impact of rainfall shocks on the amount of the marriage payments in Senegal, but there is a postponement of marriages due to credit constraints.

2.3 Returns to education in the marriage market

Returns to education in the marriage market do not receive due attention in the economics literature. This is partly due to the difficulty establishing causality and empirically estimating the complex relationship. Even with the dearth of evidence, marriage is still considered an important component of women's returns to education (Ashraf et al. 2016; Chiappori et al. 2017).

The literature on marital assets is mostly concentrated in India, where the only asset considered is dowry (Anderson 2003; Chan 2014; Srinivasan and Bedi 2007). Brideprice, on the other hand, is rarely taken into consideration, even though is it as prevalent as dowry, especially in Muslim communities (Ashraf et al. 2016; Bishai and Grossbard 2010; Khan et al. 2020; Makino 2019). This is also likely due to the lack of distinction between the type of asset received by the wife. Most household surveys would ask for the amount of the marital asset received, and do not delve into the origin of the asset. Recent studies have shown that cultural practices still have an influence on parental preferences about investments in children's education. Son bias, polygamy, patrilocality, and inheritance practices can affect how much parents invest in girls' schooling (Ashraf et al. 2016; Bau 2021; Gaspart and Platteau 2010; Jayachandran and Pande 2017; La Ferrara and Milazzo 2017; Tertilt 2005).

Ashraf et al. (2016) provide a framework for understanding the relationship between the practice of marital assets, and the parents' decision of whether to educate their daughters. The authors develop a model of educational choice with and without marital assets. Perfectly altruistic parents choose whether to educate their children. After the educational investment takes place, men and women match in a frictionless marriage market based on their educational attainments, which are complementary in the marital output function. In equilibrium, the marital assets received are larger for educated women. Hence, the practice of giving marital assets to the bride provides an additional monetary incentive for parents to invest in their daughters' education. Consistent with the model, the authors empirically find that, for groups that practice the custom of brideprice, the value of brideprice payments that the parents receive tend to increase with their daughter's education. As a consequence, the probability of a girl being educated is higher among brideprice groups.

The model also predicts that families from brideprice groups will be the most responsive to policies aimed at increasing female education, and they find evidence consistent with this prediction. The authors revisit the INPRES school construction programme in Indonesia, as well as a similar programme in Zambia, to test this prediction of the model. The programmes show large effects only in communities that partake in the tradition of brideprice. The findings by Ashraf et al. (2016) emphasize the importance of the marriage market as one of the drivers of educational investment, and provide evidence for the importance of cultural context in the effectiveness of development policy. In Pakistani marriage customs, women receive two types of marital assets, and the direction of the effect of education on the amount of each asset received is ambiguous.

3 Empirical methodology

3.1 Wealth shocks and the risk of school dropout/early marriage

The risk of school dropout and early marriage for girls can increase due to financial shocks. In dire times, parents might withdraw their daughters from school as a coping mechanism. The effect of shocks on male education and marriage is ambiguous. The empirical strategy follows Corno and Voena (2016), where the exogenous variation in natural disasters and other wealth shocks across villages, households, and years are exploited to study the causal effects of shocks on the probability of girls and boys dropping out of school and getting married by the year they turn 18. Specifically, the following linear probability

model will be estimated:

$$Y_{i,v,y} = \alpha + \sum_{a} \beta_a (Shock\ at\ age)_{i,v,y} + \gamma X_i + \delta_v + \lambda_y + \varepsilon_{i,v,y} \tag{1}$$

where $Y_{i,v,y}$ takes value 1 if person i, in village v, interviewed in year y, got married in the year she turns 18 or before, and 0 otherwise. *(Shock at age a)* is a monetary shock experienced at different ages, measured in rupees. X_i is a set of standard individual and household controls used in the literature, including age and its squared term, household size, parents' education, mother's employment status and her earnings, distance to school and operation years, and type of school. District fixed effects are also included in the estimating equation. The coefficient of interest is β_a, which captures how wealth shocks affect the probability of marrying before or at the age of 18. A positive coefficient indicates that an adverse wealth shock increases the probability of early marriage. An analogous regression is estimated for the probability of dropping out of school due to a wealth shock.

3.2 Returns to education in the marriage market

Next, the predictions of the Becker price model are tested—that is, whether the value of the marital assets increases with the educational attainment of the wife.[2]

In Pakistan's context, educated women are more likely to be aware of family laws that make the provision of brideprice mandatory on the marriage contract, and can bargain for a higher brideprice. They are also more likely to retain any marital payments and possess their marriage certificates (Khan et al. 2020). Moreover, educated women might be able to negotiate a lower dowry, as this practice is only customary and is not a requirement of marriage laws in Pakistan.

The empirical strategy follows Ashraf et al. (2016) to estimate the following hedonic regressions where marital payments are a function of the wife's education level:

$$\begin{aligned} \ln(Dowry)_{i,v,y} = \alpha + \beta_1 (Primary)_{i,v,y} + \beta_2 (Secondary)_{i,v,y} \\ + \beta_3 (Tertiary)_{i,v,y} + X_i \beta_4 + \varepsilon_{i,v,y} \end{aligned} \tag{2}$$

$$\begin{aligned} \ln(Brideprice)_{i,v,y} = \alpha + \beta_1 (Primary)_{i,v,y} + \beta_2 (Secondary)_{i,v,y} \\ + \beta_3 (Tertiary)_{i,v,y} + X_i \beta_4 + \varepsilon_{i,v,y} \end{aligned} \tag{3}$$

where i indicates a marriage, v is the village, and y is the survey year. $(Brideprice)_{i,v,y}$ is the value of the brideprice that was received by the respondent woman at the time of her marriage in rupees, while $(Dowry)_{i,v,y}$ is the value of the dowry that was paid at the time of marriage in rupees. These marital assets are calculated as a value sum of each asset that is listed by the respondent. The variables $(Primary)_{i,v,y}$, $(Secondary)_{i,v,y}$, and, $(Tertiary)_{i,v,y}$ are indicators that equal to 1 if the wife has completed schooling to primary, secondary, or tertiary level, respectively. The vector X_i includes household and individual controls (age, age-squared, and woman's employment status and earnings), including information on her marriage and her family background (age at marriage, agreement on marriage, possession of marital certificate, and parents' schooling and occupation). In the Pakistani context, marital assets include dowry and brideprice, and the returns to education in the marital market might be in the opposite direction for the two types of marital transfers. That is, according to the price model, a higher-educated bride will bring in a lower dowry while demanding a higher brideprice.

[2] The Becker price model is in line with the price model in which dowry is the price determined in the marriage market. According to Becker (1991), the person who gains in the marriage pays the price at the time of marriage. The quality of the bride determines the price (dowry)—that is, a higher-quality bride would require a lower dowry, and vice versa. In the case of Pakistan, as per the price model, the higher-quality bride would require a higher brideprice from the groom's family. The quality of the bride and the groom is estimated by characteristics considered in the marriage market; socio-economic status, academic achievements, physical attributes, age at marriage, income-earning potential (Makino 2019), and, in the Pakistani context, the groom's occupation (men employed in STEM are considered to have higher earning prospects) and 'prestigious' family name (indicating a wealthy feudal background).

3.3 The intergenerational effects of women's empowerment

To estimate the intergenerational effects of women's empowerment, the effect of marital assets on household decision-making is estimated, along with the subsequent effects on children's school attendance and expenditure. The first stage is estimated with the mother's marital assets as an instrument for women's household empowerment. The second stage estimates the effect of women's increased empowerment, due to her marital assets, on intergenerational outcomes—her children's schooling and expenditure.

The first stage is presented by Equation (4):

$$(Mother's\ empowerment)_i = \alpha + \beta_1 (Mother's\ marital\ assets)_i + \gamma X_i + \varepsilon_i \tag{4}$$

where:

- $(Mother's\ empowerment)_i$ = the respondent mother's average of the score for decision-making in the household;
- $(Mother's\ marital\ assets)_i$ = monetary value of dowry and/or brideprice; and
- γX_i = the set of individual, parental, household, and school characteristics.

The second stages for the effects of the mother's empowerment on children's schooling and expenditure are as presented in Equations (5) and (6), respectively.

$$P(Enrolment)_{i,v,y} = \alpha + \beta_1 \widehat{(Mother's\ empowerment)}_{i,v,y} + \gamma X_i + \varepsilon_{i,v,y} \tag{5}$$

$$(School\ expenditure)_{i,v,y} = \alpha + \beta_1 \widehat{(Mother's\ empowerment)}_{i,v,y} + \gamma X_i + \varepsilon_{i,v,y} \tag{6}$$

where:

- $(Enrolment)_{i,v,y}$= the child's current enrolment status;
- $(School\ expenditure)_{i,v,y}$ = the annual expenditure on schooling in rupees on each child;
- $\widehat{(Mother's\ empowerment)}_{i,v,y}$ = the instrumented measure of mother's empowerment; and
- γX_i = the set of individual, parental, household, and school characteristics.

Women's empowerment in the household is measured by the decision-making power within her marital home. The women's module in the Pakistan Panel Rural Household Survey (PRHS) has a set of 12 decisions, where the respondent woman has to state to what extent her preferences/opinions are taken into consideration in making the following types of decisions within her household: children's education, children's health treatment, children's training, fertility and family planning decisions (desire for more children, contraceptive use and methods), household expenditure decisions, participation in social and political activities, decisions regarding own paid work, and mobility decisions (visits to parents, in-laws, and neighbours). The response to each decision has an ordinal measure from 1 to 5, where 1 means the respondent woman can never make the decision, and 5 means she can always make the decision. For each woman, an average of the response variable for all decisions that she can make in her marital household is used as a measure of empowerment. It is rather complicated to use a continuous measure of household empowerment as the ordinal measure reported for every decision type. If a continuous measure is used, there will be 12 separate regressions for each type of decision. The average decision-making power in the sample is 3.5—that is, married women can make decisions, on average, a little less than half of the time.

Coming to the measurement of marital assets, there are several issues that could bias the estimates on the effects on women's empowerment in the first stage (Equation (4)). First, the lack of data and poor quality of asset measurements: marital assets in the South Asian context include, among other items, cash, jewellery, electrical goods, furniture, clothing, household items, and livestock. Assessing the monetary value of such items at the time of marriage can be a challenge. Also, recall of assets at the

time of marriage can be problematic for the measurement of marital payments received, especially for older women who have been married for many years. Recall of assets is not an issue for marriages in Pakistan, as larger marital payments are listed within the marriage contracts (Khan et al. 2020). Also, marital payments are an important part of the marriage ceremony; they are discussed extensively before signing of the contract and have to be agreed on by both parties, as the payments are relatively large. Moreover, higher-value brideprice and dowry items such as jewellery have to be worn at the time of the wedding ceremony, and displayed to the wedding guests. Consequently, respondents are expected to recall important details in their marriage arrangements (Makino 2019).

Second, endogeneity of marital assets would prevent making causal inferences regarding their effects on women's empowerment. For example, according to the price model, the husband's higher-education level increases the amount of dowry that the wife brings into the marriage. Similar to the endogeneity argument in the relationship between the level of education and labour market outcomes, the husband's parents may also increase the human capital investment in their son to increase the future amount of dowry they receive (Makino 2019). Moreover, unobserved characteristics of the parents, for example wealth and social status, may affect not only the amount of marital assets received by the wife, but also the treatment she receives from her spouse and in-laws. Wealthier parents might provide a larger dowry with the expectation of better treatment for their daughter (Makino 2019). Conversely, more progressive parents might be able to bargain for a lower dowry, as it is not a requirement in Pakistani marriage contracts. While the husband's education is information that is captured (in the vector X_i), there are other unobserved confounders that simultaneously affect the possession of marital assets and the empowerment status of women. A rich set of observed marital characteristics concerning, for example, the wife's natal family's information, ownership of marriage certificate, agreement about the match, and right to divorce are also included in the analysis.

Previous literature on Pakistan shows that women who receive/retain a higher dowry and/or brideprice are more likely to be empowered and have greater decision-making power in household matters (Khan et al. 2020; Makino 2019). It could be argued that the assets themselves can be used to fund school expenses or household expenditures. This is not a concern for Pakistani households, as marital assets are only sold for major expenses or emergencies. As gold is one of the highest-value items in the marital assets, it is more likely to be kept or passed on to the sons and daughters as their marital assets. There is also the concern of reverse causality, where the marital assets could be a result of a woman being more empowered. The measure of assets in the data is what is received at the time of her marriage, while the measure of empowerment is a current measure. Also, the amount the bride receives/pays is decided by the parents before the marriage ceremony takes place. It is very rare that the bride is involved in negotiating her marital payments, especially in a conservative rural setting. The amount at the time of her marriage can then determine how she is treated in her marital household.

3.4 Data

The data set used for analysis is the Pakistan rural household panel survey (PRHS). The PRHS is a joint project of the Pakistan Institute of Development Economics (PIDE) and the World Bank; it is a longitudinal and multi-thematic database used to analyse poverty and social dynamics in Pakistan. The PRHS has three panels, covering the years (1) 1986 and 1991; (2) 2001, 2004, and 2010; and (3) 2012, 2013, and 2014.

For this study, only the second panel is used for analysis, as this is the only panel with information on marital assets. The PRHS has information on a large number of topics, including income, employment, consumption, time use, assets and savings, loans and credit, education, government assistance, women's empowerment, marital transfers, economic shocks, and participation in social safety nets, at the household and community levels. The PRHS has a representative sample of about 4,000 households in the rural areas of three provinces: Punjab, Sindh, and Khyber Pukhtunkhwa province. The data set

also has a separate module for positive and negative shocks (natural disasters, health shocks, income shocks, government assistance, girls' school stipends, profits, etc.), with a monetary valuation of each shock.

Table 1 presents the descriptive statistics of the sample used in the analysis. Panel (a) shows the information on marital assets of married women in the sample. The data contain marital information for around 1,600 married women over the age of 15. The total dowry received, on average, is around Rs.24,000, while the brideprice received is close to Rs.13,000.

Table 1: Descriptive statistics

	Freq.	Mean	S.D.
(a) Marital information			
Decision-making mean	1,617	3.58	0.94
Total dowry (Rs.)	1,653	23,527	43,487
Total brideprice (Rs.)	1,653	12,915	30,981
Father literate	1,543	0.29	0.45
Mother literate	1,543	0.03	0.17
Opinion marriage	1,521	0.12	0.17
Nikahnama possess	1,545	0.24	0.43
Read *Nikahnama*	383	0.29	0.45
Right to divorce	383	0.001	0.021
Mahr amount	489	7,323	19,191
Conditions for the husband	1,545	0.05	0.22
Nikah (engagement) age	1,106	17.61	3.85
Under-aged brides	4,973	0.04	0.19
(b) Schooling information			
Currently enrolled	8,195	0.58	0.49
Currently enrolled girls	3,897	0.53	0.50
Currently enrolled boys	4,298	0.63	0.48
Father school	8,195	0.02	0.43
Mother school	8,195	0.01	0.13
School distance	8,195	0.49	0.82
Primary school village	8,195	0.53	0.50
Secondary school village	8,195	0.02	0.15
High school village	8,195	0.01	0.11
(c) Monetary shocks			
Shock year 2010	4,027	0.10	0.30
Shock year 2009	4,027	0.03	0.17
Shock year 2008	4,027	0.02	0.15
Shock year 2007	4,027	0.01	0.10
Shock year 2006	4,027	0.01	0.11
Monetary loss (Rs.)	4,027	129,233	715,385

Source: author's compilation based on PRHS data.

The amount of brideprice received is about Rs.7,000. About 30 per cent of married women have an educated father, while only 3 per cent have an educated mother. Only 12 per cent were asked about their approval for the marriage, while only 24 per cent are in possession of their marriage certificate (*Nikahnama*). Out of those who are in possession of their marriage certificate, only 30 per cent have read it. Only seven women in the sample reported having the right to divorce their spouse stated on the marriage certificate, and only 5 per cent had some conditions for the husband. The average age of *Nikah* (engagement) is almost 18 years. The rate of underage marriages for girls under the age of 18 in our sample is about 0.04—that is, about 4 per cent of girls under the age of 18 are already married. These statistics are consistent with other marital assets data on Pakistan (Khan et al. 2020).

Panel (b) shows the education information for children 15 years old or younger. The sample is around 8,000 children. About 63 per cent of all boys in the sample are enrolled in school, while 53 per cent of all girls are in schooling, which is consistent with nationally representative data sets. The information on

schools shows that the average school is less than 1 km away from the residence. About half of villages have a primary school, fewer have higher levels of schooling.

Panel (c) presents the information on shocks within 12 months of the years 2010, 2009, 2008, 2007, and 2006. The PRHS has detailed information on socio-economic shocks in the last five years. For each shock, households are asked the monetary value of the loss experienced for each year. The total loss in rupees is calculated as a sum of all losses in the year.[3] About 10 per cent of the households in the sample experienced a shock in the last 12 months (year 2010), while 3 per cent experienced shocks in the year 2009. The total value of loss due to shock in an average year was about Rs.130,000. About 66 per cent of households that experienced shocks were hit by natural disasters. About 17 per cent had losses of business assets due to violence, and 14 per cent had losses due to illness and death.

4 Results

4.1 Wealth shocks and children's schooling and early marriages

Table 2 presents the results for Equation (1), which estimates the effects of the wealth shocks on children's school enrolment. The regressions include controls for child and parent characteristics, household characteristics, and school characteristics. To control for spatial differences, district fixed effects are added. The standard errors are clustered at the village level. Columns 1 and 2 of Table 2 present the enrolment of girls and boys, respectively, for estimation without any controls or fixed effects. The variables of interest are the monetary shocks in each year, measured in rupees. When the monetary value of shocks in the last 12 months (2010) increases by Rs.1,000, the enrolment for girls decreases by less than 1 percentage point. There is no decrease in boys' enrolment due to the wealth shock in the last 12 months. The results for girls are robust to the addition of controls, district fixed effects, and clustering of standard errors. For the boys sample, adding controls improves the significance level, where the decrease in enrolment is the same as that for girls. This negative effect of wealth shocks on schooling is not long-lasting for either gender. Both girls and boys only experience a slight decrease in enrolment within 12 months of a wealth shock. When school characteristics are added, the school dropout rates decrease for shocks earlier than 2010, by 1 per cent for both the boys and girls sample. As school characteristics are not available for all households, the sample size is reduced by 2,000 individuals. Shocks that occurred more than 12 months ago (2009 and back) do not seem to reduce enrolment rates. Hence, there is no differential dropout by gender. In the case of wealth shocks, girls are not more likely to be removed from schools. The controls behave the same way as expected in the literature—for example, parents' schooling is positively correlated with children's schooling, and mother's employment and earnings also improve her children's earnings.

[3] The negative economic shocks include: loss of personal assets due to a natural disaster (drought, fire, flood, earthquake), loss of business assets due to a natural disaster (drought, fire, flood, earthquake), loss of personal assets due to violence or conflicts, loss of business assets due to violence or conflicts, crop failure (due to disease, drought, or floods), business bankruptcy/failure due to low sales/demand, illness/disability of income earner, illness/disability of other household member, death of an income earner, death of a household member, loss of livestock due to disease or other causes, drop in crop income, job loss, unsuccessful investment, internally displaced, and others.

Table 2: School dropouts and wealth shocks

	(1) Girls	(2) Boys	(3) Girls	(4) Boys	(5) Girls	(6) Boys	(7) Girls	(8) Boys
Shock Loss 2010 (Rs.)	–0.003**	–0.001	–0.004***	–0.004***	–0.004**	–0.004***	–0.003*	–0.004**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)
Shock Loss 2009 (Rs.)	0.001	0.006*	0.003	0.004	0.003	0.004	0.011**	0.012**
	(0.002)	(0.004)	(0.002)	(0.003)	(0.003)	(0.003)	(0.005)	(0.006)
Shock Loss 2008 (Rs.)	0.000	0.001	–0.003	–0.002	–0.003	–0.002	–0.001	–0.004
	(0.005)	(0.005)	(0.004)	(0.005)	(0.007)	(0.004)	(0.008)	(0.005)
Shock Loss 2007 (Rs.)	–0.001	0.002	–0.000	0.002	–0.000	0.002	–0.001	0.004**
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)
Shock Loss 2006 (Rs.)	–0.002	0.011	0.001	0.008	0.001	0.008	0.001	0.006
	(0.004)	(0.010)	(0.003)	(0.010)	(0.003)	(0.011)	(0.004)	(0.013)
HH and individual controls			✓	✓	✓	✓	✓	✓
School controls							✓	✓
District FE			✓	✓	✓	✓	✓	✓
Clustered SE (Village)					✓	✓	✓	✓
Observations	3,897	4,298	3,832	3,743	3,832	3,743	2,169	2,228

Note: clustered (village-level) standard errors appear below coefficients in parentheses. * significant at 10 per cent; ** significant at 5 per cent; *** significant at 1 per cent. The variable *Shock Loss* is the sum of monetary values of all shocks experienced by a household in the given year.

Source: author's compilation based on PRHS data.

Table 3 presents the results for the estimation of an analogous regression for Equation (1) for the effect of shocks on early marriage.[4] There is no significant effect of shocks on early marriages for the girls sample.[5] There is a slight negative and significant effect on underage marriage if a girl experiences shock at age 13. The average age of menarche in Pakistan is 13 years. According to Islamic practices, marriage is only allowed for girls who have reached puberty. The hazard of early marriage can only then be observed for girls of age 13 or older. This is a similar finding to Corno and Voena (2016), where girls under the age of 13 in India have a lower hazard of early marriage.

The main takeaway from Table 3 is that adverse income shocks at and before the age of 18 years did not lead to an increase in the probability of early marriage for girls. The findings go against the theoretical predictions from Corno and Voena (2016): households hit by adverse income shocks are not more likely to marry off their daughters to give away costly assets in the household. It is not clear why the findings do not support the theoretical predictions. One likely interpretation is that the practice of dowry might have an impact on early marriages, as the families cannot afford to make marital payments, but are unwilling to give up the custom and prefer to wait until the household has financially recovered from the income shock. Also, climate change has had adverse effects on rural communities in South Asia. Households that expect income shocks like floods and droughts have a larger toolbox of coping mechanisms, such as rural–urban migration, particularly of male household members (Corno and Voena 2016). Lastly, changing attitudes of parents towards child marriages and increased access to schooling for girls may also be playing a role.

[4] The variable *Shock at age a* only measures the incidence of a shock, and not the value of losses.

[5] Due to very low numbers of underage marriage for boys, the estimation is only possible for the female sample.

Table 3: Wealth shocks and early marriage: sample of girls, 18 or younger

	(1) Girls	(2) Girls
Shock at age 17 or younger (2010)	0.004	–0.000
	(0.009)	(0.009)
Shock at age 16 or younger (2009)	–0.006	0.002
	(0.017)	(0.016)
Shock at age 15 or younger (2008)	–0.013	–0.022
	(0.020)	(0.018)
Shock at age 14 or younger (2007)	0.018	0.008
	(0.023)	(0.018)
Shock at age 13 or younger (2006)	–0.036	–0.043*
	(0.031)	(0.026)
Individual characteristics		✓
Parental characteristics		✓
Household characteristics		✓
Marital info		✓
Districts FE		✓
Observations	4,973	4,973

Note: clustered (village-level) standard errors in parentheses. * significant at 10 per cent; ** significant at 5 per cent; *** significant at 1 per cent.

Source: author's compilation based on PRHS data.

To test the plausible effects of marital customs on early marriages, I test whether expectations of higher marital asset payments can discourage early marriages. Parents might not have the resources to pay for their daughters' dowry (and boys' parents for brideprice). Following Corno and Voena (2016), the average value of marital assets in the village (both dowry and brideprice) is constructed, which is the average amount received/paid by the women living in the same village as the respondent and married before the respondent turned 18. The idea behind the average marital asset is that the amount of marital assets of the neighbouring women may provide an indication to parents of how much they have to spend on marrying off their daughter at a certain age, without being directly correlated with their daughter's characteristics (e.g., education, physical appearance). Table 4 presents the augmented regression with the interaction between the incidence of a shock in the village and the average value of marital transfers in the village. Column 1 shows the analysis for all marital assets received, while columns 2 and 3 split the analysis by the two types of marital assets: dowry and brideprice. As the average price of assets in the village increases by Rs.1,000, there is also a small increase in the probability of early marriage.

The results in columns 1–3 show the interactions between adverse shocks and the average marital assets amount in the village, before the respondent turned 18. The effect is negative for shocks in the last 24 months, suggesting that girls exposed to income shocks before or at the age of 18 and living in villages where the average marital assets are higher have a *lower* probability to be married by the year they turn 18 or before. However, the magnitude of the effect is rather small: a one standard deviation increase in the interaction between an adverse shock at age 18 and the average marital assets in the village decreases the probability of early marriage for girls by less than 1 percentage point. This effect disappears for shocks in younger age groups. There is a small positive effect for shocks at age 14, only significant at the 10 per cent level. This lends some weak support to the speculation that households that experience income shocks are too credit-constrained to pay for marital assets, and hence do not marry off their daughters at younger ages.

Table 4: Marital assets and the probability of early marriage

	(1) All assets	(2) Dowry	(3) Brideprice
Average marital assets in village (Rs.)	0.001**	0.001***	0.001**
	(0.000)	(0.000)	(0.000)
Shock 2010	–0.003	–0.001	0.007
	(0.011)	(0.010)	(0.010)
Shock 2009	0.008	0.012	0.008
	(0.016)	(0.018)	(0.020)
Shock 2008	–0.008	–0.024	–0.018
	(0.020)	(0.020)	(0.022)
Shock 2007	0.008	0.010	–0.004
	(0.029)	(0.020)	(0.027)
Shock 2006	–0.033	–0.025	–0.049*
	(0.031)	(0.026)	(0.026)
Shock 2010 * average assets	–0.000	–0.000	–0.001**
	(0.000)	(0.000)	(0.000)
Shock 2009 * average assets	–0.001***	–0.001***	–0.000
	(0.000)	(0.000)	(0.000)
Shock 2008 * average assets	–0.000	–0.001**	–0.000
	(0.000)	(0.000)	(0.000)
Shock 2007 * average assets	–0.000	–0.000	0.001*
	(0.000)	(0.000)	(0.000)
Shock 2006 * average assets	–0.000	–0.001***	0.000
	(0.000)	(0.000)	(0.000)
Individual characteristics	✓	✓	✓
Parental characteristics	✓	✓	✓
Household characteristics	✓	✓	✓
Marital info	✓	✓	✓
Districts FE	✓	✓	✓
Observations	4,973	4,973	4,973

Note: clustered (village-level) standard errors in parentheses. * significant at 10 per cent; ** significant at 5 per cent; *** significant at 1 per cent.

Source: author's compilation based on PRHS data.

4.2 Marital assets and education level

Next, the analysis turns to the returns to education in the marriage market. Estimates of Equations (2) and (3) for the Becker price model are reported in Table 5, showing estimates for the hedonic regressions on the returns to education in the marital market. The estimates in columns 1 and 2 show that the amount of marital assets paid at marriage is positively associated with the respondent woman's educational attainment. In addition, as shown in columns 3–8, the relationship remains robust to the inclusion of controls (although the coefficients are half the size), for the individual controls (age and its squared term, employment status, earnings), household (size, husband's employment, and annual earnings of the respondent woman), marital information (age at marriage, agreement with match, possession of marriage certificate and having read it, right to divorce, consanguinity, dower receipt, and amount), and lastly parental characteristics (parents' education, father's salaried occupation, father's business occupation, family land ownership, and value of property). The estimates do not control for endogeneity of education and receipt of marital assets, but the rich set of controls presented above should control for some of the biases.

Table 5: Returns to education in the marriage market: determinants of marital assets (dowry and brideprice)

Log—marital asset	(1) Dowry	(2) Brideprice	(3) Dowry	(4) Brideprice	(5) Dowry	(6) Brideprice	(7) Dowry	(8) Brideprice
Primary level	0.35**	0.51***	0.22*	0.31***	0.06	0.33***	0.02	0.28***
	(0.14)	(0.14)	(0.11)	(0.10)	(0.13)	(0.11)	(0.13)	(0.10)
Secondary level	1.22***	1.23***	0.65***	0.56***	0.55***	0.50***	0.44***	0.43***
	(0.11)	(0.11)	(0.13)	(0.10)	(0.14)	(0.12)	(0.13)	(0.12)
Tertiary level	2.24***	2.46***	1.44***	1.58***	1.28***	1.57***	1.07***	1.45***
	(0.32)	(0.32)	(0.22)	(0.20)	(0.19)	(0.18)	(0.19)	(0.19)
Individual characteristics			✓	✓	✓	✓	✓	✓
Household characteristics			✓	✓	✓	✓	✓	✓
Marital information					✓	✓	✓	✓
Husband's characteristics					✓	✓	✓	✓
Parental characteristics							✓	✓
Districts FE			✓	✓	✓	✓	✓	✓
Constant	9.03***	8.36***	11.15***	10.59***	9.76***	8.61***	9.87***	8.61***
	(0.04)	(0.04)	(0.37)	(0.35)	(0.98)	(0.92)	(1.02)	(0.95)
Observations	1,624	1,611	1,624	1,611	1,027	1,018	1,020	1,010
R-squared	0.09	0.10	0.26	0.28	0.32	0.35	0.35	0.36

Note: clustered (village-level) standard errors appear below coefficients in parentheses. * significant at 10 per cent; ** significant at 5 per cent; *** significant at 1 per cent.

Source: author's compilation based on PRHS data.

The estimated effects of education on brideprice are large in magnitude. For example, according to the estimates reported in columns 1 and 2, completion of primary school is associated with a 35 per cent increase in the value of the dowry and 120 per cent increase in the value of both dowry and brideprice (relative to no schooling); completion of tertiary school is associated with an additional more than 200 per cent increase in the dowry and brideprice. Tertiary education does seem to increase the amount of brideprice received more than dowry, which is an intuitive result: educated women are expected to be more aware of the marital laws about compulsory brideprice in the country, and are able to bargain for a higher amount than those with lower levels of education. From columns 3–8, when controls, district fixed effects, and clustered standard errors at village level are added, the coefficients are halved in value. Adding controls also improves the fit of the model.

In conclusion, the Becker price model holds for the brideprice marital asset, and not for dowry. This opposite result could be driven by the different nature of dowry compared to the rest of South Asia. In Pakistan, dowry is not considered a compulsory marital payment. It is more of a customary payment made to the bride by her parents as a pre-mortem inheritance. The estimates from the parental controls show that better-educated parents with more resources are paying higher dowries, but not higher brideprices. Even women from progressive families are not abandoning the customary practice of dowry. Other studies also show that women retain dowry more than brideprice, as this is the part of the marital asset that comes from her parents' side, and she has more say in its usage (Khan et al. 2020). The marital information also provides some interesting insights into the marital practices: higher age of marriage is associated with receiving a lower brideprice, with no effect on receipt of dowry. In line with the Becker model, an older bride is viewed as less valuable. Imposing conditions on the husband (e.g. right to divorce) is also associated with a higher brideprice, but no effect on dowry. It can be interpreted that more empowered women are able to bargain for a higher brideprice. Consanguinity, possession of marital certificate, and dower do not seem to effect the amount of marital assets received.[6]

[6] The estimates for these controls are not presented for the sake of brevity.

4.3 Mothers' empowerment and intergenerational effects

Next, the analysis turns to the empowerment effects of the additional marital assets for the recipient woman, which can potentially be transferred to the next generation.

Table 6 presents the results for the mother's empowerment on children's school enrolment. Supercolumn (a) presents the results for the sum of all marital assets a woman received at the time of her marriage, separated by the daughters sample (column 1) and sons sample (column 2). The next two supercolumns, (b) and (c), replicate the analysis by splitting the marital assets into brideprice (columns 3 and 4) and dowry (columns 5 and 6). Previous studies on Pakistan show that the type of marital asset can effect how much of it is retained by the wife. In the Pakistani context, women are more likely to retain a dowry as that is what they receive from their parents' side. Brideprice, on the other hand, can be taken away by her husband or in-laws to fund emergencies (Khan et al. 2020). Therefore, the analysis is split for the two types of marital assets. Column 1 shows that if a woman is more empowered in the household, the daughter's enrolment increases by about 28 per cent. There is no effect on the son's enrolment (column 2). When the marital assets are split by the type of assets, the intergenerational effect for daughters only stays for the dowry asset (column 5). The intuition is that the mother will have more authority over her dowry. The brideprice, on the other hand, can be taken away as this is coming from the in-laws' side, or it is used up in times of emergency for consumption-smoothing. At the same time, we see in the descriptive statistics that the value of brideprice received is significantly less than the amount of dowry received. The first stage, presented in Equation (3), also provides intuitive results, where more marital assets lead to higher empowerment in the household. The instrument is only strong for the girls sample.

Table 6: Mother's empowerment and child enrolment

	(a) All assets		(b) Brideprice		(c) Dowry	
	(1) Girls	(2) Boys	(3) Girls	(4) Boys	(5) Girls	(6) Boys
Mother's empowerment	0.277***	0.052	0.125	0.005	0.328***	0.090
	(0.078)	(0.048)	(0.076)	(0.042)	(0.084)	(0.063)
Individual and parental characteristics	✓	✓	✓	✓	✓	✓
Household characteristics	✓	✓	✓	✓	✓	✓
School characteristics	✓	✓	✓	✓	✓	✓
Districts FE	✓	✓	✓	✓	✓	✓
First stage:						
Mother's assets	0.014***	0.027***	0.040***	0.063**	0.014***	0.030***
	(0.001)	(0.001)	(0.004)	(0.003)	(0.002)	(0.002)
Wald test of exogeneity (corr = 0): chi-squared (1)	9.93	2.33	3.05	0.34	9.8	3.03
Prob >chi-squared	0.002	0.13	0.081	0.56	0.002	0.08
Observations	1,544	1,629	1,544	1,629	1,544	1,629

Note: clustered (village-level) standard errors appear below coefficients in parentheses. * significant at 10 per cent; ** significant at 5 per cent; *** significant at 1 per cent.

Source: author's compilation based on PRHS data.

Table 7 replicates the analysis for schooling expenditure by gender. Women who are empowered are more likely to spend on both girls' and boys' schooling, though Rs.1,000 more per year is spent on boys. The expenses for boys are also higher as they have to travel to schools farther away, as girls are usually sent to schools in the same village, drastically decreasing the travel costs. Also, boys are more likely to be enrolled in private schools rather than public schools, which have higher tuition fees: about Rs.300 for a private school versus Rs.15 for a public school (Ahmed and Sheikh 2016). The first stage also provides intuitive results, where more marital assets lead to higher empowerment in the household. The first stage in the school expenses regression shows that marital assets are a strong predictor of a mother's decision-making in the household. The instrument is strong for both samples, where all the

strength tests come out as highly significant, with the F-test above the threshold of 10. The instrument also passes several other tests of strength, such as the Stock–Yogo weak ID F-test and the Anderson–Rubin Wald test.

Table 7: Mother's empowerment and children's school expenditure

	(a) All assets		(b) Brideprice		(c) Dowry	
	(1) Girls	(2) Boys	(3) Girls	(4) Boys	(5) Girls	(6) Boys
Mother's empowerment	1,360***	2,094***	1,776***	1,582***	1,179**	2,387***
	(437.03)	(356.03)	(485.13)	(308.25)	(483.97)	(443.10)
Individual and parental characteristics	✓	✓	✓	✓	✓	✓
Household characteristics	✓	✓	✓	✓	✓	✓
School characteristics	✓	✓	✓	✓	✓	✓
Districts FE	✓	✓	✓	✓	✓	✓
First stage						
Mother's assets	0.0095***	0.017***	0.029***	0.057***	0.0105***	0.019***
	(0.001)	(0.001)	(0.005)	(0.005)	(0.002)	(0.002)
F-test	41.4	131.79	38.69	160.97	31.42	87.93
Observations	601	951	601	951	601	951

Note: clustered (village-level) standard errors appear below coefficients in parentheses. * significant at 10 per cent; ** significant at 5 per cent; *** significant at 1 per cent.

Source: author's compilation based on PRHS data.

There is a concern that the mother's assets themselves might lead to higher enrolment or more spending on children, as these assets can be sold to fund expenses in the household. This is not a concern in the Pakistani context, as the most valuable marital asset received is jewellery, which is unlikely to be sold for funding day-to-day household expenses. These are only used in cases of large emergencies, or funding larger expenses in the household, like marriages or health emergencies. Marital assets are also saved to pass on to children at their weddings, especially jewellery (Khan et al. 2020). Moreover, school expenses are a smaller item of household expenditure, where the tuition fee is only Rs.300 per month on average for low-cost private schools, and about Rs.15 for public schools (Ahmed and Sheikh 2016).

5 Conclusion

This study supplements the literature on the driving forces behind early marriage. It also contributes to the literature that studies gender dynamics of coping mechanisms of rural households experiencing financial shocks. Lastly, this study contributes to the sparse literature on the returns to women's education in the marriage market and how these returns can play an important role in shaping women's empowerment in their marital households, and how this empowerment can be passed on to their children.

The analysis of wealth shocks on school dropout and early marriage does not find any conclusive evidence of negative effects on schooling. There is a small negative effect of wealth shocks within the last 12 months on enrolment rates of both boys and girls, which disappears for shocks in the long-run. Girls are also not likely to disproportionately leave schooling due to wealth shocks. There is also no strong evidence that these wealth shocks lead to early marriages for girls. There is a small decrease in the risk of early marriage for girls who experience shocks at age 13, which is consistent with earlier literature on child marriage. However, in villages with higher average marital payments, households that experience income shocks reduce early marriages of daughters due to credit constraints, as they cannot afford to pay for marital assets.

Regarding the returns to education in the marriage market in Pakistan, women receive a higher dowry and a higher brideprice as their education levels increase. These estimates should be interpreted as only correlations, as there are concerns of endogeneity and reverse causality. The analysis also revisits the empowerment effects of women's marital assets, and finds that women with more assets also have more decision-making power in their marital households. Lastly, there are intergenerational effects of mothers' empowerment—that is, mothers who enjoy more empowerment in their marital households invest more in their children's education.

This studies confirms previous findings that the marital customs of dowry and brideprice can improve a woman's own well-being in the household, where the positive effects are also passed on indirectly to her children. This study also indicates that the age of marriage is influenced by short-run fluctuations in the economic conditions of the household, especially in communities where giving marital assets is a tradition.

While programmes that alleviate credit constraints may reduce early marriage in sub-Saharan Africa (Baird et al. 2011), they may not necessarily have the desired impact in regions where different marital customs are practised. For countries in South Asia where dowry is practised, there is some evidence that conditional programmes are more effective in reducing child marriage than unconditional programmes (see Sinha and Yoong (2000) for India and Buchmann et al. (2017) for Bangladesh).

In order to improve our understanding of empirical research and to formulate effective policy for enhancing women's—and consequently also their children's—welfare, and for reducing child marriage, the economic role of culture and institutions should not be ignored.

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