

‘Til Dowry Do Us Part: Bargaining and Violence in Indian Families

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Abstract

We develop a non-cooperative bargaining model with incomplete information linking dowry payments, domestic violence, resource allocation between a husband and a wife, and separation. Our model generates several predictions, which we test empirically using amendments to the Indian anti-dowry law as a natural experiment. We document a decline in women’s bargaining power and separations, and a surge in domestic violence following the amendments. These unintended effects are attenuated when social stigma against separation is low and, in some circumstances, when gains from marriage are high. Whenever possible, parents increase investment in their daughters’ human capital to compensate for lower dowries.

JEL codes: J12, D13, I31, O15.

1 Introduction

Transfers of wealth between families at the time of marriage existed historically in many parts of the world, from the Babylonian civilization to Renaissance Europe, from the Roman and Byzantine empires to the Song Period in China. In current times, marriage payments remain pervasive in many areas of the developing world. While the practice of

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bride-price (a transfer from the groom's side to the bride's) is widespread in parts of East Asia and some African countries, dowries (wealth transfers from the bride's family to the groom or his family) are most common in South Asia. In India, Pakistan, and Bangladesh, dowry payments are nearly universal and quite sizable, often amounting to several times more than a household's annual income (Goody, 1973; Anderson, 2007).

The custom of dowry in India has been linked to extreme forms of gender inequality and gender-based violence (Menski, 1998; Oldenburg, 2002; Bloch and Rao, 2002; Srinivasan and Bedi, 2007). It has also been shown that higher dowries can increase women's status and decision power in their marital families (Zhang and Chan, 1999). Since more than one-third of women in India report being physically abused by their husbands and about half are excluded from consequential household decisions,¹ understanding the connections between dowries and women's status in their marital family is critical.

We develop a non-cooperative bargaining model that links dowries, women's human capital, domestic violence, intra-couple resource allocation, and separation. Popular models of intra-household bargaining (e.g., Chiappori (1988)) assume complete information and generally predict that the household allocation is efficient. However, this assumption conflicts with the occurrence of domestic violence, a prominent form of inefficient household behavior. Instead, we consider a bargaining model with incomplete information, where domestic violence is used by the husband to signal his (dis-)satisfaction with the marriage and to extract resources from his wife. We extend the non-cooperative framework of Bloch and Rao (2002) in multiple directions: by considering within-couple bargaining, by accounting for gains from marriage and their division, by endogenizing parental investments in the human capital of girls, and by examining the role of social norms against separation. To this point, we follow the insights of sociological and psychological studies on the consequences of marital dissolution in traditional societies and account for the possible psychological distress associated with separation (Sharma, 2011).

¹These figures are based on women's responses to the National Family Health Survey.

Our model generates several predictions, which we test empirically using amendments to the Indian anti-dowry law as a natural experiment. We estimate a fall in dowries following the amendments and an overall worsening of women’s post-marital outcomes. These unintended effects are attenuated (and can even be reversed) when social stigma against separation is low. Our model helps make sense of this heterogeneity. While we document possible negative consequences of anti-dowry laws, a broad body of work has identified various benefits of policies aimed at curbing or eliminating dowries in India. [Alfano \(2017\)](#) and [Bhalotra et al. \(2020\)](#), for instance, convincingly show that lower dowries can reduce parental preference for sons and hence improve girls’ outcomes. We wish to stress that we are not advocating in favor of dowries, but hope our analysis can guide the design of auxiliary policies to limit the unintended effects of anti-dowry laws. Importantly, our results are not generalizable to other contexts or policies.

Our empirical analysis focuses on the introduction of amendments to the Dowry Prohibition Act between 1985 and 1986. Since the Dowry Prohibition Act (initially introduced in 1961) and its amendments did not apply to Muslims (the Shariat governs marriage and family matters for Muslims) we exploit variation in religion and year of marriage to identify the effect of the amendments in a difference-in-differences framework. We confirm that the amendments, which tightened the existing anti-dowry legislation,² were successful at reducing dowry payments ([Alfano, 2017](#)): on average, women exposed to the amendments pay 0.2 standard deviations lower dowries (30 percent lower relative to the mean) and are 6 percentage points more likely to pay no dowry at all. Consistent with our model, we estimate a decline in women’s bargaining power and an increase in domestic violence following the introduction of the amendments. For instance, we find that women exposed to the reforms (and the subsequent decline in dowry payments) are 3 percent less likely to be involved in household decisions, on average. The decline in

²By increasing punishment, the amendments increased the cost associated with dowry exchange and essentially acted as a tax on dowry.

women's power is particularly pronounced for infrequent, possibly more consequential decisions, such as large household purchases and women's health care decisions. We also show that the amendments resulted in a 16 percent increase in the probability of domestic violence against women. Conditional on ever experiencing violence by their husbands, treated women suffer a wider array of injuries. We also document a decrease in separations after the reforms. Finally, we show that women exposed to the amendments have better human capital outcomes (e.g., education and height), suggesting that parents increased investment in the human capital of their daughters to compensate for lower expected dowries.

We uncover substantial heterogeneity in the impact of the anti-dowry reforms on women's status in their marital families. We provide evidence of differential effects by a couple's gains from marriage. Importantly, the effects of the reforms on women's post-marital outcomes are mitigated when social stigma against separation is low (such as in North-East and South India, urban areas, and villages with relatively higher rates of separation) and exacerbated when social norms concerning marital dissolution are strict. This finding suggests that the local cultural context (which likely evolves over time) may matter a great deal when designing policies aimed at changing traditional customs. It also emphasizes the need for "development approaches based on a fuller consideration of psychological and social influences" ([World Bank, 2015](#)).

2 Dowries, Violence, and Women's Power in India

In contemporary India, dowry payments are nearly universal, and a woman is typically unable to marry without such transfers.³ The prospect of paying a dowry is often listed as

³The literature on the origins of dowries and their role in the marriage market is extensive. See e.g. [Caldwell et al. \(1983\)](#); [Rao \(1993\)](#); [Edlund \(2000\)](#); [Bhaskar \(2019\)](#); [Anderson \(2003\)](#); [Botticini and Siow \(2003\)](#).

a critical factor in parents' desire to have sons rather than daughters and has been linked to female infanticide, sex-selective abortion, and the missing-women phenomenon (Sen, 1990). Dowries have also been associated with the dreadful occurrence of bride-burning and dowry-deaths (Bloch and Rao, 2002; Srinivasan and Bedi, 2007; Sekhri and Storeygard, 2014). These are extreme forms of domestic violence, which is pervasive in India as well as in other developing countries. The following figures may help gauge the gravity of the phenomenon. According to the latest National Family and Health Survey (hereafter NFHS), 36 percent of ever-married Indian women have experienced physical or sexual violence by their husbands. The most common type of domestic violence is less severe physical violence (28 percent), followed by severe physical violence (8 percent), and sexual violence (7 percent). One out of three female respondents in the India Human Development Survey (IHDS) answers affirmatively when asked whether in their community it is usual for a husband to beat his wife when her natal family does not provide enough money or gifts. According to data from the National Crime Records Bureau (NCRB), out of the almost 330,000 crimes against women committed in 2015,

Domestic violence is a dramatic form of gender inequality, but the limited decision-making power of women inside their families is another widespread example. Due to growing attention regarding the status of women in developing countries, in many household surveys, a common type of question to ask is, "Who usually makes decisions about [X] in your household?" The NFHS asks this question to ever-married women aged 15 to 49, with [X] referring to decisions regarding, e.g., own health care, contraceptive use, household purchases, and finances, visits to relatives, or even what to cook. According to the most recent wave of the survey, less than two-thirds of currently married women participate in decision-making about their health, major household purchases, or visits to their own family or relatives. One in six women reports being involved in no decision.

Divorce is rare in India and often riddled with stigma. According to the 2011 Census of India, 1.36 million individuals in India are divorced, amounting to 0.24 percent of

the currently married population, 0.21 percent of the ever-married population, and 0.11 percent of the total population (Jacob and Chattopadhyay, 2016). The dissolution of a marriage is often seen as damaging to a woman's reputation and is a source of substantial distress (Ragavan et al., 2015). Several sociological and psychological studies document the adverse consequences of marital dissolution for Indian women, which may lead to depression and anhedonia (inability to derive pleasure from various activities).⁴ As we discuss later on, the extent of women's psychological and emotional distress after separation may be critical to predict how a change in dowry impacts women's post-marital outcomes.

The Dowry Prohibition Act and Its Amendments. In 1961, the government of India enacted the Dowry Prohibition Act, prohibiting both the giving or receiving of a dowry. The law defined a dowry as "any property or valuable security given or agreed to be given either directly or indirectly (a) by one party to a marriage to the other party to the marriage; or (b) by the parents of either party to a marriage or by any other person, to either party to the marriage or any other person [...]." The act explicitly excluded from the definition of dowry (and hence from the law itself) any marital transfers "in the case or persons to whom the Muslim Personal Law (Shariat) applied." It also stipulated that dowries could be punished either by imprisonment up to six months *or* with a fine up to

⁴See Kotwal and Prabhakar (2009) and Zafar and Kausar (2014). We also provide empirical evidence in this direction. Using data from the 2004-2005 Survey on Morbidity and Health Care, we compare women's and men's probability of suffering from psychiatric disorders across marital statuses. While concerns related to under-reporting, under-diagnosis, and reverse causality are valid, we document a significantly higher probability of suffering from a mental disorder or distress for women and men who are divorced or separated (even conditional on a battery of individual controls; see Figure A1 in the Appendix). Notably, these gaps are larger for women, particularly in areas with more traditional gender norms and higher social stigma against divorce or separation.

5,000 Rupees.

The provisions of the act were not strong enough, and its attempt to reduce dowries proved mostly unsuccessful (Chiplunkar and Weaver, 2019). Between 1985 and 1986, the Indian government took a series of steps towards tightening the existing anti-dowry legislation. The Dowry Prohibition Rules (introduced in October 1985) established a set of rules according to which a list of wedding gifts must be maintained. The list must include a brief description of each gift, the approximate value of the gift, the name of the person who has given the gift, and when the person giving the present is related to the bride or groom, a description of such a relationship. Another amendment followed closely in 1986, increasing the minimum punishment for taking or abetting dowry to five years of imprisonment *and* to a fine of not less than 15,000 Rupees or the amount of the value of the dowry (whichever is higher). Finally, the amendment gave power to any state government to appoint "as many Dowry Prohibition Officers as it thinks fit," to prevent the taking or demanding of dowry and to collect the necessary evidence for the prosecution of violators of the Dowry Prohibition Act, and made it easier to punish husbands and in-laws for dowry-related cruelty. By showing an increase in the number of convicted offenders and dowry cases heard by the Supreme Court after 1986, Alfano (2017) provides evidence of both the enforcement and the public awareness of the amendments.

We obtain information about dowry payments from the 1999 Rural Economic and Demographic Survey (we provide details about this survey in Section E) and convert all dowries to 1999 Rupees. Consistent with the scope of the law, dowry payments for non-Muslims declined after 1985, while marital transfers for Muslims were virtually unaffected. In Figure 1, we present event-study graphs displaying the differences between non-Muslims and Muslims in gross and net dowries before and after 1985 (we consider two-year periods and normalize the difference in 1985 to zero). The gaps in gross and net dowries between non-Muslims and Muslims are negative and increasingly significant in the years following the reforms. These gaps are sizable, ranging between 23 to 38 percent

of the average gross dowry before 1985 and between 9 and 31 percent of the average net dowry before 1985. Consistently, the difference in the likelihood of a marriage involving no dowry at all widens after the reforms. Given the connections between dowry payments, violence, and women’s empowerment, one natural question is whether (and how) the 1985-1986 tightening of the anti-dowry law impacted women’s post-marital status. Previous work has documented an improvement in the gender composition of children following the amendments, possibly due to a decrease in parental preference for sons (Alfano, 2017). We instead focus on the effects of the reforms on women’s well-being in their marital families. While we defer a more rigorous investigation of these effects to Sections 4 and 5, it is interesting to look at the differences between non-Muslims and Muslims in women’s decisions power, domestic violence, and the likelihood of separation before and after 1985. As shown in Figure 1, there is a visible drop in women’s decision-making power after the amendments.⁵ In addition, we detect an increase in women’s likelihood to be a victim of violence by their husbands and a decrease in separation. As we discuss in the next section, these patterns are consistent with the predictions of our model.⁶

3 Theoretical Model

In this section, we focus on the post-marital bargaining between a husband and a wife, which we model as a non-cooperative bargaining game with incomplete information,

⁵We also construct event study graphs using REDS data and outcomes. Figure A12 in the Appendix presents the estimation results, which show a decrease in women’s control over food and clothing expenses after the amendments.

⁶The graphs in Figures 1 are obtained using the estimator developed in Borusyak et al. (2021), which adjusts for treatment effect heterogeneity using an imputation procedure. In Appendix F.1, we apply the methodology developed by Rambachan and Roth (Forthcoming) to test the sensitivity of these findings to parallel trends violations.

where domestic violence is used by the husband to command a higher share of the marital surplus. We draw on the framework developed by [Bloch and Rao \(2002\)](#), where violence is used by the groom's family as an instrument to extract transfers from the bride's family after marriage. Differently from [Bloch and Rao \(2002\)](#), we focus on the couple instead of their families, account for potential gains from marriage and their division, and examine the role of social norms against separation. We first develop a baseline model where the dowry amount and the human capital of brides are taken as given. We then extend the model to endogenize dowry payments as well as parental investment in their daughters' human capital. In [Appendix D](#), we consider several other extensions to our baseline model that relax or modify some of its assumptions.

3.1 Setup

Agents and Preferences. There are two agents in our model, a husband, and a wife, which we index by $j = h, w$. The two agents can be married to each other or separated. When married, the agents partake in marital gains, which may arise from joint consumption and production. For instance, both spouses can enjoy their children and live in the same home. They could also partially share some goods, such as fuel for transportation, and save on food waste and spoilage. The couple can also benefit from specialization in production, comparative advantage, and increasing returns to scale ([Becker, 1973, 1991](#)). We denote by M the material gains from marriage and define them as follows:

$$M = Y_{hw} - Y_h - Y_w \geq 0,$$

where the Y_h is the husband's resources if unmarried, Y_w is the wife's resources if unmarried, and Y_{hw} is the resources available to the couple jointly when married. Y_h and Y_w may include, but are not limited to, the husband's and the wife's family wealth. In our model, we focus on the allocation of M between the husband and the wife, and denote by

γ the share of marital gains commanded by the husband. Importantly, the insights and implications of our model are invariant to interpreting γ as the share of Y_{hw} (and not only M) allocated to the husband.

Agents derive utility from their overall resources (including their wealth and consumption) and characteristics (such as their health and education). When married, agents also derive utility from their spouse's characteristics. We denote by U_h and U_w the husband's and the wife's present discounted utility at the time of marriage. Let $U_h = u_h(C_h, \mathbf{x}_w, \mathbf{x}_h, \theta)$ and $U_w = u_w(C_w, \mathbf{x}_w, \mathbf{x}_h)$, where C_j indicates j 's wealth and consumption, \mathbf{x}_j is a vector of human capital characteristics (which are ordered so that higher values of \mathbf{x}_j correspond to more desirable traits), and θ is the husband's private type. In the spirit of [Bloch and Rao \(2002\)](#), we interpret θ as the husband's level of satisfaction with the match. Alternative interpretations are of course possible: θ , for instance, could be interpreted as a shock, whose consequences are unknown to the wife. We assume that the functions $u_h(\cdot)$ and $u_w(\cdot)$ are increasing in all their arguments.

Let $V_h = v_h(C_h, \mathbf{x}_h, m)$ and $V_w = v_w(C_w, \mathbf{x}_w, m)$ be the husband's and the wife's discounted utility flows when separated, where m denotes the marriage market conditions at the time of separation. Note that we can interpret separation as a situation where the husband and the wife stop living together while staying married. Alternatively, separation can represent an unproductive marriage, where the marital surplus is null and the spouses stop deriving utility from each others' traits. As above, we require the functions $v_h(\cdot)$ and $v_w(\cdot)$ to be increasing in all their arguments.

At the time of marriage, the bride's family pays a dowry D to the husband's family, which we take as given for now. The overall resources available to the husband and the wife can be summarized as follows: if the marriage is intact, then $C_h = Y_h + D + \gamma M$ and $C_w = Y_w - D + (1 - \gamma)M$; if separation occurs, then $C_h = Y_h + D$ and $C_w = Y_w - D$. So, each agent's overall resources depend on their resources if unmarried, any marital transfer upon marriage, and their share of marital gains (if any). Since Y_j captures to

some extent the spouses' natal family wealth, it is reasonable to assume it is increased by D for the husband and decreased by D for the wife after the marriage takes place and the dowry is exchanged.⁷

There are some features of our baseline model that deserve particular mention. First, dowries enter each spouse's utility only through their available resources C_j . The husband's private type (θ) and the marital surplus (M) are not affected by the dowry. Second, the impact of dowry on the agents' resources is twofold: on one hand, it may change the share of marital surplus they each command; on the other hand, it may reduce or increase their natal family wealth. Third, we take gains from marriage as given and do not treat them as a strategic lever of the spouses. Fourth, we assume that dowries do not serve as early bequests for daughters and that dowries are not returned to the bride's family in case of separation.

The Bargaining Game. At the time of marriage, the newlyweds learn about observable marriage characteristics. We denote such characteristics by \mathbf{z} . These include (but are not limited to) the initial division of the gains from marriage, γ_0 , which we take as given. At this time, the husband learns his private type θ . This information can trigger a post-marital renegotiation over the division of the marital surplus. For simplicity, we define θ to be binary, with satisfied husbands having θ equal to 1 and dissatisfied husbands having θ equal to 0.⁸ We denote by $p(\mathbf{z})$ the prior probability that the husband is not satisfied with the marriage.

⁷For simplicity, we assume women and men have full access to their family wealth; relaxing this assumption is straightforward and not consequential for the model predictions.

⁸This interpretation and timing is reasonable in the Indian context, where the majority of marriages is arranged by the bride's and the groom's family (Anukriti and Dasgupta, 2017; Vogl, 2013) and the spouses only meet on the day of the wedding (or shortly before then).

We model the post-marital interaction between the husband and the wife as a non-cooperative bargaining game with incomplete information. The game consists of three stages. In the first stage, the husband decides whether to exercise violence.⁹ In the second stage, the wife decides whether to accept the husband's request. In the third stage, the husband chooses whether to separate. To avoid issues related to limited commitment, we assume that any intra-couple reallocation of marital gains occurs after the husband makes the separation decision.

Context-driven Assumptions. As discussed in Section 2, divorce and separation are riddled with stigma in India, especially for women. So, while separation is undesirable for all, women disproportionately bear the cost of marital dissolution. This is an essential feature of the Indian context that we embed in our model as follows.¹⁰

Under the initial allocation of marital gains, women prefer to be in a marriage than to separate, even when the husband exercises domestic violence:

$$u_w(Y_w - D + (1 - \gamma_0)M, \mathbf{x}_h, \mathbf{x}_w) - K_w > v_w(Y_w - D, \mathbf{x}_w, m).$$

Moreover, satisfied husbands always prefer to stay married:

$$u_h(Y_h + D + \gamma M, \mathbf{x}_h, \mathbf{x}_w, 1) > v_h(Y_h + D, \mathbf{x}_h, m),$$

while, under the initial allocation of marital gains, dissatisfied husbands prefer to sepa-

⁹Note that violence may be physical or emotional (e.g., threats of violence). We will investigate this issue empirically in Sections 4 and 5.

¹⁰The Survey of Status of Women and Fertility, collected in Tamil Nadu and Uttar Pradesh between 1993 and 1994, asked respondents whether and under what circumstances a wife (husband) is justified in leaving her husband (his wife). Responses to the survey support our assumptions.

rate:

$$u_h(Y_h + D + \gamma_0 M, \mathbf{x}_h, \mathbf{x}_w, 0) < v_h(Y_h + D, \mathbf{x}_h, m).$$

3.2 Equilibrium Analysis

We analyze the bargaining game using the concept of perfect bayesian equilibrium (PBE). Given that there is a signaling component to the game through the choice of violence by the husband, we follow [Cho and Kreps \(1987\)](#) in applying the intuitive criterion as an equilibrium refinement.

We solve the game by backward induction. In the last stage of the game, only dissatisfied husbands whose demand for a higher share of marital gains is not met decide to end their marriage. In particular, dissatisfied husbands choose not to separate if the following inequality holds:

$$u_h(Y_h + D + \gamma M, \mathbf{x}_h, \mathbf{x}_w, 0) \geq v_h(Y_h + D, \mathbf{x}_h, m). \quad (1)$$

Denote by $\underline{\gamma}$ the minimal transfer that keeps the marriage intact. Then, for $\gamma = \underline{\gamma}$ equation (1) holds with equality.

In the second stage, having observed any occurrence of violence and a reallocation proposal, the wife updates her belief about her husband's satisfaction. Denote this posterior belief by σ . The wife must decide whether or not to accept the husband's proposed reallocation γ . The wife rejects any request where $\gamma < \underline{\gamma}$, since it would not dissuade the husband from separating. The wife accepts any request where $\gamma \geq \underline{\gamma}$ satisfies the following condition:

$$u_w(Y_w - D + (1 - \gamma)M, \mathbf{x}_h, \mathbf{x}_w) \geq \sigma v_w(Y_w - D, \mathbf{x}_w, m) + (1 - \sigma)u_w(Y_w - D + (1 - \gamma_0)M, \mathbf{x}_h, \mathbf{x}_w). \quad (2)$$

When the wife is indifferent between accepting or rejecting her husband's request, then

equation (2) holds with equality and $\gamma = \bar{\gamma}(\sigma)$. So, $\bar{\gamma}(\sigma)$ is the maximal share of marital gains that the husband can extract. Note that this maximal share is an increasing function of the wife's beliefs: the wife is willing to forgo a higher share of the marital gains when she is more likely to believe that her husband is dissatisfied.¹¹ The wife's optimal decision is to accept any request for $\bar{\gamma}(\sigma) \geq \gamma \geq \underline{\gamma}$ and to reject it otherwise. In the first stage, the husband decides whether to exercise violence and may demand a higher γ .

The perfect Bayesian equilibria of the game could involve pooling or separating. Any pooling equilibria would be such that both satisfied and dissatisfied husbands send the same signal with probability one. Given that the cost of violence for satisfied husbands is infinite, there are no equilibria where both satisfied and dissatisfied husbands behave violently. Consider instead a situation where both satisfied and dissatisfied husbands do not exercise violence. Then, the husband's signal would be uninformative, the wife's prior and posterior beliefs would coincide, and the wife would reject any request for reallocation. For such equilibrium to exist, off-the-equilibrium beliefs must be specified so that no one has an incentive to deviate. For this to occur, however, the wife must assign a positive probability to the event that a satisfied husband would exercise violence, which violates the intuitive criterion.

Any separating equilibria would be such that different types of husbands send different signals. There are no equilibria where satisfied husbands exercise violence and dissatisfied husbands do not. Moreover, there exists no separating equilibrium satisfying the intuitive criterion, where neither types exercise violence but demand different shares. Consider instead a scenario where the husband chooses violence when $\theta = 0$, he chooses

¹¹In what follows, we also assume that the wife is willing to increase her husband's share of gains from marriage and keep the marriage intact when she believes that her husband is dissatisfied and that she rejects any request for reallocation whenever her posterior beliefs about the husband's degree of satisfaction equals her prior. More formally, we assume that $\bar{\gamma}(1) > \underline{\gamma} > \gamma(p(\mathbf{z}))$.

non-violence when $\theta = 1$, and $\underline{\gamma} \leq \gamma(1) \leq \bar{\gamma}(1)$. Then, after observing violence, the wife accepts any request for an intra-couple reallocation of the surplus. Consequently, the husband's optimal strategy is to request a share of marital surplus equal to $\bar{\gamma}(1)$.

Denote by κ^* the cost of violence that makes dissatisfied husbands indifferent between exercising domestic violence or not. Husbands with high costs of violence ($K_h = \kappa$, with $\kappa > \kappa^*$) will not exercise violence, even when dissatisfied. The wife's posterior belief that the husband is dissatisfied after not observing violence is therefore given by:

$$\sigma(0) = \frac{p(\mathbf{z})[1 - F_\kappa(\kappa^*)]}{p(\mathbf{z})[1 - F_\kappa(\kappa^*)] + 1 - p(\mathbf{z})}. \quad (3)$$

Since $\sigma(0) < p(\mathbf{z})$ and $\bar{\gamma}(\sigma)$ is an increasing function, the wife rejects any request from a non-violent husband.

Proposition 1. *There is a unique PBE of the game that satisfies the intuitive criterion. It is a separating equilibrium, where:*

- (i) *Satisfied husbands and dissatisfied husbands with a high cost of violence do not behave violently; dissatisfied husbands with a low cost of violence behave violently.*
- (ii) *If violence occurs, the wife accepts the request for reallocation of the marital surplus and $\gamma = \bar{\gamma}(1)$; if violence does not occur, then the wife rejects any request.*
- (iii) *Satisfied husbands and dissatisfied husbands with a low cost of violence remain married; dissatisfied husbands with a high cost of violence separate.*

3.3 Comparative Statics

To derive testable predictions, we assume that the utility functions of both spouses are additively separable in C_j . So, we assume that the husband's and the wife's discounted utilities when married are $u_h(C_h, \mathbf{x}_h, \mathbf{x}_w, \theta) = f_h(C_h) + \phi_h(\mathbf{x}_h, \mathbf{x}_w, \theta)$ and $u_w(C_w, \mathbf{x}_h, \mathbf{x}_w) = f_w(C_w) + \phi_w(\mathbf{x}_h, \mathbf{x}_w)$, respectively. Analogously, we assume that the discounted utilities

when separated are $v_h(C_h, \mathbf{x}_h, m) = f_h(C_h) + \psi_h(\mathbf{x}_h, m)$ and $v_w(C_w, \mathbf{x}_w, m) = g_w(C_w) + \psi_w(\mathbf{x}_w, m)$ and that $f_j(\cdot)$ and $g_j(\cdot)$ are increasing and concave functions. Recall that C_j denotes the spouses' resources (including their wealth and consumption). For simplicity, we will refer to C_j interchangeably as resources or consumption when discussing the model predictions.

As discussed in Section 2, marital dissolution is highly stigmatized in India, especially for women, which may have important consequences for their psychological well-being and mental health (Sharma (2011), Ragavan et al. (2015), Pachauri (2018)). Consistent with anhedonia (a common symptom of depression and psychological distress), we posit that women may have different preferences for consumption when married vs. separated. Specifically, as illustrated in Figure A5, we posit that their marginal utility of consumption when married may be higher than when separated in spite of the concavity of $g_w(\cdot)$ and $f_w(\cdot)$ and the higher level of consumption achieved when married (Angelucci and Bennett, 2021).

Since our empirical analysis exploits a legal reform that reduced dowry payments in India, we focus on the effect of changes in D .¹² Additional comparative statics results are included in Appendix C.

Effect of a Change in Dowry on Intra-Couple Allocation. We first compute the change in the share of marital gains dissatisfied husbands receive in equilibrium following a change in dowry D . Consider equation (2) with $\sigma = 1$. Then, by implicit differentiation,

$$\frac{\partial \bar{\gamma}(1)}{\partial D} = \frac{1}{M} \left[\frac{g'_w(Y_w - D)}{f'_w(Y_w - D + (1 - \bar{\gamma}(1))M)} - 1 \right]. \quad (4)$$

Whether a decrease in dowry leads to an increase or a decrease in the husband's share

¹²Note that the 1985-1986 amendments raised the cost of paying a dowry, essentially introducing a tax on the dowry. In Appendix D.7 we show that under some mild assumptions, our implications are invariant to focusing on a change in dowry or in its cost.

depends on the wife's marginal utility of consumption when married versus separated. Define $R_w = \frac{g'_w(Y_w - D)}{f'_w(Y_w - D + (1 - \bar{\gamma}(1))M)}$ and note that the value of R_w may be determined by the degree of social stigma associated with separation. When social pressure is high enough to, e.g., affect a woman's emotional and psychological well-being, her marginal utility of consumption when married may be higher than her marginal utility of consumption when separated (see Panel A of Figure A5). This may hold in spite of the concavity of the utility function and of higher consumption when married vs. separated. In these cases, R_w is less than one, the derivative in equation (4) is negative, and a decrease in dowry would increase the share of marital gains devoted to the husband. When $f'_w(\cdot) = g'_w(\cdot)$ (e.g., in contexts where social stigma against separation is not so harsh to impact women's preferences over consumption), equation (4) is unambiguously positive due to concavity (Panel B of Figure A5). We also analyze how the impact of dowries on intra-couple allocation changes with gains from marriage. To this end, we compute the cross-derivative of $\bar{\gamma}(1)$ with respect to both D and M . A positive cross-derivative indicates that any effect on $\bar{\gamma}(1)$ induced by a change in dowry increases as M increases. Conversely, a negative cross-derivative indicates that any effect of dowry payments on the share of marital gains commanded by the husband is lower for higher values of M . If the cross-derivative is zero, then equation (4) is independent of M . Figure A2 provides a graphical illustration of these results.

Effect of a Change in Dowry on Domestic Violence. To understand how a change in dowry impacts domestic violence, we analyze how such change impacts κ^* (i.e., the maximal cost of violence that dissatisfied husbands are willing to face in order to force a reallocation of resources and avoid separation). When κ^* increases, the probability of violence increases; vice versa, if κ^* decreases, then a higher fraction of dissatisfied husbands refrain from exercising violence. In equilibrium, such a threshold is defined by

$$\kappa^* = f_h(Y_h + D + \bar{\gamma}(1)M) + \phi_h(\mathbf{x}_h, \mathbf{x}_w, 0) - f_h(Y_h + D) - \psi_h(\mathbf{x}_h, m). \quad (5)$$

So,

$$\frac{\partial \kappa^*}{\partial D} = R_w f'_h(Y_h + D + \bar{\gamma}(1)M) - f'_h(Y_h + D). \quad (6)$$

Recall that, given equation (4) and given that $f_w(\cdot)$ and $g_w(\cdot)$ are increasing functions, R_w is always positive. If $R_w \leq 1$, the derivative in equation (6) is unambiguously negative due to concavity, and any decrease in dowry would increase the probability of domestic violence. The sign of $\frac{\partial \kappa^*}{\partial D}$, however, is ambiguous overall. The derivative in equation (6) is negative as long as $R_w < R_h$, with $R_h = \frac{f'_h(Y_h + D)}{f'_h((Y_h + D) + \bar{\gamma}(1)M)}$. So, whether a decrease in dowry increases domestic violence depends not only on the wife's relative marginal utility of consumption when married vs. separated (our proxy for social stigma) but also on her husband's. Importantly, as before, $\frac{\partial \kappa^*}{\partial D}$ is increasing in R_w . In a context like India where social stigma against separation is particularly high, we expect the probability of domestic violence to increase following a decrease in dowry payments (see Panel A of Figure A3). Since gender norms and the stigmatization of marital dissolution vary substantially across India, however, we expect the effect of a change in dowry on the probability of violence to be highly heterogeneous.

Note that this prediction differs from Bloch and Rao (2002), who show that a decrease in dowry would unambiguously lead to an increase in domestic violence. This discrepancy arises from their framework not accounting for gains from marriage and assuming that women's preferences are the same inside or outside of the marriage (which may be questionable in conservative settings).

Our analysis of the cross-derivative of κ^* with respect to D and M yields some additional insights. As we show in Appendix C, $\frac{\partial^2 \kappa^*}{\partial D \partial M}$ is always negative. So, any increase in violence following a decrease in dowry would be particularly strong when gains from marriage are high (see Panel B of Figure A3).

Effect of a Change in Dowry on Separations. In the last stage of the game, the husband decides whether to separate from his wife; in equilibrium, only dissatisfied hus-

bands with a high cost of violence (i.e., with κ above the equilibrium threshold κ^*) separate. So, any change in dowry payments would have an impact on separations that is the reverse of its impact on domestic violence: when social stigma against separation is high, a decrease in dowry should decrease separations. In other words, the model predicts a negative correlation between changes in domestic violence and separation following a change in dowry. Figure A4 helps illustrate this prediction. The figure shows a hypothetical unimodal distribution of the cost of violence κ and the cost of violence threshold κ^* . When social stigma against separation is high, the threshold κ^* shifts upwards when D declines, hence increasing the probability of violence and decreasing the probability of separation; by contrast, when $R_w > R_h$, the threshold κ^* shifts downwards when D declines, hence decreasing the probability of domestic violence and increasing the probability of separation.

3.4 Endogenous Dowry and Human Capital

So far, we have taken dowry payments and the bride’s characteristics as given. In Appendix D.8, we provide an extension to our model that includes a pre-marital bargaining game between the bride’s family and the groom (or his family). We interpret this first stage, which we briefly summarize below, as one in which parents make decisions about how much to invest in the human capital of their daughter and about how much to save for a future dowry (Anukriti et al., 2019). For simplicity, we abstract from the specific process through which potential grooms match with brides.

In line with the social norms in the Indian context, we assume a very high social cost of a daughter remaining unmarried (as in Borker et al. (2017)). So, parents strictly prefer their daughters to be married relative to them remaining unmarried. Before the marriage takes place, the bride’s parents make a take-it-or-leave-it offer to the groom. This offer consists of the dowry payment and a set of bridal characteristics, including her human capital. At this stage, the marriage characteristics, the cost of domestic violence,

and the future marriage market conditions are unknown to the potential groom and the bride's parents (although their distributions are known). The groom decides to accept or reject the offer based on how his expected utility from marriage fares relative to his reservation utility. His expected utility from marriage takes into account the three possible post-marital scenarios discussed before (that he is satisfied, dissatisfied but non-violent, or dissatisfied and violent), while his reservation utility depends on his income, human capital, and the current marriage market conditions.

In equilibrium, the bride's parents' offer makes the potential groom indifferent between accepting and rejecting the marriage proposal. Since the groom values consumption as well as his future wife's human capital, and parents strictly prefer to have their daughter married over remaining unmarried, a decrease in dowry would lead to an increase in the human capital of future brides. However, the impact of a change in human capital on domestic violence, intra-couple resource allocation, and marital dissolution is ambiguous (see [Appendix Section C](#)). So, an increase in women's human capital may not help offset the negative consequences of lower dowries on women's well-being after marriage. In [Section 5](#), we explore this issue empirically.

3.5 Summary of the Model Predictions

Our theoretical framework illustrates the relationship between dowry payments, the allocation of marital gains between a husband and a wife, and the occurrence of domestic violence and separation. It also describes the link between dowry payments and parental investment in the human capital of future brides. Our model incorporates many features of the Indian cultural and social norms associated with marriage, including the widespread social stigma against separation. This stigma can have significant consequences not only for the material but also for the spouses' psychological well-being (especially for women), which we model as a difference in women's preferences over consumption when married vs. separated. Our predictions can be summarized as follows:

Prediction 1. If social stigma against separation is high, the share of marital gains commanded by the husband increases following a decrease in dowry.

Prediction 2. If social stigma against separation is high, the probability of domestic violence increases following a decrease in dowry.

Prediction 3. The effect of a decrease in dowry on the share of marital gains commanded by the husband and on the probability of domestic violence weakens as social stigma against separation decreases. If social stigma against separation is low enough, the husband's share of marital gains and the probability of domestic violence decrease following a decrease in dowry.

Prediction 4. The effect of a decrease in dowry on the share of marital gains commanded by the husband weakens as marital gains increase. The effect of a decrease in dowry on the probability of domestic violence strengthens as marital gains increase.

Prediction 5. If social stigma against separation is high, the probability of separation decreases following a decrease in dowry.

Prediction 6. Parental investment in the human capital of future brides increases following a decrease in (expected) dowry payments.

4 Empirical Strategy

To our knowledge, no nationally-representative dataset exists recording both dowry payments and all the outcomes of the model presented in Section 3. So, for our empirical application, we rely on two separate data sources: data on dowry payments are from the 1999 Rural Economic and Demographic Survey; data on intra-couple bargaining power, domestic violence, separation, and human capital are from the 2005-2006 National Family Health Survey. [Appendix E](#) describes our data sources in details.

As discussed in Section 2, the Dowry Prohibition Act and its amendments explicitly exclude marital transfers governed by the Muslim Personal Law. So, for our identification

strategy, we exploit variation by religion as well as the timing of the marriages. Our baseline specification is as follows:

$$y_i = \beta_1 \text{Post}_i \times \text{Non-Muslim}_i + \beta_2 \text{Post}_i + \beta_3 \text{Non-Muslim}_i + X_i' \gamma + \alpha_c + \alpha_s + \epsilon_i, \quad (7)$$

where y_i is the outcome of interest for woman i and Post_i is an indicator variable equal to one if woman i got married in or after 1986; X_i is a vector of exogenous covariates (indicator variables for religion, for living in rural areas, and for being part of disadvantaged social groups such as Scheduled Castes, Scheduled Tribes or other backward castes); α_c are women's birth-cohort fixed effects and α_s are state fixed effects. In alternative specifications presented in the [Appendix](#), we include the year of marriage and state-by-year-of-marriage fixed effects, district-level fixed effects, state-by-birth cohort fixed effects, and religion-specific time trends. β_1 is the parameter of interest and captures the average treatment effect on the treated of being exposed to the 1985-1986 tightening of anti-dowry laws in India. As a robustness check, we also include covariates that may be impacted directly by the amendments, such as women's education, household size and wealth, as well as husband's characteristics. Unless otherwise noted, we estimate equation (7) with OLS, using a sample of married women, who got married between 1975 and 1999. Standard errors are clustered at the state level. Whenever appropriate, we account for multiple hypothesis testing and apply the Romano-Wolf step-down procedure to compute adjusted p-values.

Parallel Trends. As typical in a difference-in-difference framework, the validity of our results relies on the parallel trends assumption. This assumption requires that, in the absence of the 1985-1986 amendments, the evolution of dowry payments, domestic violence, women's decision power, and human capital, and separations should have been the same for Muslims and non-Muslims. The event study graphs presented in [Section 2](#) and the related analysis in [Appendix F.1](#) provide supporting evidence in this direction.

We also perform a falsification test and estimate our baseline model with $Post_i$ being replaced by a variable equal to one if the marriage took place between 1980 and 1985 and to zero if it took place between 1975 and 1979. If there were differences in trends between Muslims and non-Muslims, we would find statistically significant coefficients on the newly defined interaction term. This is not the case for any of our outcomes of interest.

Treatment Effect Heterogeneity. There is a recent literature indicating that estimates of equation (7) may be biased if treatment effects are heterogeneous across groups or periods.¹³ To assess the robustness of our estimates to this issue, we estimate the effect of the Dowry Prohibition Act amendments using the imputation estimator developed by [Borusyak et al. \(2021\)](#), which is robust to treatment effects heterogeneity. In addition, we follow [De Chaisemartin and d’Haultfoeuille \(2020\)](#) and estimate the minimal value of the standard deviation of the average treatment effects under which β_1 and the average treatment effect on the treated could be of opposite signs. When this measure is large, it means that the estimated β_1 is not an appropriate estimate of the average treatment effect on the treated only if there is an implausible amount of treatment effect heterogeneity. In this case, treatment effect heterogeneity is not too much of a concern. By contrast, if this measure is too close to zero, then the average treatment effect on the treated and the estimate of β_1 can be of opposite signs even under small and plausible amount of treatment effect heterogeneity.

Alternative Policies. One might also worry that, during our period of analysis, other policies were implemented that may have had an impact on dowry payments and women’s outcomes. We are primarily concerned about two sets of reforms. The first set consists of early amendments to the Dowry Prohibition Act. Between 1975 and 1976, the states of Bihar, Punjab, Himachal Pradesh, Haryana, West Bengal, and Orissa introduced local amendments, increasing penalties for requesting, receiving, or giving

¹³See, e.g., [Goodman-Bacon \(2018\)](#) and [Callaway and Sant’Anna \(2020\)](#).

a dowry. Though the prescriptions of the local amendments were more moderate than those introduced in 1985-1986 nationwide, we check that the impact of the reforms is not limited to these early amended states. The second set of reforms pertains to amendments to the Hindu Succession Act that equalized women's inheritance rights to men in several Indian states between 1976 and 2005. These reforms only applied to Hindu, Buddhist, Sikh or Jain women, who were not yet married at the time of the amendment in their state. We check that the Dowry Protection Act amendments affected dowry payments and women's outcomes independently of their exposure to the inheritance rights reforms.¹⁴

Matching. One concern about using the Muslim subsample as a control group is that it is small relative to the non-Muslim one, especially in the REDS data. In addition, women in the Muslim sample may be systematically different from women in the non-Muslim group. While religion fixed-effects and conditioning on covariates help address this issue, we also employ a matching strategy to further adjust for observable differences between Muslims and non-Muslims. Specifically, we use a logit model to compute each woman's propensity score conditional on a battery of individual and household traits, and nearest-neighbor matching without replacement to match non-Muslim women with Muslim women with the closest propensity score (appropriate balancing tests are satisfied and available upon request). We then drop the unmatched observations and estimate model (7) over the matched subsample.

We start by establishing that the amendments were successful at reducing dowries. To this aim, we estimate equation (7) with measures of dowry amounts and prevalence

¹⁴Kerala in 1976, Andhra Pradesh in 1986, Tamil Nadu in 1989, and Maharashtra and Karnataka in 1994 passed reforms making daughters coparceners. National ratification of the amendments occurred in 2005. Importantly for our analysis, [Roy \(2015\)](#) shows that women who were close to marriageable age at the time of the reform in their state subsequently made higher dowry payments to their husbands.

as outcomes. Next, we test the model predictions we outlined in Section 3.3. We test Predictions 1 and 2 by estimating the regression model in equation (7) using NFHS responses to questions on domestic violence and intra-household decision-making as outcomes of interest. To test whether the impact of an exogenous decrease in dowry on the women’s decision power varies with societal norms about divorce and separation (Prediction 3), we check whether β_1 is lower in villages with higher rates of divorced or separated women or in urban, possibly more progressive, areas. Based on Singh et al. (2021), we also construct village-level measures of patriarchy and assess heterogeneity of the treatment effects along this dimension.¹⁵ Finally, we check whether the Dowry Protection Act amendments had weaker effects in North-East and South India, where marriage dissolution rates are higher.

A central assumption of household economics is that children provide union-specific utility to parents. This is particularly true in the Indian context, where out-of-wedlock fertility is rare. According to the World Values Survey (1990-1994), four out of five women in India consider children a critical component of a successful marriage. So, in the spirit of Becker (1973, 1991), we use fertility outcomes and fertility preferences to construct measures of gains from marriage. We then test Prediction 4 by allowing β_1 to vary with these measures. If the data support this prediction, we expect β_1 to be decreasing in gains from marriage when we use women’s decision-making power as the dependent variable. By contrast, we expect the effect of the anti-dowry reforms on domestic violence to be increasing in gains from marriage.

To test Prediction 5, we estimate the impact of the 1985-1986 amendments on the probability of being divorced or separated. Since divorce is extremely rare and may be

¹⁵Using principal component analysis, we construct a village-level index of patriarchy that captures male family and socio-economic domination, generational domination, patrilocality, and son preference (see Table 1 of Singh et al. (2021) for a detailed description of the underlying indicators).

suffering from under-reporting due to social stigma, we define women to be separated if they report not living together with their husbands.¹⁶ Finally, we test Prediction 6 by comparing the human capital outcomes of women who were exposed to the amendments to those of women who were not. Since we expect younger girls to be more responsive to changes in human capital investment (especially for outcomes such as height and primary school completion), we estimate different effects based on the age of women at the time of the reform.

5 Results

We now present our empirical results. We begin by documenting a decline in dowries following the introduction of the Dowry Prohibition Act amendments. We then proceed by discussing the empirical results for women’s bargaining power, domestic violence, separations, and human capital, which we present in the order in which our predictions were introduced in Section 3.5.

5.1 Dowries

Table A1 contains the baseline estimates of the impact of the 1985-1986 reforms on dowry payments.¹⁷ The first four columns focus on dowry amounts over the full sample (Columns (1) and (2)) and a sample restricted to marriages with positive or non-zero transfers

¹⁶One possible drawback of this approach is that we do not observe why the couple does not live together, and so it may include cases of temporary or permanent migration.

¹⁷We wish to stress that [Alfano \(2017\)](#) has previously investigated the impact of these reforms on dowry payments. While our analysis is qualitatively in line with this previous work, we estimate a different empirical specification, try to unpack effects at the intensive and extensive margins, and combine propensity score matching with difference-in-difference to better control for differences between Muslims and non-Muslims.

(Columns (3) and (4)). In Column (5), we study the probability of a marriage involving no dowry. In Column (6), we estimate the effect of the reforms on the likelihood of missing dowry information, possibly related to respondents refusing to answer dowry-related questions.

We estimate that the 1985-1986 reforms to the Dowry Prohibition Act were successful at reducing dowries. Specifically, the amendments decreased gross and net dowries by approximately 12,000 and 6,700 Rupees over the full sample.¹⁸ To gauge magnitudes, these correspond to reductions in dowry payments by roughly 0.2 standard deviations. Such reductions may result from changes occurring both at the extensive and intensive margins: on the one hand, we document a 6 percentage points increase in the probability that the marriage involved no transfer at all; on the other hand, we detect sizable and negative declines in dowry payments when we restrict our attention to non-zero transfers (though caution needs to be applied here, since we are restricting our sample based on outcomes).¹⁹

The last two columns of Table [A1](#) present the estimated effects of the amendments on gross dowries and the likelihood of no dowry using the matched sample, which only includes Muslim and non-Muslim women with similar observable characteristics. Reassuringly, the effects are qualitatively consistent with those estimated on the full sample. Our findings are robust to accounting for multiple hypothesis testing and treatment effect heterogeneity, as indicated by the low Romano-Wolf adjusted p-values, the estimates obtained using the [Borusyak et al. \(2021\)](#)'s estimator and the high [De Chaisemartin and](#)

¹⁸The substantially smaller samples in Columns (2) and (3) are due to missing information on transfers from the groom's to the bride's family. For this reason, our main analysis focuses on gross dowries.

¹⁹The estimation of tobit models for censored outcomes yields qualitatively similar results. Our results are quantitatively confirmed when we estimate probit regressions for binary outcomes. Our results are also robust to excluding or down-weighting outliers.

d’Haultfoeuille (2020)’s summary measures reported in Table A1. They are also robust to changes in the estimation sample and more restrictive specifications, as we describe in detail in Appendix F.2.²⁰

5.2 Predictions 1 to 4: Women’s Decision Power and Domestic Violence

Predictions 1 and 2. If social stigma against marital dissolution is high, Predictions 1 and 2 state that women exposed to the reforms should have lower decision-making power in their marital families and should face a higher likelihood of domestic violence, on average. If social stigma is low, we may see an increase in women’s decision-making power and a decrease in domestic violence following the amendments.

Table 1 reports the estimated impact of the Dowry Prohibition Act amendments on women’s participation in family decisions. The table reports estimates of linear probability models. The estimation of probit models for binary outcomes delivers estimated effects that are quantitatively similar and significantly smaller standard errors (results are available upon request). In Columns (1) and (2), the dependent variables are an indicator variable equal to one if the woman reports being involved in at least one financial or health-related decision (see Section E for details) and the number of decisions she has a say in (conditional on being involved in at least one decisions). In line with the prediction of our model and the widespread societal attitude against separation in India, we find that women’s decision-making power declines following the introduction of the 1985-1986 reforms: women exposed to the reforms are 2.6 percentage points less likely to being involved in household decisions, on average (approximately 3 percent); if they are at all involved, the scope of their involvement declined by approximately 2.9 percent (once again these results need to be interpreted with caution, as we are restricting the estimation sample based on an outcome).

²⁰While we do not report these results for brevity, we take several steps to address concerns about the possible endogeneity of treatment. Our findings are confirmed.

To better understand these results, we estimate equation (7) using indicators for specific decisions as dependent variables (Columns (3) to (6)). The estimated coefficients are negative and statistically significant for infrequent and possibly more consequential decisions, such as large household purchases and a woman's health care (including decisions about contraception). We also document a reduction in women's decision-making power regarding how to spend their husband's earnings.

We present the estimation results for the domestic violence outcomes in Table 2. Following a structure similar to Table 1, the first two columns feature, as outcomes, an indicator for a woman ever suffering injuries due to her husband's actions and the number of different types of injuries she has suffered, respectively. As we described in Section E, the array of injuries we consider include eye injuries, sprains, dislocations, burns, deep wounds, broken bones or teeth, or any other serious injury. In line with Prediction 2, women's exposure to the Dowry Prohibition Act amendments increases their likelihood of being victims of domestic violence, both at the extensive and (in a slight misuse of terminology) at the intensive margin. The estimated effects are sizable and indicate that the reforms increased the likelihood of wife-abuse by 1.9 percentage points (15.8 percent). Conditional on ever experiencing violence by their husbands, treated women suffer a wider array of injuries.

In Columns (3) to (6), we exploit additional survey questions about women's experience of physical, sexual, and emotional violence by their husbands. While all the point estimates support the existence of a positive association between women's exposure to the amendments and their likelihood to be abused by their husbands, the estimated coefficients for women's exposure to sexual and emotional violence are not statistically significant at conventional levels. By contrast, we find that the amendments substantially increased the likelihood of severe and less severe physical violence (by 3.4 percentage points and 2.9 percentage points, respectively).²¹

²¹As mentioned in Section 2, the 1985-1986 amendments made it easier to punish hus-

To gauge the magnitudes of the estimated effects presented in Tables 1 and Tables 2, we compare them to alternative policies. For example, [Heath and Tan \(2019\)](#) estimate that amendments to Hindu Succession Act (that equalized inheritance rights for women and men in several Indian states between 1976 and 2005) increased women’s participation in decisions about large purchases by 10 percentage points, about their own health by 5 percentage points, and about how to spend their husbands’ money by 3 percentage points (though this coefficient is not statistically different from zero). [Sunder \(2020\)](#) shows that women’s exposure to the District Primary Education Programme (a flagship policy of the Indian government in the 1990s, which led to the construction of over 160,000 new schools and boosted female primary school completion rates by 12 percentage points) increased women’s participation in household spending decisions by 8 percentage points. In the Kenyan context, [Haushofer et al. \(2019\)](#) find that a large cash transfer targeting men (approximately equal to \$700 PPP, on average) decreased the likelihood of women being slapped by their husbands by 10 percentage points (32 percent) and kicked, dragged, or beaten by 9 percentage points (59 percent). In our context, the Dowry Prohibition Act amendments (which reduced gross dowries by roughly \$1,200 PPP and net dowries by \$600 PPP) increased the likelihood of severe and less severe physical violence by 33 and 9 percent, and the likelihood of ever suffering any injury by the husband by 16 percent.

Column (6) of Tables 1 and 2 reports the effects of the amendment estimated on women’s power and domestic violence obtained from the sample of Muslim and non-Muslim women matched based on their propensity score. The estimated effects on the restricted sample are consistent with those from the full sample. In fact, they are larger in magnitude, suggesting that our findings are unlikely driven by the limited size or comparability of the control group. As indicated by the additional measures reported at the bottom of Table A1, our estimates are generally robust to accounting for multiple hypothesis bands and in-laws for dowry-related cruelty. This, however, should have reduced (rather than increased) the occurrence of violence.

testing and treatment effect heterogeneity. To further test the sensitivity of our findings, we perform a battery of additional robustness checks, which we present in [Appendix F.2](#).

Prediction 3. Next, we study the presence of differential effects of the anti-dowry reforms by the level of social stigma against separation. Our model predicts that any impact on women’s decision-making power and the occurrence of domestic violence following a decrease in dowry should be stronger when social norms regarding marital dissolution are strict (Prediction 3). While we cannot empirically test that social stigma against separation impacts women’s preferences over consumption (though psychological and sociological studies point in this direction; see [Section 2](#)), to study Prediction 3, we leverage the spatial variation in the degree of stigmatization of marital dissolution across India. Divorce and separations are more prevalent (and more accepted) in the North-Eastern states and in South India. Moreover, people in urban India, especially younger generations, adhere to less traditional ideas of marriage and are typically more open to marriage dissolution, divorce, and women’s autonomy more broadly.

[Table A2](#) reports our estimation results. Each specification includes our baseline difference-in-difference terms, a set of indicators for areas with likely low(er) social stigma against marital dissolution, and their interactions. For brevity, we here focus on binary outcomes for women’s decision-making power and domestic violence (results are confirmed when using the full set of outcomes of [Tables 1](#) and [2](#), and are available upon request). Consistent with our model, we find that the unintended negative effects of the 1985-1986 reforms on women’s decision-making power are mitigated in more progressive areas ([Columns \(1\) to \(2\)](#)). Women exposed to the reforms are 2.9 percentage points less likely to be involved in family decisions in rural areas (the omitted category in [Column \(1\)](#)), while for women living in urban areas, the estimated effect is not statistically different from zero. The most striking differences in the impact of the reforms on women’s decision power, however, are found across regions, with the nation-wide effects presented in [Table 1](#) being driven mostly by North Indian states (which are often viewed as the most

conservative and traditional states for gender norms). In this region (the omitted category in Column (2)), women exposed to the reforms are 3.7 percentage points less likely to be involved in household decisions relative to non-exposed women. Note that these spatial differences are present, though less pronounced, for the domestic violence outcomes (Columns (4) to (5)).²²

To measure the prevalence of divorce and separations at the village level, we compute the share of respondents within a primary sampling unit (which in the NFHS is a village in rural areas or a block in urban areas) who report being divorced, separated, or living apart from their spouse. In high-prevalence areas (i.e., in the top half of the distribution, where marital dissolution may be less stigmatized), the introduction of the Dowry Prohibition Act amendments had a weaker impact on women's involvement in household decisions (the point estimate is -0.021, but not statistically different from zero). This pattern is qualitatively confirmed for the domestic violence outcome, with women experiencing a 1.1 percentage point (9.5 percent) increase in violence in high-prevalence areas and a 2.3 percentage points (19 percent) increase in low-prevalence areas. We also estimate heterogeneous effects by the strength of patriarchy within a primary sampling unit (Singh et al., 2021). Consistent with the model prediction, the reforms had a much stronger impact on women's involvement in household decisions and domestic violence in high-patriarchy areas (in the top half of the distribution, where marital dissolution may be more stigmatized).²³

Prediction 4. We now turn to Prediction 4, which states that the effect of a change

²²Naturally, since REDS is only collected in rural areas, we cannot test whether dowries were less affected by the reforms in urban areas (which could also rationalize this finding). However, we do not detect heterogeneous effects of the reforms on dowries across geographic regions, which is reassuring.

²³These results are also robust to using state-level patriarchy index directly obtained from Singh et al. (2021). We thank the authors for sharing the data with us.

in dowry payments should vary with gains from marriage. Specifically, any impact on women's decision-making power following a decrease in dowry should be weaker when gains from marriage are high; by contrast, the impact on domestic violence should be more pronounced when gains from marriage are large. As discussed in Section 4, we construct proxies for gains from marriage based on a couple's fertility outcomes and preferences. We also test Prediction 4 using alternative measures of marital surplus, with results available upon request. Table A3 reports estimates of the differential effects by gains from marriage of the anti-dowry reforms on women's decision-making power and domestic violence. In Columns (1) and (4), we measure a couple's marital gains with the number of children they have. The estimated coefficients are consistent with the model predictions. Women who were exposed to the anti-dowry reforms are 7.9 percentage points (8.6 percent) less likely to be involved in financial and health-related decisions if they have no children. These effects, however, are significantly weaker for women with children. In line with our model, the impact on wife-abuse is stronger when children are present, as indicated by the positive coefficients on the interaction terms in Column (4). In essence, exposure to the anti-dowry reforms increased domestic violence for women with and without children. However, the effect is more prominent (and statistically significant only) when children are present.

One might worry that more children do not necessarily yield higher gains. This is especially true if there is a mismatch between realized and desired fertility. One may expect gains from marriage to be the highest when the couple meets their fertility preferences, and the fertility is complete. In Columns (2) and (5), we estimate different effects by a couple's achievement of their desired fertility, which we measure with an indicator variable equal to one if the number of children equals a woman's ideal number of children and her spouse does not want any more (or any less) children. While the estimated coefficient is only significant for the violence outcome, both signs are as expected.

Finally, we use the gender of the firstborn child as an alternative measure of marital

gains. While parental preferences for sons are widespread in India, the sex of the firstborn child is quasi-random (Anukriti et al., 2016). We find that the impact of the policy on women’s decision power is mitigated when gains from marriage are high (i.e., when the firstborn child is male). We do not find any statistically significant difference for domestic violence.

Discussion. Taken together, the results presented so far are mostly consistent with Predictions 1 to 4 of our model. They also imply that the tightening of anti-dowry laws introduced by the Indian government between 1985 and 1986 had some unintended negative consequences for women’s welfare. The overall decline in women’s involvement in household decisions and the increase in domestic violence following the amendments (and the consequent decreases in dowry payments documented in Section 5.1) indicate that social stigma against separation in India is high, on average (that is, $R_w < 1$). We document substantial variation in the stigmatization and social cost of marital dissolution across regions, which results in markedly differential impacts of the anti-dowry reforms on women’s outcomes (Prediction 3). The unintended consequences of the reforms appear to be mitigated in more progressive areas and exacerbated in more conservative regions, suggesting that one-size-fits-all policies may not be optimal, and that the social and cultural context may matter a great deal when designing policies aimed at changing traditional customs (an important point also raised by Rao and Walton (2004), World Bank (2015), and Ashraf et al. (2020)).

Our heterogeneity analysis by gains from marriage hinges on the assumption that any changes in dowry payments did not affect the number of children a couple decides to have. In our theoretical model, this assumption is reflected in gains from marriage being taken as given and not chosen strategically by the agents. While this is a challenging task, we attempt to empirically investigate the validity of this assumption by estimating the impact of the anti-dowry reforms on fertility. In Section F.4, we compare the fertility preferences and outcomes of treated and untreated women and do not find noteworthy

differences. Although these results provide suggestive evidence of the validity of our assumption, given the challenge of accurately measuring marital gains, we wish to interpret our test of Prediction 4 with caution.

5.3 Prediction 5: Separations

We have documented a surge in domestic violence following the amendments to the Dowry Prohibition Act. The fifth prediction to emerge from our model states that the effect on the probability of separation should be the reverse. This prediction follows from the fact that, in equilibrium, only dissatisfied husbands with a high cost of violence choose to separate. So, we expect the decrease in dowries induced by the amendments to decrease the probability of separation.

The estimated effects reported in Table A4 are consistent with this prediction. Odd numbered columns report estimates of equation (7) featuring a binary indicator for a woman being divorced, separated, or living apart from her husband as the dependent variable. The estimation sample varies across columns. In Column (1), we consider the full sample of ever-married women aged 15 to 49, who got married between 1975 and 1999, and find a 2.9 percentage points decrease in the probability of separation following the anti-dowry amendments. In Column (3), we restrict the estimation sample to rural areas outside of the North-East and South India regions (hence more traditional and less open to divorce and separation), while in Column (5), we only consider women who live in urban areas, North-East India or South India (typically more progressive and more accepting of marital dissolution). A comparison of the estimated coefficients across columns suggests that the decrease in separation induced by the reforms is stronger in more conservative areas, where social stigma against marital dissolution is high (although we cannot reject the null hypothesis of equal effects). In even-numbered columns, we report the estimated differential effects by gains from marriage. Consistent with our model, we find evidence of a more pronounced decline in the probability of separation following the

1985-1986 amendments for couples with high marital gains.

5.4 Prediction 6: Women's Human Capital

We now turn to our last prediction, which states that parental investment in the human capital of future brides should increase following a tightening of anti-dowry laws. The NFHS does not include information on past expenditure or saving patterns of a woman's natal family. So, we rely on women's outcomes in adulthood to inform us of any changes in parental investment induced by the reforms.

We focus on two sets of human capital outcomes: outcomes related to education, such as years of schooling and the probability of having completed primary school; and long-run health outcomes, such as height and the probability of being in the bottom half of the stature distribution in our sample. Naturally, parents' ability to shape their daughters' human capital in response to the 1985-1986 amendments would be limited if their daughters were too old at the time of the reforms. Height, for instance, is mostly determined by early childhood inputs. So, any response from parents whose daughters were, e.g., five or older in 1985, may not be reflected in their daughter's outcomes in adulthood. Similarly, the effect of the amendments on primary school completion may be strongest for those women who were not too old to attend primary school in 1985. We test these hypotheses by estimating equation (7) using measures of women's education and height as dependent variables over four sub-samples based on women's age in 1985.²⁴

We summarize the results of our analysis in Figure A6 (the corresponding coefficients and standard errors are reported in Tables A5 and A6). Panel A shows the estimated ef-

²⁴When estimating the response of the amendments on human capital using the full sample rather than by age, the estimates are statistically significant only for years of education. For this outcome, we construct an event study graph using the [Borusyak et al. \(2021\)](#)'s approach and apply the [Rambachan and Roth \(Forthcoming\)](#) methodology to assess the sensitivity to parallel trends violations. See Figure A11.

fects of the reforms on education outcomes (years of schooling on the left-hand side axis and a binary indicator for primary school completion on the right-hand side); Panel B plots the estimated effects on long-run health (height in centimeters on the left axis and a binary indicator for below-median height on the right axis). The horizontal axis denotes each cohort's age as of 1985. The estimated coefficients are consistent with our expectations. If possible (that is, for girls who were not too old at the time of the amendments), parents successfully improved their daughters' human capital outcomes: the younger the girls at the time of the reforms, the more pronounced the effects. For the education outcomes, the gradient is positive (with the younger cohort experiencing the largest increases), and the estimated effects are statistically different from zero for women who were children or teenagers at the time of the reforms. For height, the gradient is also positive. As expected, however, we do not detect any statistically significant differences for those cohorts who were six or older at the time of the reform.²⁵

5.5 Alternative Channels

There may be alternative explanations of our findings that are outside of our model but may be critical to fully understand the connections between dowries, domestic violence, women's decision-making power, and the occurrence of separation. For instance, marital sorting and matching may change in response to a drop in dowries. Fertility outcomes and preferences may also be impacted by the reforms. Finally, the validity of our domestic violence findings may be jeopardized if the reforms changed women's propensity to report domestic abuse. In [Appendix F.4](#), we assess the scope of alternative mechanisms.

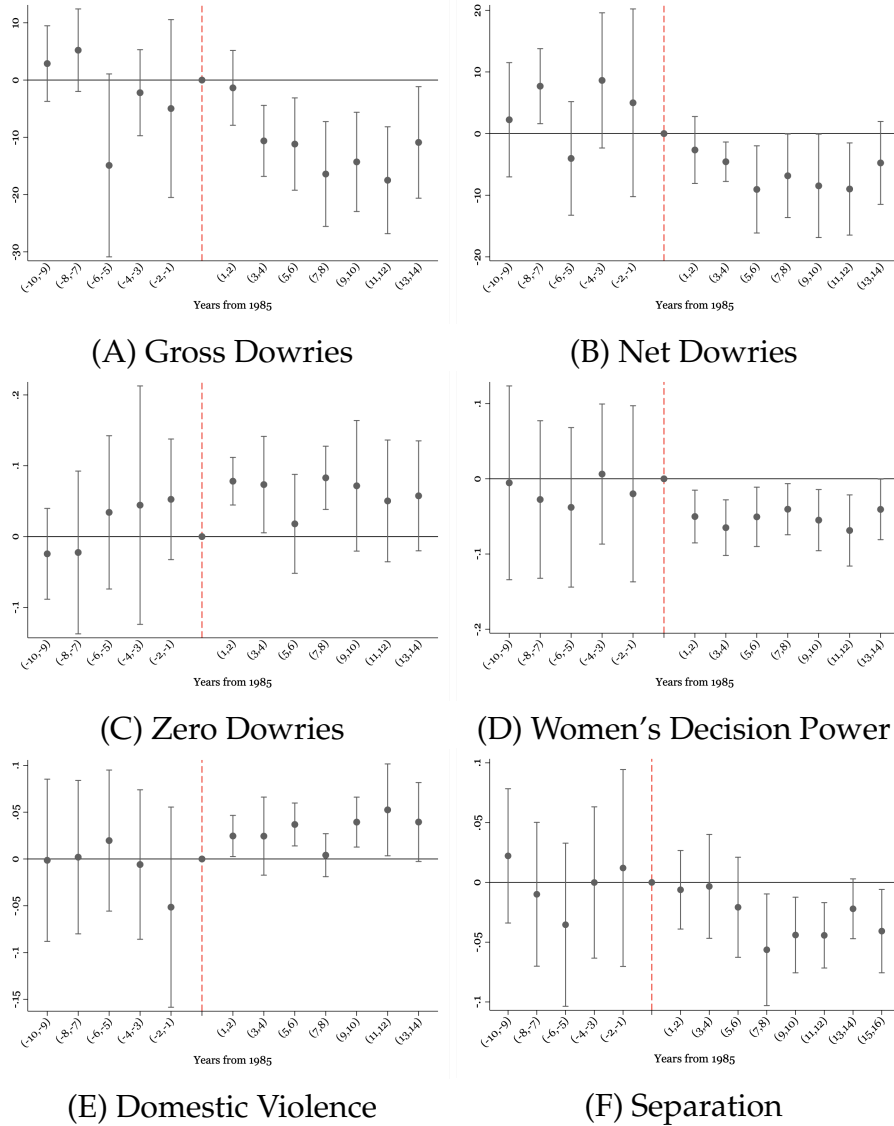
²⁵Note that any change in women's human capital outcomes may also reflect a change in parental beliefs about their marriage market return and in parental preference for girls' human capital. Given the data at hand, however, it is not possible to distinguish one channel from the other.

6 Conclusion

We provide a framework to understand the complex connections between dowry payments, parental investment in girls, women’s decision-making power in their marital families, the occurrence of domestic violence, and the likelihood of separation. We derive predictions on how changes in dowries can impact women’s well-being in their marital families. To test these predictions empirically, we exploit legal reforms to the Indian anti-dowry law that successfully reduced dowry payments. Consistent with our model, we find that women’s decision-making power decreases and domestic violence increases following a reduction in dowries. The likelihood of separation also decreases, indicating that women are unable or unwilling to exit abusive marriages. To compensate for lower dowries in the marriage market, parents increase their investment in the human capital of their daughters.

For women, the reputation cost of separating from their husbands is prohibitive, which leaves them little to no escape from unsatisfying or abusive marriages. We incorporate this fact in our model and argue that the extent of women’s psychological distress after separation may be critical to predict how a change in dowry may impact women’s post-marital outcomes. In line with this model insight (which admittedly remains empirically untested in this work), we unveil substantial heterogeneity by social stigma against separation in the impact of the anti-dowry reforms on women’s status in their marital families, suggesting that one-size-fits-all policies may not be optimal and that the local social and cultural context may matter a great deal when designing policies aimed at changing traditional customs. We hope future work will further investigate the interactions between such policies and local gender norms, and directly study their psychological and emotional effects.

Figure 1: Event Study Graphs



Notes: Data are from the 1999 Rural Economic and Demographic Survey (REDS). Estimates based on [Borusyak et al. \(2021\)](#). This figure plots the differences in outcomes between non-Muslims and Muslims around the amendments and 90 percent confidence intervals. The coefficients are estimated in 2-year intervals from the year of treatment. State, religion, and year of marriage fixed effects included in all specifications. All dowry amounts are converted to 1999 Rupees ('000). Data are from the 1999 Rural Economic and Demographic Survey (REDS).

Table 1: Prediction 1: Women’s Decision Power

	Full Sample						Matched Sample
	Any Decision	Number of Decisions (if>0)	Type of Decision				Any Decision
			Household Purchases	Health & Contracept.	Husband’s Money	Daily Decisions	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post × Non-Muslim	-0.026* (0.014)	-0.125** (0.052)	-0.056*** (0.017)	-0.029* (0.016)	-0.025* (0.014)	-0.017 (0.016)	-0.034** (0.012)
Individual Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	65,105	61,309	65,054	62,496	59,977	65,105	15,836
R sq.	0.088	0.066	0.063	0.068	0.047	0.063	0.075
Mean Dep. Var.	0.917	4.219	0.619	0.876	0.737	0.816	0.895
FWER Adj. P-values	0.070	0.030	0.006	0.070	0.070	0.136	0.022
BJS Estimate	-0.032	-0.110	-0.053	-0.036	-0.024	-0.024	-0.034
TEH Robust $\hat{\sigma}$	0.091	0.644	0.057	0.034	0.141	0.002	0.095

Notes: Data are from the 2005-2006 National Family Health Survey (NFHS). OLS estimates. Sample of women aged 15 to 49 in 2005, who married between 1975 and 1999. The matched sample is obtained using one-to-one nearest-neighbor matching without replacement to match non-Muslim and Muslim women with the closest propensity score (based on caste, age, wealth, own and spouse’s education, and household size). The caliper width equals 0.2 of the standard deviation of the propensity score. Individual controls include indicator variables for religion, year of marriage after 1985, type of residence (rural or urban), and belonging to schedule caste, schedule tribe, or other backward castes. Standard errors (in parentheses) are clustered at the state level. ***, **, * mean statistical significance at 1, 5, and 10 percent levels. The Romano-Wolf FWER adjusted p-values are based on 500 bootstrap replications. See Table A1 for details on BJS Estimate and TEH Robust $\hat{\sigma}$.

Table 2: Prediction 2: Domestic Violence

	Full Sample						Matched Sample
	Any Injury	Number of Injuries (if>0)	Type of Violence				Any Injury
			Severe Violence	Less Severe Violence	Sexual Violence	Emotional Violence	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post × Non-Muslim	0.019* (0.010)	0.114* (0.058)	0.034** (0.015)	0.029** (0.013)	0.011 (0.014)	0.008 (0.019)	0.037** (0.014)
Individual Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	50,006	16,894	50,084	50,080	50,085	50,085	11,581
R sq.	0.046	0.023	0.028	0.073	0.059	0.021	0.047
Mean Dep. Var.	0.119	1.970	0.102	0.322	0.082	0.142	0.131
FWER Adj. P-values	0.112	0.112	0.086	0.086	0.491	0.545	0.032
BJS Estimate	0.010	0.093	0.026	0.018	0.001	0.014	0.033
TEH Robust $\hat{\sigma}$	0.116	0.682	0.154	0.291	0.055	0.049	0.007

Notes: Data are from the 2005-2006 National Family Health Survey (NFHS). OLS estimates. Sample of women aged 15 to 49 in 2005, who married between 1975 and 1999. The matched sample is obtained using one-to-one nearest-neighbor matching without replacement to match non-Muslim and Muslim women with the closest propensity score (based on caste, age, wealth, own and spouse's education, and household size). The caliper width equals 0.2 of the standard deviation of the propensity score. Individual controls include indicator variables for religion, year of marriage after 1985, type of residence (rural or urban), and belonging to schedule caste, schedule tribe, or other backward castes. Standard errors (in parentheses) are clustered at the state level. ***, **, * mean statistical significance at 1, 5, and 10 percent levels. The Romano-Wolf FWER adjusted p-values are based on 500 bootstrap replications. See Table A1 for details on BJS Estimate and TEH Robust $\hat{\sigma}$.

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