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Abstract

We study the relationship between dowries - wealth transfers from the bride's family to the groom or his family at the time of marriage - and individual-level poverty in rural India. Based on the estimates of a collective household model, we show that the share of household consumption expenditure allocated to a woman is strongly associated with the dowry she paid at the time of her marriage. We compute poverty rates separately for women and men and find that women's poverty relative to men decreases with dowry. Moreover, women who paid dowries are less likely to be poor relative to women who did not, even when their households' consumption expenditures are the same. Our counterfactual policy analysis indicates that abolishing or reducing dowries (through anti-dowry laws or taxes, for example) may have the unintended effect of aggravating intra-household inequality and increasing women's risk of living in poverty after marriage.

JEL Classification: D13, I32, J12, J16

Keywords: dowry, resource shares, collective model, intra-household inequality, India, poverty

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1 Introduction

Dowries are wealth transfers from the bride's family to the groom or his family at the time of marriage. Historically, dowries served as a pre-mortem bequest to a daughter, especially in patrilocal and patrilineal societies, where male children inherit the family wealth and a couple typically resides with or near the husband's parents (Botticini and Siow, 2003). In India, dowries have transitioned from their original function of endowing daughters with economic safety to a groom-price (a wealth transfer from the bride's parents to the groom or his family, with the bride having limited property rights over it; Srinivas (1984); Anderson and Bidner (2015)). In this paper, we show that, despite this transition, dowries may still serve as an indirect transfer from parents to their daughters through their impact on women's access to resources in their marital families.

Dowries are a crucial feature of the Indian marriage market and often amount to one to several times the annual income of the average family (Goody et al., 1973; Anderson, 2007; Chiplunkar and Weaver, 2019). The custom of dowry may contribute to parents' desire to have sons instead of daughters (Jayachandran, 2015), leading to sex-selective abortion (Alfano, 2017; Bhalotra et al., 2020) and the missing women phenomenon (Sen, 1990). It has also been associated with the occurrence of violence against women, including dowry deaths and bride burning (Bloch and Rao, 2002; Srinivasan and Bedi, 2007; Calvi and Keskar, 2020). For these reasons, the Dowry Prohibition Act forbids both the giving and receiving of a dowry.[1] However, the Act has been mostly ineffective, and several policymakers and advocacy groups have repeatedly pled for the elimination of this practice (Majumdar, 2005).

Marital transfers to the groom or his family, however, can also influence women's bargaining power, with smaller dowries weakening women's bargaining position in their marital families (Zhang and Chan, 1999). In India, women's intra-household bargaining power is typically feeble,[2] which is reflected in their limited access to household resources and, consequently, in their higher risk of poverty than men (Calvi, 2020). By tracing the relationship between dowry payments and the intra-household allocation of resources after marriage, we study the effects of limiting dowry payments on women's post-marital well-being and risk of living in poverty.

We start by documenting a positive association between marital transfers and self-reported measures of women's control over household food and clothing expenditure. While insightful, these measures are limited in scope and do not allow us to quantify the link between dowry payments and women's post-marital poverty. To overcome this limitation, we use a collective household model to structurally estimate the intra-household allocation of total consumption expenditure (Chiappori, 1988, 1992; Apps and Rees, 1988). In this framework, each household member has separate preferences over goods, and the household is Pareto efficient in its allocation of goods. We estimate the model using data from the Rural Economic and Demographic Survey, a nationally representative survey of rural India, which exceptionally contains detailed households' consumption recalls and retrospective information

[1] The Dowry Prohibition Act was enacted in May 1961. 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 [...]." See Section 2 for details.

[2] According to the National Family Health Survey, less than two-thirds of the women in India participate in critical decisions about household purchases and their health; more than two-thirds of respondents to the Survey of Women's Status and Fertility (SWAF) report having no say in consequential household decisions and approximately one-third of the women report having no say in the number of years of schooling their children should receive or who their children should marry.

on marital transfers.

We estimate women's *resource shares* (i.e., the fraction of total household expenditure consumed by women; Browning et al. (2013)) conditional on a large set of observable household traits and study how they vary with the dowry women paid upon marriage. Following previous work, resource shares are identified by comparing Engel curves of clothing items consumed exclusively by men, women, and children (Dunbar et al., 2013; Calvi, 2020). In line with Calvi (2020), we find that women in rural India are allocated a smaller fraction of household consumption than men, with women's resource shares amounting to 83 percent of men's resource shares, on average. In addition, we show that a woman's access to household resources is increasing in the dowry she paid at the time of her marriage. Specifically, we estimate that a one standard deviation increase in log-dowry (approximately 15,000 Rupees) increases the woman's resource share by 3.6 percentage points. At the extensive margin, we find that women who did not pay a dowry receive a significantly smaller portion (approximately one half) of household resources relative to women who did. Moreover, compared to women who paid an above-median dowry, women who paid a low dowry exert a five percentage points lower control over household consumption. These findings are confirmed by an instrumental variable analysis that addresses the potential endogeneity of dowry amounts.

Based on the model estimates, we compute individual-level consumption expenditures that are adjusted for intra-household inequality. We show that dowries can substantially impact women's consumption and hence their well-being after marriage. This impact is twofold: first, dowry payments may increase the resources available to the bride's new family; second, they increase the portion of household resources allocated to women. We argue that the latter mechanism is far from negligible. Women's likelihood to live in poverty *relative* to men decreases with their dowry. Moreover, for any given level of household expenditure, women who paid a dowry are significantly less likely to be poor compared to women who did not. This holds true for women living in both poor and non-poor households (that is, with a level of per-capita consumption below or above the poverty line; Brown et al. (2018)): for women who live in families with per-capita consumption above the poverty line, the absence of dowry is associated with a 24 percentage points higher likelihood to be allocated a level of consumption expenditure that is lower than the poverty line; for women who live in poor families, it is associated with a twice as high probability of living in poverty.

While anti-dowry laws can successfully reduce parental preferences for sons and hence improve girls' welfare before marriage (Alfano, 2017; Bhalotra et al., 2020), we show that abolishing dowries may have the unintended effect of reducing the share of resources commanded by women in their marital families and hence increase their risk of living in poverty after marriage. We implement counterfactual simulations to assess the scope of this effect. We find that women's likelihood to be impoverished after marriage could increase by 1.6 times in the absence of dowry payments. We also show that taxing dowry payments may widen the gender poverty gap (i.e., women's poverty relative to men's). We find, for example, that a 5,000 Rupees lump-sum tax could increase women's post-marital poverty by almost eight percent; a 25 percent proportional tax could increase it by two percent. Finally, the full enforcement of the pecuniary fines mandated by the Indian anti-dowry law may substantially increase the risk of living in poverty after marriage not only for women, but also for men and children.

The World Health Organization lists poverty as one of the determinants of health and mortality (WHO, 1999, 2015).[3] So, policies that aim at reducing dowries or eliminating them altogether may have unexpected and severe consequences for women's post-marital well-being. To minimize the adverse effect of otherwise well-intended policies and successfully improve the status of Indian women, it is critical to understand the link between dowry payments and women's access to resources in their marital families. As one-sixth of the global female population live in India, doing so would represent a significant step toward eliminating gender inequality worldwide – a United Nations Sustainable Development Goal to be achieved by 2030.

Related Literature. Our work relates to two main strands of the literature: the previous research on dowries and their impact on women's bargaining power, and the literature on intra-household resource allocation and individual-level poverty.

The literature on the origins of dowries and their role in the Indian marriage market is extensive. Several papers have studied the role of population growth in combination with a spousal age gap at marriage as a cause of rising of dowries in India (see, e.g., Rao (1993b, 2000); Edlund (2000); Bhaskar (2019)). Botticini and Siow (2003) argue that parents transfer bequests to sons and dowries to daughters to solve a free-riding problem that may arise in patrilocal societies. Anderson (2003) develops a matching model in which dowry inflation emerges naturally during the process of modernization in a caste-based society, while Anderson and Bidner (2015) construct an equilibrium model of the marriage market with intra-household bargaining to study shifts in women's property rights over marital transfers. Their model formalizes a dowry's dual role as a pre-mortem bequest and a market-clearing price (Becker, 1991), and predicts that women's property rights over dowry deteriorate with development. One exception to this primarily theoretical literature is Chiplunkar and Weaver (2019), who analyze the evolution of dowry payments in India over the past century. They also show that the emergence and evolution of dowry are consistent with a dynamic search model, where potential grooms and brides are randomly matched and bargain over dowry, and can be explained by shifts in the distribution of groom quality over time.[4]

Previous work has investigated the impact of dowry payments on women's status in their marital families. For example, studying the custom of dowry in China, Brown (2009) finds that the payment of a dowry positively impacts numerous measures of a woman's well-being and life satisfaction. Makino (2019) estimates that higher dowries improve women's autonomy and decision power in their marital household in the Pakistan Punjab. Close to our work is a paper by Zhang and Chan (1999), who include marital transfers into a Nash bargaining model, showing both theoretically and empirically using data from Taiwan that higher dowries lead to improved welfare for women. In this paper, we revisit the insights of Zhang and Chan (1999) and analyze them in the Indian context. In line with their paper, we assume that the household allocation of resources is Pareto efficient. Consistent with the collec-

[3] For instance, Indian women who live in extreme poverty are estimated to face 2.7 times higher probability of death than those who do not.

[4] An extensive literature documents the consequences of marital transfers from the groom to the bride's family (bride-price). Studying marriages in Uganda, Bishai and Grossbard (2010), e.g., document a robust correlation between bride-price payment and lower rates of non-marital sexual relationships for men. Lowes and Nunn (2017) find that larger bride-price payments are associated with better-quality marriages as measured by beliefs about the acceptability of domestic violence, the frequency of engaging in positive activities as a couple, and the self-reported happiness of the wife. Using data from Indonesia and Zambia, Ashraf et al. (2020) find that the probability of a girl being educated is higher among ethnic groups practicing bride-price and that families from bride-price groups are the most responsive to policies, like school construction, that aim at increasing female education.

tive household framework, however, we remain agnostic about the specific bargaining protocol used by the decision-makers. Differently from Zhang and Chan (1999), who proxy a woman's bargaining power with their husbands' contribution to household chores, we estimate our model structurally to recover the intra-household allocation of consumption expenditure. As surveys are typically conducted at the household level and goods can be shared, each family member's individual consumption is not observable and must be estimated.[5]

A growing literature has applied the collective household model to quantify intra-household inequality in developing countries and estimate individual-level poverty rates. These are different from standard poverty rates, which are based on household per-capita consumption and therefore assume an equal distribution of resources among family members. This approach has been used to study inequality between spouses or between parents and children (Dunbar et al., 2013, 2019; Bargain et al., 2014, 2018; Tommasi, 2019; Sokullu and Valente, 2018; Hoehn-Velasco and Penglase, 2019; Lechene et al., 2020), the well-being of older women in India (Calvi, 2020), the treatment of foster children in Malawi (Penglase, 2018), and the allocation of resources among prime-aged adults, the elderly, and children by sex and birth-order in Bangladesh (Brown et al., 2018). In line with these works, we show that a correct measurement of poverty may require considering how resources are allocated among household members, especially in contexts like India, where gender inequality is high and incomes are low. We also show that traditional customs, such as dowries, may be critical in determining intra-household resource allocation and women's likelihood to live in poverty after marriage. To our knowledge, ours is the first paper to apply this approach to study the link between marital transfers and the allocation of consumption within families.

The rest of the paper is organized as follows. Section 2 provides an overview of the custom of dowry in India and presents some descriptive analyses. Section 3 presents the theoretical framework and the identification method. Section 4 discusses our empirical strategy and results. Section 5 describes the relationship between dowry payments and intra-household consumption allocation and discusses the implications for women's relative poverty. Our counterfactual simulations are in Section 6. Section 7 concludes.

2 Dowries, Wealth, and Self-reported Resource Control

In this section, we describe the custom of dowry and the legal framework governing marital transfers in India. We also analyze the relationship between dowry payments and household wealth and the link between dowries and women's self-reported control over household resources. The results of this

[5]The tradition of dowry has also been associated with domestic violence against women. Consistent with a non-cooperative bargaining model with incomplete information where the groom's family uses domestic violence as a signal to extract additional resources from the bride's family post-marriage, Bloch and Rao (2002) show that women who pay a lower dowry are more likely to be victims of domestic abuse in rural Karnataka. Srinivasan and Bedi (2007) find similar results using data from a village in South India. In related work (Calvi and Keskar, 2020), we show that amendments to the Indian anti-dowry law that increased punishment for receiving or giving a dowry led to an increase in domestic violence and a decrease in women's decision-making power. For simplicity, the present paper abstracts from domestic violence, but we acknowledge that it may be the source of inefficiencies. Recent work by Lewbel and Pendakur (2020) develops a collective model where households behave inefficiently (they engage in domestic violence and do not fully exploit scale economies), but shows that this does not have a large effect on the estimates of resource shares in Bangladesh. In rural India too, where food (which is mostly private) is a large share of the budget, economies of scale and the consumption losses due to inefficiencies are likely limited (Calvi et al., 2020).

analysis motivate our later study of intra-household total consumption inequality, which we discuss in Section 4.

2.1 Dowries in India

In India, the payment of a dowry upon marriage is a nearly universal custom and a woman is typically unable to marry without such transfer. Traditionally, dowries served as a pre-mortem bequest to a daughter (*stridhan*). Over time, the institution of dowry has departed from its original purpose of endowing daughters with financial security into a groom-price (Anderson and Bidner, 2015). Srinivas (1984) associates the emergence of groom-price to the creation of white-collar jobs in the British bureaucracy during the 1930s and 1940s. High-quality grooms in these positions were very attractive and able to command substantial dowry payments from potential brides who pursued them.

Starting with the seminal work by Caldwell et al. (1983) and Rao (1993a,b), the custom of dowry in India and the phenomenon of *dowry inflation* in particular (i.e., the rise of dowries over the second half of the twentieth century) have been widely studied (see, e.g., Edlund (2000),Rao (2000), Anderson (2003), Anderson and Bidner (2015), Bhaskar (2019)). Chiplunkar and Weaver (2019) investigate the evolution of dowries in India over the past century, documenting a rapid increase in the prevalence of dowry between 1935 and 1975. Since then, more than 80 percent of Indian marriages have involved the payment of a dowry, although dowry amounts declined in real terms and as a fraction of household income after 1975. Despite this decline, dowries remain strikingly sizable, with the total value of dowry payments estimated to be approximately equal to the Indian national government's annual spending on health.[6]

The dowry system places a substantial financial burden on the bride's family. The prospect of paying a dowry is often listed as a crucial 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 (Jayachandran, 2015; Alfano, 2017; Borker et al., 2017; Bhalotra et al., 2020). Anukriti et al. (2019) show that the expectation of higher future dowry increases current parental savings and that fathers of first-born girls work more days in a year relative to fathers of first-born sons. 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).

In 1961, the Indian government enacted the Dowry Prohibition Act to mitigate the adverse consequences of dowry payments. Any individual caught engaging in the practice of dowry could receive a prison sentence of up to six months or a fine of up to 5,000 Rupees (approximately US$540 in 2011 PPP).[7] Such provisions were not strong enough, as dowry payments remained pervasive in India after 1961. Dowry laws were tightened further between 1985 and 1986. The 1985-1986 amendments to the Dowry Prohibition Act increased the prison sentence from six months to one year and the fine amount from 5,000 Rupees to 15,000 Rupees (or the dowry amount, whichever is larger). The reforms also

[6] Anukriti et al. (2019) also find evidence of an increase in the total value of gifts exchanged at the time of the marriage between 1960 and 1980, followed by a decrease in real terms during the 1980s and 1990s. They use the 2006 wave of the Rural Economic Development Survey, which, unlike the 1999 wave we use in this paper, records marital payments as the total value of gifts exchanged at the marriage time instead of actual dowry payments. As shown in Figure C.7 of their paper, there has been minimal change in marital transfers between 1999 and 2006.

[7] The Act excluded any person to whom the Muslim Personal Law (Shariat) applies.

shifted the burden of proving no dowry was exchanged to the person receiving the payment and required both the parties involved in the wedding to maintain a list of gifts along with details such as the name of the person who gave the gift, a brief description of the gift, and the value of the gift. Alfano (2017) and Calvi and Keskar (2020) show that these amendments were successful in reducing (but not eliminating) dowry payments in India.

Figure A7 in the Appendix plots the empirical distribution of dowry payments from the 1999 round of the Rural Economic and Demographic Survey based on all available recalls of marital transfers for the household head, their parents, their sisters, and brothers, and their daughters and sons (Panel A) and on the recalls of the families in our estimation sample (Panel B).[8] All dowries are converted to 1999 Rupees.

2.2 Dowries and Family Wealth

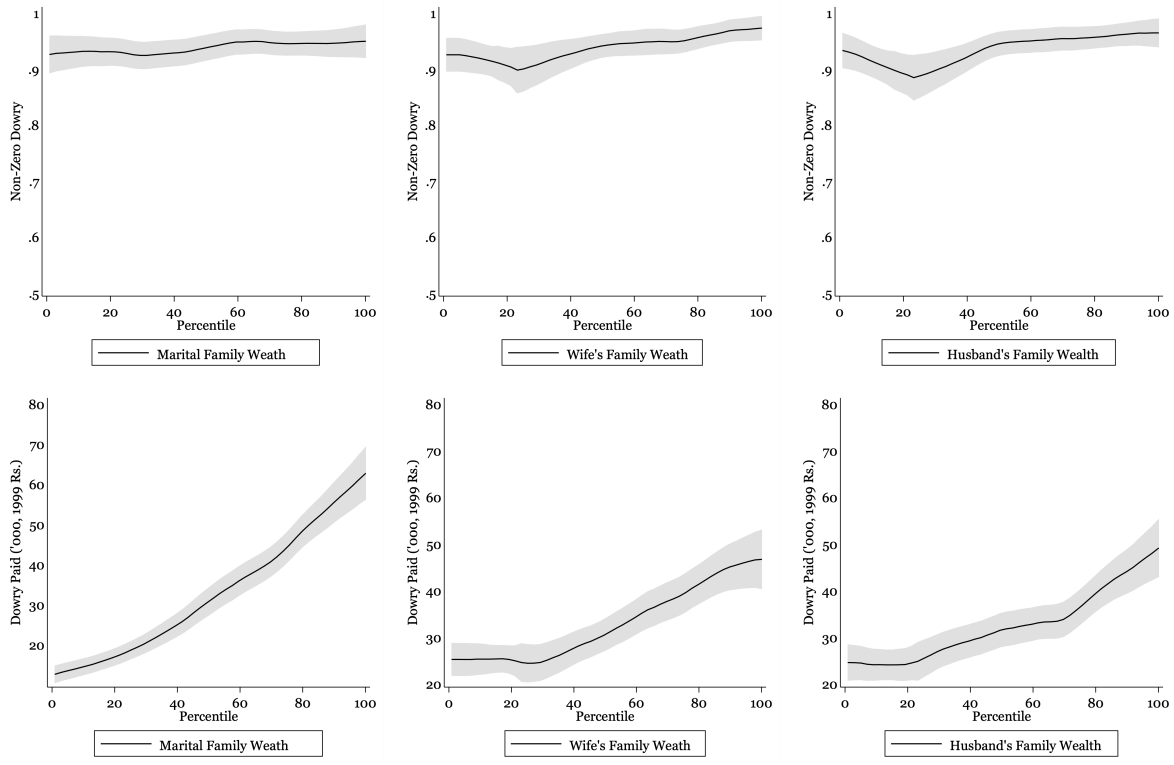
Contrary to what one might think, dowry payments in India are as prevalent in poor families as they are in rich families. Panel A of Figure 1 plots the share of marriages involving dowries by the marital family's wealth rank, which we construct using principal component analysis and a list of 35 assets owned by the household at the time of the survey. At each point of the wealth distribution, approximately 90 percent of marriages involve the payment of a dowry. Unsurprisingly, the dowry amount is higher for better-off families, with dowry payments in the top ten percent of the wealth distribution being approximately six times the dowry payments in the bottom ten percent. On average, dowries in families at the top of wealth distribution amount to twice the annual household consumption expenditure for these families; at the bottom of the distribution, they are approximately equal to how much these families spend in a year.

Analogous patterns emerge when plotting dowry prevalence against the wealth rank of the bride's and the groom's natal families, which we construct based on information about their land possessions and the fathers' educational attainment (Panels B and C). Once again, about 90 percent of marriages throughout the natal families' wealth distributions involve a dowry. The average dowry amount is constant up to the 35th percentile of the bridal family's wealth, which can be interpreted as suggestive evidence of hypergamy (i.e., women marry wealthier men, on average; Borker et al. (2017)): impoverished families prefer to marry their daughters to more affluent men, whom they attempt to attract by offering larger dowries.

Since dowries are widespread (and quite sizable) even among the economically worse-off families, it is critical to understand how marital transfers impact individual consumption and one's likelihood to live in poverty. Previous work has focused on pre-marital effects. Anukriti et al. (2019), for example, show that the expectation of a future dowry payment substantially changes parents' saving behavior. Corno et al. (2020) show that Indian parents delay their daughters' marriage as a strategy to cope with income volatility and avoid the payment of a dowry, at least in the short-run. We instead focus on post-marital effects and analyze the relationship between dowry payments, the intra-household allocation of resources between a husband, a wife, and their children, and their relative poverty risk.

[8] See Section 4.1 for details on the estimation sample.

Figure 1: Dowry Payments and Family Wealth



(A) Marital Family (B) Wife's Natal Family (C) Husband's Natal Family

Note: Dowry payments are inflation adjusted to 1999 Indian Rupees. The sample consists of nuclear families in rural India. Results are confirmed when considering both nuclear and non-nuclear families. See Figures A8 in the Appendix.

2.3 Dowries and Self-reported Resource Control

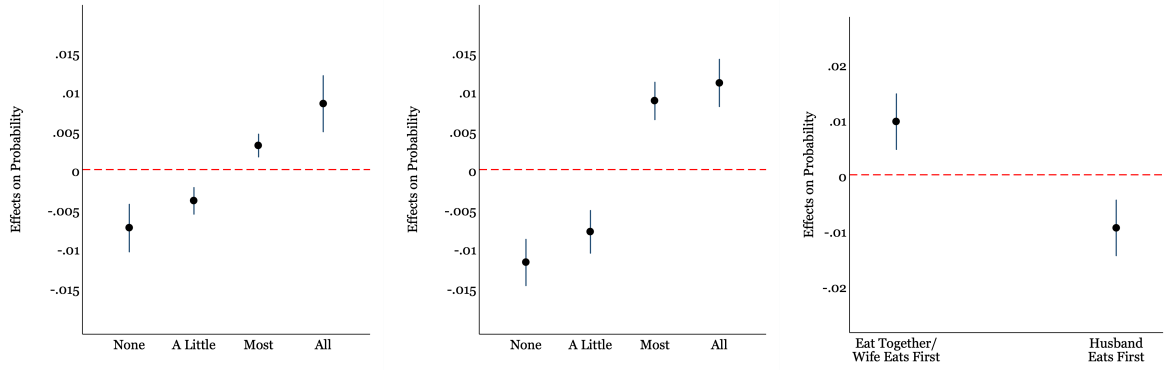
In addition to collecting information on marital transfers, the Rural Economic and Demographic Survey (hereafter REDS) asks women about their degree of control over food and clothing expenditures. The specific question reads as follows: "Your household spends some amount on food (clothing) items. How much of this amount is handled by you personally?" We now analyze the relationship between women's self-reported control over food and clothing expenditures and the amount they paid at the time of their marriage. Since there are four possible answers to these questions, ranging from "None" to "All," we estimate the following ordered logit model with maximum likelihood:

$$p_{ik} = \Pr\left(\kappa_{k-1} < \beta D_i + X_i'\Gamma + \epsilon_i \leq \kappa_k\right) = \frac{1}{1+\exp(-\kappa_k + \beta D_i + X_i'\Gamma)} - \frac{1}{1+\exp(-\kappa_{k-1} + \beta D_i + X_i'\Gamma)}, \quad (1)$$

where, p_{ik} is the probability that woman i reports having different degrees of control over food or clothing expenditure and κ_k are the cutoff points for the underlying latent variable. D_i is the amount of dowry she paid at the time of her marriage (in logarithms, adjusted for inflation),[9] X_i is a set of individual and household controls (including the respondent's age and years of schooling as well as her husband's, the number of children in the family, total household expenditure, and indicator variables

[9]Let d be the dowry amount in 1999 Rupees. In order to keep observations with dowries equal to zero, we compute $D = \ln(1+d)$.

Figure 2: Dowry Payments and Self-reported Resource Control



(A) Woman's Control of Food Expenditure

(B) Woman's Control of Clothing Expenditure

(C) Meal Schedule

Note: Dowry payments are inflation adjusted to 1999 Indian Rupees. The sample consists of nuclear families in rural India. Results are confirmed when considering both nuclear and non-nuclear families. See Figure A9 in the Appendix.

for religion, caste, year of marriage, and geographic region), and ϵ_i is a logistically distributed error term.

In our sample, three out of four women report handling most or all of the food expenditure. By contrast, women have minimal control over clothing expenditure, with 14.3 and 55.4 percent of respondents reporting having no and little control, respectively. Panels A and B of Figure 3 plot the estimated marginal effects of dowries on the probability of each outcomes, together with the associated 95 percent confidence intervals. Dowry payments are positively and significantly associated with a woman's self-reported control over her household's food and clothing expenditures. We find that a one standard deviation increase in log-dowry decreases her likelihood of having no control over food expenditure by 1.9 percentage points and over clothing expenditure by 2.7 percentage points. By contrast, higher dowries are associated with a significantly higher probability that the respondents report handling most or all of food and clothing expenditures.

It is not uncommon that Indian women eat only after the rest of their family have finished their meals (possibly limiting the amount of food they have access to). So, REDS respondents are also asked about the order in which family members eat meals. Based on these responses, we construct an indicator variable equal to one if the husband eats before his wife and zero otherwise. Husbands eat first in 14.3 percent of households in our sample instead of eating together with their wives or their wives eating first (although only three women in our sample report eating before their husbands). To better understand the link between dowries and family meals schedule, we estimate a logistic regression with an indicator for husbands eating first as the outcome variable. Consistent with our previous results, we find that higher dowries reduce the likelihood that men consume their meals before women do (by 2.6 percentage points for a one standard deviation increase in log-dowry). Despite our controlling for several household and individual traits, we acknowledge that establishing causality in this context is challenging. In Appendix A.4, we show that our findings are confirmed (with larger estimated effects) when using an instrumental variable approach.

One limitation of relying on self-reported measures of control is that they are qualitative in na-

ture and might be tainted by some degree of subjectivity. Moreover, while nutrition and clothing consumption are essential components of individual well-being, other dimensions of consumption (such as healthcare, housing, and education) may be equally critical. In the next section, we set out a structural model to estimate how total consumption is divided among family members, allowing us to further investigate the impact of dowry payments on intra-household inequality and assess their implications for poverty.

3 Theoretical Framework

A fundamental challenge to calculate the share of total household resources that are allocated to women is that individual consumption is typically not observable in its entirety. Control over household resources is also hard to observe as most goods in a household can be consumed jointly to some extent by household members. In this section, we summarize the collective model of Browning et al. (2013) and Dunbar et al. (2013), and discuss its application to identify and then estimate the intra-household allocation of total consumption.

3.1 Model

Consider a household consisting of one man, one woman, and their children, which we index with m, w, and c, respectively.[10] Let C be the number of children in the family and Y be the household's total expenditure. Also, let X be a vector of household's observables characteristics (such as the age of household members, the number of children, the duration of the marriage, and other socio-economic variables) and D be the dowry paid by the woman upon marriage.

The household consumes K types of goods with prices $p = (p^1, ..., p^K)$. We denote by $h(p, Y, X, D)$ the vector of observed quantities of the K goods purchased by each household and by $q_j(p, Y, X, D)$ the vector of *private good equivalents*, defined as the unobserved quantities of goods consumed by individual $j = m, w, c$. As in Browning et al. (2013) and Dunbar et al. (2013), we model economies of scale in consumption through a Barten-type consumption technology, which converts purchased quantities by the household into private good equivalents. This technology assumes the existence of a $K \times K$ matrix $A = A(X, D)$ such that $h = A(q_m + q_w + Cq_c)$. Among the set of K goods, we single out goods that are *private* (i.e., they are not jointly consumed) and *assignable* (i.e., they are consumed exclusively by household members of known type j). If good k is a private good, then the kth row of A equals one in the kth column and zero elsewhere.

Each member has a monotonically increasing, twice continuously differentiable, and strictly quasi-concave utility function over goods. We denote by $U_j(q_j, X, D)$ the consumption utility of individual j over the vector of goods q_j. Each member may also care about other family members' well-being, so that her total utility $\tilde{U}_j$ may depend on the utility of other household members. We assume j's total utility to be weakly separable over the consumption utility functions of all household members. So,

[10] It is possible to extend the model to accommodate non-nuclear families (as in Calvi (2020) and Brown et al. (2018)). Due to data availability, which we discuss in detail in Section 4, our empirical analysis focuses on nuclear families only. In Section A.1 in the Appendix, however, we lay out a general collective model with multiple decision-makers.

e.g., a woman who gets utility from other family members' well-being as well as her own would have a utility function $\tilde{U}_w = \tilde{U}_w(U_w(q_w, X, D), U_m(q_m, X, D), U_c(q_c, X, D))$.[11]

The household program is as follows:

$$\max_{h,q_m,q_w,q_c} \sum_{j\in\{m,w,c\}} \mu_j \tilde{U}_j \quad \text{such that} \quad h = A(q_m + q_w + Cq_c), \;\; y = h'p, \tag{2}$$

where $\mu_j = \mu_j(p/Y, X, D)$ are the *Pareto weights*. The solutions to this program provide the bundles of private good equivalents, q_j. Pricing those at the shadow prices $A'p$ yields the *resource shares*, which we denote by λ_j. Resource shares are defined as the fraction of total household resources devoted to men, women, and children, respectively.[12]

Consistent with the standard formulation of collective models, the key assumption about decision making within the household is that outcomes are Pareto efficient. Thus, the household program can be decomposed into two steps: in a first step, resources are allocated among family members; in a second step, each household member chooses q_j as the bundle maximizing her utility function subject to a Lindahl-type shadow budget constraint. By substituting the indirect utility functions in Equation (2), the household program simplifies to the choice of optimal resource shares subject to the constraint that total resources shares must sum to one.

While the household demand functions for other goods are more complex (Browning et al., 2013; Lewbel and Pendakur, 2008), for the private assignable goods they simplify to:

$$W_j(Y, p, X, D) = \lambda_j(Y, p, X, D) w_j(A(X, D)'p, \lambda_j(Y, p, X, D)Y, X, D), \tag{3}$$

where w_j is the demand function of each household member of type j when facing her shadow budget constraint (with prices $A'p$ and income $\lambda_j Y$). Note that one cannot just use W_j as a measure of λ_j, because different household members may have very different tastes for their private assignable good. Following the methodology developed in Dunbar et al. (2013), we instead estimate Engel curves for each household member type j's private assignable good (namely, men's, women's, and children's clothing). Then, given W_j and Y, we implicitly invert these curves to recover the resource shares. Note also that dowry payments D may affect preferences directly (that is, w_j itself is a function of D) or indirectly through resource shares and the consumption technology function. Since our identification strategy does not require restricting how dowries impact household behavior (see Section 3.2), we choose not to do so. Alternatively, one may treat dowry as a *distribution factor*, i.e., a variable impacting household behavior only through its decision-making process but not preferences nor the budget constraint. Since we cannot rule out a direct impact of dowries on preferences or the budget constraint, such an approach is not suitable for our context.

Our model is one of full commitment, i.e., the household commits to a specific intra-household allocation plan at the moment of household formation. Specifically, it rules out the possibility of intra-

[11] As $\tilde{U}_w$ depends upon q_m and q_c only through the consumption utilities they produce, we rule out direct consumption externalities.

[12] Pareto weights are traditionally interpreted as measures of intra-household bargaining power: the larger is the value of μ_j, the greater is the weight that individual j's preferences receives in the household program. Browning et al. (2013) show that there exists a monotonic correspondence between Pareto weights and resource shares. Moreover, they argue that the latter is a more tractable measure of bargaining power, as it is invariant to unobservable cardinalizations of the utility functions.

household renegotiation after the marriage takes place and the dowry is paid. An alternative approach would be to consider a framework with limited commitment, allowing for the renegotiation of intra-household allocations any time the participation constraint of one of the decision-makers binds.[13] As discussed in Chiappori and Mazzocco (2017), however, "in more traditional environments (such as rural societies in many developing countries), renegotiation may be less frequent since the cost of divorce is relatively high, threats of ending a marriage are therefore less credible, and noncooperation is less appealing since households members are bound to spend a lifetime together." A full commitment model represents a good and more tractable approximation of household behavior in many such contexts, including ours.[14]

3.2 Identification of Resource Shares

Dunbar et al. (2013) show that resource shares are identified under observability of private assignable goods, semi-parametric restrictions imposing similarity of preferences over the private assignable goods, and the assumption that resource shares are independent of expenditure.[15] We here focus on the commonly used Piglog (price independent generalized logarithmic) functional form, which we later use for estimation. Piglog preferences conveniently yield Engel curves that are linear in the logarithm of household expenditure and resource shares that do not depend on Y.[16] Under this assumption and after omitting the dependence on p, Y, X, and D to avoid clutter, the demand functions for the private assignable goods can be written in Engel curve form as follows:

$$\begin{cases} W_w = \lambda_w(\alpha_w + \beta_w \ln \lambda_w + \beta_w \ln Y) \\ W_m = \lambda_m(\alpha_m + \beta_m \ln \lambda_m + \beta_m \ln Y) \\ W_c = C\lambda_c(\alpha_c + \beta_c \ln \lambda_c + \beta_c \ln Y). \end{cases} \tag{4}$$

W_w, W_m and W_c are the budget shares spent on women's, men's and children's assignable goods and Y is the total household expenditure; α_j and β_j are combinations of underlying preference parameters, while λ_j the share of resources devoted to women, men, and children.

Identification of resource shares is achieved by imposing similarity of preferences for the private assignable goods across household members. These restrictions allow us to identify individual resource shares by comparing household demands for assignable clothing across people within households. In what follows, we employ the set of restrictions from Dunbar et al. (2013) known as SAP (or Similar

[13] Collective household models can assume limited or full commitment, depending on whether the household can commit to permanent Pareto weights at the moment of household formation. In limited commitment collective models (e.g., Mazzocco (2007); Mazzocco et al. (2014); Voena (2015)), household decisions are efficient subject to the constraint that in each period and state of nature both spouses can choose to leave the household and take the best available outside option if the level of welfare it provides is higher than the welfare provided by staying in the household. The threat to leave triggers a renegotiation that modifies the intra-household allocation plan and restores individual rationality. Identifying and estimating Pareto weights in limited commitment models is possible only under specific functional forms and requires panel data. To our knowledge, no previous work has estimated resource shares and individual consumption under limited commitment.

[14] According to the 2011 Census of India, 1.36 million individuals in India are divorced, amounting to only 0.24 percent of the married population and 0.11 percent of the total population (Jacob and Chattopadhyay, 2016). By contrast, in the US, about 40 percent of marriages end in divorce (CDC/NCHS National Vital Statistics System).

[15] Menon et al. (2012) show that for Italian households, resource shares do not exhibit much dependence on household expenditure, therefore supporting the identification of resource shares based on this particular assumption. Using data from Bangladesh, Bargain et al. (2018) reaches a similar conclusion. Moreover, this restriction still permits resource shares to depend on other variables related to expenditure, such as wealth measures (including dowry payments).

[16] See Dunbar et al. (2013) for a more general discussion of resource shares identification using Engel curves of private assignable goods.

Across People).[17] Provided that $\beta_m = \beta_w = \beta_c = \beta$, the slopes of the Engel curves in System (4) can be identified by linear regressions of the assignable clothing budget shares on a constant term and log-expenditure. Note that $\beta\lambda_m$, $\beta\lambda_w$, and $C\beta\lambda_c$ are the slopes of the household-level assignable clothing Engel curves. These slopes are proportional to the unknown resource shares, with the factor of proportionality set by the constraint that the resource shares must sum to one. In Section A.2 in the Appendix, we assess the validity of this restriction in our context. In Section A.3.3, we show that our findings are robust to using an alternative identification method that allows preferences to vary more flexibly across people, but restricts how they vary across household types.

4 Estimation

4.1 Data and Estimation Strategy

The Rural Economic and Demographic Survey (REDS) is a nationally representative survey of rural Indian households collecting detailed economic and demographic information. Households were first interviewed in 1969 and then followed in 1970, 1971, 1982, 1999, and 2006. Several features of the 1999 REDS dataset make it ideal for our analysis. First, it collects retrospective information on marriages and dowry amounts. Second, it records detailed household consumption, including spending on private assignable goods such as clothing items for men, women, and children, separately.[18] As discussed in Section 3.2, this is a key requirement to identify resource shares. Third, unlike the 2006 round, the 1999 round allows us to distinguish between cases when respondents could not recall dowry payments and when they paid zero dowry. By contrast, the 2006 round records a missing value when the respondent states that no dowry was paid, which may be problematic.

The survey collects information from 7,474 households. From these, we select 1,242 households as follows. Since we are interested in the impact of dowry payments on women's share of household resources, and we observe the dowry transfer and private assignable consumption only for the wife of the household head, we exclude non-nuclear families from our analysis. Admittedly, this is a significant restriction, but required to accurately analyze the relationship between the dowry a woman pays upon marriage and the post-marital share of household resources she receives.[19] Additionally, we focus on marriages that occurred after 1970 and exclude households with more than five children, with a female head or reporting multiple household heads, and with live-in domestic workers. To eliminate outliers, we exclude families in the top one percent of total expenditure, the top one percent of spending on religious ceremonies (which may involve the extraordinary purchase of assignable clothing items), and the top one percent of dowry amount.

[17] Related identification approaches include Dunbar et al. (2019), who identify resource shares for women, men, and children with *distribution factors* (i.e., factors that impact the decision making process, but not preferences nor the budget constraint) instead of similarity restrictions on preferences and accommodate random resource shares. Sokullu and Valente (2018) weaken the preference restrictions of Dunbar et al. (2013) by using panel data, Brown et al. (2018) do so by using multiple assignable goods, and Penglase (2018) identifies resource shares using private goods and are only partially assignable. In a similar framework, Lewbel and Pendakur (2020) relax the assumption of Pareto efficiency, while Calvi et al. (2020) develop an approach to identify both resource shares and the extent of joint consumption. Botosaru et al. (2020) achieve point-identification of random resource shares using short panel data.

[18] While dowry data are available for each head of the household as well as their siblings and offsprings, information about private assignable goods consumption is not collected for these members.

[19] If the wife of the head of household is allocated a larger fraction of household consumption expenditure relative to other women in extended

Table 1: REDS: Summary Statistics

	Obs.	Mean	St.Dev.	Median	Min.	Max.
	(1)	(2)	(3)	(4)	(5)	(6)
Total Annual Expenditure($\times 10^3$)	1,242	25.509	11.725	23.212	7.457	91.770
Man's Assignable Clothing Budget Share	1,242	0.006	0.007	0.004	0.000	0.039
Woman's Assignable Clothing Budget Share	1,242	0.020	0.014	0.017	0.000	0.074
Children Assignable Clothing Budget Share	1,242	0.033	0.020	0.030	0.000	0.129
Food Budget Share	1,242	0.582	0.107	0.586	0.177	1.000
Dowry Payment ($\times 10^3$)	981	28.410	38.749	13.749	0.000	232.439
Dowry Payment (incl. imputed)	1,242	32.598	39.571	17.475	0.000	232.439
Dowry Payment (incl. imputed) if Dowry>0	1,161	34.872	39.948	19.992	0.172	232.439
$\mathbb{1}$ [Hindu]	1,242	0.928	0.259	1.000	0.000	1.000
$\mathbb{1}$ [SC,ST,OBC]	1,242	0.552	0.498	1.000	0.000	1.000
$\mathbb{1}$ [Region North]	1,242	0.347	0.476	0.000	0.000	1.000
$\mathbb{1}$ [Region South]	1,242	0.275	0.447	0.000	0.000	1.000
$\mathbb{1}$ [Region East]	1,242	0.171	0.376	0.000	0.000	1.000
$\mathbb{1}$ [Region West]	1,242	0.207	0.405	0.000	0.000	1.000
$\mathbb{1}$ [Wife's Primary Education]	1,242	0.242	0.428	0.000	0.000	1.000
$\mathbb{1}$ [Husband's Primary Education]	1,242	0.478	0.500	0.000	0.000	1.000
Husband's Age	1,242	34.838	5.947	35.000	20.000	65.000
Wife's Age	1,242	29.811	5.139	30.000	18.000	55.000
Number of Children	1,242	2.574	1.023	2.000	1.000	5.000
Number of Female Children	1,242	1.188	0.994	1.000	0.000	5.000

Notes: Total expenditure is the sum of the annual expenditures on cereals, pulses, other food items, and non-durable expenditure. Dowry amounts are converted to 1999 Rupees using the Consumer Price Index from FRED. Raw Dowry amount includes 959 non-missing observations. When missing, dowry payments are imputed using the average dowry paid in the same state and marriage year. North India includes Utter Pradesh, Madhya Pradesh, Haryana, Punjab, and Bihar. East India includes Orissa, West Bengal, and Assam. South India includes Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu. West India includes Gujarat, Rajasthan, and Maharashtra. Male assignable good is dhotis and female assignable good is sarees. Children's assignable good is expenditure on children's clothing (excluding school uniforms). SC, ST, OBC stands for the family belonging to Schedules Tribes, Scheduled Castes, or Other Backward Castes.

Based on households' reports of their annual expenditure on dhotis, sarees, and children's clothing, we construct budget shares for these private assignable goods for men, women, and children. Total household expenditure is obtained as the sum of the household's spending on cereals, pulses, other food items such as meat, fish, fruits, vegetables, milk, spices, fuel, clothing, footwear, and other non-durable goods. Table 1 presents descriptive statistics for the variables included in the empirical analysis. The average annual expenditure on non-durable goods is 25,509 Rupees (about $2,755 in 2011 PPP), and food accounts for nearly 60 percent of the total household consumption. Assignable clothing budget shares are much smaller.[20] The median age of women in our sample is 30 years and that of men is 35 years. Educational attainment is low, with only one out of four women and one in two men having completed primary school. The median number of children a family has in our sample is two, 93 percent of the families are Hindu, and 56 percent belong to a scheduled tribe (ST), a scheduled caste (SC), or

families (Calvi, 2020), then our analysis would likely underestimate the extent of gender inequality in consumption within households.

[20]Recall from Section 3.2 that identification of resource shares hinges on variation in these budget shares with household-level expenditure and not on the absolute magnitude of the budget shares. The magnitude of these budget shares is in line with other works in the literature (Dunbar et al., 2013; Calvi, 2020). Tommasi and Wolf (2018) show that if the data exhibit relatively flat Engel curves in the consumption of the private assignable goods, then identification of the resource shares is weak. As we discuss in Section A.2 of the Appendix, households in our dataset display a considerable variation in the consumption of private assignable goods and the Engel curves are all negatively sloped. So, we do not have a weak identification problem with our data.

other backward castes (OBC).

The average dowry amount is 28,410 Rupees ($3,068 in 2011 PPP terms), which is about 1.1 times the average annual household expenditure. Note that dowry information is missing for 21 percent of our sample. To address this issue, we impute missing dowries using the average dowry paid for marriages that took place in the same year and the same state. After this imputation, the average dowry payment is approximately 32,598 Rupees ($3,520 in 2011 PPP). For our primary analysis, we use the larger sample to estimate the model. In Appendix A.3.2, we check the sensitivity of our analysis to different approaches to tackle the issue of missing dowries. Specifically, we estimate the model over a smaller sample that excludes missing observations and find that our results are quantitatively confirmed. Alternatively, we treat missing dowries as zero dowries or use LASSO regression to predict missing dowries based on a large set of observable socio-economic and demographic household traits. Our findings are robust to all different approaches.

We implement the model empirically by adding an error term to each equation in System (4), and by imposing similarity of preferences over private assignable goods ($\beta = \beta_m = \beta_w = \beta_c$) and that resource shares must sum to one ($\lambda_m + \lambda_w + C\lambda_c = 1$). We specify α_j, λ_j, and β as linear functions of observable household characteristics and the dowry amount (in logarithms, adjusted for inflation). Household traits include the duration of marriage, details about the composition of the household (including the number of children and the gender composition of children), socio-economic characteristics (such as caste and religion), and the woman's and man's age and education. It also contains region indicators (South, East, West, and North, with West being the excluded category), which may capture unobserved geographical heterogeneity and area-specific characteristics, such as price levels. Note that conditioning on these variables addresses concerns regarding preference parameters and resource allocation likely changing with households socio-economic traits.

We estimate the system of three Engel curves using a Non-Linear Seemingly Unrelated Regression model and an iterative FGNLS estimator.[21] This approach is equivalent to maximum likelihood with multivariate normal errors.

4.2 Estimation Results

Table 2 reports summary statistics of the estimated resource shares and Figure A10 in the Appendix plots their empirical distributions. In Columns 1 and 2 of Table 2, we report the resource shares and the corresponding standard error for the reference household (defined as a nuclear family in West India with observable household characteristics, X, and the dowry payment, D, equal to their median values). Columns 3 to 7 show some descriptive statistics of the estimated resource shares. These take into account the empirical distributions of the covariates and dowry payments. It is reassuring that the minima and maxima of the estimated resource shares do not fall outside the 0 to 1 range.

In reference households, the resource shares for women and children amount to approximately 52 percent of the man's resource share. Recall that the median number of children in a household is two

[21] As it is common in non-linear models, the sum-of-squared residuals function has multiple local minima. We performed a grid search over 100 starting values and selected the estimates corresponding to the maximum of the likelihood function. To improve the stability of our estimates, we set the intercepts of the resource shares functions to fixed values that minimize the sum-of-squared residuals.

Table 2: Estimated Resource Shares

	Reference Household		All Households				
	Estimate	St.Err.	Mean	Median	St.Dev.	Min.	Max.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Woman ($\hat{\lambda}_w$)	0.251	0.081	0.317	0.329	0.103	0.010	0.561
Man ($\hat{\lambda}_m$)	0.484	0.082	0.381	0.375	0.121	0.000	0.775
Children ($C\hat{\lambda}_c$)	0.264	0.074	0.301	0.296	0.103	0.041	0.598
Each Child ($\hat{\lambda}_c$)	0.132	0.037	0.125	0.116	0.041	0.041	0.385

Notes: Reference household consists of a nuclear family in West India, with other observable characteristics and the dowry amount fixed to their median value.

and the model assumes that children's resources are equally divided among all the children in a given family. So, in the reference household, each child is allocated 13.2 percent of the total budget. On average, men have a larger resource share than women and children, with women, men, and children being allocated 32.1, 38.1, and 30.1 percent of household consumption.

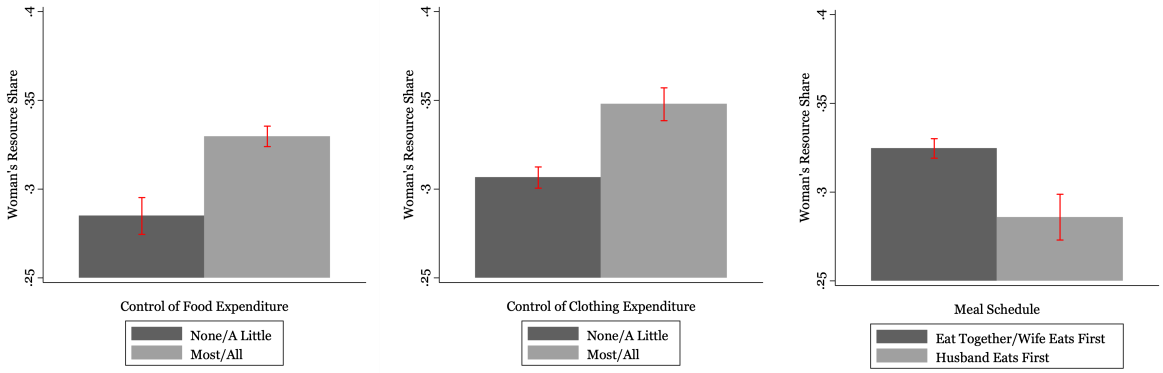
Table A4 in the Appendix shows the estimated coefficients of all the covariates for women's resource shares. Importantly for our analysis, the coefficient on the dowry paid by the woman is positive and statistically significant (with p-value equal to 0.048), indicating that a one log-point increase in the dowry paid at the time of marriage increases the share of household consumption allocated to the woman by 1.3 percentage points. Alternatively, a one standard deviation increase in log-dowry (approximately 15,000 Rupees) increases the woman's resource share by 3.6 percentage points.[22]

Our results are robust to alternative specifications to our baseline model. In Section A.3.1 of the Appendix, we estimate a model with two decision-makers. In this model, the man and the woman in the family are the decision-makers, while children are treated as public goods (as in Blundell et al. (2005)). In Section A.3.4, we allow for heterogeneous effects of dowry payments on intra-household allocation by marriage duration and distance from the wife's natal family. These alternative specifications deliver qualitatively and quantitatively similar results. In addition, we do not detect statistically significant differences in how dowries influence women's resource shares in younger vs. older marriages or by proximity to a woman's natal family.

Comparison with Self-reported Resource Control. In Section 2, we focused on women's self-reported control of food and clothing expenditures and the family's meal schedule, and provided some preliminary evidence of the role of dowries in shaping intra-household allocations after marriage. Before proceeding with our analysis, we compare our estimated resource shares to these measures. While such measures are somewhat limited, we expect to find them positively correlated with the estimated resource shares. Indeed, we find that women who have a higher estimated resource share also report having a significantly higher control of household clothing and food spending (see Panels A and B of Figure 3) and a higher probability of eating meals first or together with the rest of the family instead of in a second sitting (Panel C). On average, $\hat{\lambda}_w$ is 3.2 percentage points lower for women who

[22]Analogous tables for children's resource shares are available upon request (men's resource shares are substituted in the system by the constraint that resource shares must sum to one). The coefficient on log-dowry is statistically insignificant for children's resource shares, suggesting that an increase in dowries should decrease man's resource shares.

Figure 3: Estimated Resource Shares and Self-reported Resource Control



(A) Woman's Control Food Expenditure

(B) Woman's Control Clothing Expenditure

(C) Meal Schedule

Note: The graphs shows average resource shares for women by self-reported measures of control together with 90 percent confidence intervals. 24.2 percent of women in the sample report having "None" or "A Little" control over food resources, 69.3 percent report having "None" or "A Little" control over clothing resources, and 15 percent report their husbands' eating meals first. Table A5 in the Appendix contains the results of two-sided t-tests for differences in means.

report having little or no control over food expenditure relative to women who report having most or all control over it; this gap equals 3.9 percentage points when considering control over clothing expenditure. Similar findings emerge when assessing the difference in our estimated resource shares by the household's meal schedule. In this case, the share of household consumption allocated to the woman is 2.6 percentage points lower in families where husbands eat before their wives. As shown in Table A5 in the Appendix (which reports the results of two-sided t-tests for differences in means), these differences are statistically significant.

Dealing with Endogeneity of Dowry Amounts. As we discussed earlier, quantifying causal links may be challenging in this context. To start, there may be unobserved confounding factors influencing both dowry payments and the post-marital allocation of resources. Endogeneity issues may also arise from measurement error in dowry amounts, due, e.g., to recall and rounding errors.

In Appendix A.4, we deal with these potential sources of endogeneity using an instrumental variable approach. To be valid, an instrument must correlate with dowries but not directly impact the household's consumption allocation decisions. Ignoring endogeneity may lead to biased estimates of the relationship between dowries and resource shares. However, the direction of such bias is *a priori* ambiguous. For example, a higher competition in the marriage market may drive dowries up and women's post-marital bargaining power down, biasing our estimates of the link between dowries and women's resource shares towards zero. Moreover, gender norms are often stricter among upper, wealthier castes (Jayachandran, 2015), which again may introduce downward bias in our estimates. Finally, the husband or his family may possess some unobserved desirable traits that are positively correlated with women's post-marital status and can attract higher dowries in the marriage market. The existence of such traits may lead us to overestimate the effect of dowries on women's resource shares.

We provide estimates based on two instruments. First, we construct leave-one-out averages of dowry payments by state and year of marriage, which measure the prevalence and norms regarding

dowry payments at the time of marriage. Second, we follow Bhalotra et al. (2020) and exploit gold prices in the year of marriage as an additional source of variation. As gold, typically in the form of jewelry, is an integral part of dowries in India, changes in gold prices may lead to an increase in the cost of dowry. The instrumental variable approach delivers resource share estimates that are largely consistent (both qualitatively and quantitatively) with those presented in Table 2. On average, we find that women are allocated 30.7 percent of the household's consumption expenditure, while men and children receive 38.5 and 30.8 percent, respectively. The estimated effect of log-dowry on women's resource shares remains positive and statistically different from zero (with a p-value equal to 0.074 based on 200 bootstrap repetitions), with a one standard deviation increase in log-dowry increasing the woman's resource share by 4.5 percentage points.

5 Dowries, Intra-household Allocation, and Poverty

In Section 2, we documented the positive association between dowries and women's control over household food and clothing expenditures. In this section, we show that the higher is the dowry amount women paid upon marriage, the higher is their share of total household consumption, and the lower is their likelihood of living in poverty after marriage. Below, we present results based on our baseline resource shares estimates; we discuss the instrumental variable estimates in Appendix A.4.

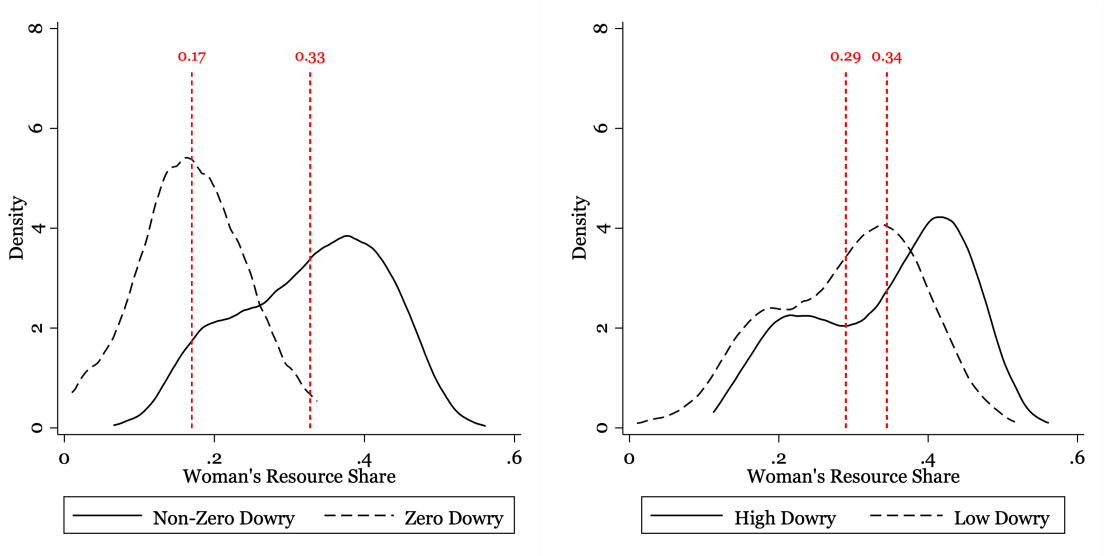
5.1 Dowries and Intra-household Allocation

We noted earlier that the estimated coefficient on log-dowry in Table A4 is positive and statistically different from zero, indicating that the dowry paid by a woman at the time of the marriage is positively associated with her intra-household resource share after marriage. Now we explore this relationship further.

Panel A of Figure 4 compares the empirical distributions of women's resource shares in households where women paid a dowry upon marriage and in households where women paid no dowry (which account for 6.5 percent of our estimation sample). On average, women who paid a positive amount control 32.8 percent of the household resources, whereas women who did not pay a dowry command 17.0 percent. Based on a two-sided t-test (which we report in Table A6 in the Appendix), this gap is statistically significant at the 1 percent level. Based on a two-sample Kolmogorov-Smirnov test, we also reject the hypothesis that the distributions in the two groups are equal (Table A7).

Since it is quite rare for women not to pay a dowry upon marriage, we also compare the estimated resource shares for women who paid an above-median dowry and women who paid a below-median dowry (Panel B of Figure 4). While smaller, the difference between the two groups is still sizable: women in the top half of the distribution of dowry payments are allocated 34.5 percent of the total household consumption on average, while women in the bottom half receive 29.0 percent. Table A6 and A7 in the Appendix present the results from a two-sided t-test and a Kolmogorov-Smirnov test, both of which highlight the differences between the two groups. These differences remain statistically different from zero, even when we exclude women who did not pay a dowry from the sample.

Figure 4: Distribution of Estimated Women's Resource Shares by Dowry Amount



(A) Zero vs. Non-Zero Dowry (B) Below vs. Above Median Dowry

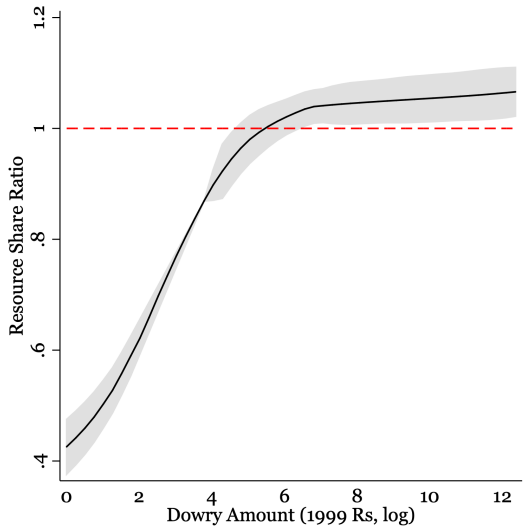
Note: Median dowry amount is 17,475 Rupees ($1,887 in 2001 PPP). Women did not pay a dowry upon marriage in 81 out of the 1,242 families in the estimation sample.

Define the *resource share ratio* as the woman's resource share relative to the man's (i.e., λ_w/λ_m): a resource share ratio equal to one indicates no gender inequality in intra-household resource allocation, while values less than one indicate that the woman is allocated a smaller fraction of household consumption relative to the man. Note that this measure is independent of the amount of resources allocated to children: the ratio will take the same value in households where men and women both receive 30 percent of total resources and where they both receive 20 percent.

In Figure 5, we plot the results of a local polynomial regression of $\hat{\lambda}_w/\hat{\lambda}_m$ on the log-dowry amount. The plot shows that women's resource shares relative to men's are increasing in the dowry amount. So, as the dowry payment increases, gender inequality in the intra-allocation of consumption expenditure decreases. This pattern is driven by changes in intra-household allocation both at the extensive and intensive margin of the distribution of dowry amounts. While the initial steep increase in women's access to household consumption is driven by the sharp decline in men's resource shares as we move from zero to non-zero dowry payments, we also detect a positive and statistically significant association when focusing on 1,161 nuclear families with non-zero dowry amounts (see Figure A11 in the Appendix). As shown in Appendix A.4, the positive and significant association between dowry amounts and women's access to consumption expenditure in their marital families is confirmed by the instrumental variable estimates.

Taken together, these results indicate that the payment of a dowry upon marriage (or lack thereof) may have substantial consequences for women's ability to access household resources relative to their husbands. Moreover, the higher is the dowry amount women paid, the higher is the share of household consumption expenditure they command relative to their husbands.

Figure 5: Estimated Resource Share Ratio by Dowry Amount



Note: The graph plots the results of a local polynomial regression of $\hat{\lambda}_w/\hat{\lambda}_m$ (estimated ratio of woman's resource share to man's resource share) on log-dowry. The sample consists of 1,242 nuclear families.

5.2 Dowries and Individual Poverty

So far, we have documented a robust association between dowry payments and gender inequality in intra-household consumption allocation. However, if household consumption were high enough, intra-household inequality would not necessarily have a severe impact on individuals' well-being. The 1999 REDS does not collect information on health status, anthropometric indicators, or the occurrence of diseases or deaths in the family, limiting our ability to study the link between dowries and commonly-used measures of a woman's well-being directly. Still, individuals living in poverty face a significantly higher risk of death and disease (WHO, 1999, 2015). So, we explore the link between dowries and women's post-marital well-being indirectly and study how gender inequality within the household affects women's risk of poverty.

Based on our model estimates of individual-level consumption, we compute poverty rates separately for women, men, and children. These poverty rates are different from the standard poverty measures, which assume an equal division of resources within the household. Individual-level consumption is calculated as the product between the estimated resource share and the total household consumption expenditure. The poverty rate is then computed by comparing individual-level consumption to poverty lines. In what follows, we use the threshold set by the World Bank for extreme poverty (1.90 US$/day). As in Dunbar et al. (2013) and Calvi (2020), we set the poverty line for children to 60 percent of adults' to account for the fact that children may have lower needs.

As shown in Column 4 of Table 3, we estimate that 45.2 percent of women and 30.2 percent of men in our sample have a level of estimated individual consumption below the extreme poverty line. So, the probability of a woman living in poverty is approximately 50 percent higher than a man living in poverty. In line with Dunbar et al. (2013), the poverty rate for children is much higher. Recall that each child's resource share is the total children's resource share divided by the number of children,

Table 3: Individual-level Consumption and Poverty Rates

	Consumption (Rupees)			Poverty Rate		
	Mean	St.Dev.	Median	All Hhs.	Poor Hhs.	Non-Poor Hhs.
	(1)	(2)	(3)	(4)	(5)	(6)
Women	8,062.325	4,847.480	6,931.638	0.452	0.614	0.102
Men	9,543.606	4,856.860	8,611.307	0.302	0.423	0.041
Children	3,196.036	1,935.561	2,719.297	0.755	0.956	0.321
Per-Capita	5,781.559	2,835.812	5,138.300	0.684	1.000	0.000

Note: Sample includes 1,242 Nuclear families. Poverty rates are calculated using the World Bank's $1.90/day poverty line for adults and 0.6*$1.90/day for children.

which may partly explain the extremely high poverty rates for children.

Standard poverty calculations classify a household (and hence all household members) as poor if its per-capita household expenditure falls below the 1.90 US$/day threshold. According to this definition, around 68 percent of households in our sample are classified as poor. Columns 5 and 6 of Table 3 show the breakdown of individual-level poverty by household-level poverty. On average, women's and men's poverty rates in non-poor families equal to 10.2 percent and 4.1 percent, respectively. So, women with per-capita household expenditure above the poverty line face a more than twice as large likelihood to live in poverty relative to men. Turning to individuals living in poor families, their likelihood to be allocated a level of consumption expenditure below the poverty line equals 61.4 percent for women and 42.6 percent for men. So, while most women in poor families are poor, most men are not.[23] As shown in Panel A of Figure 6, the higher is the household expenditure, the lower are the individual-level poverty rates for both men and women. This is not surprising. However, at any given level of household expenditure, we find that women are significantly more likely to live in poverty than men.

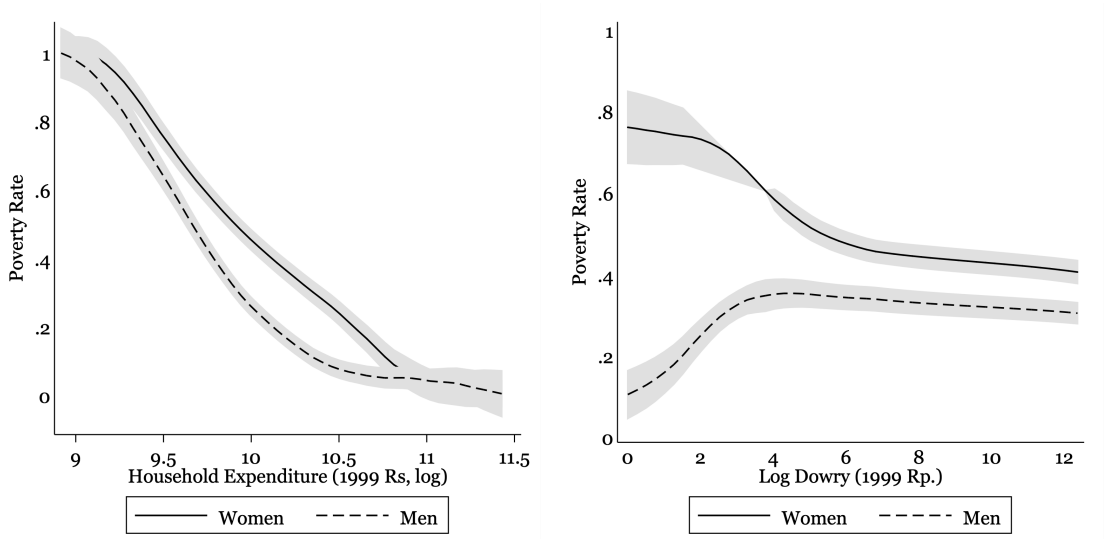
Next, we analyze how women's relative poverty rates vary with the dowry they paid upon marriage. Note that dowry payments may increase consumption by increasing the resources available to the marital family; they may also increase women's consumption by increasing the portion of household resources they receive. Panel B of Figure 6 graphs individual-level poverty rates for men and women by dowry amounts. Two observations stand out. First, at all dowry amounts, there is a positive and significant *gender poverty gap* (i.e., the difference between poverty rates for women and men) . Second, as dowry payments increase, the gap narrows considerably. For families where women did not pay a dowry upon marriage, the gender poverty gap equals 67.9 percentage points. The gap is smaller but still positive (11.3 percentage points) for those who paid a non-zero dowry. The gender poverty gap equals 6.8 percentage points for families with above-median dowries, 23.2 percentage points for families with below-median dowries, and 16.5 percentage points for families with below-median but positive dowries.

Since dowry payments and household expenditure are positively correlated,[24] we also plot women's

[23] In Table A8 in the Appendix, we calculate household level, as well as individual-level poverty rates using the 2012 Indian Planning Commission rural poverty threshold of 27 Rupees/day (13 Rupees/day in 1999 Rupees). While the poverty rates are lower in absolute terms, our results on relative poverty are qualitatively confirmed.

[24] The pairwise correlation between log-dowry and log-expenditure is statistically significant at the 1 percent level, and equal to 0.09 when both zero and non-zero dowries are considered and to 0.29 when only non-zero dowries are included.

Figure 6: Gender Poverty Gap by Household Expenditure and Dowry Amount

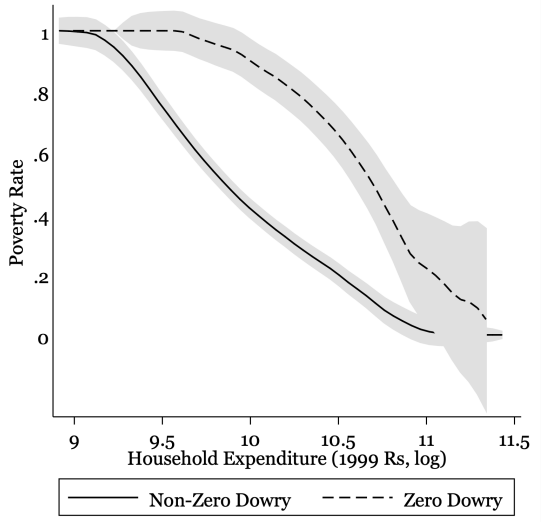


Note: The graph in Panel A plots the results of a local polynomial regression of indicator variables for poor women and men household on log-expenditure.Panel B plots the results of a local polynomial regression of indicator variables for poor women and men household on log-dowry.

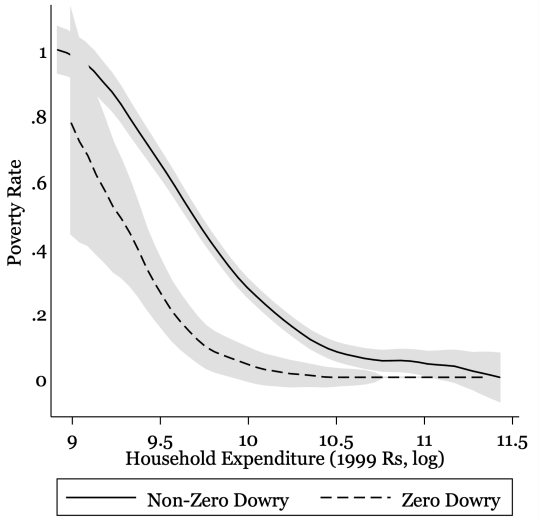
poverty and men's poverty rates by total household expenditure and dowry amounts. Panel A and B of Figure 7 graph individual-level poverty rates for men and women by total household expenditure and dowry amount. The solid lines focus on families with positive dowries, while the dashed lines refer to those with no dowry. As before, we see women's and men's poverty rates falling with total expenditure. However, at any given level of household consumption expenditure, women's poverty rates are higher (and men's poverty rates are lower) when no dowry was paid at the time of marriage. A similar conclusion can be reached when we compare the poverty rate for women who paid an above-median dowry to women who paid a below-median dowry at different total expenditure levels (see Figure A12 in the Appendix). For both groups, the poverty rate decreases with total expenditure. Still, at every expenditure level, women who paid an above-median dowry face a lower probability of living in poverty than women who paid a below-median dowry.

Finally, we compare individual-level poverty rates for men and women by household-level poverty and dowry amount. Panel C of Figure 7 plots the shares of men and women with estimated individual consumption below the poverty line in households with per-capita consumption below or above the poverty line. These shares are calculated separately for families with zero and non-zero dowry amounts. In both poor and non-poor families, women are more likely to live in poverty than men. In both poor and non-poor families, women who paid a positive dowry are less likely to live in poverty than women who paid no dowry. Moreover, the gender poverty gap is substantially larger among households with no dowry payment made upon marriage. On average, the gender poverty gap equals 3.8 percentage points among non-poor households with positive dowries and 35.7 among non-poor families with zero dowries. In poor households, almost the totality of women are individually poor if they did not pay a dowry upon marriage, while their husbands face a much lower poverty risk. As shown in Panel C of Figure A12 in the Appendix, a statistically significant gender poverty gap persists when comparing

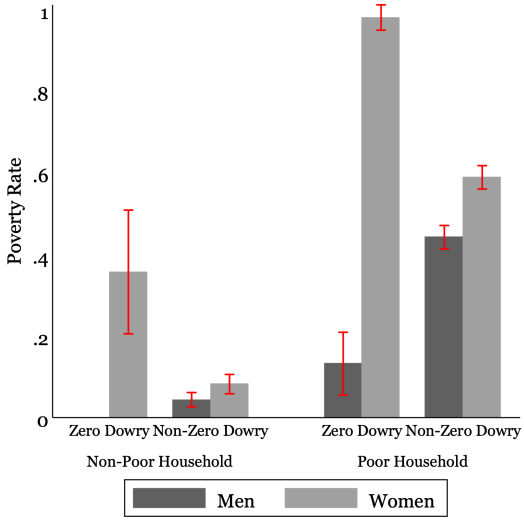
Figure 7: Individual Poverty Rates for Women and Men by Household Expenditure and Dowry Amount



(A) Women Poverty by Hh. Expenditure and Dowry Amount



(B) Men Poverty by Hh. Expenditure and Dowry Amount



(C) Women and Men Poverty by Household Poverty and Dowry Amount

Note: Poverty rate is calculated using the World Bank $ 1.90/day poverty line.

families with below-median and above-median dowries. This holds true both in poor and non-poor families.

6 Counterfactual Experiments

We now present the results of two counterfactual experiments. In a first experiment, we exogenously vary dowry payments in the sample and study the impact on intra-household resource allocation and individual-level poverty. In a second experiment, we simulate the effect of retroactively enforcing the pecuniary fines imposed by the Dowry Prohibition Act. Recall from Section 2 that the 1961 Act mandated that any individual caught engaging in the practice of dowry could receive a prison sentence of up to six months or a fine of up to 5,000 Rupees ($540 in 2011 PPP). The 1986 amendment to the Dowry Prohibition Act increased the prison sentence to one year and the pecuniary fine to 15,000 Rupees ($1,620 in 2011 PPP) .

Before discussing our findings, there are a few caveats to our counterfactual analysis that deserve mention. First, since our theoretical framework in Section 3.1 abstracts from the impact of dowry payments on marital matching and sorting, we take the match as given. So, we can simulate how the post-marital allocation of consumption within families and the gender poverty gap changes following a change in dowry, but only conditional on the realized matches. Second, since we do not model how changes in the (expected) dowry amounts impact pre-marital decisions, such as parental investments in the human capital of future brides and grooms, we are unable to quantify how other factors influencing intra-household allocations would respond to such changes. Third, in our second experiment, we ignore any non-pecuniary aspects of the Indian anti-dowry law (e.g., incarceration) and take the probability of being convicted as well as the dowry amounts as exogenously given. Moreover, we abstract from how any pecuniary fine may impact the household's demand for goods, which we take as given. Admittedly, these are quite strong assumptions which we make to keep our analysis tractable. While we wish to interpret the results of our counterfactual experiments with caution, we believe they help improve our understanding of the relationship between traditional marital transfers and women's post-marital well-being, and lay forward a path for future research.

Exogenous Changes in Dowry Amounts. As a first set of counterfactual experiments, we vary dowry payments and analyze the impact of such changes on intra-household resource allocation and individual-level poverty relative to our baseline results (see Table 2).[25] Columns 2 to 6 of Table 4 show the counterfactual resource shares and individual-level poverty rates for women, men, and children when the dowry amount is exogenously set for all households or reduced by a certain amount. So, e.g., Column 2 reports the estimated resource shares and poverty rates in the counterfactual scenario of all women in our sample paying no dowry upon marriage; in Column 3, we report the estimated resource shares and poverty rates in the scenario of all women paying a dowry equal to the median

[25] In what follows, we keep household expenditure fixed, therefore isolating the impact of a reduction in dowries on individual poverty that comes from changes in relative consumption (i.e., intra-household allocation) rather than absolute household consumption. Moreover, we focus on individual consumption and poverty in marital families as opposed to natal families. Changes in dowry payments may impact savings and spending decisions of the bride's and groom's family (Anukriti et al., 2019). Since we do not observe pre-marital consumption, however, we are not able to quantify the impact of these changes on individual poverty in the natal families and hence we cannot quantify how these changes may impact poverty in the population overall.

Table 4: Counterfactual Experiments

	Zero Dowry	Median Dowry	Maximum Dowry	Dowry Tax 25%	Lump-Sum Dowry Tax		Ex-post Fine	
					5,000 Rs.	15,000 Rs.	5,000 Rs.	15,000 Rs.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A) Resource Shares:								
Women	0.196	0.326	0.360	0.314	0.297	0.267	0.316	0.287
Men	0.490	0.374	0.343	0.385	0.399	0.426	0.397	0.437
Children	0.314	0.300	0.297	0.302	0.303	0.307	0.287	0.276
B) Poverty Rates:								
Women	0.733	0.428	0.337	0.460	0.486	0.570	0.585	0.843
Men	0.131	0.312	0.370	0.299	0.271	0.219	0.434	0.717
Children	0.729	0.757	0.765	0.755	0.750	0.745	0.829	0.900

Note: Sample includes 1,242 Nuclear families. Poverty rates are calculated using the World Bank's $1.90/day poverty line for adults and 0.6*$1.90/day for children.

dowry (17,884 Rupees) in our sample. As expected, a woman's resource share increases (and her spouse's share decreases) as we increase the dowry she paid upon marriage. By contrast, the share of household consumption allocated to children is relatively stable. When the dowry amount is set to zero for all households in the sample, women are allocated only 40 percent of men's resources, on average; when all dowries are set to the maximum value of the dowry distribution (232,438 Rupees), women receive five percent more resources than men. The changes in intra-household allocation are reflected in the counterfactual poverty rates reported in Panel B. In the counterfactual scenario of all women not paying a dowry upon marriage, 73.3 percent of women and 13.1 percent of men live below the poverty threshold of $1.90/day. If all women paid a dowry equal to the median amount, then the poverty rates for women and men would equal 42.8 and 31.2 percent, respectively.

In Column 4, we set dowry payments for each household to the 75 percent of the actual recorded dowry, which simulates the effect of a 25 percent tax on dowries. In Columns 5 and 6, we set all dowry payments to 5,000 or 15,000 Rupees less than the actual recorded dowry payment.[26] These experiments are analogous to imposing a lump-sum tax on all dowry payments. Contrary to our previous experiments, where all dowries in the sample are set to the same amount, here all dowries are reduced by the same percentage or by the same amount. Since the proportional and the lump-sum taxes do not impact the household expenditure after marriage, one can interpret them as borne by the bride's or groom's natal family with no pass-through to the marital family.

When comparing the counterfactual resource shares with our baseline estimates in Table 2, three observations stand out. First, the gender gap in intra-household allocation and poverty rates increase following a reduction in dowries. This is true following both the lump-sum and the proportional reductions. Second, even though the average dowry is higher after a 5,000 Rupees lump-sum reduction than after the proportional reduction,[27] the changes in resource shares and poverty rates induced by the former are larger. This finding is consistent with the regressive nature of lump-sum taxes and the concave relationship between dowries and intra-household gender inequality we presented in Figure 5.

[26] Pre-tax dowry amounts below 5,000 or 15,000 Rupees are recoded as zeros.

[27] The average dowry payment is 28,340 Rupees after the 25 percent proportional tax, 24,448 Rupees after the 5,000 lump-sum tax, and 21,852 after the 15,000 reduction.

Enforcement of Pecuniary Fines. In our second experiment, we study the impact of enforcing the pecuniary fines imposed by the Dowry Prohibition Act and its 1986 amendment. Earlier, we simulated the effect of lump-sum taxes borne by the natal families. We now simulate the effect of retroactive equivalent fines borne by the marital family. Given that we only observe household consumption expenditure in 1999 and do not have any information about past or future consumption, we assume the fine to be charged in 1999. So, for those families who engaged in a positive dowry payment, these fines would decrease the total household expenditure in 1999 by 5,000 or 15,000 Rupees. In what follows, we assume the anti-dowry law to be perfectly enforced (that is, the probability of being charged the fine is equal to one if a dowry was paid upon marriage). Like many crimes against women in India, however, violations of the Dowry Prohibition Act are likely underreported (Sekhri and Storeygard, 2014). So, in Appendix A.5, we simulate the effect of imposing the pecuniary fine under the assumption that the law is imperfectly enforced.[28]

To obtain the counterfactual resource shares, we re-estimate our model after reducing the total household expenditure by 5,000 or 15,000 Rupees for those families with non-zero dowries and after adjusting the assignable clothing budget shares accordingly.[29] Columns 7 and 8 of Table 4 report the results of this analysis. While retroactively imposing a 5,000 Rupees fine has virtually no effect on the way resources are allocated between men, women, and children, it increases poverty rates substantially. The lower household expenditure levels yield poverty rates that are approximately 29.4 percent (13.3 percentage points) larger for women, 43.7 percent (13.2 percentage points) larger for men, and 9.8 percent (7.4 percentage points) larger for children. Imposing a 15,000 Rupees fine yields poverty rates are much larger, especially for women. This is the result of both the decrease in total household expenditure after the pecuniary fines are charged and the exacerbation of intra-household gender inequality.

In summary, the counterfactual experiments disussed in this section indicate that a reduction in dowry payments may alter how household consumption expenditure is allocated between spouses after marriage, with possibly significant consequences for women's poverty risk relative to men. These are critical aspects to consider when promoting policies to reduce or eliminate dowry payments. While previous work has stressed the positive impact of anti-dowry laws on son-preference and sex-ratios (Alfano, 2017; Bhalotra et al., 2020), we identify some unintended consequences of such laws. This analysis complements the results in Calvi and Keskar (2020), who document an increase in domestic violence against women and a reduction in women's decision-making power following the tightening of the Dowry Prohibition Act in the mid-80s. Our counterfactual experiments also show that anti-dowry laws may have substantially different consequences on the post-marital well-being of men and women depending on who is held responsible for breaking the law (e.g., the natal families vs. the marital family). Notwithstanding the caveats mentioned before, our analysis sheds light on these issues and may guide the design of auxiliary policies to curtail the negative effects of anti-dowry laws.

[28] Imperfect enforcement can also be interpreted as households being charged only a fraction of the pecuniary fine or facing a fixed probability of being charged the fine in year 1999.

[29] To avoid negative or unrealistically low expenditure, we bottom-code all post-fine total household expenditures and set them equal to the minimum of the pre-fine household expenditure distribution.

7 Conclusion

Despite being illegal, dowries are a typical feature of Indian marriages. Moreover, Indian women often face severe intra-household inequality within their marital homes and higher poverty rates relative to men (Calvi, 2020). This paper brings together these two facts and studies the relationship between dowry payments, women's access to household resources, and their post-marital likelihood to live in poverty.

Using detailed data on marital transfers and household consumption in rural India and a collective household model, we show that the share of household resources allocated to a woman is positively associated with the dowry she paid upon marriage. Based on the model estimates, we compute individual-level poverty rates adjusted for intra-household inequality and study how women's poverty relative to men's varies with dowry payments. We find that women who paid higher dowries are less likely to be poor relative to women who did not, even when their households' consumption expenditure is the same. In both poor and non-poor families (that is, with per-capita expenditure below or above the poverty line), women who paid a dowry are less likely to live in poverty than women who did not. Moreover, the gender poverty gap is substantially larger among households with no or low dowry payment made upon marriage.

Results from counterfactual simulations indicate that policies aimed at reducing or eliminating the traditional custom of dowry, though well-intentioned, may have the unintended negative consequences of lowering women's post-marital consumption and increasing their poverty risk. Still, previous work has documented the positive impact of anti-dowry policies on son-preference and sex-ratios (Alfano, 2017; Bhalotra et al., 2020). Understanding the interlinkages between dowry payments and a woman's well-being at different stages of her life is critical to devise policies to successfully improve women's status in India. While our analysis is primarily descriptive, it makes progress in this direction and complements existing and future works studying the causal effects of marital transfers on post-marital outcomes. Future research should also focus on investigating the motives and mechanisms underlying such effects.

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A Appendix

Contents

A.1 Theoretical Model: Details

In this section, we summarize the derivation of the Engel curves for private assignable good based on Browning et al. (2013) and Dunbar et al. (2013), making their dependence on dowry payments D explicit. We here consider a general model with multiple decision makers.

Consider a household with N individuals indexed by $n = 1, .., N$ (as discussed in Sections 3 and 4, in our framework $n = m, w, c$). Let Y denote the household's total expenditure. Each household is characterized by a vector $(\mathbf{X}, D)$, where, $\mathbf{X}$ is a vector of observables characteristics and D is the dowry paid by the wife to her husband at the time of the wedding.

Each household consumes a vector of K types of goods. Out of the K goods, let $k = 1, ..., N$ be the private assignable goods, which are consumed by individual n exclusively (so they are *private*). We observe which individual within the household is consuming the good (so they are *assignable*). Let $\mathbf{S}$ be the vector $K - N$ goods that are not private or assignable. So, $\mathbf{S} = \sum_{n=1}^{N} \mathbf{S_n}$, where $\mathbf{S_n}$ is the unobserved vector of non-assignable goods consumed by individual n. The vector of goods purchased by a household is $(A(\mathbf{X}, D)\mathbf{S}, \sum_{n=1}^{N} Q_n)$, where $A(\mathbf{X}, D)\mathbf{S}$ is the vector of non-assignable and possibly shared goods purchased by the household and, $\sum_{n=1}^{N} Q_n$ is the sum of the private assignable good purchased by the household. The matrix of Barten scales $A(\mathbf{X}, D)$ captures the extent to which goods are shared within the household.[30] Let $P_1, P_2, ..., P_N$ be the prices of the N private assignable goods. As these goods are not shared within the household, their shadow prices equal market prices. $\mathbf{P_S}' A(\mathbf{X}, D)$ is the vector of shadow prices for non-assignable and possibly shared goods. For private goods, shadow prices equal market prices; for goods that are jointly consumed within the household, shadow prices are lower than market prices.

Each household member's utility function is monotonically increasing, twice differentiable and

[30] As in Dunbar et al. (2013), we allow for economies of scale in consumption by assuming each household has access to a Barten type consumption technology (Barten, 1964), which converts goods purchased by the household into individual-level consumption goods and allows the sum of privately consumed goods to be greater than or equal to what the household purchases. The Barten technology is represented by a matrix $A(\mathbf{X}, D)$. Smaller is an element of $A(\mathbf{X}, D)$, larger is the sharing of that particular good within the household.

strictly quasi-concave over a bundle of goods K. Let $U_n(\mathbf{S_n}, Q_n)$ be the sub-utility function of individual n over her consumption. Each individual's total utility can depend on other household member's utility. We assume the utility functions to be weakly separable in their arguments, i.e., $\widetilde{U}_n = \widetilde{U}_n[U_n(\mathbf{S_n}, Q_n, \mathbf{X}, D), U_{-n}(\mathbf{S_{-n}}, Q_{-n}, \mathbf{X}, D)]$.

The household solves the following optimization problem is:

$$\begin{aligned} \max_{Q_1,Q_2,\ldots,Q_N,\mathbf{S_1},\mathbf{S_2},\ldots,\mathbf{S_N}} \quad & \sum_{n=1}^{N} \widetilde{V}[\widetilde{U}_1, \widetilde{U}_2, \ldots \widetilde{U}_n | \mathbf{X}, D, \mathbf{P}/Y] \\ \text{s.t.} \quad & \mathbf{S} = \sum_{n=1}^{N} \mathbf{S_n} \\ & Y = \mathbf{P_S}' A(\mathbf{X}, D)\mathbf{S} + \sum_{n=1}^{N} P_n Q_n \end{aligned} \tag{A1}$$

where, $\widetilde{V}$ is the household decision-making process. Under the assumption of Pareto efficiency, $\widetilde{V}$ can be written as a weighted average of individual utilities, with weights capturing the bargaining power of each member. Note that household traits and dowries $(\mathbf{X}, D)$ can impact preferences, the extent to which goods are shared within the household, and the decision-making process.

Following Browning et al. (2013), we can write the dual of the household optimization problem in (A1) as one in which each individual solves the following problem:

$$\begin{aligned} \max_{Q_n,\mathbf{S_n}} \quad & \widetilde{U}_n[U_n(\mathbf{S_n}, Q_n, \mathbf{X}, D), U_{-n}(\mathbf{S_{-n}}, Q_{-n}, \mathbf{X}, D)] \\ \text{s.t.} \quad & \lambda_n(\mathbf{P}, Y, \mathbf{X}, D)Y = \mathbf{P_S}' A(\mathbf{X}, D)\mathbf{S_n} + P_n Q_n, \end{aligned} \tag{A2}$$

where, $\lambda_n(\mathbf{P}, Y, \mathbf{X}, D)$ is the resource share and represents the fraction of household resources allocated to individual n. Browning et al. (2013) show that there exists a monotonic correspondence between intra-household bargaining power and resource share. Therefore, the larger an individual's bargaining power, the larger is their resource share. Resource shares lie between zero and one, and the sum of the resource shares of all individuals within the household sums to one.

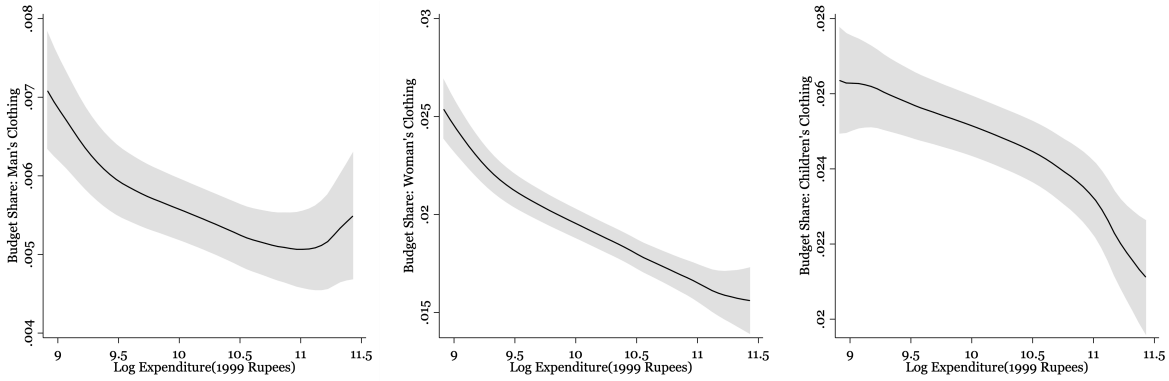
Under Pareto efficiency, the household's optimization problem can be decomposed into two steps: the optimal allocation of resources across household members and the individuals' maximization of their utility function conditional on their resource share, $\lambda_n(\mathbf{P}, Y, \mathbf{X}, D)$. So, each household member optinally chooses a consumption bundle that maximizes her utility function $\widetilde{U}_n(.)$ subject to her shadow budget.

Let $h_n(\lambda_n(\mathbf{P}, Y, \mathbf{X}, D)Y, \mathbf{P}, \mathbf{X}, D)$ be the optimally chosen demand for the assignable good n by individual n in the decentralized program. Since Q_n is a private assignable good, the quantity of the good demanded by an individual n is equal to the quantity of the good demanded by the household as a whole:

$$Q_n = h_n(\lambda_n(\mathbf{P}, Y, \mathbf{X}, D)Y, \mathbf{P}, \mathbf{X}, D). \tag{A3}$$

Let $W_n = P_n Q_n / Y$, be the household budget allocated to individual n's private assignable good. Dunbar et al. (2013) demonstrate that identification of resource shares can be achieved from Engel curve data, which means that prices are fixed. A fundamental requirement for identification is that

Figure A1: Assignable Clothing Engel Curves: Non-Parametric Regressions



(A) Man's Clothing (W_m) (B) Woman (W_w) (C) Children (W_c)

resource shares are independent of expenditure at low levels of Y, at least a low levels of expenditure. With Piglog (price independent generalized logarithmic) preferences, the Engel curves are linear in the logarithm of household expenditure, resource shares do not depend on Y and equation (A3) is can be written in Engel curve form as follows:

$$W_n = \lambda_n(\mathbf{X}, D)[\alpha_n(\mathbf{X}, D) + \beta_n(\mathbf{X}, D)\ln(\lambda_n(\mathbf{X}, D)) + \beta_n(\mathbf{X}, D)\lambda_n(\mathbf{X}, D)\ln(Y)]. \tag{A4}$$

A.2 Validity of the Assignable Goods

Recall from Section 3.1 that, in order to identify and estimate the resource shares, we apply the SAP (Similar Across People) restriction of Dunbar et al. (2013). This restriction requires that $\beta_m = \beta_w = \beta_c = \beta$. So, a necessary condition for this assumption to be satisfied is that assignable clothing items have Engel curves that are either all positively sloped or negatively sloped. In other words, if assignable clothing is a necessity for some but a luxury for others, then the SAP restriction would be immediately violated. Moreover, since resource shares are identified from the ratio of the slope of such Engel curves, identification fails when the Engel curves of the assignable goods are flat (as clearly discussed in Tommasi and Wolf (2018)). In this section, we confirm that the assignable clothing items we use for estimation satisfy these two requirements.

We start by plotting the results of local polynomial regressions of assignable clothing budget shares on log-expenditure in Figure A1. All Engel curves are downward sloping, with non-trivial slopes, which is reassuring. Next, we regress the clothing budget shares on log-expenditure for men, women, and children, conditional on a battery of household socio-economic and demographic characteristics, and verify that the slope coefficients are all negative and statistically different from zero, on average. While encouraging, this analysis may mask some important heterogeneity across households (Lechene et al., 2020). Since our empirical model allows for heterogeneity in preferences and resources shares (which essentially means that we estimate different Engel curves for different household types and observable characteristics), we also estimate the following fully-interacted linear regression model:

$$W_h^{k_j} = \alpha_0 + (X_h, D_h)'\alpha + (X_h, D_h)'\beta \ln y_h + \epsilon_h. \tag{A5}$$

Table A1: Assignable Clothing Engel Curves: Parametric Regressions

	Linear Regression		Fully Interacted Model			
			Slope		| t-stat |	
	Slope	| t-stat |	Mean	Median	Mean	Median
	(1)	(2)	(3)	(4)	(5)	(6)
Women's Clothing	-0.001	2.187	-0.002	-0.003	2.223	2.152
Men's Clothing	-0.007	7.985	-0.007	-0.007	3.216	2.442
Children's Clothing	-0.006	6.900	-0.007	-0.008	2.627	2.668

This approach allows us to compute slope coefficients for all household types and test that they are significantly different from zero. The full set of results are presented in Table A1, which reports the estimates of simple household-level linear regression models as well as descriptive statistics of the empirical distributions of t-statistics (in absolute values) of the slope coefficients in Equation (A5). Taken together, these results provide evidence supporting the validity of clothing items as assignable goods in our context.

A.3 Robustness Checks

A.3.1 Model with Two Decision-Makers

As a robustness check, we consider an alternative version of our model, featuring only two decision-makers. In this model, the man and the woman are the only decision-makers in the household, and children are treated as public goods (Blundell et al., 2005). The system of Engel curves gets modified to:

$$\begin{aligned} W_w = &\quad \alpha_w \lambda_w + \beta_w \lambda_f \ln \lambda_w + \beta_w \lambda_w \ln Y \\ W_m = &\quad \alpha_m \lambda_m + \beta_m \lambda_m \ln \lambda_m + \beta_m \lambda_m \ln Y. \end{aligned} \tag{A6}$$

Note that resource shares now denote the share of household consumption expenditure they control, not necessarily how much of it they consume (as part of their share may be allocated to children). Once again, resource shares and preference parameters are modeled as linear functions of the observable traits in Table 1 and the dowry payment. Under the assumption that the husband and the wife are the only decision-makers, the husband controls 58.3 percent of the household resources, and the wife controls 41.7 percent of household resources.

As shown in Panel A of Figure A2, the new specification delivers results on the relation between dowry and woman's control over household consumption that are qualitatively in line with our main findings. Clearly, the magnitude of the estimated resource shares differs since household resources are split between two (instead of three) types of individuals. Sill, we document a strong positive correlation between dowries and women's resource share and women's resource share relative to men. The full set of estimates for resource shares and preference parameters of men and women for this alternative model are available upon request.

Table A2: Robustness Checks: Resource Shares

	Only Adult Decision-Makers		Missing Dowry: Drop		Missing Dowry: Equal Zero		Missing Dowry: LASSO		Restricted Sample		SAT Restriction	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.
Woman	0.417	0.130	0.320	0.116	0.268	0.084	0.325	0.083	0.336	0.066	0.316	0.093
Man	0.583	0.130	0.373	0.140	0.404	0.135	0.386	0.127	0.380	0.109	0.378	0.102
Children	-	-	0.307	0.133	0.328	0.119	0.290	0.113	0.284	0.066	0.306	0.075

Columns 1 and 2 reports descriptive statistics of resource shares estimated using a model with only two adult decision-makers. In Columns 3 and 4, missing dowries are recoded as zero dowry payment. In Columns 5 and 6, observations with missing dowries are dropped from the sample. In Columns 7 and 8, missing dowries are imputed using LASSO regression. In Columns 9 and 10, the estimation sample is restricted to 765 nuclear households in Andhra Pradesh, Bihar, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh, West Bengal, and Assam. Columns 11 and 12 report descriptive statistics for resource shares estimated using the SAT identification restriction.

A.3.2 Missing Dowry Data

As discussed in Section 4, information on dowry amounts is missing for 21 percent of our sample. To address this issue, we impute missing dowries using the average dowry paid for marriages that took place in the same year and the same state. Here we use alternative strategies to deal with the issue of missing data. First, we recode missing dowries as zero dowries. Second, we estimate resource shares using a smaller sample that simply drops observations with missing dowry data. Third, we impute missing dowries using LASSO (least absolute shrinkage and selection operator), with a penalty parameter is specified using the minimum Bayesian information criterion (BIC) (Tibshirani, 1996; Belloni et al., 2013).[31] As shown in Columns 3 to 8 in Table A2 and Panels B, C, and D of Figure A2, our main results are qualitatively confirmed under all alternative approaches. In line with our expectations, the average resource share for women is lower when missing dowries are coded as zeros.

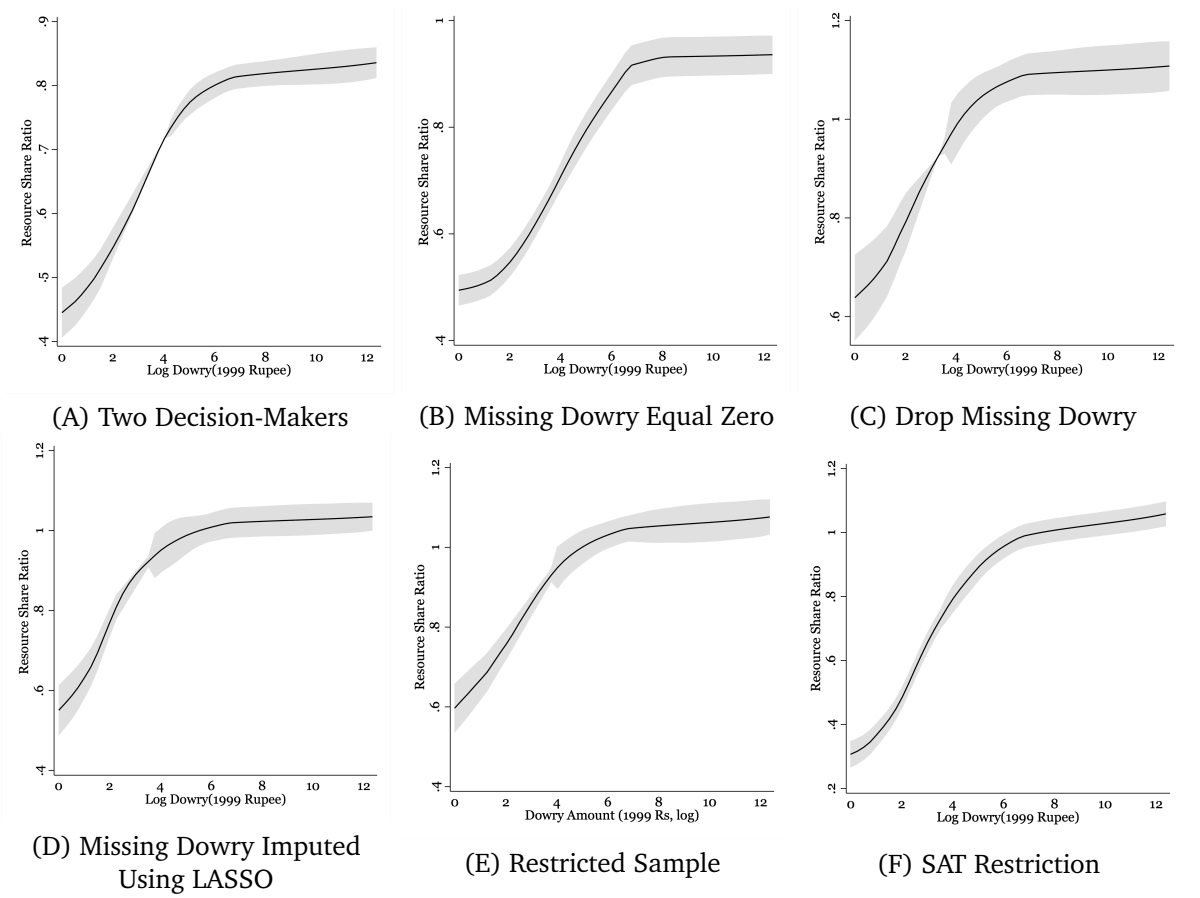
As pointed out by Chiplunkar and Weaver (2019), there are some inconsistencies in how the REDS surveyors in different states administered dowry-related questions. In Karnataka, for instance, zero dowries were recorded as missing values. In Maharashtra, surveyors successfully recorded whether respondents paid a dowry, but were unable to elicit the precise amount. As an additional robustness check, we estimate our model excluding all potentially problematic states. The restricted sample contains 765 nuclear households in Andhra Pradesh, Bihar, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh, West Bengal, and Assam. Descriptive statistics for the estimated resource shares, which are similar to our baseline estimates, are reported in Columns 9 and 10 of Table A2. Panel E of Figure A2 shows the results of a local polynomial regression of the resource share ratio on log-dowry based on the restricted sample.

A.3.3 Alternative Identification Assumption

In our main analysis, we applied the identification approach of Dunbar et al. (2013) called Similar Across People (or SAP). This approach restricts how preferences over the private assignable goods vary across family members. In the case of Piglog preferences, the restriction involves the slopes of the assignable clothing Engel curves for men, women, and children. In particular, provided that $\beta = \beta_m = \beta_w = \beta_c$, resource shares are identified by comparing the slopes across family members and imposing

[31] we do not present the full set of LASSO regression estimates for the sake of brevity, they are available upon request.

Figure A2: Robustness Checks: Resource Share Ratio by Dowry Amount



(A) Two Decision-Makers

(B) Missing Dowry Equal Zero

(C) Drop Missing Dowry

(D) Missing Dowry Imputed Using LASSO

(E) Restricted Sample

(F) SAT Restriction

Note: Resource share ratio is the ratio of woman's resource share to man's resource share. Panel A plots the resource share ratio by dowry amount estimated using a model with only two adult decision-makers. In Panel B, missing dowries are recoded as zero dowry payment. In Panel C, observations with missing dowries are dropped from the sample. In Panel D, missing dowries are imputed using LASSO (least absolute shrinkage and selection operator) regression from the variables selected using lasso regularization (Tibshirani, 1996; Belloni et al., 2013). The penalty parameter is selected using the minimum BIC information criteria. In Panel E, the estimation sample is restricted to 765 nuclear households in Andhra Pradesh, Bihar, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh, West Bengal, and Assam. Panel F plots the resource share ratio by dowry amount estimated using the SAT identification restriction.

the constraint that resource shares must sum to one. In addition to SAP, Dunbar et al. (2013) provide an alternative identification approach called SAT (Similar Across Types). SAT restricts how preferences over the private assignable goods vary across household types. In our framework with nuclear families with children, a household type is defined by the number of children in each family. Denote by C the household's number of children. Under SAT, Piglog preferences and the restriction that $\beta_n = \beta_{nC}$, for $n = m, w, c$, resource shares are identified by comparing the Engel curve slopes across families with varying number of children and imposing the constraint that resource shares must sum to one.

As a robustness check, we estimate resource shares using this alternative identification approach. As shown in Columns 11 and 12 of Table A2, there is no major difference in the resource shares obtained under the SAP and SAT restrictions. Moreover, as shown in Panel F of Figure A2, the relationship between dowry payments and intra-household consumption inequality is confirmed.

Table A3: Heterogeneous Effects of Dowry on Women's Resource Shares

	Women's Resource Share			
	(1)	(2)	(3)	(4)
Dowry (log)	0.017**	0.007	0.016**	0.013*
	(0.008)	(0.012)	(0.008)	(0.008)
Dowry (log)×𝟙 [Years of Marriage>12]	-0.002	0.007	-	-
	(0.007)	(0.011)	-	-
Dowry (log)×𝟙 [6<Years of Marriage≤12]	-	0.009	-	-
	-	(0.010)	-	-
Dowry (log)×𝟙 [Distance (log)>3]	-	-	-0.005	-0.003
	-	-	(0.012)	(0.012)
Dowry (log)×𝟙 [2<Distance (log)≤3]	-	-	0.009	0.006
	-	-	(0.010)	(0.008)
Mean of Estimated Shares	0.350	0.312	0.324	0.287

The 10th percentile of the distribution of years of marriage from the woman's natal family equals 6, while the 50th percentile equals 12. The 25th percentile of the distribution of log-distance from the woman's natal family equals 2, while the 50th percentile equals 3.

A.3.4 Heterogeneity by Marriage Duration and Proximity to Natal Family

Our baseline model specifies resource shares as linear functions of dowry payments and observable household characteristics. These characteristics include the duration of marriage. The importance of dowry payments for intra-household consumption allocation, however, may itself vary with the length of the marriage. On one hand, dowry payments may be more salient in younger marriages; on the other hand, older marriages may adhere more strongly to traditional customs and attach a higher weight to the dowries. While it is challenging to disentangle marriage duration from marriage cohort using cross-sectional data, we estimate an alternative model that allows for heterogeneous effects of dowry payments on intra-household allocation by length of marriage. Specifically, we consider an alternative specification for the resource share equations, where log-dowry is interacted with marriage length. As shown in Columns 1 and 2 of Table A3, we do not detect any statistically significant difference in the impact of dowry payments on women's resource shares by length of marriage.

Next, we study possible heterogeneity by distance from the wife's natal family. India is a patrilocal society and the woman typically moves in or close to the groom's family upon marriage. One might think that the closer the wife's natal family, the higher the ability to monitor that a higher dowry actually translates in higher consumption for the woman. However, one might also think that the closer the wife's natal family, the lower the salience of dowry payment. If the wife's family is nearby, they may directly enforce women's access to marital resources, reducing the importance of dowries. We estimate an alternative model that allows for heterogeneous effects of dowry payments on intra-household allocation by distance from the wife's natal family (in log-km). Specifically, we consider an alternative specification for the resource share equations, where log-dowry is interacted with measures of proximity. As shown in Columns 3 and 4 of Table A3, the impact of dowry payments on women's resource shares is slightly lower when the wife's family network is far. However, this difference is not statistically significant at any conventional level. Moreover, proximity to the wife's family *per se* is not

significantly associated with women's resource shares.

A.4 Endogeneity of Dowry Amounts: Instrumental Variables Estimates

Quantifying the causal link between dowry amounts and women's control over household resources after marriage may be challenging. For example, unobserved confounding factors influencing both dowries and the post-marital consumption allocation may lead to spurious correlations. Additional endogeneity issues may arise from measurement error in dowry amounts due, e.g., to recall and rounding errors. In Calvi and Keskar (2020), for example, we apply Benford's law (which states that distribution of first digits should naturally be skewed towards low numbers) to REDS dowry records. We document abnormal spikes in the distribution of first digits equal to five, likely due to rounding and approximation errors. This section addresses concerns related to measurement and misreporting of dowry amounts and other sources of endogeneity using an instrumental variable approach. As shown in the following paragraphs, all of our findings are confirmed.

Instruments. We provide estimates based on two instruments. First, we construct leave-one-out averages of dowry payments by state and year of marriage. Such averages aim at proxying the prevalence and norms regarding dowry payments at the time of marriage. Second, we exploit gold prices in the year of marriage as an additional source of variation: gold (typically in the form of jewelry) is a critical part of dowries in India, and changes in gold prices may lead to changes in the cost of dowry. Based on the 1999 REDS, Bhalotra et al. (2020) estimate that the elasticity of dowries with respect to gold prices is less than (and statistically different from) one. Since dowries do not fully adjust to changes in the price of gold, Bhalotra et al. (2020) argue that increases in gold prices map into an increase in the cost of dowry. In our framework, too, we cannot reject the hypothesis that the instrument are correlated with log-dowries. Conditional on the household socio-economic traits previously used in our empirical analysis, the instruments are jointly significant at the 1 percent level. The first-stage F-statistics is largely above the suggested threshold of 10 (equal to 21.74). Figure A3 plots the distribution of leave-one-out averages of dowry payments by state and year of marriage (Panel A) and the price of gold (deflated using the US Consumer Price Index as in Bhalotra et al. (2020)) by year of marriage (Panel B). In Panel C, we show the relationship between actual and predicted dowries, which we obtain by using gold prices and leave-one-out average dowries as excluded instruments). The pairwise correlation between the two variables is 0.48 and statistically significant at the 1 percent level.

Dowries and Self-reported Resource Control. In Section 2, our analysis of the relationship between dowries and self-reported measures of control is primarily descriptive. We now present instrumental variables estimates of the effect of dowry amounts on women's self-reported control over household's food and clothing expenditures and on the family's meal schedules.

Recall that for control over food and clothing expenditures, women's answers are ordinal and range from 1 to 4. Panels A and B of Figure A5 present the estimated marginal effects of log-dowry on the probability of each outcome from ordered logit models, where log-dowry is instrumented using prices of gold (log) in the year of marriage and the average dowry (log) paid by other women who married in the same year and the same state. The 95 percent confidence intervals are based on 200 bootstrap repetitions. The IV-estimates qualitatively confirm our initial findings and are substantially larger in

Figure A3: Instrumental Variables

(A) Average Dowries by State and Year of Marriage

(B) Gold Prices by Year of Marriage

(C) Predicted and Actual Dowries

Note: Sample includes 1,242 nuclear families. In Panel A, leave-one-out averages are computed as the average dowry (log) other women paid in the same state and year of marriage. The box plots sho the distribution of average dowries across states in each year. Panel B shows the average closing price of gold (log) by year deflated using the US Consumer Price Index. Panel C plots the relationship between actual and predicted dowries, obtained by using gold prices and leave-one-out average dowries as excluded instruments. Dowry payments are inflation adjusted to 1999 Indian Rupees.

magnitude: a one standard deviation increase in log-dowry decreases her likelihood of having no control over food expenditure by 5.5 percentage points and over clothing expenditure by 10.3 percentage points. Panel C presents the estimated marginal effects of log-dowry on the probability that men consume their meals before women do and indicates that a one standard deviation increase in log-dowry decreases this probability by 12.6 percentage points.

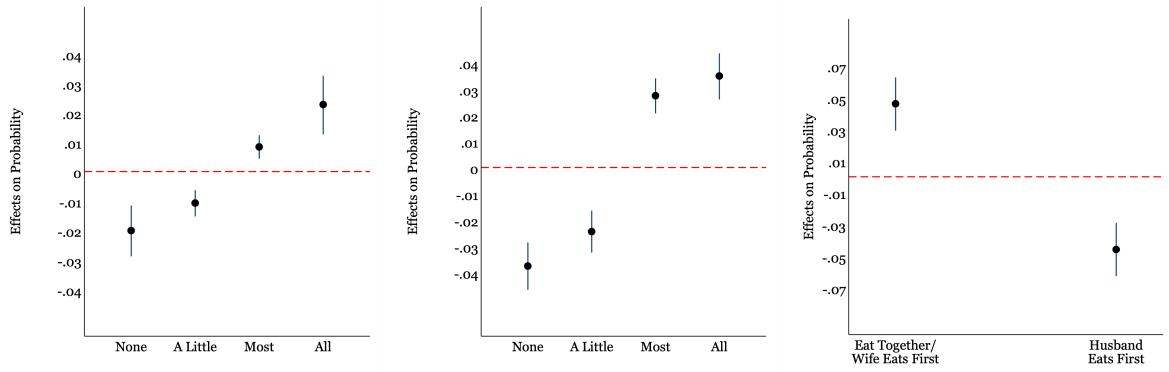
Dowries, Intra-household Allocation, and Poverty. Our results of Sections 4.2 and 5 are confirmed by the IV-estimates. While the full set of results is available upon request, we summarize the main takeaways below.

The estimated effect of log-dowry on women's resource shares is positive and statistically different from zero (with a p-value equal to 0.074 based on 200 bootstrap repetitions). Specifically, we find that a one log-point increase in the dowry paid at the time of marriage increases the share of household consumption allocated to the woman by 1.6 percentage points. Alternatively, a one standard deviation increase in log-dowry increases the woman's resource share by 4.5 percentage points.

The resource shares for men, women, and children obtained when instrumenting dowry amounts with gold prices and average dowries at the time of marriage align closely with our baseline estimates. On average, women are allocated 30.7 percent of the household's consumption expenditure, while men and children receive 38.5 and 30.8 percent, respectively. Consequently, the individual-level poverty rates are virtually unchanged, with 27 percent of women and 44.6 percent of men in our sample having a level of estimated individual consumption below the extreme poverty line.

The instrumental variable analysis also confirms the positive and significant association between dowries, women's post-marital consumption, and poverty risk relative to men. Figure A5 presents our three leading graphs adjusted for the potential endogeneity of dowry amounts: the resource share ratio by dowry amount (Panel A), women poverty rates by household expenditure and dowry amount

Figure A4: Dowry Payments and Self-reported Resource Control: IV Estimates



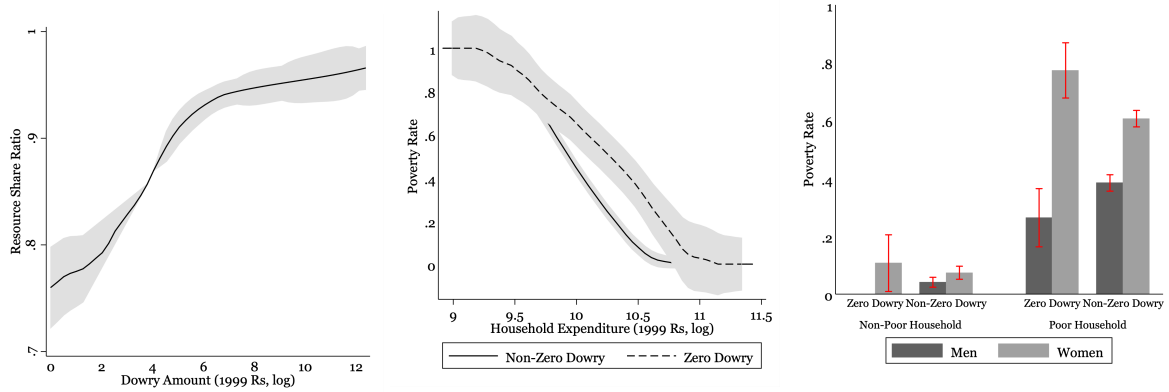
(A) Woman's Control of Food Expenditure

(B) Woman's Control of Clothing Expenditure

(C) Meal Schedule

Note: Dowry payments are inflation adjusted to 1999 Indian Rupees. Sample consists of 1,242 nuclear families. Instruments for log-dowry are leave-one-out averages of dowry payments by state and year of marriage (log) and real world gold prices in the year of marriage (log). Bootstrap standard errors are based on 200 repetitions.

Figure A5: Dowries, Intra-household Allocation, and Poverty: IV Estimates



(A) Resource Share Ratio by Dowry Amount

(B) Individual Poverty by Hh. Expenditure and Dowry Amount

(C) Individual Poverty by Hh. Poverty and Dowry Amount

Note: Dowry payments are inflation adjusted to 1999 Indian Rupees. Sample consists of nuclear families. Instruments for log-dowry are leave-one-out averages of dowry payments by state and year of marriage (log) and real world gold prices in the year of marriage (log).

(Panel B), and women and men poverty rates by household-level poverty and dowry amount (Panel C). Once again, we find that women's resource shares relative to men's are increasing in log-dowry. So, as the dowry payment increases, gender inequality in the intra-allocation of consumption expenditure decreases. Moreover, we see women's and men's poverty rates falling with total expenditure. However, at any given level of household consumption expenditure, women's poverty rates are higher (and men's poverty rates are lower) when no dowry was paid at the time of marriage. Finally, in both poor and non-poor families, women who paid a positive dowry are less likely to live in poverty than women who paid no dowry. Moreover, the gender poverty gap is more pronounced among households with no dowry payment made upon marriage.

In summary, while concerns about the endogeneity of dowry amounts are undoubtedly valid, the instrumental variable estimates presented in this section are largely consistent with our baseline results. This is reassuring since it indicates that our findings are unlikely to be the result of spurious correlations driven by unobserved confounding factors. Moreover, measurement error in the dowry data causes our estimates to be biased towards zero (mainly when studying the effect of dowries on self-reported measures of control and not so much when analyzing the link between dowries and women's resource shares). So, our baseline analysis, if anything, may slightly underestimate the influence of dowry payments on women's post-marital well-being.

A.5 Counterfactual Experiment: Imperfect Enforcement of Pecuniary Fines

In Section 6, we simulated the impact of enforcing the pecuniary fine imposed by the Dowry Prohibition Act on intra-household consumption allocations and poverty rates. There, we assume a perfect enforcement of the anti-dowry law (that is, the probability of being charged the fine is equal to one if a dowry was paid upon marriage). We now allow for an imperfect enforcement of the law. Like many crimes against women in India, violations of anti-dowry laws are likely to go unreported (Sekhri and Storeygard, 2014). So, the assumption of full enforcement may be unrealistic in the Indian context. Recall that the 1961 Dowry Prohibition Act introduced a fine of 5,000 Rupees for receiving or giving dowry. We interpret the fine as a decrease in the total household expenditure by 5,000 Rupees for families who were caught and charged engaging in a dowry transfer. Results for the higher fine of 15,000 Rupees introduced by the 1986 amendment are qualitatively similar and available upon request.

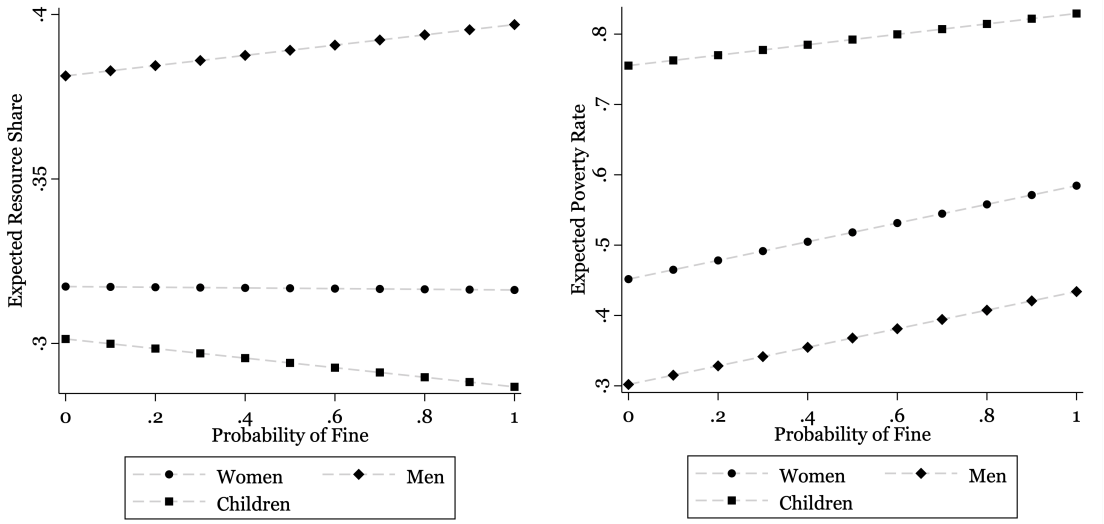
Let p denote the probability of being caught having received a dowry upon marriage and being charged a fine. We denote with $\eta_{j,nf}$ the resource share of household member j when the household is not charged any fine and with $\eta_{j,f}$ the resource share of household member j when the household pays a fine of 5,000 Rupees. The expected resource shares are given by:

$$\mathrm{E}[\eta_j] = p\eta_{j,f} + (1-p)\eta_{j,nf}. \tag{A7}$$

We exogenously vary the probability that a household who engaged in a dowry transaction must pay the dowry fine and calculate the counterfactual expected resource share of men, women, and children. Panel A of Figure A6 plots the counterfactual expected resource shares $\mathrm{E}[\eta_i]$, for men, women and children for different values of p. As the probability of fine increases, there is a slight increase (decrease) in men's (women's) resource share.

Using the estimated resource shares, we then calculate the counterfactual expected poverty rates for men, women, and children. Implementing a dowry fine has two effects on individual-level poverty: first, the fine decreases the total household expenditure, possibly making everyone poorer; second, the fine results in a change in resource shares. An increase in resource share for individuals in families with dowry transfer would result in a larger share of the smaller household consumption. If the increase in resource share were large enough to offset the decrease in household expenditure, these individuals would experience lower poverty rates. By contrast, if the increase in resource shares were not large enough, these individuals would face a higher poverty risk. Individuals whose resource share shrinks after the fine would unambiguously face higher poverty rates. From Panel B of Figure A6, we see that, as the probability of fine increases, both men's individual-level poverty and women's individual-level

Figure A6: Counterfactual Experiment: Imperfect Enforcement of Pecuniary Fines



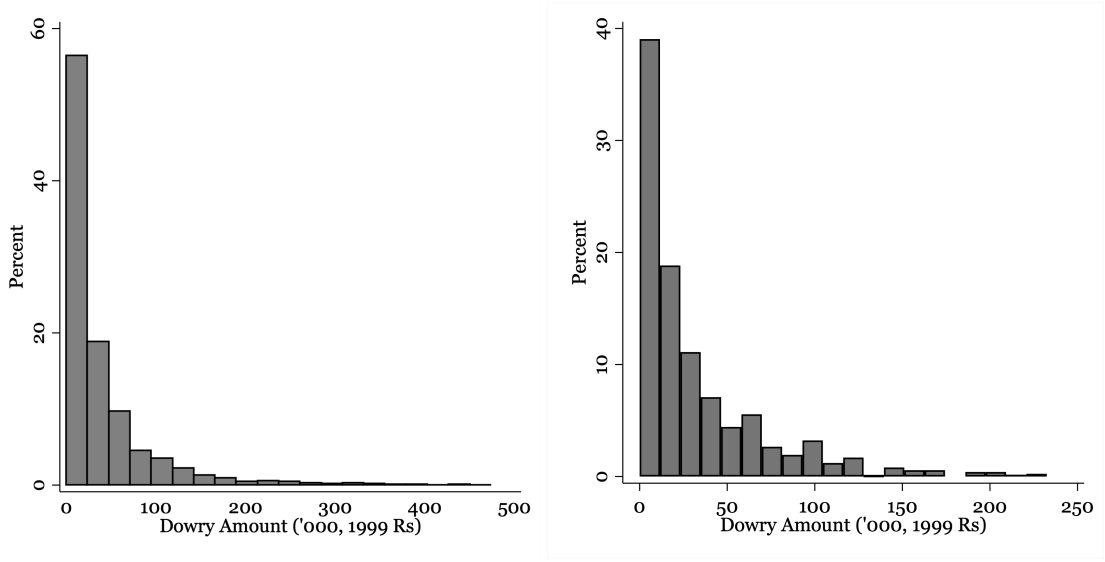
(A) Resource Shares (B) Poverty Rates

Note: Sample includes 1,242 nuclear families.

poverty rate increase. Women's poverty rate increases from 0.42 to 0.58, whereas men's poverty rate increases from 0.27 to 0.43. So, despite seeing a widening of the gender gap in resource shares, the poverty gender gap remains unchanged.

A.6 Additional Figures

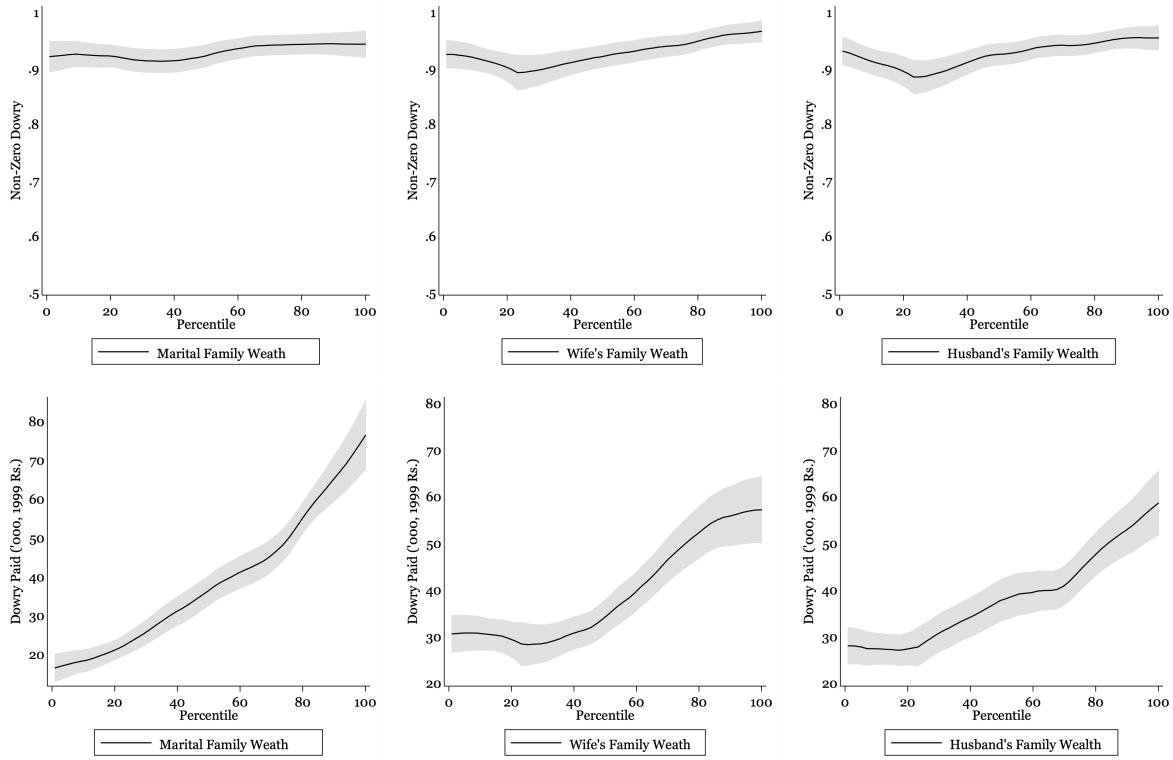
Figure A7: Empirical Distribution of Dowry Payments



(A) Full Sample (B) Estimation Sample

Note: Empirical distribution of dowry payments. Panel A includes all available recalls about dowry payments for the household head, their parents, their sisters and brothers, and their daughters and sons. Panel B focuses on dowry payments in the sample of households used to estimate the structural model (see Section 4.1 for details).

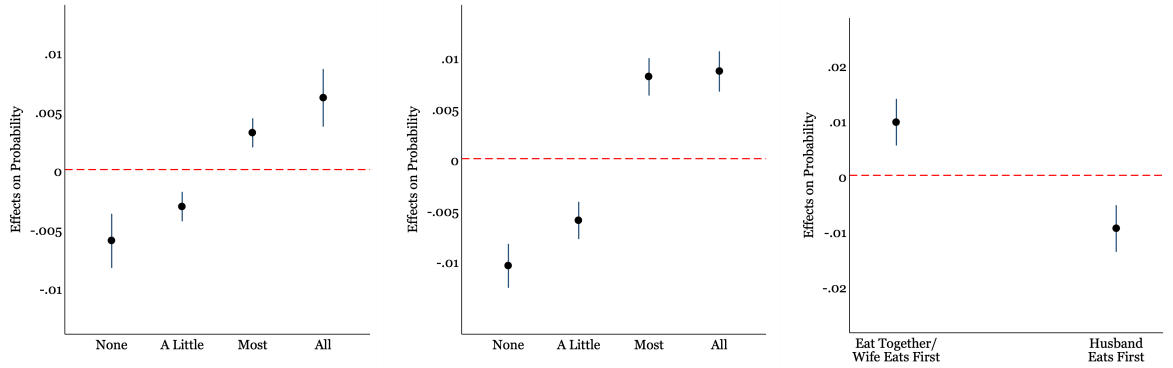
Figure A8: Dowry Payments and Wealth: Nuclear and Non-Nuclear Families



(A) Marital Family (B) Wife's Natal Family (C) Husband's Natal Family

Note: Dowry payments are inflation adjusted to 1999 Indian Rupees. Sample consists of nuclear and non-nuclear families.

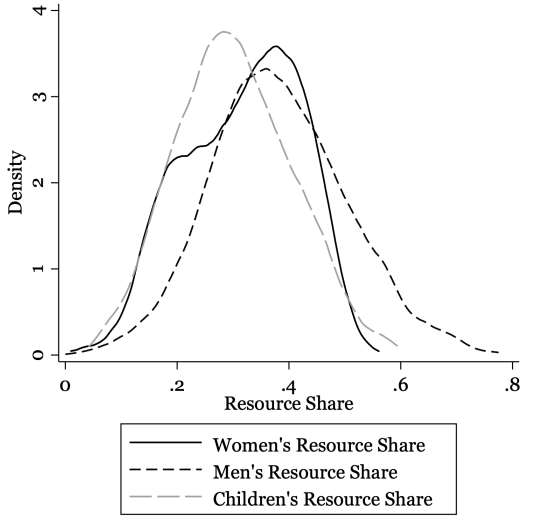
Figure A9: Dowry Payments and Self-reported Resource Control: Nuclear and Non-Nuclear Families



(A) Woman's Control of Food Expenditure (B) Woman's Control of Clothing Expenditure (C) Meal Schedule

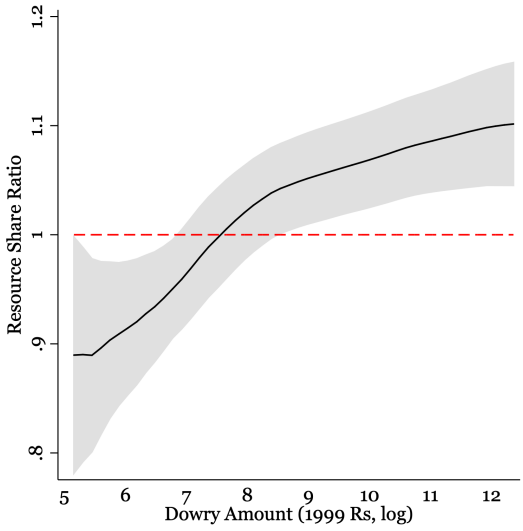
Note Dowry payments are inflation adjusted to 1999 Indian Rupees. Sample consists of nuclear and non-nuclear families.

Figure A10: Distribution of Resource Shares



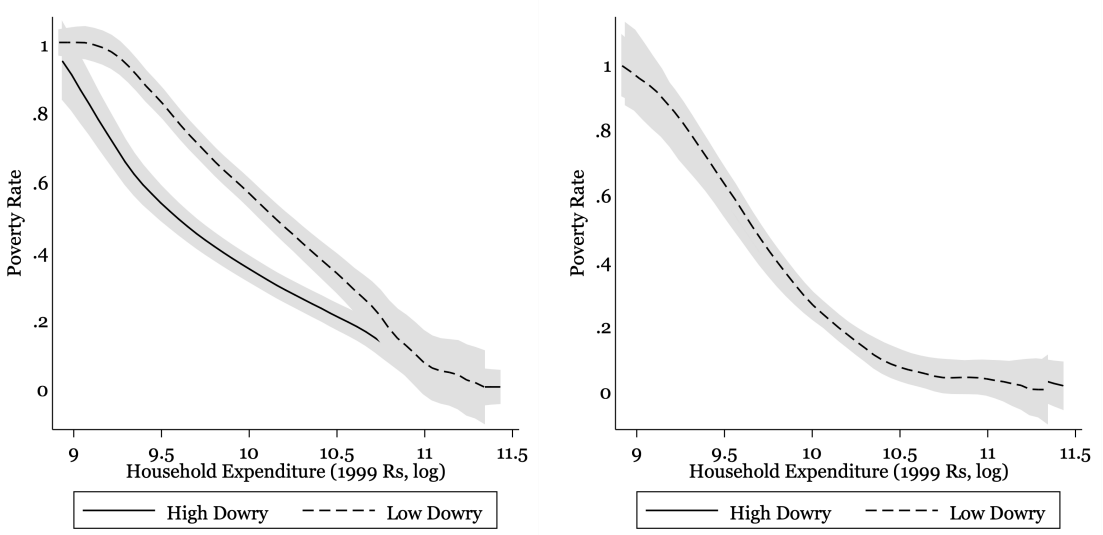
Note: Estimated resource shares for men, women and children from a sample of 1,242 nuclear families in India.

Figure A11: Estimated Resource Share Ratio by Dowry Amount (Non-Zero Only)



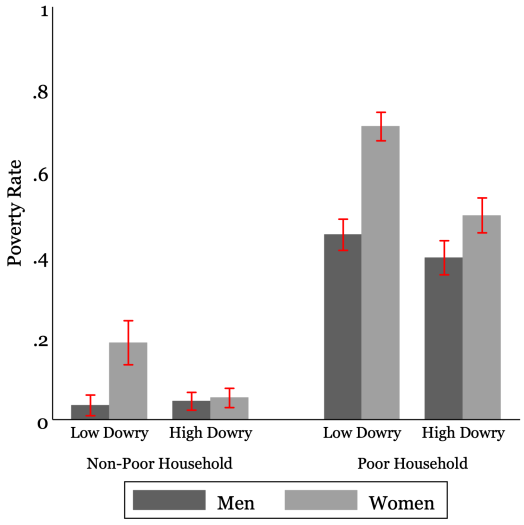
Note: The graph plots the results of a local polynomial regression of $\hat{\lambda}_w/\hat{\lambda}_m$ on log-dowry. The sample consists of 1,161 nuclear families with positive dowry amounts.

Figure A12: Individual Poverty Rates for Women and Men by Household Expenditure and Dowry Amount



(A) Women Poverty by Hh. Expenditure and Dowry Amount

(B) Men Poverty by Hh. Expenditure and Dowry Amount



(C) Women and Men Poverty by Household Poverty and Dowry Amount

Note: Poverty rate is calculated using the World Bank $ 1.90/day poverty line.

A.7 Additional Tables

Table A4: Woman's Resource Share: Estimated Coefficients

	Women's Resource Share ($\hat{\lambda}_w$)
Dowry (log)	0.013**
	(0.007)
Years Married	0.000
	(0.006)
𝟙 [Hindu]	-0.001
	(0.054)
𝟙 [SC,ST,OBC]	0.049
	(0.043)
𝟙 [Husband's Primary Education]	-0.014
	(0.045)
𝟙 [Wife's Primary Education]	0.010
	(0.055)
Wife's Age	0.006
	(0.007)
Husband's Age	-0.001
	(0.006)
Number of Children	-0.045*
	(0.023)
Number of Female Children	0.010
	(0.024)
𝟙 [North]	0.169**
	(0.075)
𝟙 [East]	0.079
	(0.079)
𝟙 [South]	0.193**
	(0.079)
N	1,242

Note: Sample includes 1,242 nuclear families. Log-dowry measured in 1999 Rupees. SC-STBC denotes that the household belongs to a Scheduled Caste,Scheduled Tribe or Other Backward Caste. Primary Education Wife and Primary Education Husband are indicator variables representing education levels greater than or equal to primary (fifth grade). Region North, East and South include states as indicated in Table 1. Robust standard errors in parentheses. * $p < 0.1$, ** $p < .05$, *** $p < 0.01$.

Table A5: Self-Reported Control and Women's Resource Shares: Mean-Comparison Tests

	No	Yes	Diff.	Std. Error
Control over Food Expenditure	0.2849	0.3297	-0.0448***	0.0072
Control over Clothing Expenditure	0.3065	0.3478	-0.0413***	0.0067
Husband Eats First	0.3246	0.2859	0.0387***	0.0085

Notes: The table reports results from t-tests on equality of means across groups. For food and clothing expenditure, Diff. is the difference in the average resource share estimated for women reporting "None" or "Little Control" and those reporting "Most" or "All Control." For eating order Diff. is the difference in the average resource share estimated for women in households where husband and wife eat together and those in households where they eat after their husband. Sample includes 1,242 nuclear families. * $p < 0.1$, ** $p < .05$, *** $p < 0.01$.

Table A6: Dowry Payments and Women's Resource Shares: Mean-Comparison Tests

	No	Yes	Diff.	Std. Error.
Non-Zero Dowry	0.170	0.328	-0.158***	0.008
Above-Median Dowry	0.290	0.345	-0.055***	0.006
Above-Median Dowry (if Dowry>0)	0.313	0.342	-0.030***	0.006

Note: The table reports results from t-tests on equality of means across groups. Sample includes 1,242 nuclear families. * $p < 0.1$, ** $p < .05$, *** $p < 0.01$.

Table A7: Dowry Payments and Women's Resource Shares: Kolmogorov-Smirnov Tests

Smaller Group	Difference	P-value
No Dowry	0.649	0.000
Non-Zero Dowry	0.000	1.000
Combined K-S:	0.649	0.000
Below-Median Dowry	0.269	0.000
Above-Median Dowry	0.000	1.000
Combined K-S:	0.269	0.000
Below-Median Dowry (if Dowry>0)	0.2167	0.000
Above-Median Dowry (if Dowry>0)	-0.0201	0.792
Combined K-S:	0.2167	0.000

Note: The table reports results from two-sample Kolmogorov-Smirnov tests of the equality of distributions. Sample includes 1,242 nuclear families. * $p < 0.1$, ** $p < .05$, *** $p < 0.01$. In the first panel, e.g., the first line tests the hypothesis that the group of women who paid no dowries contains smaller values of estimated women's resource shares than the group of women who paid positive dowries. The largest difference between the distribution functions is 0.649. The approximate asymptotic p-value for this is 0.000. The second line tests the hypothesis that the group of women who paid no dowries contains larger values of estimated women's resource shares than the group of women who paid positive dowries. The largest difference between the distribution functions is 0.000. The approximate asymptotic p-value for this is 1.000. The approximate asymptotic p-value for the combined test is 0.000, which leads to a rejection of the null hypothesis of equality of distribution between the two groups.

Table A8: Planning Commission Poverty Line

	Poverty Rate		
	Not-Poor Hhs.	Poor Hhs.	All Hhs.
Women	0.107	0.440	0.249
Men	0.029	0.287	0.139
Children	0.282	0.902	0.547

Notes: Sample includes 1,242 nuclear families in India. Poverty rates are calculated using the 27 Rupees/day rural poverty line of the Indian Planning Commission report in 2012, which translates to 13 Rupees/day in 1999 Rupees.