Traditional Institutions in Modern Times: Dowries as Pensions When Sons Migrate*

Natalie Bau† Gaurav Khanna‡ Corinne Low§
Alessandra Voena¶

April 19, 2023

This paper examines whether an important cultural institution in India – dowry – can enable male migration by increasing the liquidity available to young men after marriage. We hypothesize that one cost of migration is the disruption of traditional elderly support structures, where sons live near their parents and care for them in their old age. Dowry can attenuate this cost by providing sons and parents with a liquid transfer that eases constraints on income sharing. To test this hypothesis, we collect two novel datasets on property rights over dowry among migrants and among families of migrants. Net transfers of dowry to a man's parents are common but far from universal. Consistent with using dowry for income sharing, transfers occur more when sons migrate, especially when they work in higher-earning occupations. Nationally representative data confirms that migration rates are higher in areas with stronger historical dowry traditions. Finally, exploiting a large-scale highway construction program, we show that men from areas with stronger dowry traditions have a higher migration response to reduced migration costs. Despite its potentially adverse consequences, dowry may play a role in facilitating migration and therefore, economic development.

*We are grateful to Siwan Anderson, Chris Bidner, Nathan Nunn, Aloysius Siow, and Tom Vogl, as well as seminar and conference audiences for helpful comments and discussions. We also thank Paola Giuliano and Nathan Nunn for sharing their Ancestral Characteristics data. Asia Francavilla, Matias Giaccobasso, Sarah George, Kyle Hancock, Ruchi Mahadeshwar, Sreyashi Sharmin, and Yohan Wang provided exceptional research assistance.

†Universty of California, Los Angeles, NBER, CEPR, and BREAD
‡Universty of California San Diego
§University of Pennsylvania, NBER
¶Stanford University, NBER, CEPR, SIEPR, and BREAD

1 Introduction

Reallocating workers from rural areas where labor has lower marginal returns to urban areas with higher returns is a key driver of economic development. Yet, there are many obstacles to migration for financially constrained, rural households in low-income settings. Migration comes with large up-front costs (Bazzi, 2017; Bryan and Morten, 2019), and migrants face both financial risks (Lagakos et al., 2018; Bryan et al., 2014) and the prospect of losing access to local insurance networks (Munshi and Rosenzweig, 2016). Migration also reduces the co-residence between generations and may hence limit parental access to a child's resources (Leibenstein, 1957; Caldwell, 1978; Bau, 2021; Fetter et al., 2022). In economies where children provide most old-age support, households may forgo even high-return migration opportunities if migration prevents the optimal allocation of resources across generations.[1] Consequently, providing young people with increased liquidity during potential migration periods may play a significant role in facilitating their mobility.

This paper introduces and tests the new hypothesis that dowry, a transfer from the bride's family upon marriage that is prevalent throughout India, encourages migration. Specifically, dowry provides young men with timely resources that can be transferred to their parents to compensate for the old age support that would otherwise be lost when sons migrate. Indeed, transferring some or all of the dowry to the groom's parents in at least some cases is consistent with anecdotal evidence (The Times of India, 2022). Exploiting newly collected data, which includes the first quantitative information on property rights over dowry in India, as well as ethnographic variation in dowry traditions across India, and a natural experiment that varied migration costs, this paper provides the first evidence that dowry traditions help enable migration.

To illustrate our mechanism, we develop a model in which parents and sons act collectively but experience frictions in income sharing when the son migrates. If parental income is high enough relative to the son's income, this friction will not affect migration decisions. If, however, parents rely on income pooling with sons for sufficient consumption, sons may be less likely to migrate unless the returns are sufficiently high to offset utility losses to the household from parents' lost consumption.

[1] For example, Fernando (2022) argues that eldest sons, who are expected to care for parents in India, benefit less from their inheritance because they cannot pursue migration opportunities.

Dowry mitigates this friction by providing a liquid pool of resources that the son can transfer to the parents in case of migration, bringing consumption closer to the first best allocation and lowering the net returns needed for a son to migrate.

Our model produces several testable predictions. First, depending on parents' and sons' weighted marginal utilities of consumption, some parents will make net transfers to sons while others will receive transfers from the dowry. Second, parents will be more likely to take from the dowry when sons migrate, consistent with substituting to taking from the dowry since frictions in income-sharing arise when sons migrate. Third, accounting for parental wealth, parents will be more likely to take when migrant sons are expected to have a higher income, consistent with the fact that parents will have a higher relative marginal return to consumption. Fourth, in aggregate, sons raised in areas where dowry traditions are practiced are more likely to leave the village. Fifth, as long as migration rates are relatively low, a decline in the cost of migration will lead to a greater male migration response in areas where dowry is practiced. Finally, an extension of our model with remittances predicts that parents who receive remittances from migrant sons are also more likely to have taken a portion of the dowry.

The first three predictions, as well as the remittance prediction, are borne out in our newly-collected data from over 2,500 families across six Indian states (the "Origin Survey") and over 550 prime-age male workers in Delhi (the "Destination Survey"). The survey data carefully explore the property rights and control over all items gifted at the time of marriage. We find that 29% and 45% of parents have taken from the son's dowry across the two samples, respectively. Taking is more frequent when the son is a migrant and especially when he has a high occupational score, holding fixed the father's occupational score. It is also more frequent when the son reports not having wanted to marry without the parents' consent, a proxy for parental bargaining power. In addition, we find that parents whose migrant son sends them financial remittances are 17 percentage points more likely to have taken from the dowry than parents of a migrant son who does not transfer remittances.

We then turn to the final two predictions, which aim to assess the role of dowry in enabling migration. To test these predictions, we use nationally representative data from a detailed migration module collected in Round 64 of the National Sample Survey (NSS), conducted in 2007-08. We combine these data at the district level with the Ancestral Characteristics data assembled by Giuliano and Nunn (2018), which

uses anthropological data to estimate the share of the current population belonging to groups with dowry traditions. We confirm that while dowry payments in India are nearly universal, this variation is strongly predictive of the size of payments in the Rural Economic and Demographic Survey (REDS) and the India Human Development Survey (IHDS).

In line with the fourth prediction of the model, we find that male migration rates are indeed higher in districts where more of the population belongs to groups with dowry traditions. To test our fifth prediction about heterogeneity in responsiveness to a decline in the cost of migration, we exploit a time- and geographically-varying shock to this cost, the construction of the Golden Quadrilateral and North-South/East-West highway expansions. While the Golden Quadrilateral has been previously studied in the context of trade and productivity (see, for example, Ghani et al., 2016; Asturias et al., 2018), we use a complete database on capital projects in India to assemble new, detailed data on the district-level timing of the construction of highway segments. We then use the latest techniques in staggered-entry event study analyses to estimate the effect of highway construction on out-migration (Borusyak et al., 2021; Callaway and Sant'Anna, 2020). Separately estimating the effects of highway construction in districts with and without strong dowry traditions, we find that dowry areas indeed had substantially greater migration responses to road construction among young men who were likely below marriage age at the time of the construction. These results are driven by migration for employment, and migration that is out of the district, aligning with the channel in our model where dowry helps to resolve frictions for economically beneficial migration that weakens ties to parents.

Our findings suggest that the roles played by cultural traditions may evolve as economic development changes the environment. While dowry is thought to have traditionally served as a bequest to the bride (Goody and Tambiah, 1973; Botticini and Siow, 2003), today, transfers often flow from the bride's to the groom's side (Anderson and Bidner, 2015). Our findings suggest that this realignment of resources may help sons reduce intra-household distortions to efficient migration decisions. Thus, while dowry may have many negative consequences, it can also improve the spatial allocation of workers, while also facilitating income-sharing within households. More speculatively, our results may point to an additional explanation for why the prevalence of dowry has only grown, despite attempts to ban it (Chiplunkar and Weaver, 2021), since economic development has been associated with a decline in patrilocality

and thus, filial old age support of parents.

This paper brings together two largely distinct literatures. First, we contribute to the literature on migration costs and the drivers of the inefficient allocation of labor across space (Gollin et al., 2014; Bryan and Morten, 2019; Bryan et al., 2014; Meghir et al., 2022; De Janvry et al., 2015; Kone et al., 2018), and particularly the literature emphasizing how migration interacts with informal social insurance (Munshi and Rosenzweig, 2016). We contribute to this literature by identifying a new friction that reduces migration – parents' need for old age support in settings with limited formal social insurance – and showing how a cultural tradition like dowry can relax this friction.

Second, we contribute to a growing literature that recognizes the importance of culture for economic outcomes (Fernández and Fogli, 2009; Fernández, 2011; Bau and Fernández, 2021) and shows that taking into account the cultural environment is critical for understanding the effects of both economic shocks and policies (La Ferrara and Milazzo, 2017; Ashraf et al., 2020; Corno et al., 2020; Dahl et al., 2022; Bau, 2021). Here, we show that the effects of policies that reduce migration costs in India, such as road construction programs, depend critically on underlying cultural traditions whose role has been shifting in modern times.

Finally, we also contribute to a large literature on the economic effects of dowry. Dowry payments have been shown to affect a range of outcomes, including intimate partner violence (Bloch and Rao, 2002; Calvi et al., 2021), resource sharing within the household (Calvi and Keskar, 2021), female neonatal and infant mortality (Bhalotra et al., 2020), savings behavior (Anukriti et al., 2022), and sex selection (Borker et al., 2017). We expand this literature, building on past theoretical work on property rights over dowry (Anderson and Bidner, 2015), to evaluate whether dowry can play a role as an intergenerational transfer facilitating migration.

2 Background on Marriage Traditions in India

Historically, a variety of marriage traditions have co-existed in India across different groups. The *Law Code of Manu*, an authoritative and well-known legal text from ancient India, describes eight different marriage rites, which include both dowry (a more acceptable form for the higher castes) and bride wealth (payments from the groom's side of the family), as well as free romantic union, abduction, and seduction

(Manu and Olivelle, 2004). Consistent with this, Chiplunkar and Weaver (2021) find that in the period from 1915 (the earliest year for which they have data) to 1930, less than 40% of marriages included dowry payments. This also matches the 1911 Census of India report, which documents a wide variety of marriage practices in India, including both dowry and bride price (Gait et al., 1913).

Anthropologists suggest that traditionally dowry was a bequest to the bride (Goody and Tambiah, 1973). Thus, women received their inheritance from their parents at the time of marriage, while men received it at the time of their parents' death. Botticini and Siow (2003) show that this arrangement has advantages in patrilocal societies like India, where sons remain with their parents, work the family farm, and care for parents in their old age. This is because bequests via dowry mitigate agency problems that would otherwise occur if a daughter inherited part of the returns to her brother's effort after their parents' deaths.

In modern India, the practice of dowry appears to have changed greatly relative to the traditional practice in two ways. First, both quantitative and qualitative sources suggest that the prevalence of the practice has dramatically increased. Chiplunkar and Weaver (2021) show that between 1935 and 1975, the share of marriages with dowry increased from about 40% to close to 90%, and dowry has remained nearly universal thereafter. Similarly, a detailed report by AIDWA (2003) on the *Expanding Dimensions of Dowry* observes that, "*Dowry is a Brahmic custom which today has spread to all sections of society*" (p. 69).

Second, while prior to this paper, we are not aware of any *quantitative* evidence on property rights over dowry in India, qualitative evidence suggests that even if dowry originated as a bequest to the bride, brides have limited property rights today. Even as early as the 1970s, Goody and Tambiah (1973) observed, "*It cannot be denied that the normative... notion of dowry may in the face of contemporary developments.. show a shift whereby it may amount to a 'sale' of a son in marriage... This is an instance where modernization... may distort a traditional arrangement rather than eradicate it*" (p. 63). Similarly, AIDWA (2003) writes, "*Nor is the identification of dowry with pre-mortem inheritance given to a daughter and her bride groom satisfactory today*" (p. 12) and further asserts that in Bihar, for example, "*The majority of women do not have control over even their own jewelry*" (p. 91). These qualitative patterns match the theoretical insights of Anderson and Bidner (2015), who show that economic development can cause the bride's parents to reallocate property rights to the groom

to attract higher-quality grooms for their daughters.

Understanding the modern practice of dowry is further complicated by the fact that marriage transactions are more complex than simply payments from the bride's side to the groom's side or vice versa.[2] The qualitative literature does not just note that the groom's side has meaningful property rights over dowry today but also that the groom's parents may be capturing some or all of the dowry. AIDWA (2003) observes that for the groom's parents, dowry can be an "*avenue for acquisition of consumer goodies and wealth and control over the future support of earning children*" (p. 19). This observation captures the exact mechanism we study in this paper – that modern dowry can sometimes become a form of financial old-age support for grooms' parents, especially as patrilocality declines and migration increases. In the next section, we characterize this mechanism in a simple model.

3 Theoretical Framework

We develop a simple model to explain the relationship between dowry, intergenerational income sharing, and migration. This generates testable predictions, which we bring to the data.

3.1 Setup

We model parents and sons as making collective household choices (Chiappori, 1988) over migration and resource sharing. At the time of the son's marriage, the household decides whether the son should migrate and chooses the flow of transfers between parents and children by optimizing the Pareto-weighted sum of their utilities. Importantly, migration introduces a friction that prevents optimal transfers within the collective household.

Households have parents – who act as a single unit – and a son.[3] Parents have Pareto weight θ and earn income y_P. The son has Pareto weight $(1-\theta)$, earns income y_K, and receives an additional return, net of cost, R in the case of migration, denoted as $m = 1$. Households can be heterogeneous in θ, y_P, y_K, and the return to migration

[2] As Goody and Tambiah (1973) observe, "*Transactions in the same direction may be destined for different social persons*" (p. 6).

[3] In Appendix A.2.5, we consider the case of households with sons and daughters and show that the predictions of the model are unchanged.

R, with R distributed according to a continuous and unimodal distribution. Because parents are older, they have accumulated their full income at the time of their son's marriage, while sons have not yet started working. Thus, y_P is fully liquid, while y_K is illiquid before the potential migration. This constrains the types of transfers that can be made by the parents and the son.

Sons marry and receive a marriage transfer E, representing the bride's endowment. We use a simple framework to characterize the matching process, as this is not primarily a model of marriage-market matching. Utility is transferable between husband and wife, and we assume positive assortative matching between the son's earnings y_K and E (Andrew and Adams, 2022). Brides' families are unable to discern family dynamics in terms of likely transfer flows (described below), and so only match based on grooms' earning potential. E is liquid at the time of marriage if there is dowry ($d = 1$) and illiquid otherwise ($d = 0$).[4]

There are two types of transfers between sons and parents: a lump sum transfer τ, the net marriage payment, that occurs around the time of the son's marriage (i.e., when the son is young and has not yet earned his income) and an income-sharing transfer α (which occurs when the son earns his income). We define both so that positive values represent flows from sons to parents, and negative values represent flows from parents to sons. Negative τ can be used by parents to transfer resources to sons, while if sons wish to transfer to parents, τ is bounded above by the liquid portion of the bride's endowment ($\tau \leq dE$).[5]

Since parents can already fully flexibly make transfers to the son through τ, we assume that $\alpha \geq 0$. Because α is paid later in life, it is subject to frictions due to migration. If the son migrates, sharing resources later in life may become more costly or even impossible because of lack of information, limited commitment, and remittance costs. To simplify exposition, in our baseline model, we constrain α to be 0 when the son migrates ($m = 1$) due to these frictions. In section 3.5, we show that

[4]Intuitively, when there is a dowry, parents of daughters give a liquid gift equal to E at the time of the wedding. If there is no dowry, this endowment of the bride may take the form of her education or other investments that increase utility in marriage, or an inheritance that can be consumed later in life.

[5]A further constraint is that $-\tau$ is bounded by the parents' income ($-\tau \leq y_P$) and α is bounded by the son's income ($\alpha \leq y_K$) to rule out the possibility that the parents can donate more than their income and then receive it back as a transfer from their son. The presence or absence of this constraint does not influence the model's implications and hence, we can omit it from the model formulation.

extensions that allow remittances to occur with some probability or at a cost do not alter the model's predictions.

In sum, the household chooses marriage transfer τ, son's transfer α, and migration status m to solve the following problem:

$$\begin{aligned} \max_{\substack{\alpha \geq 0, \tau \leq dE, \\ m \in \{0,1\}}} \quad & \theta \ln(c_P) + (1-\theta)\ln(c_K) \\ \text{s.t. } & c_P \leq y_P + \tau + \alpha(1-m) \\ & c_K \leq y_K + Rm + E - \tau - \alpha(1-m). \end{aligned} \tag{1}$$

3.2 Solution

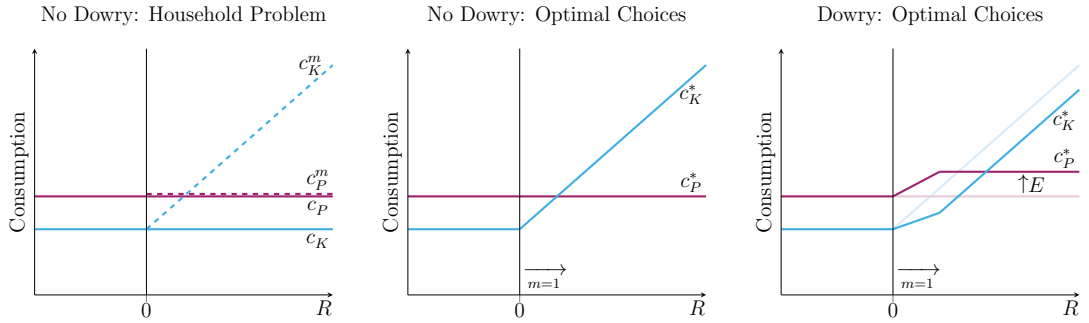
In this section, we describe the solution to the model. For all mathematical detail and proofs, see Appendix A.2.1. To solve the household's problem, we first solve for consumption and transfers conditional on migration and then compare the utilities when $m = 1$ and $m = 0$ to determine whether migration is utility-maximizing.

Without frictions, the household would choose consumption to equalize the parents' and the son's Pareto-weighted marginal utilities of consumption. With logarithmic utility, the parents' share of household resources ($y_K + y_P + E + Rm$) would be θ, and the son's would be $1-\theta$. Note that, as there is no friction if migration doesn't occur, the household always implements this solution when $m = 0$.

When $m = 1$, α is constrained to be zero. If the τ that equalizes the weighted marginal utilities is still feasible, it is implemented. This occurs when the optimal $\tau^* \leq dE$. If the τ that equalizes marginal consumption is greater than dE, the household sets τ at the upper bound, dE.

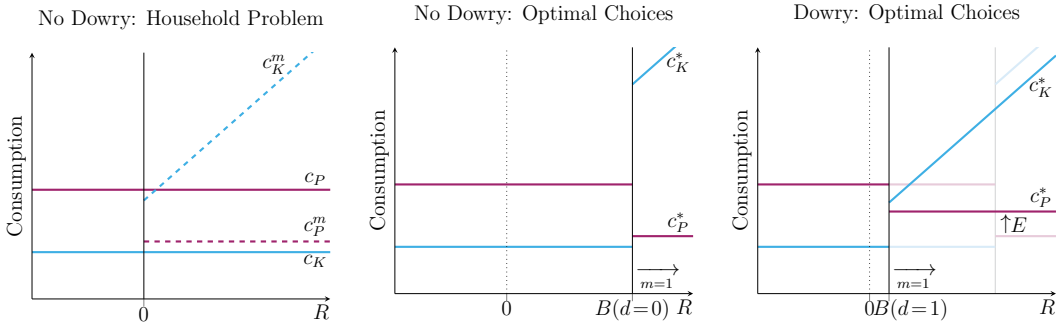
When the sum of parents' income and the upper-bound τ is weakly greater than their consumption allocation without migration, migrating when $R > 0$ will be a Pareto improvement for the household – making the son better off without making the parents worse off. We call these parents "Satisfied," since they are able to satisfy their consumption needs without requiring an income transfer from the son. The first panel of Figure 1 illustrates the hypothetical consumption with and without migration, over the possible returns R, for the no dowry case.

Figure 1: Household Migration Problem: Satisfied Parents



Notes: The first figure depicts the possible consumption for parents and sons with and without migration for Satisfied Parents with no dowry, $d = 0$, over the range of migration returns R. c_P and c_K depict the parents' and son's consumption without migration, respectively, and c_P^m and c_K^m their consumption with migration, where the parents are left to consume their income. The second panel depicts the optimal migration choice and consumption allocation when $d = 0$, and the third panel for when $d = 1$. In both cases, migration $m = 1$ occurs when net returns are above 0, and dowry simply allows consumption sharing that is closer to the first best.

Figure 2: Household Migration Problem: Seeking Parents



Notes: The first figure depicts the possible consumption for parents and sons with and without migration for Seeking Parents with no dowry, $d = 0$, over the range of migration returns R. c_P and c_K depict the parents' and son's consumption without migration, respectively, and c_P^m and c_K^m their consumption with migration, where the parents are left to consume their income. The second panel depicts the optimal migration choice and consumption allocation when $d = 0$, and the third panel for when $d = 1$. Migration $m = 1$ occurs without dowry when net returns are above $B(d = 0)$ and with dowry when net returns are above $B(d = 1)$.

When the sum of parents' income and the upper-bound τ is lower than their non-migration consumption allocation, migration will reduce parents' consumption. We call these parents "Seeking," since they are seeking an income transfer from sons, and this is illustrated in the non-dowry case in the first panel of Figure 2.

Definition *Parents with $y_P+dE \geq \tilde{c_P}$ are "Satisfied" and parents with $y_P+dE < \tilde{c_P}$ are "Seeking," where $\tilde{c_P}$ represents the parents' consumption without migration.*

Now consider the migration decision. If parents are Satisfied, there is no distortion, and the household chooses m to maximize total resources. Then, $m = 1$ as long as $R \geq 0$, as illustrated for the non-dowry case in the second panel of Figure 1. If the parents are Seeking, the returns on migration to the son must be high enough to compensate the household for the loss in the parents' consumption. Thus, migration only occurs if $R \geq B(d) > 0$, as illustrated for the non-dowry case in the second panel of Figure 2.[6]

3.3 Predictions for the Distribution of Dowry

Our first set of predictions concern the direction of the net marriage transfer τ. We refer to cases where $\tau > 0$ as "parents taking" from the son's dowry. For proofs of these predictions, see Appendix A.2.1.

Prediction 1 *τ^* can be positive or negative.*

The equilibrium marriage transfer τ^* can be negative or positive depending on the relative size of the son's and parents' weighted marginal returns to consumption in the absence of transfers.

Prediction 2 *For any set of parameters y_P, y_K, and θ, the probability that parents are Net Takers of dowry will be higher if $m = 1$ than if $m = 0$.*

This occurs for two reasons. First, if migration is optimal, $R \geq 0$. Then, the son's resources increase as a result of migration, increasing τ^*. Second, if $m = 1$, transfers that could otherwise occur through α must occur through τ.

Prediction 3 *If $m = 1$, holding y_P fixed, the probability that parents are Net Takers of dowry is increasing in son's income y_K and parental Pareto weight θ.*

The optimal total transfer from a son increases in his income y_K (because his marginal return to consumption in the absence of a transfer is decreasing in y_K) and in the parental Pareto weight θ (because the household places a greater weight on parents' consumption). But τ^* is only defined (as opposed to $\tau^* + \alpha^*$) when $m = 1$ since otherwise the son is indifferent between transferring with τ (up to the constraint) or α, and thus, τ may not vary with these factors in the absence of migration.

[6] $B(d)$ is given by $(1-\theta)Y\left(\frac{\theta Y}{y_P + d\,E}\right)^{\frac{\theta}{1-\theta}} - y_K - (1-d)E$.

3.4 Predictions for the Relationship Between Dowry Traditions and Migration

In this section, we consider the aggregate effect of dowry traditions on migration.

Prediction 4 *Households with a dowry tradition ($d = 1$) have a higher probability of having a migrant son.*

See Appendix A.2.2 for proof.

This occurs for two reasons. First, recall that in Satisfied households, a son migrates if $R \geq 0$. Because dowry strictly increases the set of feasible τ, a larger set of households will be Satisfied if $d = 1$. Second, even if households are Seeking, because the upper-bound transfer is greater in dowry societies, the distortion to parents' consumption is smaller, and the threshold for the return to migration such that migration is optimal $B(d)$ is lower. For a given set of parameters y_K, y_P, and θ, therefore, $B(d = 1) \leq B(d = 0)$ and the probability that $R \geq B(d = 1)$ is greater than the probability $R \geq B(d = 0)$. The effect of dowry on migration decisions is illustrated for Satisfied households in the third panel of Figure 1 and for Seeking households in the third panel of Figure 2.

Because migration rates depend on dowry *ceteris paribus*, the migration response to reducing the cost of migration also depends on dowry. When migration rates are low, i.e. when sons with the modal return to migration do not migrate, a decline in the cost of migration will have a larger effect on migration rates where there is a higher baseline level of migration (dowry is present). This is because the density of men on the margin of migrating is greater.[7]

Prediction 5 *If migration rates are low, a decline in the cost of migration (or equivalently, an increase in the net returns to migration) will increase the probability of migration more when dowry is present.*

See Appendix A.2.3 for proof.

[7]This result relies on the single-peak assumption on the distribution of R. A similar argument is used in Ashraf et al. (2020) for examining heterogeneity in the response of education to school construction. The assumption that migration rates are low is consistent with the fact that only 15% of adult males in the NSS Round 64 migration module have permanently migrated out of their natal village.

3.5 Extensions: Remittances and Household with Sons and Daughters

We consider two sets of extensions to our baseline model.

Allowing for Remittances The baseline model assumes that sons cannot send parents remittances if they migrate. We consider two extensions with remittances. One extension allows remittances to fail with a non-zero probability, capturing the possibility, for instance, that the parent-son bond becomes weaker after migration. The other extension introduces costly remittances, capturing transaction costs.[8] Both extensions are detailed in Appendix subsection A.2.4, which shows that allowing for remittances does not qualitatively change the model's predictions.

In both extensions, remittances occur in the households in which sons would make transfers to parents in the absence of migration. Because remittances are costlier/less reliable than transferring through the dowry, households will first exhaust transferring through τ before making any transfers through remittances. Thus, the extensions deliver an additional, perhaps counter-intuitive prediction.

Auxiliary Prediction 1 *Parents who receive remittances from their migrant sons are more likely to be Net Takers of dowry than those that do not receive remittances.*

Sons and Daughters For simplicity, in our baseline model, households do not have both sons and daughters. In Appendix A.2.5, we show that accommodating daughters does not change the model's qualitative predictions. We propose an extension where households have one daughter and one son. The impact of dowry traditions on male migration is still weakly positive. This is because, in the model, while the benefit to the parent of the son's transfer is canceled out by paying the daughter's dowry, the difference between the parents' and son's consumption with dowry is still lower, as the son does not consume E himself. Thus, dowry reduces the distortion from migration (and the return needed to migrate) since sons' consumption is lower than in the non-dowry case where they consume E.[9] In addition to this extension, we note that even if paying a daughter's dowry exactly canceled out the incentive effect of

[8] In Bangladesh, a similar context, "Remitting money is difficult and migrants carry money back in person" (Bryan et al., 2014).

[9] Proof is provided in Appendix A.2.5.

dowry traditions on a male sibling's migration, this would not lead dowry to have zero effect in aggregate. This is because there is a positive effect on male migration in son-only households and households with more sons than daughters. Even if sex ratios are balanced, there are mechanically more sons in households with a greater number of sons. Since total male migration is not affected by households with only daughters, this leads to a positive effect on migration in aggregate. In fact, India's sex ratio is significantly male-skewed, amplifying the aggregate dowry effect.

4 New Data Collection & Testing Predictions on the Distribution of Dowry

To test the first set of predictions of the model, we collected two original, distinct survey datasets on what gifts were given at the time of the wedding and who benefited from those gifts. While other datasets have collected information on the size of dowry payments, these are the first data to our knowledge to measure how the dowry is eventually allocated across individuals. Motivated by the connection between migration and property rights over dowry in the model, we collected survey data from both a major migration destination and from origin villages distributed throughout Northern India. We describe each below. The first dataset allowed us to obtain detailed information through in-person interviews with young or middle-aged men. The latter dataset, which was collected over the phone from parents of adult sons, sacrificed some of this detail but has the key advantage of allowing us to compare migrants to non-migrants from the same origin locations.

4.1 Destination Survey

The 'Destination Survey' data was collected through in-person surveys of migrants and locals in Gurugram (a city just outside of Delhi, which is known as a technical and financial hub) in 2018. We chose Gurugram because Delhi is one of the largest migration destinations in India (and has the highest fraction of migrants to native-born of any Indian city), and Gurugram, in particular, has many employment opportunities that may attract migrants.[10] The sample was stratified to consist of roughly 20%

[10] According to the 2011 Census of India, Delhi had the second largest number of in-migrants after Mumbai but had the highest population share of in-migrants.

Delhi natives and 80% individuals who had moved to Delhi, although this included those who moved as children. This allows for a comparison between migrants and non-migrants, with the caveat that migrants and non-migrants are likely to differ in other respects.

Table 1: Summary Statistics: Destination Survey

	Mean	SD	Obs
Son's Age	30.08	5.17	557
Son's Years of Education	12.26	3.66	557
Son's Monthly Income	21,197	24,035	557
Ln(Son's Occupation Score)	8.96	0.69	506
Ln(Father's Occupation Score)	8.57	0.42	498
Total Dowry	202,866	269,894	557
Share of Net Takers	0.45	0.50	557
Share of Migrants	0.62	0.49	557

Notes: This table reports summary statistics for variables of interest in the Destination Survey conducted in 2018. Income and dowry are in Rupees. The occupation scores are the median monthly earnings of a certain occupation created by mapping our occupational categories to data from the NSS. 'Net Takers' are defined as grooms' parents who benefited financially from the marriage. Individuals who weren't born in Delhi are coded as migrants unless they migrated with parents as children (less than 15) or currently co-reside with parents.

We surveyed 557 men between the ages of 21 and 41. 84% were born in 185 districts outside Delhi across 21 states. For our analysis, we define migrants as those who moved to Delhi alone or as an adult (age 15 or greater) with their families and pool those who moved to Delhi with their families before age 15 with non-migrants (our analysis is robust to other age thresholds, including using only those born in Delhi).[11] This definition of migrant is motivated by our model, where migration introduces a friction for income-sharing by physically separating sons and parents. After collecting basic demographic information and details about their (and their parents') income and education, we asked for a detailed account of gifts transferred between the groom's and bride's sides at the time of their wedding. For each category of gifts (e.g. jewelry, utensils, clothing, etc.), we asked who gave and who received the gift, as well as who had 'ownership rights' over it. Using this ownership breakdown, we calculated the value of the gifts that were given and owned by the groom's parents (as well as those given and owned by the bride's parents, bride, and groom). Thus,

[11] While age 15 may seem young for independent migration, employment is restricted for those 14 and under (child labor) in India, and education is no longer compulsory at 15. So, this is a natural cut-off for when migration for employment may begin to occur.

we can calculate one of our key measures – net transfers to the groom's parents from the marriage – as the sum of the gross transfers from the bride's parents to the groom's parents net the groom's parents' transfers to other parties (excluding gifts they "gave" but ultimately own). We consider a groom's parents "Net Takers" ($\tau > 0$ in the model) if this net transfer is positive and "Net Givers" if it is negative ($\tau \leq 0$). In other words, the groom's parents are "Net Takers" if, once all the transfers are taken into account, they were made financially better off by the marriage. Finally, we also asked about financial assistance given to and received from parents, as well as co-residence patterns with parents. Table 1 reports summary statistics from these data. Consistent with the literature (Anderson, 2007), dowry is high, roughly 10 times the son's monthly earnings.

4.2 Origin Survey

The 'Origin Survey' data were collected through phone surveys in 34 districts in 6 North Indian states (Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh, and Maharashtra) in 2020 in partnership with IDinsight (IDI), a global advisory and data analytics research organization. The households contacted were drawn from a pre-existing roster of household members who IDI had surveyed in-person for previous projects. These households were identified via voter rolls and community health worker registers.[12] We surveyed a total of 2,541 households. Due to our interest in dowry, we restricted our survey sample to households where the head had a married son. Since households resist taking part in phone surveys with a duration greater than 20 minutes, we randomly sampled one married son and asked the head about that son's dowry and migration behavior.[13] To ensure our sample included enough migrants to be informative, if there was at least one migrant married son, we randomly drew one of the migrant married sons with a 70% probability and drew a non-migrant married son with a 30% probability. After completing this module, we then asked the respondents if they would be willing to complete the module for a second son. This allowed us to collect data on 3,069 sons, 20% of whom were migrants. For selected sons, we asked the parents about the gifts transferred at the time of their son's

[12]The voter rolls are representative of the population and compare well with averages from census and survey data (Joshi et al., 2020).

[13]Providing incentives for survey participation in India is challenging because mobile money is not widespread, and most households have monthly, unlimited cell phone bundles, reducing the value of offering households extra data or cell phone minutes.

Table 2: Summary Statistics: Origin Survey

	Mean	SD	Obs
Son's Age	29.28	6.81	3,050
Son's Years of Education	8.61	4.51	2,832
Son's Monthly Income	6,955	10,751.5	2,375
Parents Monthly Income	6,387	12,611	3,068
Ln(Son's Occupation Score)	9.87	0.33	2,216
Ln(Father's Occupation Score)	8.39	0.35	2,160
Total Dowry	75,643	640,713	2,204
Share of Net Takers	0.27	0.44	1,878
Share of Migrant Sons	0.20	0.40	3,066

Notes: This table shows summary statistics for variables of interest in the Origin Survey. Income and dowry are in Rupees. The occupation scores are the median monthly earnings of a certain occupation created by mapping our occupational categories to data from the NSS. 'Net Takers' are defined as parents who had a positive net transfer with the bride's parents. Sons are coded as migrants if they have permanently moved away from the parents' village.

marriage. By asking parents how much of each category of gifts they owned, we were able to calculate their self-reported ownership, complementing the data collected from grooms in the 'Destination Survey.' Due to the limited time to conduct the survey, we also directly asked respondents to estimate the size of gifts they gave at the time of the wedding and the gifts they had received from other parties. The net transfer to the groom's family is then calculated as the difference between these two values. Alongside asking about gifts, we also collected demographic details on the household head, information about their son's income and education, and financial assistance given to/received from their son. Table 2 reports summary statistics for these data.[14] Again, dowry is roughly 10 times the son's monthly earnings, although these rural families are on average poorer, and both dowry and income are lower.

Importantly, these two surveys collect data on dowry and transfers of the marriage gifts in different ways and from different family members. Therefore, if we see similar patterns across datasets, it is reassuring that the results are not driven by measurement issues or systematic biases from specific types of respondents.

[14]As shown in Table 2, due to recall issues and attrition during the phone survey, there is considerable variation in the sample size by question. The Net Taker variable has a relatively higher missing rate because this value could only be calculated when parents provided numeric answers for the amount of gifts given and taken. In many cases, parents are able to report the existence of a gift and whether it was given or taken but cannot estimate the value. Thus, this attrition appears to be related to recall rather than discomfort discussing taking from dowry. To ensure our results are robust to systematic recall error, we will also show a robustness test where we proxy for Net Taker with a measure that does not require reporting the quantitative values of gifts.

4.3 Empirical Tests of Predictions 1 – 3 and Auxiliary Prediction 1

In this subsection, we test the model's first set of predictions, as well as the auxiliary prediction, exploiting the newly-collected data's unique information on marriage payment transfers.

Prediction 1 Prediction 1 states that we should observe both net negative and net positive marriage payments to parents due to underlying heterogeneity in relative incomes, returns to migration, and Pareto weights. There is evidence in favor of this prediction in both datasets. In the Destination Data (where there is a higher share of migrant sons), 45% of grooms' parents take from the dowry on net (Table 1). In the Origin Data, 27% take on net (Table 2).

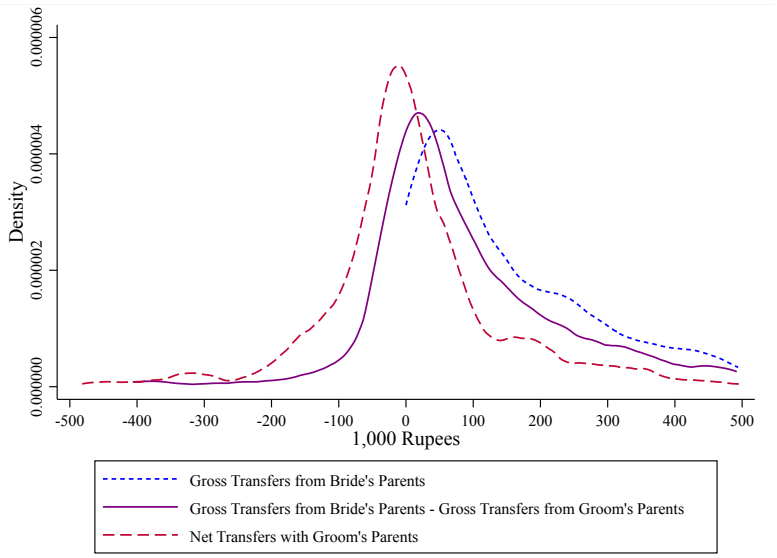
Figure 3 uses the Destination Data to plot the gross transfer from brides' parents (the value of all gifts given by the bride's side to the groom's side) and the net transfer from brides' parents (the value of all gifts given by the bride's side net the gifts received by the bride's side from the groom's side), two commonly collected dowry measures, alongside the net transfer taken by the grooms' parents.[15] Gross dowry is highest and universally positive, while net dowry is lower, with some negative mass, and still centered above zero. The net amount taken by the groom's parents, however, is approximately centered at zero, with mass on both sides. This reflects the fact that – consistent with Prediction 1 – a substantial share of grooms' parents do, on net, benefit from their son's dowry. Many grooms' parents, on the other hand, endow their sons with resources on net at the time of marriage.

In addition to confirming Prediction 1, this figure reveals an important fact about dowry from our new data. The "net dowry" measure often used in the literature does not correspond to the "net groom's parents' benefit." While much of the literature has focused on the distinction between gross and net dowry measures (e.g., Edlund (2006)), our results indicate that both measures do not capture the internal allocation of resources within the groom's family. Data on property rights over dowry are needed to understand dowry's implications for consumption across generations.

Finally, in Figure 4, using the Destination Data, we plot the inverse hyperbolic

[15] We use the Destination Data because parents in the Origin Survey were not asked about what the bride's family gave to all other parties. This is both because of time constraints in the phone survey and because they are less likely to know the transfers on the bride's side.

Figure 3: Distribution of Gross and Net Transfers in the Destination Survey

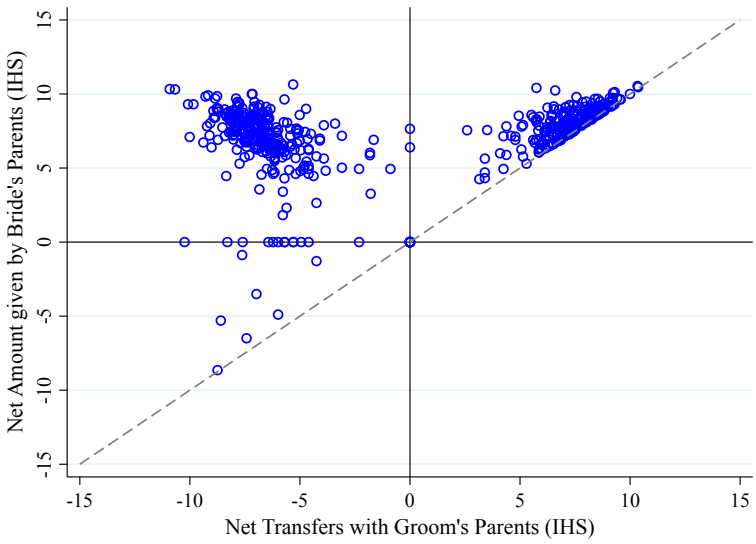


This figure shows the distribution of three different measures of dowry payments (gross transfer from bride's parents, net transfer from bride's parents, and net transfer to the groom's parents) in the 2018 Destination Survey. All values are coded so that transfers in the direction of the groom's parents are positive and away from the groom's parents are negative.

sines of the net amount given by the bride's side against the net transfer taken by the groom's parents. This allows us to look at what groom parent giving and taking looks like across different dowry amounts. The fact that almost all data points are positive shows that dowry *giving* is essentially universal—there are only a handful of families practicing bride price, where the bride's family benefits on net (the dots below the x-axis). By contrast, dowry *taking* is far from universal, and the deep heterogeneity in grooms' parents behavior emerges even more clearly in this graph. In about half of the cases where the brides' parents give positive dowry, the grooms' parents also give net transfers to the young couple (dots to the left of the y-axis), and the amount given increases in the amount given by the bride's side. In the other half of cases, to the right of the y-axis, grooms' parents benefit from the transfers from the bride's side. Here, the amount taken is positively related to the amount given.

We next investigate the drivers of this substantial heterogeneity in dowry's allocation by testing the model's other predictions.

Figure 4: Distribution of Net Transfers



This figure shows the relationship between the inverse hyperbolic sine of the net amount (in 100s of Rupees) given by the bride's parents and net amount received by the groom's parents in the 2018 Destination Survey.

Prediction 2 We test whether parents are more likely to be Net Takers from the dowry if the son is a migrant in columns 1 (Origin Survey) and 3 (Destination Survey) of Table 3.[16] In these columns, we regress an indicator variable for whether the groom's parents took on net from the dowry (an indicator for $\tau > 0$) on an indicator variable for whether the son is a migrant. We additionally control for whether the son currently co-resides with his parents account for the fact that property rights may be hard to measure in cases where sons and parents co-reside. The omitted category is, therefore, sons that remain in the same village as their parents (Origin Survey) or were born in Delhi or came to Delhi as children with their parents (Destination Survey) but do not currently co-reside. Consistent with the model's prediction, parents of migrants are 8 percentage points more likely to take in the Origin Survey and 27

[16]In Appendix Table A1, for the Origin Survey, we perform the same analysis with an alternative measure of taking with fewer missing observations – the average fraction of gifts owned by the groom's parents. We recover the same patterns as in Table 3 with this alternate measure. We do not use the fraction of gifts owned as our main measure because it is less closely aligned with our model, which predicts that parents take *on net*. Determining if parents take on net relies on monetary valuations for the gifts given and taken. Nonetheless, the fraction of gifts owned is highly correlated with the Net Taking in cases where we are able to construct both.

Table 3: Predictions 2 & 3: Migration, SES, Pareto Weights, & Net Taking

	Dep. Var.: Parents are Net Takers			
	Origin Survey:		Destination Survey:	
	(1)	(2)	(3)	(4)
Migrant Son	0.076**	0.008	0.271***	0.245**
	(0.037)	(0.056)	(0.087)	(0.116)
Migrant Son × Ln(Son Occ Score)		0.192**		
		(0.085)		
Non-Migrant Son × Ln(Son Occ Score)		0.027		
		(0.050)		
Ln(Father Occ Score)		-0.034		
		(0.039)		
Migrant Son × Parents have veto power				0.278***
				(0.075)
Non-Migrant Son × Parents have veto power				0.289***
				(0.086)
Coresidence & Mar. Year & Age FEs	Yes	Yes	Yes	Yes
Education dummies	Yes	No	Yes	Yes
Mean of dependent variable	0.273	0.270	0.447	0.449
R-squared	0.042	0.051	0.115	0.151
Observations	1869	1300	557	552

Notes: This table reports the relationship between migration, socioeconomic status, and net-taking behavior in both the Origin Survey (columns (1) & (2)) and the Destination Survey (columns (3) & (4)). The outcome is an indicator variable for whether the grooms' parents are Net Takers (i.e., those who had a positive net transfer with the bride's parents). In the Destination Survey, we define migrants as those who moved to Delhi alone or as an adult and do not currently live with their parents. In the Origin Survey, we define migrants as individuals who have permanently left their parents' village. The occupation scores are the median monthly earnings of a certain occupation created by mapping our occupational categories to data from the NSS. Parents are coded as having veto power if their son reports that he would not have married without their consent. Standard errors are clustered at the household level for the Origin Survey. *,**, and *** denote 10, 5, and 1% significance respectively.

percentage points more likely to take in the Destination Survey.[17]

Prediction 3 This prediction states that the groom's parents' likelihood of taking is increasing in both the migrant son's income and the parents' Pareto weight, holding parents' income fixed. To test the first part of this prediction, we exploit the fact that our Origin Survey (but not the Destination Survey) collected information on both fathers' and sons' occupations. This provides a more accurate proxy of y_P and y_K than current earnings because it is less subject to age at the time of the

[17]The difference in the point estimates between the Origin and Destination Surveys could reflect the differences in the samples' characteristics. For example, the grooms in Delhi are much richer, and in our model, parents are more likely to take from relatively wealthier sons.

survey, seasonality, the endogenous migration decision, and recall noise than current income measures. We convert this information into occupational scores by matching it to the nationally representative National Sample Survey's (round 68, conducted in 2011-12) occupational codes. The occupational score is then the median monthly earnings of the occupation. Column 2 of Table 3 tests whether, conditional on the father's occupational score, parents are more likely to take when migrant sons have higher occupational scores. This is indeed the case. There is a large and statistically significant interaction between the son's occupational score and migrating. For migrant men, a 100% increase in the son's occupational score increases the likelihood of parents taking by 19 percentage points. In contrast, for non-migrant sons, the son's occupational score is not meaningfully associated with taking, which, although not a prediction of the model, is consistent with the availability of the income transfer α to share extra income with parents without resorting to dowry.

Column 4 of Table 3 tests the second part of Prediction 3. To proxy for the parents' Pareto weight θ, we exploit the following question from the Destination Survey: *"If your parents had not approved of the marriage, how much would that have affected your decision?"* We interpret parents as having a higher θ when sons report that they would not have married without parental approval. Thus, we expect that parents will be more likely to take when sons report that parents have veto power. This is indeed the case: when sons report parents have veto power, parents of migrant sons are 28 percentage points more likely to be Net Takers. Interestingly, this is true for migrant and non-migrant sons, suggesting that dowry is used to redistribute consumption according to Pareto weights, regardless of migration status.[18]

While consistent with the predictions of the model, the results in Table 3 are less consistent with an alternative model in which dowry facilitates migration because it can be used to pay other migration costs such as setting up a new household or business. In columns 1 and 3, we observe that parents are more likely to take when a son migrates. This is inconsistent with a world where dowry enables migration because it is used to pay migration costs. In that case, we might expect there to be

[18]We speculate that the difference between son's income, which only correlates with net-taking for migrants, versus Pareto weights, could stem from the fact that variation in income necessarily provides the liquidity to use the income transfer, α, to redistribute it for non-migrants, whereas for migrants this tool would not be available. By contrast, Pareto weights could vary such that even non-migrant sons do not have sufficient liquid income for the required redistribution, such as if sons' earning is through work on the family farm.

less dowry left for parents to benefit from when sons migrate.

Auxiliary Prediction 1 The Origin Survey contains information about transfers received by the parents from sons and vice versa. To test auxiliary Prediction 1, which states that parents who receive remittances from migrant sons are more likely to have taken from the dowry than parents that do not receive remittances, we construct an indicator variable for whether a son made net financial transfers to the parents in the year prior to the survey (before the COVID-19 pandemic). Overall, around 30% of sons transfer on net to their parents (45% for migrant sons). We relate this variable to net taking and find a strong positive relationship between net taking of the dowry by parents and receiving remittances from migrant sons (Table 4), consistent with the model. As in the model, sons sending remittances appears to be a signal of being in a Seeking household where parents are also likely to take from the dowry.

Table 4: Auxiliary Prediction 1: Remittances & Net Taking

	(1)	(2)
	Net Taker	Net Taker
Son Transfers	0.052*	0.008
	(0.031)	(0.035)
Migrant Son		-0.008
		(0.051)
Son Transfers × Migrant Son		0.168**
		(0.074)
Coresidence & Mar. Year & Age FEs	Yes	Yes
Education Dummies	Yes	Yes
Mean of Dependent Variable	0.271	0.271
R-squared	0.062	0.068
Observations	1128	1128

Notes: Data are from the Origin Survey. 'Net Takers' are defined as grooms' parents who had a positive net transfer with the bride's parents. That is, they were made financially better off by the total gifts transferred at the time of the marriage. Son transfers is an indicator variable equal to 1 if the son made positive net financial transfers to his parents in the year prior to the survey. Standard errors are clustered at the household level. *,**, and *** denote 10, 5, and 1% significance respectively.

5 Migration Predictions

In this section, we test the predictions of the model about dowry's role in enabling migration. These predictions are important for understanding the dowry tradition's

aggregate effects and whether dowry can help facilitate structural change. In the first subsection, we test Prediction 4, and in the second subsection, we test Prediction 5.

5.1 Prediction 4: Association Between Dowry Traditions and Migration

In this section, to test whether households with a dowry tradition have a higher probability of having a migrant son, we regress male migration on a measure of the strength of dowry traditions. To do so, we must introduce two new data sources. We first discuss the geographic variation in historical dowry traditions (our right-hand-side variable). We then introduce the main dataset used to test the predictions, the National Sample Survey's migration module (the source of our left-hand-side variable). Finally, we combine these datasets to test the prediction.

5.1.1 Variation in Historical Dowry Traditions

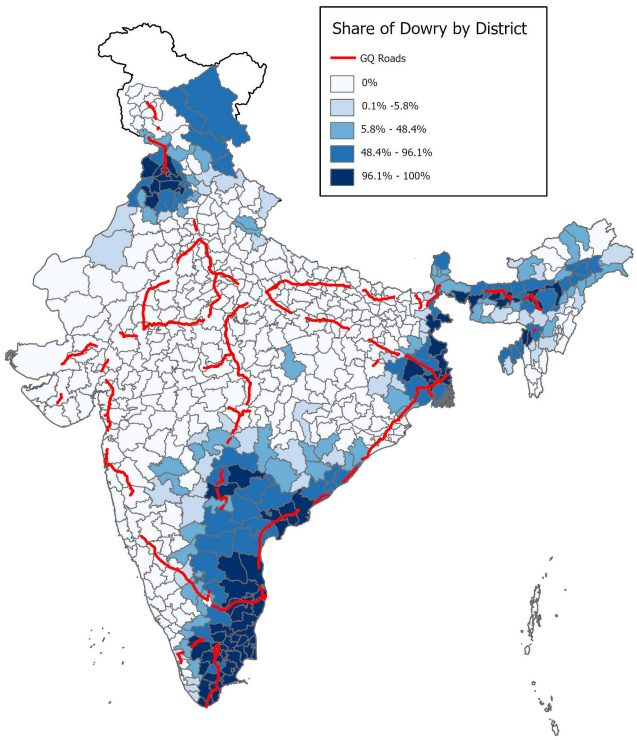
Testing the prediction requires a source of variation in the strength of dowry traditions. For this, we draw on geographic variation in the extent that dowry was traditionally practiced in India. As long as places that traditionally practiced dowry still have higher dowries today (e.g., because cultural change is slow and dowry payments are somewhat path dependent), we should expect households in these places to behave more like the "dowry" households in the model relative to individuals from places with a weaker history of dowry traditions. An advantage of using this variation is that it predates the large changes in India that have accompanied economic development and which may affect both migration and dowry payments.

Measure of Dowry Traditions We use the *Ancestral Characteristics* data developed by Giuliano and Nunn (2018) to create a district-level measure of the strength of dowry traditions. The *Ancestral Characteristics* data combine ethnicity-level anthropological data (predominantly from the *Ethnographic Atlas* (Murdock, 1967)) with maps of the current distribution of 7,500 language groups from the *Ethnologue* (Gordon Jr, 2009). After mapping the language groups in the *Ethnologue* to the *Ethnographic Atlas* (and other anthropological sources), Giuliano and Nunn (2018) calculate the weighted average of each traditional cultural trait among the population in an area by averaging over the population-weighted current language polygons,

using weights from the 2007 LandScan population data. As the public version of the data made available by Giuliano and Nunn (2018) calculates trait averages at the state level for India, we follow Giuliano and Nunn's methodology but recalculate trait values at the district level.

Figure 5 reports the district-level share of the population with traditional dowry according to this measure. The strength of dowry traditions varies within broad regions, and the measure is frequently 0, implying there is no linguistic group connected to an ancestral group that practiced dowry. But the measure can also take very high values. Given the non-negligible mass of districts with values just above 0 (likely due to either minor linguistic groups reporting dowry or group boundaries extending just over district boundaries), for a district-level discrete dowry measure, we code districts as having historical dowry if more than 0.1% of the population traditionally practiced dowry (368 districts out of 582). We then show robustness to other cutoffs.

Figure 5: Share of Population From Groups That Traditionally Practice Dowry by District, and Map of GQ and NS-EW corridors



This figure shows the district-level share of the population with a tradition of dowry. The data are generated following the methodology of the *Ancestral Characteristics* data developed by Giuliano and Nunn (2018). The map of highways that make up the Golden Quadrilateral (GQ) and NS-EW corridors is overlaid over the dowry variation in red.

Geographic Variation & Consistency With Qualitative Data Sources The variation in the dowry measure shown in Figure 5 may seem surprising for two reasons. First, it suggests a relatively low prevalence of dowry, even though dowry is nearly universal today. This is because our measure is based on historical practices, in most cases prior to contact with the British. As Section 2 discusses, historically dowry *was* far from universal, and a variety of marriage traditions were practiced in India. Thus, some areas that are coded as having no dowry traditionally may have experienced rapid increases in dowry's prevalence in recent decades. This appears to be the case, for example, in Kerala: "*The dowry system is not general everywhere in Kerala. In Palghat and Trivandrum districts it has become common, Nayars having taken the cue from Christians and Tamil Brahmins, among whom the dowry system was well entrenched*" (Puthenkalam, 1977); and in Madhya Pradesh: "*Until 15 years earlier, the demand for dowry was very limited*" (AIDWA, 2003, p. 135).

Second, the geographic regions with higher rates of dowry may not align with contemporary impressions about the status of women in different states, which may raise questions about the validity of the coding. To address this concern, we validated the ancestral measure by comparing it to qualitative evidence from (1) two summary publications on dowry practices, Goody and Tambiah (1973) and AIDWA (2003), and (2) Yale's *Human Relations Area Files* (HRAF) database of ethnographic studies. Both AIDWA (2003) and Goody and Tambiah (1973) are consistent with the greater prevalence of dowry in the South (relative to the North) seen in the map. AIDWA writes, "*Thus in North India, unlike South India, land, territory, and productive assets were not usually given in dowry*" (p. 16). Goody and Tambiah (1973) observe, "*What I call 'indirect dowry,'*" where the groom's family provides bridewealth, "*is more common in North India than in the South, where dowry proper... prevails*" (p. 20).

The underlying ethnographies by cultural group in the HRAF database further confirm the Giuliano and Nunn (2018) coding based on specific language groups. The states and territories that have high ancestral dowry, Andhra Pradesh, Assam, Punjab, Tamil Nadu, Telangana, West Bengal, and Ladakh, have large cultural groups that historically practiced dowry in their present population.[19] The central Northern

[19]Telugu in Andhra Pradesh and Telangana (Dube, 1955; Tapper, 1987), Bengali in West Bengal and Assam (Fruzzetti, 1982; Rohner et al., 1988; Roy, 1975), Punjabis in Punjab (Eglar, 1960; Honigmann, 1957), Tamil in Tamil Nadu (Beck, 1972; Dhanasekaran, 1965), and Tibetan in Ladakh (Hermanns and Schuetze, 1948; Rockhill, 1895).

states that are coded as having little ancestral dowry are home to ethnic groups that traditionally practiced bride price.[20]

Quantitative Validation We next check if the ancestral data is predictive of contemporary practices. Because this variation is historical, it may not explain all or even most of the modern variation in dowry. Indeed, since dowry is widespread today, we use this measure as a source of intensive margin variation in dowry size rather than extensive margin variation in dowry prevalence. We validate our measure using contemporary measures of dowry sizes from the large-scale 1999 round of the Rural Economic and Demographic Survey (REDS) (National Council of Applied Economic Research (India), 1999). An advantage of validating the measure in the 1999 REDS is that these data were collected right before the highway construction program whose differential effects in dowry vs. non-dowry districts will be used to test Prediction 5 in Section 5.2. In Table A2, we regress log gross and net dowry measures on the tradition measure.[21] All specifications control for marriage year fixed effects to account for inflation over time. Columns 1 and 2 show that the historical dowry measure is associated with an 81% (gross) to 109% (net) greater dowry payment. Columns 3 and 4 show that a positive relationship remains (though it shrinks) even after controlling for regional geographic variation via fixed effects for six geographic regions. We conclude that the ethnographic data is predictive of modern dowry payments.

We next turn to a more geographically widespread dataset, the India Human Development Survey (IHDS) (2011), which allows us to also include state fixed effects. In Table A3, we test if the traditional dowry measure is associated with whether dowry is frequently or ever paid in gold (a proxy for dowry size, which is not measured directly in the IHDS). The IHDS data confirm that the district-level traditional dowry measure is associated with a greater likelihood of having dowries paid in gold, even after controlling for state fixed effects.

[20]For example, Bhil in Madhya Pradesh, Gujarat, Maharashtra, and Rajasthan (Naik, 1956; Singha, 1987; Mann, 1985) and Gond in Madhya Pradesh and Maharashtra (Fuchs, 1960; Grigson and Elwin, 1949).

[21]We focus on log dowry measures because dowry values are extremely skewed, and intensive margin variation in dowry payments is likely to be more relevant since practicing any dowry is nearly universal (Chiplunkar and Weaver, 2021).

5.1.2 National Sample Survey: Migration Module

We obtain nationally representative data on out-migration from a special module included in the 64th round (collected July 2007-June 2008) of India's National Sample Survey (NSS) (Indian Ministry of Statistics and Programme Implementation, 2008). All rounds of the Schedule 10 Survey of the NSS ask detailed questions about employment and education for current household members. However, the 64th round also asks an extensive set of migration-related questions. A respondent lists all family members who have migrated and provides demographic details about the migrant, as well as the reason for migration and the year of migration. We focus on the set of questions regarding permanent migration rather than seasonal migration.

Table A4 reports the means of key socioeconomic characteristics drawn from these data and evaluates whether these characteristics are systematically different in dowry and non-dowry districts. We report results from regressions where our explanatory variable of interest is the population-weighted share of the district that practiced dowry traditionally, and the outcome is a particular district characteristic. After controlling for state fixed effects, out of the 14 characteristics we test, only distance to the closest city is statistically significantly different between dowry and non-dowry districts. Thus, in subsequent analyses, we control for state fixed effects (in cross-sectional regressions) and state-by-year fixed effects (in panel regressions). In robustness checks, we also control for distance to the closest city (along with various demographic and economic characteristics of households), since this is the only non-balanced characteristic conditional on the state fixed effects.

5.1.3 Test of Prediction 4

We combine the NSS data with the historical measure of dowry traditions to test Prediction 4, which states that stronger dowry traditions increase the probability of male migration. Here, and elsewhere, we only consider permanent rather than seasonal migrants. In Table 5, using a sample of males aged 15–45, we regress an indicator variable equal to 1 if an individual had migrated by 2007 (the year the data were collected) on three different versions of the district-level dowry tradition measure. The first, continuous measure is the share of the population belonging to groups with dowry traditions (columns 1–3). While this measure uses the most information, we also consider two discrete measures, since we will need to categorize

districts as high and low traditional dowry districts to test Prediction 6. The second measure is an indicator variable equal to 1 if the continuous value is greater than 0.1% (columns 4–6). For our other discrete measure, we use a more stringent cut-off of 10% to capture districts with a high share of traditional dowry (columns 7–9). We focus on males aged 15–45 since younger men are unlikely to have had the opportunity to migrate without their parents and the older sample may be affected by selection due to mortality and poor recall regarding early migrants. Additionally, migration rates for those with earlier birth years are negligible. For each measure, we report the estimates with no controls (first column) and add state and year of birth fixed effects (second column), as well as caste fixed effects, household head education controls, and additional geographic controls for the district centroid's latitude and longitude, the distance to the coast, and the distance to the closest big city (third column).

Columns 1-3 show that the continuous dowry measure is positively and significantly related to male migration. Despite controlling for a substantial fraction of the geographic variation in dowry practices with the state fixed effects and geographic controls, the positive relationship remains and continues to be significant (the point estimate actually becomes larger than the baseline specification). For the discrete measures, which leverage less information, the association between traditional dowry and male migration is still positive, though no longer statistically significant with the inclusion of the most stringent additional controls. Reassuringly, as we would expect, the point estimate is larger for the higher cut-off of 10% relative to 0.1%.

In Table A5, we also use the two waves of IHDS data to test this prediction. Across different combinations of fixed effects and age groups, our results are again consistent with the prediction.

Altogether, our results confirm that historical dowry traditions are associated with higher rates of male out-migration, supporting the hypothesis that dowry can ease migration frictions. One alternative explanation for this finding is that the dowry is used to pay migration costs. However, combining this result with the results of our survey data indicates that intra-household frictions are likely to play an important role. This is because, as mentioned earlier, if dowry were instead used to pay the pecuniary costs of migration, we would expect parents of migrant sons to receive *less* dowry rather than more.

Table 5: Prediction 4: Association Between Dowry Traditions and Male Migration

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Dep Var.: Individual Migrated								
Dowry (Continuous)	0.0266***	0.0434**	0.0367**						
	(0.0099)	(0.0195)	(0.0181)						
Dowry (0.1% Threshold)				0.0193**	0.0127	0.0068			
				(0.0084)	(0.0112)	(0.0109)			
Dowry (10% Threshold)							0.0222***	0.0282*	0.0242
							(0.0085)	(0.0170)	(0.0165)
Mean of Dependent Variable	0.238	0.238	0.222	0.238	0.238	0.222	0.238	0.238	0.222
Observations	194,957	194,957	191,052	194,957	194,957	191,052	194,957	194,957	191,052
R-squared	0.001	0.048	0.053	0.000	0.048	0.052	0.001	0.048	0.053
State FEs	N	Y	Y	N	Y	Y	N	Y	Y
Year of Birth FEs	N	Y	Y	N	Y	Y	N	Y	Y
Distance Controls	N	N	Y	N	N	Y	N	N	Y
Caste FEs	N	N	Y	N	N	Y	N	N	Y
Education Controls	N	N	Y	N	N	Y	N	N	Y

Notes: This table reports the relationship between district-level dowry traditions from the *Ancestral Characteristics* data and male migration using data from the NSS Round 64 migration module. The outcome is an indicator variable for whether an individual migrated. The sample is restricted to males born after 1945. The continuous dowry measure is the share of a district's current population belonging to groups with dowry traditions. The 0.1% threshold discrete measure is an indicator variable equal to 1 if more than 0.1% of the district population belongs to groups with dowry traditions. The 10% threshold discrete measure is an indicator equal to 1 if more than 10% of the district population belongs to groups with dowry traditions. The distance control includes the district centroid's latitude and longitude, the distance to the coastline, and the distance to one of the closest large cities (Mumbai, Kolkata, Delhi, Chennai). Standard errors are clustered at the district-level. *,**, and *** denote 10, 5, and 1% significance respectively.

5.2 Prediction 5: Do Males From Dowry Districts Migrate More in Response to Highway Construction?

Finally, we investigate how the effect of a reduction in migration costs varies with traditional dowry prevalence. Prediction 5 states that, as long as migration rates are relatively low, communities in which dowry traditions are stronger should experience a greater increase in male migration in response to a decline in the cost of migration. In this section, we first introduce the cost shock we will use – two highway expansion programs – and then empirically test the prediction.

5.2.1 The Golden Quadrilateral & North-South/East-West Highway Expansions

To test Prediction 5, we exploit a reduction in the cost of migration due to the expansion of India's highway system. We study the construction of the Golden Quadrilateral (GQ) highway system, which connects the four nodal cities, as well as the North South-East West (NS-EW) corridor, which connected the corners of the GQ through the interior.[22] Starting in 1999, these projects upgraded more than 5,846 km of already existing highways in India. The National Highway Development Project (NHDP) invested about US $71 billion to build roads, widen the national highways, and strengthen them for heavy traffic and truck transportation. Previous work shows how the expansion of the GQ affected firm distribution (Ghani et al., 2016) and that better connections to large cities improved economic development (Alder, 2016) and welfare (Asturias et al., 2018).

The NHDP has publicly released a list of projects that were part of the construction of the GQ and the NS-EW corridor highways. We matched these projects to the CapEx data maintained by the Centre for Monitoring Indian Economy (CMIE) (2023), which includes detailed information on all infrastructure projects in India with a cost greater than 10 million Rupees (roughly 135,000 USD). By cross-referencing the NHDP list with CapEx, we can identify the completion year and district of each of these projects. Figure 5 plots the location of the full set of projects we identify.

[22]Three of the four cities (Mumbai, Kolkata, and Chennai) were chosen to be capitals of the British Presidencies as they were natural harbors and could be used as ports for trade. There was little economic activity in these three regions prior to the British and not much of a pre-existing road network. The fourth (Delhi) was a major historical capital of various pre-Colonial empires and was a British cantonment during the Raj.

5.2.2 Test of Prediction 5

Empirical Strategy We leverage the staggered timing of highway construction across districts as a source of variation in migration costs over time and space under the assumption that access to roads reduces the cost of migration (Morten and Oliveira, 2023). The staggered timing of the construction of highway segments combined with information on the timing of migration from the NSS allows us to estimate the effect of highway construction on male out-migration in dowry vs. non-dowry districts. For our analysis, we transform our cross-sectional dataset into a panel at the individual i-year t level for the years between 1996 and 2007.[23] The transformed data would allow for the estimation of the following, "naive" event study regression separately for individuals from dowry and non-dowry districts:

$$y_{iajdt} = \alpha_i + \theta_{jt} + \delta_a + \sum_s \beta_s GQ_{dts} + \mathbf{X}_{iajdt}\boldsymbol{\gamma} + \epsilon_{iajdt}, \tag{2}$$

where y_{iajdt} is an indicator variable equal to 1 if an individual i of age a, state j, and district d has migrated before year t. We first examine migration for all purposes and then for employment purposes only.[24] The fixed effects α_i, δ_a, and θ_{jt} are at the individual, age, and state-by-year level. GQ_{dts} is an indicator variable equal to 1 if in year t a highway segment had been constructed s years ago in district d. This framework should therefore control for any time-varying shocks at the state level, as well as any individual-level and age-specific time-invariant differences. Depending on the specification, the controls $\mathbf{X}_{iajdt}$ also include differential trends for geographic characteristics and cultural features (e.g., patrilineal inheritance and historical plow adoption), caste-by-year fixed effects, and differential trends by household consumption.

This naive approach and its related difference-in-differences regression, which assumes a constant treatment effect across treated units over time, may be problematic. A growing literature suggests that researchers must be cautious when estimating the effect of staggered treatments with two-way fixed effects (Goodman-Bacon, 2021; Callaway and Sant'Anna, 2020; Sun and Abraham, 2021; De Chaisemartin and

[23] Corno et al. (2020) use a similar approach to analyze the effects of droughts on child marriage in India and Sub-Saharan Africa.

[24] Employment-related migration includes the following NSS categories under reason for migration: in search of employment, in search of better employment, business, to take up employment/better employment, transfer of service/contract, and proximity to the place of work.

D'Haultfuille, 2020). This literature shows that, in many instances, a traditional two-way fixed effects model does not recover easily interpretable estimates of the Average Treatment Effect (ATE) or the Treatment on the Treated (ATT). This is for at least two reasons. First, if effects evolve over time or are heterogeneous, previously treated units will form a bad control group for later treated units.[25] Second, the weighting of different treatment effects from different units will depend on the number of periods that a unit is observed as treated, so that the estimated treatment effect in the naive difference-in-differences regression depends on the timing of treatment.

To account for these issues, our empirical strategy utilizes the proposed solution of Borusyak et al. (2021), as their framework adheres most closely to our context. We also show robustness to using the method proposed by Callaway and Sant'Anna (2020), which produces very similar results.[26] We estimate event studies with carefully chosen comparison units (for instance, previously treated units are never used as controls). Given the differential timing of our treatments, this implies that certain units will have more pre-treatment periods, while others will be observed longer post treatment. We include the controls from the event study regression described above.

Borusyak et al. (2021) employ an imputation-based approach, where they model the non-treated potential outcome using only the control group (in our application, the not-yet treated districts and the never treated districts) and extrapolate the non-treated outcome to impute the unobserved potential outcomes of treated units. They compute individual-level treatment effects for each observation using the imputed values, which are then aggregated to give the average effect for each event-time. Standard errors are clustered at the district-level, and the omitted period is the earliest pre-treatment period.

We focus on individuals' migration decisions between the years 1996 and 2007 (the last year detailed migration data are available), though we exploit information on projects implemented as late as 2016 to estimate the pre-treatment effects of highway construction. For those in GQ districts, we restrict our sample to those between 13 and 45 at the time they received the project, so as to not pick up how

[25]See Goodman-Bacon (2021) for a decomposition of how the traditional two-way fixed effects ATT is a weighted average of each of the 2x2 ATTs, which may lead to issues when previously treated groups are control groups for certain 2x2 comparisons. The paper also suggests diagnostic tests for when it is appropriate to use the traditional two-way fixed effects model.

[26]We use the doubly robust estimator, as recommended by Callaway and Sant'Anna (2020). Standard errors are calculated using the wild bootstrap and clustered at the district-level.

GQ affected dependent (child or old-age) migration.[27] But in all specifications, we also include age fixed effects that account for differential migration rates by age and perform a robustness check where we match the non-GQ sample to the realized age distribution in the GQ districts.

We expect the strongest impacts to be on individuals who were between 15 and 30 at the time of the survey (2007). We view this as the group that is most intensively treated because those younger than 15 are more likely to be too young to respond, and the average male marriage age in our sample is 23.[28] Thus, those as old as 30 in 2007 would have still been around marriage age when the first GQ projects were built. Older men are likely to have already married, and allocation decisions over the dowry may be difficult to change ex-post due to the highway construction. So, it is reassuring if we estimate smaller (or null) effects for the 31-45 year old sample.

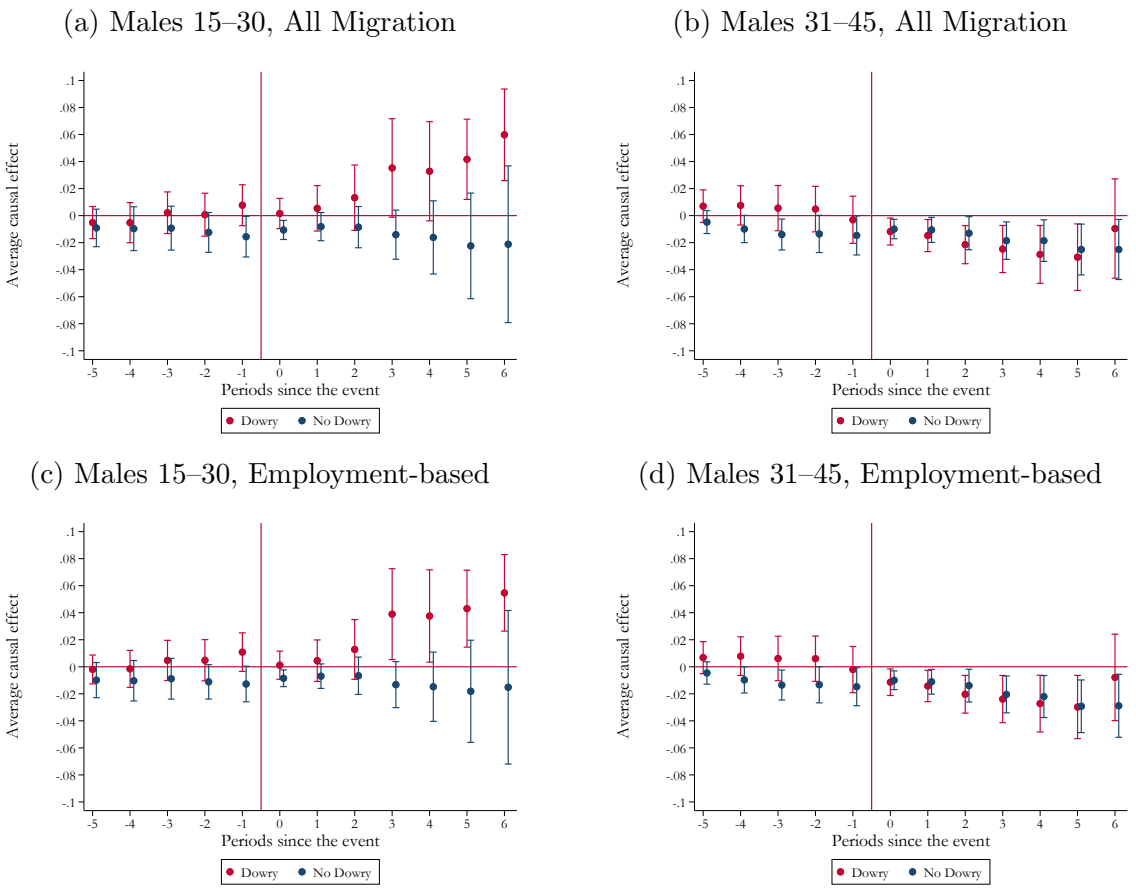
Results Figure 6 reports the results using the methodology of Borusyak et al. (2021). The top panels report results for migration for any reason, while the bottom panels restrict the outcome to be migration for employment-related reasons only. Panel (a) reports the results for males who were 15–30 at the time of the survey (our intensively treated group), while Panel (b) reports the results for males who were 31–45 (the less intensively treated group). Panels (c) and (d) do the same but for employment-based migration only. In all cases, zero is normalized to be the year of the first highway construction project in the district. None of the panels exhibit pre-trends in migration rates prior to GQ construction.

After the receipt of the first highway construction project, Panel (a) shows that there is a large and significant increase in out-migration for prime-age men in dowry regions, while the estimated effect on migration for non-dowry males is indistinguishable from zero. In contrast, there is no increase in migration for older males (Panel (b)). This lack of an increase is consistent with the idea that the allocation of dowry at the time of marriage (which is likely to have already occurred for the older group) is important for allowing young men to take advantage of increased migration opportunities. If anything, there is a decline for older groups, which could be a reaction to the increase among younger men (e.g., if there are more young migrants, fewer older men now migrate for risk mitigation purposes). Restricting the outcome to be

[27] We choose an initial age slightly younger than 15 to capture individuals who may be too young to initially migrate but could respond to the expansion after a few years.

[28] The average male age of marriage was 22 in our Origin Survey and 23 in our Destination Survey.

Figure 6: Effects of GQ on Male Migration by Dowry Status



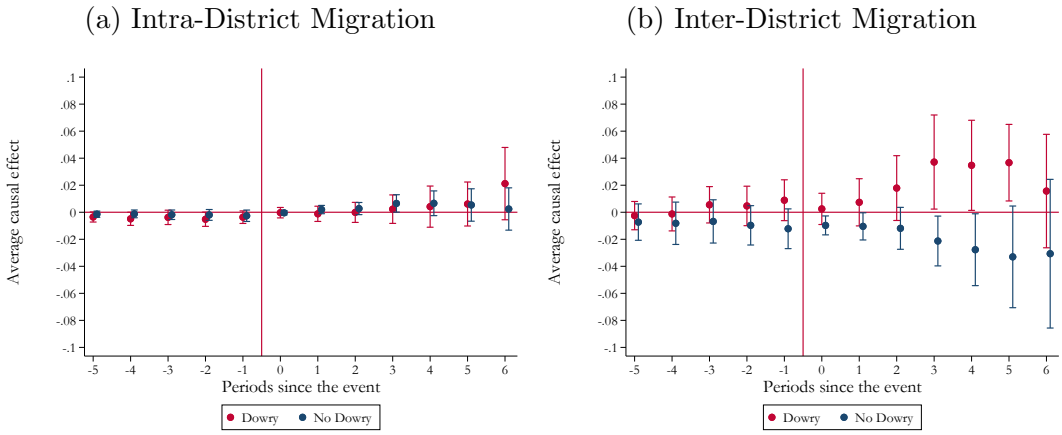
This figure shows the event study estimates of the effect of the GQ on migration. Panels (a) and (b) show the event study estimates of the effect of the GQ on all migration, while Panels (c) and (d) are restricted to employment-based migration specifically undertaken either: in search of employment, in search of better employment, for business, to take up employment/better employment, due to the transfer of service/contract, or for proximity to the place of work. In Panels (a) and (c), the sample is of males in the 2007 NSS who were aged 15-30. In Panels (b) and (d), the sample is of males in the 2007 NSS who were aged 31-45. For those in GQ districts, we restrict our sample to those between 13 and 45 at the time they received the project. All estimates use the methodology of Borusyak et al. (2021) and include individual, age, and state-by-year fixed effects. Standard errors are clustered at the district level.

defined as employment-based migration (as opposed to any migration) in Panel (c) confirms that the results are driven by migration for employment, consistent with the idea that men are migrating to capture higher returns to migration.

Next, in Figure 7, we estimate the effects of the GQ by dowry tradition on *intra*-district and *inter*-district migration separately. That is, the dependent variables are indicator variables for migrating within or out of the district. We find no evidence of a strong effect on intra-district migration for either group. This is consistent with the fact that GQ segments would have mainly connected locations to other

districts *and* with the fact that nearby migrations may not create the same frictions for optimal income sharing as farther afield migrations. In contrast, our migration effects for the dowry sample are concentrated in inter-district migrations, where we would expect that the income-sharing frictions created by migration would be greater. Altogether, these results suggest that dowry enables longer-distance migrations for employment purposes in response to a reduction in the cost of migration, consistent with improvements in labor allocation and larger wage gains.

Figure 7: Effects of GQ on Young (Age 15-30) Male Intra/Inter-District Migration by Dowry Status Using Borusyak et al. (2021)



This figure shows the event study estimates of the effect of the GQ on migration based on the out-migrant's destination for males in the 2007 NSS who were aged 15-30. In Panel (a), the out-migrant's current location is located within the same district as their previous household. In Panel (b), the out-migrant's current location is not located within the same district as their previous household, although it is possible their current location is in the same state. All estimates use the methodology of Borusyak et al. (2021) and include individual, age, and state-by-year fixed effects.

Robustness We also conduct a number of robustness checks in Figures A1 and A2. First, in Figure A1 we include additional geographic controls (Panel (a)), and control for differential time trends by distance to the closest city and distance to coastlines. Even though all our specifications already include state-by-year fixed effects, the controls help ensure that the results are not driven by differential time trends across areas (within states), as neither the locations of the GQ nor dowry traditions are randomly assigned. The results remain similar.

Next, we control for caste-by-year fixed effects and the time-varying effects of the NSS's measure of household expenditures (Panel (b)). This test is intended to control for any socioeconomic characteristics that may be related to belonging

to a dowry group and would otherwise lead to bias from differential time trends or heterogeneous effects of the GQ due to differences in socioeconomic status rather than cultural traditions. Even though the household expenditure measure is observed after migration decisions have taken place and is therefore endogenous, we do not find that including these controls substantially affects our results.

In Figure A1 Panel (c), we control for other characteristics from the *Ethnographic Atlas* that may be related to dowry traditions or otherwise affect household behavior (such as the district-level prevalence of the plow and patrilineal inheritance) and allow the effects of these controls to vary over time.[29] This robustness check helps ensure that our results are not driven by other cultural traits that may be correlated with dowry and migration.

In Panel (d) of Figure A1, we use a different estimation procedure proposed by Callaway and Sant'Anna (2020).[30] Our qualitative results are similar: we see an increase in emigration from rural areas for younger cohorts that receive a GQ segment in dowry areas. In Panels (e) and (f) we investigate whether our results could be biased by age-specific trends. Due to our sample restriction in the GQ districts that individuals are 13–45 at the time of the road construction, the age distribution between GQ and non-GQ districts differs. In Panel (e), we show that failing to include the age fixed effects does not affect our estimates, suggesting that our results are not sensitive to age-specific trends. In Panel (f), we adjust the age distribution in the non-GQ districts to ensure that the age distributions are the same between GQ and non-GQ regions.[31] Our results again remain the same.

Finally, in Figure A2 we vary the cutoff for what constitutes a dowry prevalent district. In our baseline specification, we classify a district as dowry prevalent if it

[29]We focus on these two controls because the plow has been shown to be related to female labor force participation (Alesina et al., 2013), and male inheritance is thought to coincide with the practice of dowry (Botticini and Siow, 2003).

[30]Callaway and Sant'Anna (2020) recognize that the effects may be dynamic (so vary over time-since-treatment t), and that early treated groups may have different effects from later treated groups (and so vary over treated groups g). As such, the event study estimates an $ATT(g,t)$ that varies over time and by treated group, estimating every possible combination of 'group-time' $ATT(g,t)$, which are then aggregated in different ways (by time-period, by group or by event-time) to get overall ATTs. We use the doubly robust estimator, as recommended by Callaway and Sant'Anna (2020). Standard errors are calculated using the wild bootstrap and clustered at the district-level.

[31]We first compute the fraction of in-sample individuals in each age group in GQ districts after implementing the age restrictions (individuals need to be 13–45 at the time of the road construction). A new control group is then drawn via stratified random sampling from non-GQ districts to match the distribution of ages in the GQ districts.

has greater than 0.1% historical dowry practice. In Figure A2, we vary this cutoff to be 1%, 10%, and 25% in the different panels. Each of these cutoffs produces very similar patterns in male prime-age out-migration.

In sum, our analysis indicates that the main predictions of our model are satisfied by the data, both in terms of how dowry is distributed across generations, and in terms of how dowry may enable long-term migration.

6 Conclusion

This paper explores whether cultural traditions can relax migration constraints in a developing context, where improving the allocation of labor may have large returns. Specifically, we consider the possibility that dowry – a payment from the bride's family accompanying marriage – can provide households with liquidity at the time of marriage, enabling migration. We focus on one important reason that increased liquidity may facilitate migration in low-income contexts. In India, like many low-income countries, sons are expected to care for parents in their old age. Migration may then disrupt traditional forms of old-age support. If this is the case, dowry may provide an alternative mechanism for liquidity-constrained sons to make transfers to their parents.

To explore this hypothesis, we build a model of a household's migration decision in the presence of dowry. This model produces six novel predictions, which we test with two newly-collected survey datasets on property rights over dowry, a large representative migration survey collected by the Indian government, ethnographic data on dowry traditions, and variation from a natural experiment. We confirm that some, but not all, grooms' parents retain a substantial fraction of the dowry. Parents are more likely to retain dowry when sons migrate and especially when sons' earnings are higher and parents' bargaining power is greater. Somewhat counterintuitively, but consistent with the predictions of the model, parents are also more likely to take dowry from migrating sons who remit. Furthermore, male migration rates are higher in places with a strong history of dowry traditions (where dowry payments are also higher today), and in these places, males migrate more in response to a reduction in the cost of migration.

Dowry is a widespread practice throughout India, a country of 1.4 billion people, which contains roughly one-sixth of the world's population. This alone makes un-

derstanding the effects of this practice – and how it affects the allocation of labor – important. However, more broadly, our results also speak to the role of family social insurance and the lack of formal sources of old age support as constraints on migration in low-income settings.

More speculatively, our results may also speak to why the practice of dowry has remained widespread and even become more popular despite attempts by the Indian government to ban it. The decline of patrilocality and increased uncertainty in intergenerational old-age support may contribute to dowry's popularity. If there are large returns to migration, dowry traditions may allow families to take advantage of these returns while mitigating losses to old-age support. Notably, the practice of patrilocality (married sons living with or near parents) has been declining in India over the past several decades. Thus, attempts to discourage the practice of dowry may be more successful if they are accompanied by expansions in pension programs or other formal means of old-age support.

References

AIDWA (2003). *Expanding dimensions of dowry*. All India Democratic Women's Association.

Alder, S. (2016). Chinese Roads in India: The Effect of Transport Infrastructure on Economic Development. *Working Paper*.

Alesina, A., Giuliano, P., and Nunn, N. (2013). On the origins of gender roles: Women and the plough. *The Quarterly Journal of Economics*, 128(2):469–530.

Anderson, S. (2007). The economics of dowry and brideprice. *Journal of Economic Perspectives*, 21(4):151–174.

Anderson, S. and Bidner, C. (2015). Property rights over marital transfers. *The Quarterly Journal of Economics*, 130(3):1421–1484.

Andrew, A. and Adams, A. (2022). *Revealed beliefs and the marriage market return to education*. Institute for Fiscal Studies.

Anukriti, S., Kwon, S., and Prakash, N. (2022). Saving for dowry: Evidence from rural india. *Journal of Development Economics*, 154:102750.

Ashraf, N., Bau, N., Nunn, N., and Voena, A. (2020). Bride price and female education. *Journal of Political Economy*, 128(2):591–641.

Asturias, J., García-Santana, M., and Ramos, R. (2018). Competition and the Welfare Gains from Transportation Infrastructure: Evidence from the Golden Quadrilateral of India. *Journal of the European Economic Association*, 17(6):1542–4766.

Bau, N. (2021). Can policy change culture? government pension plans and traditional kinship practices. *American Economic Review*, 111(6):1880–1917.

Bau, N. and Fernández, R. (2021). Culture and the family. Technical report, National Bureau of Economic Research.

Bazzi, S. (2017). Wealth Heterogeneity and the Income Elasticity of Migration. *American Economic Journal: Applied Economics*, 9(2):219–55.

Beck, B. (1972). *Peasant society in Konku: a study of right and left subcastes in south India*. University of British Columbia Press, Vancouver. Brenda E. F. Beck.

Bhalotra, S., Chakravarty, A., and Gulesci, S. (2020). The price of gold: Dowry and death in india. *Journal of Development Economics*, 143:102413.

Bloch, F. and Rao, V. (2002). Terror as a bargaining instrument: A case study of dowry violence in rural india. *American Economic Review*, 92(4):1029–1043.

Borker, G., Eeckhout, J., Luke, N., Minz, S., Munshi, K., and Swaminathan, S. (2017). Wealth, marriage, and sex selection. *Working Paper*.

Borusyak, K., Jaravel, X., and Spiess, J. (2021). Revisiting event study designs: Robust and efficient estimation. *Working Paper*.

Botticini, M. and Siow, A. (2003). Why dowries? *American Economic Review*, 93(4):1385–1398.

Bryan, G., Chowdhury, S., and Mobarak, A. M. (2014). Underinvestment in a profitable technology: The case of seasonal migration in Bangladesh. *Econometrica*, 82(5):1671–1748.

Bryan, G. and Morten, M. (2019). The aggregate productivity effects of internal migration: Evidence from Indonesia. *Journal of Political Economy*, 127(5):2229–2268.

Caldwell, J. C. (1978). A theory of fertility: from high plateau to destabilization. *Population and Development Review*, pages 553–577.

Callaway, B. and Sant'Anna, P. H. C. (2020). Difference-in-Differences with Multiple Time Periods. *Journal of Econometrics*.

Calvi, R. and Keskar, A. (2021). Dowries, resource allocation, and poverty. *Journal of Economic Behavior & Organization*, 192:268–303.

Calvi, R., Keskar, A., et al. (2021). 'til dowry do us part: Bargaining and violence in indian families. Technical report, CEPR Discussion Papers.

Centre for Monitoring Indian Economy (CMIE) (2023). CapEx.

Chiappori, P.-A. (1988). Rational household labor supply. *Econometrica: Journal of the Econometric Society*, pages 63–90.

Chiplunkar, G. and Weaver, J. (2021). Marriage markets and the rise of dowry in india. *Working Paper*.

Corno, L., Hildebrandt, N., and Voena, A. (2020). Age of marriage, weather shocks, and the direction of marriage payments. *Econometrica*, 88(3):879–915.

Dahl, G. B., Felfe, C., Frijters, P., and Rainer, H. (2022). Caught between cultures: Unintended consequences of improving opportunity for immigrant girls. *The Review of Economic Studies*, 89(5):2491–2528.

De Chaisemartin, C. and D'Haultfuille, X. (2020). Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects. *American Economic Review*, 110(9):2964–96.

De Janvry, A., Emerick, K., Gonzalez-Navarro, M., and Sadoulet, E. (2015). Delinking land rights from land use: Certification and migration in mexico. *American Economic Review*, 105(10):3125–49.

Dhanasekaran, S. (1965). *Visavanoor*, volume Vol. 9 of *Village survey monographs*, page 118. Manager of Publications, Delhi. S. Dhanasekaran.

Dube, S. C. (1955). *Indian village*. Cornell University Press, Ithaca, N.Y. S. C. Dube; with foreword by Morris Edward Opler.

Edlund, L. (2006). The price of marriage: net vs. gross flows and the south asian dowry debate. *Journal of the European Economic Association*, 4(2-3):542–551.

Eglar, Z. S. (1960). *Punjabi village in Pakistan*. Columbia University Press, New York. By Zekiye Eglar.

Fernández, R. (2011). Does culture matter? *Handbook of Social Economics*, 1:481–510.

Fernández, R. and Fogli, A. (2009). Culture: An empirical investigation of beliefs, work, and fertility. *American Economic Journal: Macroeconomics*, 1(1):146–77.

Fernando, A. N. (2022). Shackled to the soil? inherited land, birth order, and labor mobility. *Journal of Human Resources*, 57(2):491–524.

Fetter, D. K., Lockwood, L. M., and Mohnen, P. (2022). Long-run intergenerational effects of social security.

Fruzzetti, L. (1982). *gift of a virgin: women, marriage, and ritual in a Bengali society*. Rutgers University Press, New Brunswick, N.J. Lina M. Fruzzetti.

Fuchs, S. (1960). *Gond and Bhumia of eastern Mandla*. Asia Pub. House, Bombay, New York. Stephen Fuchs.

Gait, E. et al. (1913). Census of india, 1911. vol. i: India. part i: Report.

Ghani, E., Goswami, A. G., and Kerr, W. R. (2016). Highway to success: The impact of the golden quadrilateral project for the location and performance of indian manufacturing. *The Economic Journal*, 126(591):317–357.

Giuliano, P. and Nunn, N. (2018). Ancestral characteristics of modern populations. *Economic History of Developing Regions*, 33(1):1–17.

Gollin, D., Lagakos, D., and Waugh, M. E. (2014). The agricultural productivity gap. *The Quarterly Journal of Economics*, 129(2):939–993.

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, 225(2):254–277.

Goody, J. and Tambiah, S. J. (1973). *Bridewealth and dowry*. Number 7. CUP Archive.

Gordon Jr, R. G. (2009). *Ethnologue: Languages of the World. Dallas: SIL International*. 16 edition.

Grigson, W. V. and Elwin, V. (1949). *Maria Gonds of Bastar*. Oxford University Press, London. by W. V. Grigson; with an introduction by J. H. Hutton.

Hermanns, M. and Schuetze, F. (1948). *A Mdo Pa greater Tibetans: the socio-economic bases of the pastoral cultures of Inner Asia*. Philosophische Fakultät der Universität Freiburg in der Schweiz, Freiburg, Switzerland. [by] Matthias Hermanns.

Honigmann, J. (1957). Women in west pakistan. John J. Honigmann.

India Human Development Survey (IHDS) (2005/2011). IHDS 1, IHDS 2.

Indian Ministry of Statistics and Programme Implementation (2007/2008). 64th round of the National Sample Survey (NSS).

Joshi, R., McManus, J., Nagpal, K., and Fraker, A. (2020). Are voter rolls suitable sampling frames for household surveys? evidence from india. *Field Methods*.

Kone, Z., Liu, M., Mattoo, A., Ozden, C., and Sharma, S. (2018). Internal Borders and Migration in India. *Journal of Economic Geography*, 18(4):729–759.

La Ferrara, E. and Milazzo, A. (2017). Customary norms, inheritance, and human capital: evidence from a reform of the matrilineal system in ghana. *American Economic Journal: Applied Economics*, 9(4):166–85.

Lagakos, D., Mobarak, A. M., and Waugh, M. E. (2018). The welfare effects of encouraging rural-urban migration. Technical report, National Bureau of Economic Research.

Leibenstein, H. (1957). *Economic backwardness and economic growth*. Wiley.

Mann, K. (1985). Bhil women: changing world-view and development. *Human science: journal of the Anthropological Survey of India*, Vol. 34:57–66. Kamlesh Mann.

Manu and Olivelle, P. (2004). *The law code of Manu*. Oxford University Press, USA.

Meghir, C., Mobarak, A. M., Mommaerts, C., and Morten, M. (2022). Migration and informal insurance: Evidence from a randomized controlled trial and a structural model. *The Review of Economic Studies*, 89(1):452–480.

Morten, M. and Oliveira, J. (2023). The effects of roads on trade and migration: Evidence from a planned capital city. *NBER Working Paper*, 22158:1–64.

Munshi, K. and Rosenzweig, M. (2016). Networks and misallocation: Insurance, migration, and the rural-urban wage gap. *American Economic Review*, 106(1):46–98.

Murdock, G. P. (1967). *Ethnographic Atlas*. University of Pittsburgh Press, Pittsburgh.

Naik, T. B. ([pref. 1956]). *Bhils: a study*. Bharatiya Adimjati Sevak Sangh, Delhi. T. B. Naik.

National Council of Applied Economic Research (India) (1999). India Rural Economic and Demographic Survey (REDS) 1999.

Puthenkalam, J. J. (1977). *Marriage and the family in Kerala: with special reference to matrilineal castes*, pages xvi, 246. Dept. of Sociology, University of Calgary, Calgary. by Fr. J. Puthenkalam S. J.

Rockhill, W. W. (1895). *Notes on the ethnology of Tibet*, pages 665–747 , plates. Smithsonian Institution, Washington, D.C. By William Woodville Rockhill.

Rohner, R. P., Chaki-Sircar, M., and University Of Connecticut (1988). *Women and children in a Bengali village*. Published for University of Connecticut, University Press of New England, Hanover, Conn. [by] Ronald P. Rohner and Manjusri Chaki-Sircar.

Roy, M. (1975). *Bengali women*. University of Chicago Press, Chicago. [by] Manisha Roy.

Singha, R. (1987). Marriage and law among the bhils of rajasthan. *Eastern anthropologist*, Vol. 40(no. 2):87–99. Roop Singh.

Sun, L. and Abraham, S. (2021). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, 225(2):175–199.

Tapper, B. E. (1987). *Rivalry and tribute: society and ritual in a Telegu village in South India*, pages xvi, 309. Hindustan Pub.Corp., Delhi. Accessed on: 2022-06-03.

The Times of India (2022). In-laws get 7-year imprisonment for dowry death. *The Times of India*.

Appendix

A.1 Appendix Tables

Table A1: Robustness for Predictions 2 & 3: Migration, SES, & Net Taking in the Origin Survey

	Origin Survey:	
	(1)	(2)
	Average Fraction Owned	Average Fraction Owned
Migrant Son	0.058***	0.042**
	(0.012)	(0.017)
Migrant Son × Ln(Son Occ Score)		0.079***
		(0.027)
Non-Migrant Son × Ln(Son Occ Score)		0.023
		(0.017)
Ln(Father Occ Score)		-0.026*
		(0.013)
Coresidence & Mar. Year & Age FEs	Yes	Yes
Education dummies	Yes	No
Mean of dependent variable	0.136	0.140
R-squared	0.068	0.067
Observations	2598	1819

Notes: This table reports the relationship between migration, socioeconomic status, and the average fraction of dowry gifts owned by the parents in the Origin Survey. For each category of gifts, grooms' parents were asked what approximate share they owned (the options were the categories 0%, 25%, 50%, 75%, 100%). The outcome variable is the average over the percent parents reported owning of each category. Migrant sons are individuals who are reported to have permanently left their parents' village. The occupation scores are the median monthly earnings of a certain occupation created by mapping our occupational categories to data from the NSS. Standard errors are clustered at the household level. *,**, and *** denote 10, 5, and 1% significance respectively.

Table A2: Validation of the Traditional Dowry Measure in the REDS

	(1)	(2)	(3)	(4)
	Ln(Gross Dowry)	Ln(Net Dowry)	Ln(Gross Dowry)	Ln(Net Dowry)
Historical Dowry (Continuous)	0.810***	1.094***	0.297	0.790**
	(0.207)	(0.249)	(0.223)	(0.298)
Marriage Year FEs	Yes	Yes	Yes	Yes
Region FEs	No	No	Yes	Yes
Mean of Dependent Variable	7.916	7.462	7.916	7.462
R-squared	0.349	0.388	0.443	0.435
Observations	50831	32444	50831	32444

Notes: This table shows the results from regressing log gross and net dowry measures from the 1999 round of REDS on the fraction of a district population traditionally practicing dowry. Columns (3) and (4) add region fixed effects. Standard errors are clustered at the district level. *,**, and *** denote 10, 5, and 1% significance respectively.

Table A3: Validation of the Traditional Dowry Measure in the IHDS

	(1)	(2)	(3)	(4)
	Often gold	Often gold	Any gold	Any gold
Historical Dowry (Continuous)	0.152***	0.185**	0.054***	0.111**
	(0.035)	(0.088)	(0.013)	(0.048)
State Fixed Effect	No	Yes	No	Yes
Mean of Dependent Variable	0.749	0.749	0.931	0.931
R-squared	0.019	0.261	0.007	0.164
Observations	40550	40550	40550	40550

Notes: This table shows the results from regressing whether gold gifts are common upon marriage in the respondent's community from the 2005 round of IHDS on the fraction of a district population traditionally practicing dowry. Columns (2) and (4) add state fixed effects. Standard errors are clustered at the district level. *,**, and *** denote 10, 5, and 1% significance respectively.

Table A4: Summary Statistics and the Association Between Dowry Prevalence and District Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Without State FE			With State FE		
Dependent Variable	Mean	Coef.	Std. Err.	P-value	Coef.	Std. Err.	P-value
District Population Density	716.96	570.86	376.94	0.13	-202.12	716.35	0.78
Social Group: Share Scheduled Tribe or Caste	0.32	-0.04	0.02	0.04	0.02	0.08	0.77
Share Urban Sector	0.32	0.05	0.02	0.01	-0.07	0.04	0.11
Share Agricultural Sector	0.43	-0.10	0.02	0.00	-0.00	0.05	0.99
Religion: Share Hinduism	0.76	-0.04	0.03	0.11	-0.03	0.05	0.54
Religion: Share Islam	0.12	0.00	0.02	0.88	0.00	0.05	1.00
Share complete Primary School	0.55	0.05	0.01	0.00	-0.02	0.03	0.53
Share complete Secondary School	0.24	0.04	0.01	0.00	-0.02	0.02	0.32
Monthly HH Consumer Expenditure	4,563.45	-12.09	180.41	0.95	-406.92	442.14	0.36
Share that owns at least 0.005 ha of Land	0.83	-0.04	0.02	0.03	0.01	0.04	0.73
Share that owns at least 0.21 ha of Land	0.45	-0.16	0.02	0.00	-0.01	0.04	0.90
Share that owns at least 1.01 ha of Land	0.19	-0.09	0.01	0.00	0.00	0.03	0.88
Log Distance to Coastline (km)	5.74	-0.71	0.14	0.00	-0.15	0.17	0.38
Log Distance to closest big City (km)	5.92	-0.32	0.10	0.00	-0.45	0.16	0.01

Notes: This table shows summary statistics for the NSS Round 64 and the relationship between district characteristics and district-level dowry traditions from the Ancestral Characteristics data. The continuous dowry measure is the share of a district's current population belonging to groups with dowry traditions. The reported standard errors are robust.

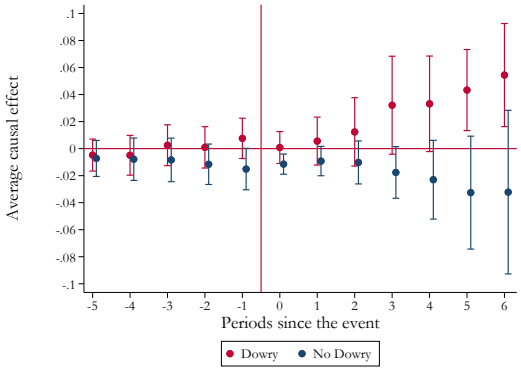
Table A5: Association Between Traditional Dowry and Migration: IHDS Data

	(1)	(2)	(3)	(4)
	Migrated	Migrated	Migrated	Migrated
Historical Dowry (Continuous)	0.0690*	0.0666*	0.0894**	0.0902**
	(0.0354)	(0.0357)	(0.0378)	(0.0381)
Observations	23,240	23,239	11,008	11,007
R-squared	0.044	0.053	0.051	0.057
Sample Ages	17 - 26	17 - 26	22 - 26	22 - 26
Age Fixed Effects	Yes	No	Yes	No
State Fixed Effects	Yes	No	Yes	No
Age-by-State FE	No	Yes	No	Yes

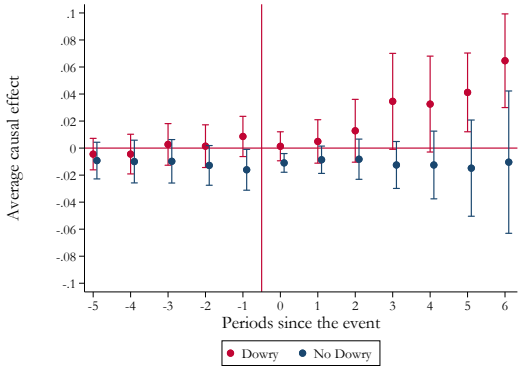
Notes: This table shows the results from regressing whether an individual (male) migrated between the 2005 and 2011 rounds of the IHDS on the historical prevalence of dowry in the district. We determine whether an individual migrated using the IHDS tracking data; therefore, we only observe migrations that took place between the two rounds, leading us to focus on a sample of young men who would be most likely to migrate during this 6 year period. The sample consists of only males aged 17-26 (Columns (1) and (2)) or 22-26 (Columns (3) and (4)). Columns (1) and (3) have state and age fixed effects. Columns (2) and (4) add state-by-age fixed effects. Standard errors are clustered at the district-level. *,**, and *** denote 10, 5, and 1% significance respectively.

Figure A1: Effects of GQ on Male Migration by Dowry Status Using Borusyak et al. (2021), Males 15–30: Robustness Specifications

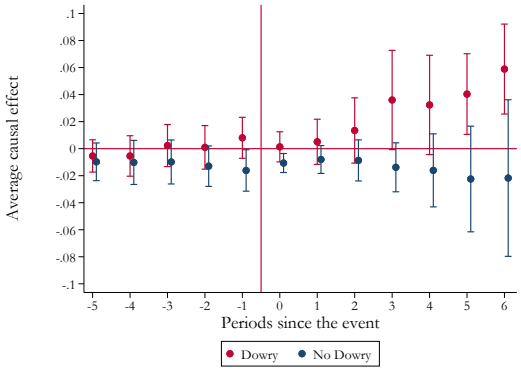
(a) +Time-Varying Geographic Controls



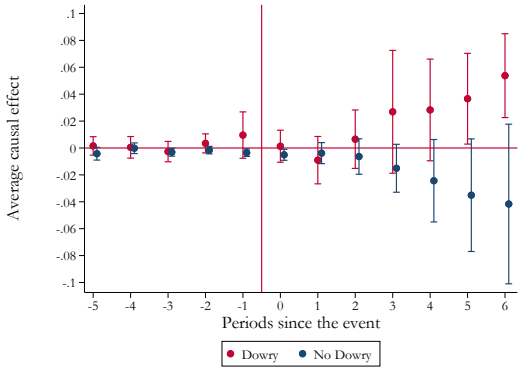
(b) +Caste-Year FEs and Time-Varying Household Consumption Controls



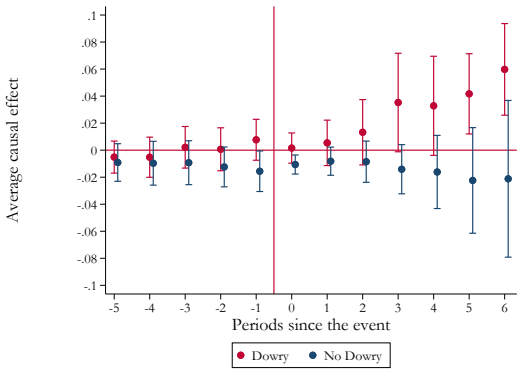
(c) +Time-Varying Cultural Controls



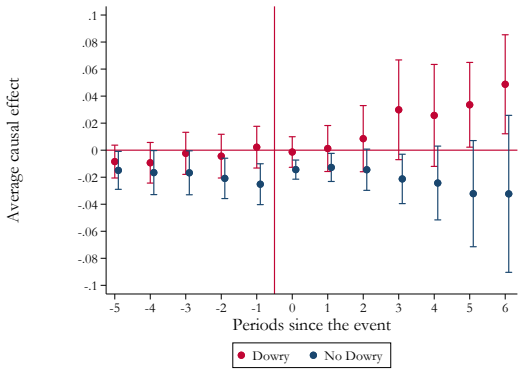
(d) Callaway and Sant'Anna (2020)



(e) No Age FEs (Person + State-Year FEs)

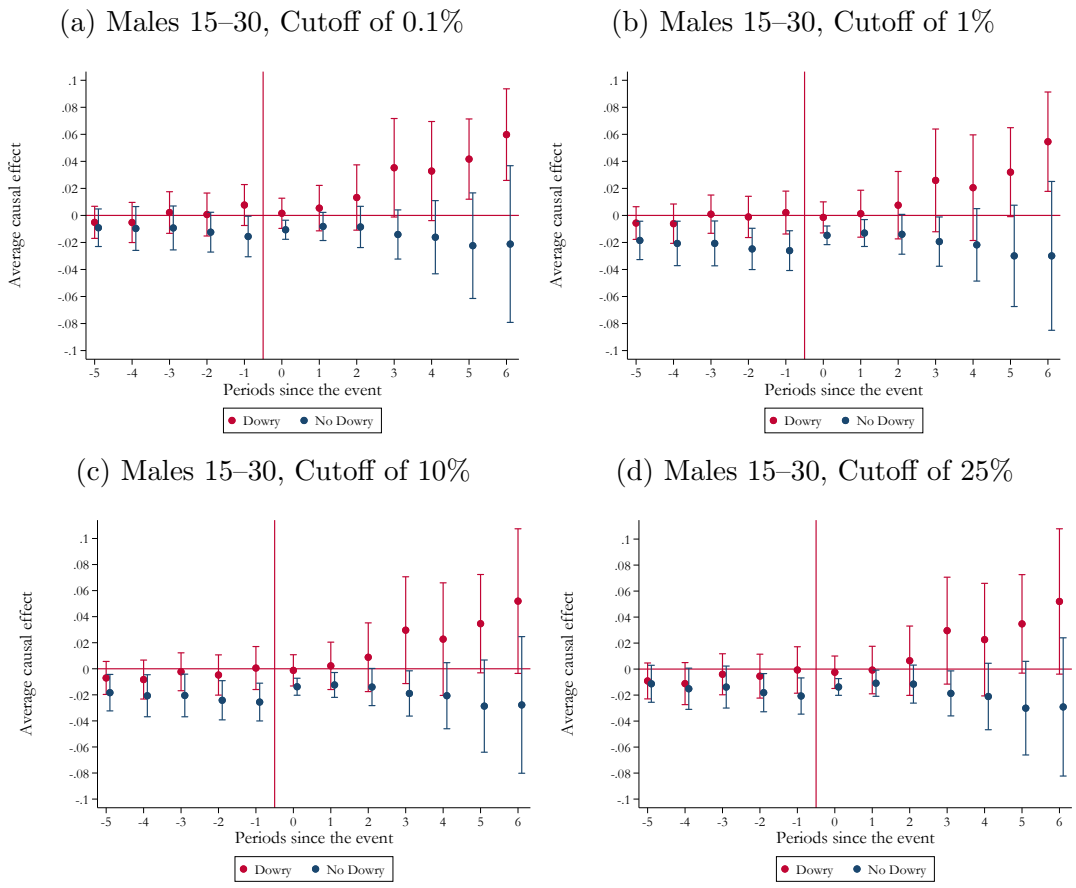


(f) Adjusted Age Distribution



This figure reports event study estimates of the effect of the GQ on migration. Panel (a) includes time-varying distance controls (distance to closest big city and distance to nearest coastline). Panel (b) includes caste-by-year fixed effects and a time-varying control for household consumption expenditures. Panel (c) includes time-varying controls for the proportions of the district population that historically had plow technology and of the district population that practiced a patrilineal system of inheritance. Panel (d) estimates use the methodology of Callaway and Sant'Anna (2020), including state-by-year fixed effects. All other estimates use the methodology of Borusyak et al. (2021) and include individual, age, and state-by-year fixed effects. Panel (e) reproduces Figure 6 panel (a) without age fixed effects. Panel (f) adjusts the age distribution, whereby we randomly sample individuals from non-GQ districts to match the distribution of ages in GQ districts. All samples restrict to males in the 2007 NSS who were aged 15-30. In GQ districts, they further restrict to those who were 13-45 at the time of construction.

Figure A2: Effects of GQ on Male Migration by Dowry Status Using Borusyak et al. (2021), Varying Dowry Cutoffs



This figure shows the event study estimates of the effect of the GQ on migration. The panels vary the cutoff of the district-level measure of the strength of dowry traditions for determining dowry status. Panel (a) shows estimates using a 0.1% cutoff, replicating the preferred specification shown in Figure 7 Panel (a). Panel (b) uses a cutoff of 1%, Panel (c) a cutoff of 10%, and Panel (d) a cutoff of 25%. All samples are of males in the 2007 NSS who were aged 15-30. In GQ districts, they further restrict to those who were 13-45 at the time of construction. All estimates use the methodology of Borusyak et al. (2021) and include individual, age, and state-by-year fixed effects.

A.2 Theoretical Appendix

A.2.1 Baseline Model Solution and Proof of Predictions 1, 2, and 3

Allocations and transfers The first order condition with respect to τ will set the optimal value of τ as a function of α and m:

$$\tau^* = \theta(y_K + Rm + E) - (1-\theta)y_P - (1-m)\alpha \tag{3}$$

We first consider the case of no migration ($m = 0$). In this case, transfers happen through the combined $\tau + \alpha$ with

$$\tau^* + \alpha^* = \theta(y_K + E) - (1-\theta)y_P. \tag{4}$$

Hence, the sharing of the dowry is undetermined in this case. We will assume that parents will not take from the child's dowry if they are certain to be able to income share later through α.

Consumption is then equal to $c_P^* = \theta(Y)$ and $c_K^* = (1-\theta)(Y)$, where, for simplicity, we have defined $Y = y_K + y_P + E$ as total household resources without migration. Utility takes the value

$$V(m=0) = \theta ln(\theta(Y)) + (1-\theta) ln((1-\theta)(Y)) = \Theta + ln(Y)\ ,$$

where $\Theta \equiv \theta ln(\theta) + (1-\theta) ln(1-\theta)$ and $V(m)$ is the solution to equation 1 for a fixed migration decision m.

In the case of migration ($m = 1$), income transfers are no longer possible in the baseline model (this assumption is relaxed below). Hence, $\alpha^* = 0$ and, from the first order condition on τ, we have that

$$\tau^* = min\{\theta(y_K + R + E) - (1-\theta)y_P, d\,E\}. \tag{5}$$

Predictions 1, 2, and 3 follow directly from the above results.

Proof of Predictions 1–3. For Prediction 1, note that τ is positive when $\theta(y_K + R + E) > (1-\theta)y_P$, and negative otherwise.

For Prediction 2, consider that, in the case of migration, τ^* is given by equation 5, while in the case of no migration, τ^* is strictly less than the sum between τ^* and α^* in equation 4 since $\alpha^* \geq 0$ with $\tau^* \leq dE$. This implies that τ^* in the case of migration is weakly larger than τ^* without migration. Therefore, if parents are Net Takers when the son is not a migrant, they are also takers when he is a migrant. If they are Net Givers when the son is not a migrant, they may remain Net Givers or switch to being Net Takers. Therefore, migration weakly raises net taking.

Finally, for Prediction 3, we have that $\frac{\partial \tau^*}{\partial (y_K + R)} = \theta > 0$ and $\frac{\partial \tau^*}{\partial \theta} = (Y + R) > 0$ in an internal solution and 0 otherwise. Therefore, an increase in either $y_K + R$ or θ can turn a net-giving household into net-taking parents, but never the other way around.

■

Figure A3 illustrates how the optimal τ will move with migration and household characteristics. The x-axis is the parent's first-best consumption without migration compared to their income, and thus the desired transfer from son to parent absent migration. With no migration, when this quantity is negative, τ is used to "make up" the difference, and when it is positive, either τ or α is used, and thus τ is indeterminate (represented by the shaded region). Migration shifts the desired transfer up relative to the gap between parents' first-best no-migration consumption and their own earnings. With migration, because α cannot be used, there is a closed-form solution to τ as the minimum of the optimal transfer and the liquid dowry.

Consumption allocations depend on whether the constraint on τ binds or not. This constraint binds when $y_P + d\,E \leq \theta(y_P + y_K + E)$.

If the constraint does not bind, the optimal intergenerational transfer at marriage is

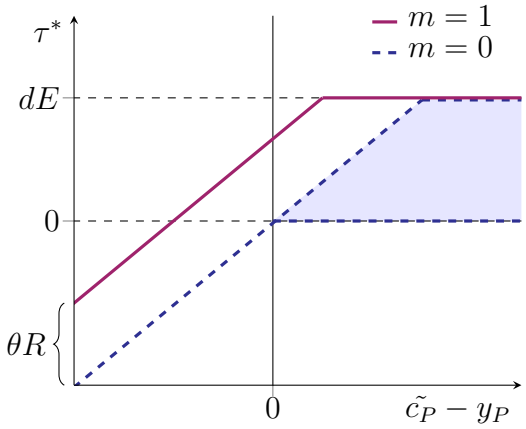
$$\tau^* = \theta(y_K + R + E) - (1 - \theta)y_P.$$

Consumption is then equal to $c_P^* = \theta(Y + R)$ and $c_K^* = (1 - \theta)(Y + R)$. Utility takes the value

$$V(m = 1) = \theta ln(\theta(Y + R)) + (1 - \theta) ln((1 - \theta)(Y + R)) = \Theta + ln(Y + R).$$

If the constraint binds, the optimal intergenerational transfer at marriage is, of course, $\tau^* = dE$. Consumption is then equal to $c_P^* = y_P + d\,E$ and $c_K^* = y_K + R +$

Figure A3: How τ^* Varies with Migration and Household Characteristics



This figure shows how the household's chosen τ will vary with the gap between the parents' no-migration optimal consumption, $\tilde{c_P}$, and their income, y_P. For parents of non-migrant sons, when this gap is negative–the parent earns more than they need to consume–they will transfer to sons. When this gap of positive, these parents can receive transfers through α or τ, and so the optimal τ will be indeterminant, up to its limit of dE. Migration shifts up the parents' ideal pareto-weighted consumption, and thus transfers will be positive for a broader range of households. Moreover, parents of migrant sons can only receive transfers through τ. Thus, we will observe more parents of migrant sons taking from dowry.

$(1-d)E$. Utility takes the value

$$V(m=1) = \theta ln(y_P + d\,E) + (1-\theta) ln(y_K + R + (1-d)E).$$

Migration For Seeking Parents, migration requires that R is sufficiently high to satisfy:

$$\theta ln\,(y_P + d\,E) + (1-\theta) ln\,(y_K + R + (1-d)E) > \Theta + ln(Y). \tag{6}$$

A.2.2 Proof of Prediction 4

Recall, from equation (6):

$$\theta ln\,(y_P + d\,E) + (1-\theta) ln\,(y_K + R + (1-d)E) > \Theta + ln(Y).$$

We define two key quantities. Recall that whether parents are Satisfied or Seeking depends on whether $y_P + dE > \tilde{c_P}$. Filling in the first best consumption allocation, we have, $y_P + dE > \theta(y_P + y_K + E)$. Rearranging, define $A(d) = \frac{1-\theta}{\theta}(y_P + d\,E) - (y_K + (1-d)E)$ as the condition that defines whether parents are Satisfied ($A(d) \geq 0$)

or Seeking ($A(d) < 0$). Define $B(d)$ as the smallest level of return to migration that satisfies the migration decision inequality (as a function of dowry tradition d) and, hence, justifies migration. This means that sons of Seeking parents migrate if and only if $R > B(d)$.

The threshold $B(d)$, which takes the closed-form solution

$$(1-\theta)Y\left(\frac{\theta Y}{y_P + d\,E}\right)^{\frac{\theta}{1-\theta}} - y_K - (1-d)E,$$

satisfies two properties:

1. It is positive. This is because, at $R = 0$, the RHS of equation 6 is the optimization of the intergenerational allocation that admits the LHS as a possible allocation.

2. It is lower when $d = 1$ than when $d = 0$ when $A(d = 0) < 0$. To see this, consider $sign(\frac{\partial B}{\partial d}) = sign(A(d = 1))$.

Based on these two cases, we see that the migration decision depends on returns relative to resources available to transfer outside of earnings.

1. Seeking parent households, for whom $A < 0$:
   (a) $R < B$: no migration ($m = 0$), $\tau^* + \alpha^* = \theta(y_K + E) - (1-\theta)y_P$.
   (b) $R \geq B$: migration ($m = 1$), $\tau^* = d\,E$ and $\alpha^* = 0$

2. Satisfied parent households, for whom $A > 0$:
   (a) $R < 0$: no migration ($m = 0$), $\tau^* + \alpha^* = \theta(y_K + E) - (1-\theta)y_P$.
   (b) $R > 0$: migration ($m = 1$)
      i. $0 < R < A$: $\tau^* < d\,E$, $\alpha^* = 0$
      ii. $R > A$: $\tau^* = d\,E$, $\alpha^* = 0$

Since $A(d = 1) > A(d = 0)$ we should expect higher migration in societies that have dowry.

In the remittances extension, the same patterns hold. The threshold for migration $B'(\pi, d)$ can be defined implicitly as:

$$\pi\left[\Theta + ln(Y + B')\right] + (1-\pi)\left[\theta ln(y_P + d\,E) + (1-\theta)ln(y_K + B' + (1-d)E\right] \equiv \Theta + ln(Y).$$

By the Implicit Function Theorem (IFT), $\frac{\partial B'}{\partial \pi} \leq 0$, so increasing the probability that remittances can take place reduces the required return for migration. Similarly, also by the IFT, $\frac{\partial B'}{\partial d} \leq 0$.

A.2.3 Proof of Prediction 5

Define $\tilde{R}$ as the idiosyncratic economic returns of migration, and λ as the average cost of migration. Then $R = \tilde{R} + \lambda$ and $\tilde{R}$ is distributed with cdf F and pdf f. Consider the GQ as a reduction in λ.

Comparing dowry and no-dowry economies, there are three cases:

1. Both $A(d = 1)$ and $A(d = 0)$ are positive.
   In this case, migration will occur when returns are positive and it will be equally likely to occur with and without dowry:

$$P(m = 1|d = 1, A(d = 1) > 0) = 1 - F(\lambda)$$

$$P(m = 1|d = 0, A(d = 0) > 0) = 1 - F(\lambda)$$

   A decline in the cost of migration will have the same positive effect on migration in dowry and non-dowry economies:

$$\frac{\partial P(m = 1|d = 1, A(d = 1) > 0)}{\partial \lambda} - \frac{\partial P(m = 1|d = 0, A(d = 0) > 0)}{\partial \lambda} = 0$$

2. $A(d = 1)$ is positive and $A(d = 0)$ is negative.
   In this case, migration will occur when returns are positive with dowry and when returns are greater than $B > 0$ without dowry, and hence will be more likely to occur with dowry than without:

$$P(m = 1|d = 1, A(d = 1) > 0) = 1 - F(\lambda)$$
$$P(m = 1|d = 0, A(d = 0) < 0) = 1 - F(\lambda + B(d = 0))$$

   A decline in the cost of migration will have a larger effect on migration in dowry economies than non-dowry economies when the distribution of returns of migration is unimodal and the rates of migration are low (i.e. the person with

modal return does not migrate):

$$\frac{\partial P(m=1|d=1, A(d=1)>0)}{\partial \lambda} - \frac{\partial P(m=1|d=0, A(d=0)<0)}{\partial \lambda} =$$
$$f(\lambda) - f(\lambda + B(d=0))$$

3. Both $A(d=1)$ and $A(d=0)$ are negative.
   In this case, migration will occur when returns are greater than $B(d) > 0$, and hence will be more likely to occur with dowry than without since $B(d=0) > B(d=1)$:

$$P(m=1|d=1, A(d=1)<0) = 1 - F(\lambda + B(d=1))$$

$$P(m=1|d=0, A(d=0)<0) = 1 - F(\lambda + B(d=0))$$

   Again, a decline in the cost of migration will have a larger effect on migration in dowry economies than non-dowry economies when the distribution of returns to migration is unimodal, and the rates of migration are low (i.e. the person with modal return does not migrate):

$$\frac{\partial P(m=1|d=1, A(d=1)<0)}{\partial \lambda} - \frac{\partial P(m=1|d=0, A(d=0)<0)}{\partial \lambda} =$$
$$f(B(d=1)+\lambda) - f(B(d=0)+\lambda)$$

A.2.4 Remittances and Proof of Auxiliary Prediction 1

Risk of No Remittances We consider a case in which remittances are possible, but only with a fixed probability π, to capture the fact that remittances are subject to the risk that the son may become estranged from the parents or to prohibitively

high costs.

$$\max_{\substack{\alpha\geq 0,\tau\leq dE,\\ m\in\{0,1\}}} \quad \theta E[\ln(c_P)] + (1-\theta)E[\ln(c_K)]$$

s.t. with probability π

$$c_P \leq y_P + \tau + \alpha(1-m)$$

$$c_K \leq y_K + Rm + E - \tau - \alpha(1-m)$$

with probability $1-\pi$

$$c_P \leq y_P + \tau + \alpha$$

$$c_K \leq y_K + Rm + E - \tau - \alpha$$

The value of migration when the constraint on τ is binding is now

$$V(m=1) = \Theta + \pi ln(Y+R) + (1-\pi)\left[\theta ln\left(\frac{y_P + d\,E}{\theta}\right) + (1-\theta)ln\left(\frac{y_K + R + (1-d)E}{1-\theta}\right)\right],$$

while the value of not migrating continues to be

$$V(m=0) = \Theta + ln(Y).$$

In this modified version of the model, the frictions are attenuated by the possibility of remittances. Nevertheless, as long as $\pi < 1$, dowry will continue to play the same qualitative role as in the absence of remittances.

Costly Remittances We now consider an alternative case in which remittances are always possible but at a cost γ. Again, the household chooses marriage transfer τ, son's transfer α, and migration status m to solve:

$$V = \max_{\substack{\alpha\geq 0,\tau\leq dE,\\ m\in\{0,1\}}} \quad \theta\ln(c_P) + (1-\theta)\ln(c_K)$$

s.t. $c_P \leq y_P + \tau + \alpha$

$$c_K \leq y_K + Rm + E - \tau - \alpha(1+\gamma m).$$

This version of the model will give rise to a new indirect utility function, associated with making a strictly positive α transfer in case of migration:

$$V(m=1,\alpha^*>0) = \Theta + ln(Y_i + R_i + \gamma(y_P + d\,E_i)) - \theta ln(1+\gamma)$$

with

$$\alpha^* = max\left\{\frac{\theta(y_K + R_i + (1-d)E_i) - (1-\theta)(1+\gamma)(y_P + d\,E_i)}{1+\gamma}, 0\right\}.$$

The value of migration when $\alpha^* = 0$ is now

$$V(m=1,\alpha^*=0) = \Theta + \left[\theta ln\left(\frac{y_P + d\,E}{\theta}\right) + (1-\theta) ln\left(\frac{y_K + R + (1-d)E}{1-\theta}\right)\right]$$

while the value of not migrating continues to be

$$V(m=0) = \Theta + ln(Y).$$

Auxiliary Prediction 1 Auxiliary Prediction 1 follows directly from the above.
Proof. When remittances are uncertain, sons transfer to their parents up to the full value of dowry, and then choose a remittance payment that is sufficient to equate the weighted marginal utilities of consumption. When a unit of α costs γ, households first exhaust the costless transfers from son to parents with dowry, i.e. $\tau \in (0, E]$ with $d > 0$. ■

A.2.5 Daughters

Model Extension We now extend our model slightly to accommodate parents with daughters and sons. For simplicity, we assume that parents can have one son, one daughter, or one son and one daughter. Parents who only have daughters will not play a role in aggregate son migration, and so we focus on parents with either one son, or one son and one daughter.

To simply illustrate the impact of having a daughter versus having a son only, we assume parents in dowry culture have to pay their daughter's dowry, and that it is exactly equivalent to E, the dowry their sons receive, due to assortative matching. We further assume that in the absence of "dowry culture," the parents would leave their daughters a bequest at the end of life only, when it did not affect their own

consumption, and thus it is treated as costless, but such a bequest from his bride's parents will still increase (later) consumption for the son.[32]

If a son migrates and the transfer constraint binds, joint utility for parents with daughters will be:

$$V(m=1) = \theta ln(y_P - dE + dE) + (1-\theta) ln(y_K + R + (1-d)E).$$

Note that while the benefit to the parent of the son's transfer from dowry is canceled out by paying the daughter's dowry, the difference between parent and son consumption with dowry is still lower, as the son does not consume E himself.

Thus, although the migration decisions for sons of families with daughters will not be as greatly affected by dowry as for families without daughters, the presence of dowry will still lower the required return for migration. We can see this by examining $B_{dtr}(d)$, the lowest return required in order to choose migration:

$$B_{dtr}(d) = (1-\theta)(y_P + y_K + (1-d)E) \left(\frac{\theta(y_P + y_K + (1-d)E)}{y_P} \right)^{\frac{\theta}{1-\theta}} - y_K - (1-d)E.$$

When the household is Seeking, then $B_{dtr}(d=1) < B_{dtr}(d=0)$, for two reasons. First, the distortion in consumption is smaller, since the son does not keep the dowry amount. Second, the overall household resources are lower, creating a greater loss from forgoing migration.

Proposition $B_{dtr}(d=1) < B_{dtr}(d=0)$ when $A(d=0) < 0$.
Proof. By the IFT, $\frac{\partial B_{dtr}}{\partial d} \leq 0$ when parents are Seeking.

■

Implications of Household Composition Additionally, even if we adjusted the model such that having one son and one daughter exactly canceled out the impact of dowry on male migration and thus having more daughters than sons could make the impact of dowry on migration negative, there would still be an overall positive net effect on migration from the presence of dowry. This is due to household composition.

[32]Note that as discussed in Botticini and Siow (2003), if this bequest lessened sons' motivation to work on the family farm, this would lessen the comparative negative impacts of paying dowry for daughters on parental consumption.

Table A6: Household Composition and the Effect of Dowry on Male Migration

		Sons			
		0	1	2	3
Daughters	0	·	↑	↑	↑
	1	·	·	↑	↑
	2	·	↓	·	↑
	3	·	↓	↓	·

This table shows the aggregate impact of dowry on male migration by family type in a model where paying dowry for a daughter and receiving it for a son exactly cancel out in terms of the migration decision. Columns identify the number of sons in the household, rows identify the number of daughters, and each cell reports the direction of the effect on male migration for that household. Up arrows mean a positive impact, down arrows mean a negative impact, and dots mean no impact.

Families with no sons cannot have their sons' migration decisions impacted. Furthermore, with a balanced sex ratio, mechanically, there will be more sons in households where their migration will increase than in households where it would fall. This is illustrated in Table A6 for balanced sex ratios under the assumption that the impact of dowry is 0 when the number of sons equals the number of daughters. Moreover, given that sex ratios are actually skewed male, the aggregate dowry effect will be even stronger.