TRADITIONAL INSTITUTIONS IN MODERN TIMES: DOWRIES AS PENSIONS WHEN SONS MIGRATE*

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This paper uses newly collected data on the allocation of dowry to examine its role in resolving intergenerational frictions around migration in India. Migration disrupts traditional elderly support structures, in which sons live near their parents and care for them in old age. We develop a model in which dowry can promote migration by allowing sons to make upfront transfers to their parents and ease constraints on income sharing. To test this hypothesis, we collect two new data sets that measure the distribution of dowry between family members. We document for the first time that net transfers of dowry to a man's parents are common but far from universal. Consistent with using dowry for income sharing, such transfers occur more often when sons migrate, especially when they work in higher-earning occupations. In nationally representative data, 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 historical dowry traditions migrate more when migration costs fall. Our findings provide some clues as to why dowry persists despite its well-documented adverse consequences. *JEL codes:* J12, J61, O12.

I. Introduction

Large marital payments, on the order of many times households' annual income, are pervasive in low-income countries

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(Anderson 2007). Today, despite attempts to ban dowry and evidence that it is damaging for women's welfare (Jayachandran 2015), dowry payments are nearly universal in India (Chiplunkar and Weaver 2023). Despite dowry's importance, there is little quantitative evidence on how these payments are allocated across family members and how this allocation affects household decision making, both of which determine the persistence of dowry traditions. Using rich new data collection, this article illuminates how dowry is allocated within the household and, for the first time, demonstrates the role it can play in resolving intrahousehold frictions between parents and sons associated with migration.

The migration of workers from areas where labor has lower marginal returns to 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, Mobarak, and Waugh 2023; Bryan, Chowdhury, and Mobarak 2014) and the prospect of losing access to local insurance networks (Munshi and Rosenzweig 2016; Fernando 2022). Migration also reduces the co-residence between generations and may limit parental access to a child's resources (Leibenstein 1957; Caldwell 1978; Bau 2021; Fetter, Lockwood, and Mohnen 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. Consequently, providing young people with increased liquidity during potential migration periods may facilitate their mobility.

We introduce and test the new hypothesis that dowry can play a role in encouraging 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.[1] Transferring some or all of the dowry to the groom's parents has been widely documented by the media (Times of India 2022), but the ownership of dowry, as well

1. Based on calculations from the 2011 census, a substantial fraction of men in the average district leave their natal villages (24%). In survey data we collected in Delhi, 77% of male migrants said that their parents would be justified in taking from the marriage gifts from the bride's family.

as variation in this ownership, has not been formally measured. We collect the first quantitative information on property rights over dowry in India and use these novel data together with ethnographic variation in dowry traditions across India and a natural experiment that varied migration costs to test the hypothesis that dowry traditions play a role in enabling migration.

To illustrate our mechanism, we develop a model in which parents and sons act collectively but incur a cost in sharing resources 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 or services provided by the son or his wife, sons may be less likely to migrate unless the returns are sufficiently high to offset parents' utility losses. Dowry mitigates this friction by providing a transferable pool of resources that the son can share with his parents before 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, since migration produces frictions in sharing future income. Third, accounting for parental wealth, parents are more likely to take from the dowry when migrant sons expect a higher income, consistent with the fact that parents have a higher relative marginal utility of consumption. Fourth, parents who receive remittances from migrant sons are also more likely to have taken a portion of the dowry. Fifth, in aggregate, sons raised in areas where dowry practices are stronger are more likely to leave the village. Finally, 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 practices are stronger.

The first four predictions 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 wanting to marry without the parents' consent, a proxy for parental bargaining power. We also find that parents whose migrant son sends them financial remittances are 17pp 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 assess dowry's role in enabling migration. We use nationally representative data from a detailed migration module conducted by the National Sample Survey (NSS) in 2007–08. We combine these data at the district level with estimates of the share of the current population belonging to groups with dowry traditions based on anthropological data, following the methodology of Giuliano and Nunn (2018). While dowry payments are nearly universal in India, payment size varies. We confirm that the variation in the historical tradition strongly predicts the size of dowry payments in the Rural Economic Demographic Survey (REDS) and the likelihood of payments in gold in the India Human Development Survey (IHDS), consistent with historical traditions predicting dowry practices today. Historical dowry traditions appear to generate variation in the degree to which marriage transfers occur through dowry payments.

In line with the fifth prediction of the model, we find that male migration rates are indeed higher in districts where more of the population belongs to groups with historical dowry traditions, controlling for a range of other factors.

To test our sixth 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, Goswami, and Kerr 2016; Asturias, García-Santana, and Ramos 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, Jaravel, and Spiess 2024; Callaway and Sant'Anna 2021). Separately estimating the effects of highway construction in districts with and without strong historical dowry traditions, we find that areas with stronger traditions 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), anecdotal evidence suggests that grooms' parents are benefiting from and agitating for greater dowries in modern India (AIDWA 2003). Our paper provides the first quantitative evidence that, indeed, most brides do not retain property rights over transfers made by their parents at the time of marriage, and that nominal property rights over these transfers are divided between the groom and his parents. At the same time, by carefully documenting property rights over dowry, we also show that grooms' parents do not universally possess the entire amount, demonstrating the tradition is more complex than an inverse bride price.[2]

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 2023), since economic development has been associated with a decline in patrilocality and thus filial old-age support of parents. Based on our findings, policymakers may wish to seek alternative means of ensuring parents without co-located sons receive adequate old-age support. Doing so may both curb demand for dowry and help ensure that intra-household frictions do not hamper efficient migration as economic development increases the returns to urbanization.

This paper brings together three largely distinct literatures. First, we contribute to a growing literature that recognizes the importance of culture for economic outcomes (Fernández and Fogli 2009; Fernández 2011; Bau and Fernández 2023) and shows

2. There need not be a contradiction between brides' parents transferring dowry to improve their daughters' well-being and grooms' parents claiming a portion of the transfer. As outlined in Anderson and Bidner (2015), the means of improving the daughter's welfare can simply transition from direct transfers to a better marriage, shifting nominal property rights. Our findings about property rights over dowry align with this proposed mechanism and suggest that this reallocation of resources may help sons reduce intrahousehold distortions to efficient migration decisions.

that taking into account the cultural environment is critical for understanding the effects of both economic shocks and policies (Ashraf et al. 2020; Corno, Hildebrandt, and Voena 2020; 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.

Second, we contribute to work on the economic effects of dowry. Dowry affects 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, Chakravarty, and Gulesci 2020), savings behavior (Anukriti, Kwon, and Prakash 2022), and sex selection (Borker et al. 2017). Our novel data collection allows us to report new facts about how dowry is allocated across family members and generations. Preexisting data sets that collect information on dowry do not allow for this either because they do not collect any information on property rights over dowry (REDS, IHDS) or only collect information on the property rights of husbands and wives (SWAF). Furthermore, building on past theoretical work on property rights over dowry between men and women (Anderson and Bidner 2015), we evaluate whether dowry may play a role in facilitating migration by resolving household frictions that result from the disruption of traditional old-age support systems.

Finally, we contribute to the literature on migration costs and the drivers of the inefficient allocation of labor across space (Bryan, Chowdhury, and Mobarak 2014; Gollin, Lagakos, and Waugh 2014; De Janvry et al. 2015; Kone et al. 2018; Bryan and Morten 2019; Meghir et al. 2022) and particularly the literature emphasizing how migration interacts with informal social insurance (Munshi and Rosenzweig 2016). Facilitating the movement of individuals from areas where they earn low wages to where they earn higher wages can greatly improve individual well-being and aggregate productivity, and so understanding barriers to migration is crucial for economic development. We contribute by identifying a new friction that reduces migration—parents' need for old-age support in settings with a limited formal social safety net—and showing how a cultural tradition like dowry can relax this friction. To the extent that rural-to-urban migration—a key driver of economic development—remains low in India (Foster and Rosenzweig 2008), we shed light on an important obstacle

to migration and highlight a new set of policies, such as pension plans, that could enable it.

II. Background

II.A. Marriage Traditions and Marriage Environment in India

1. *Traditions.* Although dowry dominates today, historically, a variety of marriage traditions have coexisted 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 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 2004). Consistent with this, Chiplunkar and Weaver (2023) find that between 1915 (the earliest year for which they have data) and 1930, less than 40% of marriages included dowry payments. This matches the 1911 Census of India, which documents a wide variety of marriage practices, including dowry and bride price (Gait et al. 1913).

Anthropologists suggest that traditionally, dowry in India was a bequest to the bride, as in Europe (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' deaths. 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.[3] First, both quantitative and qualitative sources suggest that the prevalence has dramatically increased. Chiplunkar and Weaver (2023) show that between 1935 and 1975, the share of marriages with dowry increased from about 40% to close to 90%, and dowry

3. Arunachalam and Logan (2016) posit that in South Asia, dowry is used by some families as a bequest to daughters, and others as a groom price paid to in-laws (Arunachalam and Naidu 2010).

has remained nearly universal thereafter.[4] Similarly, a detailed report by AIDWA (2003) observes that, "Dowry is a Brahmic custom which today has spread to all sections of society" (69). Anderson (2003) notes this increase is despite a decline of dowry with modernization in Europe, perhaps due to the caste system.

Second, while prior to this article, we are not aware of quantitative evidence on property rights over dowry between generations in India, qualitative evidence suggests that even if dowry originated as a bequest to brides, 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" (63). Similarly, AIDWA (2003) writes, "Nor is the identification of dowry with pre-mortem inheritance given to a daughter and her bridegroom satisfactory today" (12) and further asserts that in Bihar, for example, "The majority of women do not have control over even their own jewelry" (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.

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.[5] 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" (19). This observation captures the exact mechanism we study here—that modern dowry can sometimes become a form of financial old-age support for grooms' parents, especially as patrilocality

4. The extent to which dowry payments have increased in real terms in India in recent decades is subject to more debate (Rao 1993; Edlund 2006; Anderson 2007; Chiplunkar and Weaver 2023).

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

declines and migration increases. In Section III, we characterize this mechanism in a simple model.

2. *The Marriage Environment.* Data we collected from married migrants to Delhi—the Destination Survey described in Section IV.A—help shed light on the marriage environment for migrants in India today. Focusing on a sample of men who migrated to Delhi as adults, these data show that marriage and migration decisions are often undertaken when a man is young (the average age of marriage is 23 and of first migration to Delhi is 22) and tend to be close to concurrent, especially when taking into account that marriages typically occur after multimonth engagements. The modal migrant marries within a year of migrating (25%), and the majority (54%) marry within three years of migrating. Migrants typically marry women identified by their families rather than meeting women in their destination, and families are involved in all aspects of the marriage decision. Ninety-two percent of migrants' wives are introduced to them by their parents (44%) or other relatives (48%), and 92% of wives are from the migrant's state of birth. Moreover, grooms report that their parents have the final say over marriage in 87% of cases, and in 51% of cases, wives live with the grooms' parents (and apart from their husbands) after marriage, although this figure declines significantly with age, likely as sons establish themselves.

As we will see, these aspects accord with the theoretical framework described in Section III, where sons are young at the time of migration and therefore have few liquid assets, parents have substantial power over the marriage, increasing their ability to obtain resources, and the marriage and migration decisions have similar timing.

II.B. Old-Age Support in India

Traditionally, the elderly in India, as in many low-income countries, have relied on family, especially sons (Jayachandran 2015), for old-age support.[6] Based on evidence from two rounds of the special NSS of aged persons (1986–1987 and 1995–1996), Chakraborti (2004) notes that the majority of elderly are supported by their children. Indeed, in survey data we collected in Delhi (the Destination Survey described in Section IV.A), 88%

6. As late as 2018, 48% of elderly respondents to the Longitudinal Aging Study in India reported residing with an adult son.

of migrants said taking care of elderly parents was one of the most important factors for their reputation. At the same time, Chakraborti (2004) writes, "The family also has its limitations, which are becoming increasingly apparent, as social and economic development undermines traditional values" (26), and "Ageing increasingly appears to be a rural issue. The problem becomes more intense when younger family members move to the cities, leaving behind the elderly to look after themselves" (253). Thus, even in the late 1990s/early 2000s, it was evident that modernization was disrupting traditional modes of old-age support that were dependent on coresidence.

Disrupting traditions of coresidence may not deprive the elderly of old-age support if migrating children compensate for the loss of in-person support by sending remittances to their parents. However, in line with Chakraborti's observations, qualitative evidence suggests that this is not the case. Focus groups and life histories in Rajan, Miśra, and Sarma (1999) suggest that the elderly are concerned about incentive problems in ensuring old-age support when children live elsewhere. One respondent commented that "The elderly can only expect old age care from their children provided they stay with them" (305), while respondents in focus groups said that property should not be distributed to children before death lest it remove the incentive to provide old-age support (271). Even in the absence of incentive problems, sending remittances is difficult and costly. While a national scheme has led 80% of Indians to nominally have bank accounts, as of 2018, a large fraction of accounts were inactive (Anand 2018). Forty-eight percent had zero transactions in the past year (Abraham 2019). As of 2018, mobile money was uncommon: less than 5% of Indians have used mobile phones or the internet to access a financial institution, and only 29% have made or received digital payments (Anand 2018). Consistent with lower-income South Asians rarely using electronic banking or mobile money to make transfers, in Bangladesh, a similar context, "Remitting money is difficult and migrants carry money back in person" (Bryan, Chowdhury, and Mobarak 2014). For many migrants, such in-person visits are infrequent. In our Destination Survey, the modal male migrant visited his parents twice a year, and 10% of respondents had not visited parents at all in the past year.

Despite growing frictions in providing traditional old-age support, as in many lower-income contexts, the state also has a limited role in providing old-age support. Pension coverage is low

and uneven across states (Chakraborti 2004). In data from the 2018 Longitudinal Aging Study (LASI), only 9% of respondents over age 60 received or expected to receive a pension.

III. Theoretical Framework

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

III.A. Setup

Families have parents—who act as a single unit—and a son. Families make decisions over migration and resource sharing. We model the groom and his parents as a collective family (Chiappori 1988) and do not take a stance on the process of decision making. In a first stage, at the time of the son's marriage, the family decides how much of the available resources to allocate to the parents in old age ($S_1 \geqslant 0$), how much to give to the son as a marriage gift ($G \geqslant 0$), and whether the son should migrate ($m \in \{0, 1\}$). In the second stage, the son earns his income, the family chooses the optimal level of transfers between the son and the parents ($\alpha \geqslant 0$), and consumption takes place. Families optimize the Pareto-weighted sum of their utilities. Importantly, migration introduces a friction that makes it more costly to transfer resources.

Parents have Pareto weight $\theta(\mathbf{z})$, and the son has Pareto weight $1 - \theta(\mathbf{z})$. The vector $\mathbf{z}$ represents the distribution factors that influence the relative power of parents versus the child in the decision-making process in a collective framework in addition to mutual altruism (Chiappori, Fortin, and Lacroix 2002), making the model nonunitary (Browning, Chiappori, and Weiss 2014). For brevity, we use $\theta(\mathbf{z})$ and θ interchangeably.

Parents earn income y_{1P} in the first stage, and zero in the second stage, when they are retired. The son earns zero in the first stage and income y_{2K} in the second stage, when he may also receive an additional income, net of cost, R in the case of migration.[7]

7. This formulation of migration reflects that most men migrate for employment. The special migration module of the NSS Round 64 shows that 82% of men who emigrated from their households migrated for work. Male outmigration for marriage is negligible at less than 1% of male migration in the data.

Households can be heterogeneous in θ, y_{1P}, y_{2K}, and the return to migration R. The latter is distributed according to a continuous and unimodal conditional distribution.

When sons marry, they gain access to their bride's endowment, E. In a setting like India, where women's outside options are low, and women have limited property rights or protections in the case of divorce, we expect men to be able to direct the use of household resources. We assume the bride and groom's traits are complements in creating household surplus, and thus there will be positive assortative mating between the groom's earnings y_{2K} and the bride's endowment, E.[8] We assume that although brides' parents know y_{2K}, they do not know individual migration returns R or Pareto weight θ. If brides' parents knew R, this would only strengthen the connection between migration and dowry, since if brides' parents endogenize the response of the grooms' household to higher liquid dowries, they may give more to facilitate migration.

A portion $d \in [0, 1]$ of the bride's endowment E is available at the time of marriage, representing liquid or movable gifts (dowry) given by the bride's family when $d > 0$, while a portion $(1 - d)$ of the bride's endowment is illiquid, and represents the bride's future inheritance or the value of her human capital.[9] We treat d as exogenous to our model and allow it to be influenced by the extent to which local customs favor liquid upfront dowry, whereas E reflects matching in the marriage market equilibrium. We now refer to $d \cdot E$ as dowry payments, or dowry for short, and d as dowry practices.

In the first stage, the son marries, the family decides whether the son will later migrate, and allocates available resources, $y_{1P} + d \cdot E$, between savings $S_1 > 0$ and a lump-sum gift to sons $G > 0$.

8. Assortative matching will result as the decentralized marriage market equilibrium in a transferable utility model where the household surplus function is supermodular in the traits of each side, which is common in models with children as a public good (Chiappori 2017). We do not aim to calculate the surplus shares assigned to each side of the market, but the predictions of a model in which an equilibrium transfer clears the marriage market, as in Andrew and Adams (2022), would be similar.

9. Consistent with theoretical work on dowry, we assume brides' parents give dowry for their daughters' well-being. Dowry alternatives include educational investments or later inheritances (Anderson and Bidner 2015). Roy (2015) discusses substitutability between dowry and inheritance.

Therefore, $d \cdot E - G$ will represent the amount of dowry kept by grooms' parents.

In the second stage, the son receives his income and the return to migration, if any, $y_{2K} + R \cdot m$, as well as the illiquid portion of the bride's endowment $(1-d) \cdot E$, and families decide how much should be transferred to parents, denoted as $\alpha \geqslant 0$. This transfer can be monetary, or represent in-kind support from the son or daughter-in-law. We denote G and α as net transfers, meaning that family members do not make a transfer that gets returned through a new transfer in the opposite direction. Following any transfers, parents and sons consume at the end of stage 2.

A key assumption is that migration makes transferring resources from the son to the parents through α costly. We denote as $\gamma > 0$ the cost of transferring a unit of α after migration occurs, capturing the effect of distance (especially for in-kind support and services) and financial frictions in remittances, as well as, in a reduced-form way, lack of information (on relative consumption needs) and limited commitment.

In sum, the household chooses marriage gifts G, savings for the parents S_1, migration status m, and son's transfer α, along with consumption levels in the second stage $\{c_{2P}, c_{2K}\}$ that satisfy the budget constraint, to solve the following problem:

$$
\begin{aligned}
(1) \qquad & \max_{\substack{G \geqslant 0,\, S_1 \geqslant 0,\, \alpha \geqslant 0,\\ m \in \{0,1\},\, c_{2P} \geqslant 0,\, c_{2K} \geqslant 0}} \quad \theta(\mathbf{z}) \ln(c_{2P}) + (1 - \theta(\mathbf{z})) \ln(c_{2K}) \\
& \text{s.t.} \quad S_1 + G \leqslant y_{1P} + d \cdot E \\
& \qquad c_{2P} \leqslant S_1 + \alpha \\
& \qquad c_{2K} \leqslant y_{2K} + (1-d) \cdot E + R \cdot m + G - (1 + \gamma \cdot m) \cdot \alpha.
\end{aligned}
$$

III.B. Solution

Here we provide the intuition behind the model solution. The Online Appendix contains the full description and all mathematical details and proofs. We solve the model by first considering consumption allocations with and without migration, then determining whether migration occurs given the Pareto-weighted family utility in each scenario.

1. *Consumption Allocation and Transfers.* The first-best solution to the intergenerational allocation problem, in the absence of frictions, is to equalize the parents' and the son's weighted

marginal utilities of consumption. With log utility, the parents' share of total resources ($y_{1P} + y_{2K} + E + R \cdot m$) would be θ, and the son's would be $1 - \theta$.

If migration does not occur ($m = 0$), the household always implements the first-best solution, as there are no relevant frictions on transfers. When migration occurs ($m = 1$), transfers from the son to the parents in the second stage α become costly to implement. Families where transfers would flow from sons to parents in the first best may choose not to have the son transfer or to transfer less. Both choices distort the optimal allocation of resources between generations, making migration relatively less attractive for those families whose parents expect support from their son.

There are three possible solutions to the intrafamily allocation problem in the case of migration:

(i) **Marriage gifts solution**: $\alpha^* = 0$ and $G^* > 0$. This solution arises when the pool of resources in the first stage is large enough that parents can achieve their optimal level of second-stage consumption (given the Pareto weights and overall household resources) without relying on transfers from their son in the second stage. Because the household faces no constraints on transfers, consumption will be the first best.

(ii) **Autarky solution**: $\alpha^* = 0$ and $G^* = 0$. This solution arises when the resources available in the second stage are in an intermediate range, which can be solved for in terms of the migration return, resulting in a range of R's for which autarky will arise. In this solution, parents consume the resources available in the first stage, leaving no marriage gifts for the son, and the son consumes those available in the second stage with no transfers.

(iii) **Remittances solution**: $\alpha^* > 0$ and $G^* = 0$. This solution arises if R is higher than some threshold, meaning the resources available to the son in the second stage relative to those available in the first are high enough to warrant transfers, even at a cost. Remittances are still lower than in the first best, however, due to the cost of transferring.

In the latter two cases, the household faces a trade-off between improving parental consumption and maximizing total household resources.

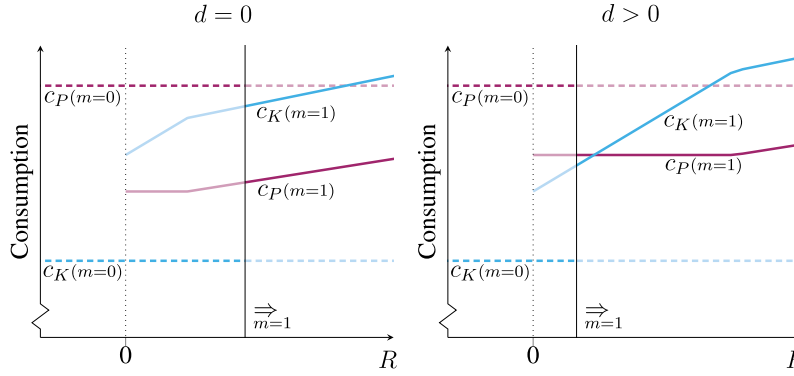

FIGURE I

Household Migration Problem: Constrained Households

This figure depicts the possible consumption for parents and sons with and without migration when no versus some of the bride's endowment is transferred via dowry payments. The figure illustrates a family where the son's resources, his income y_{2K} and bride's endowment E, exceed the income of the parents y_{2P}, but the parents have a greater Pareto weight. Thus, in the absence of migration, transfers flow from sons to parents. With migration, at an R of zero, parental consumption would fall, and son's consumption would rise, reducing Pareto-weighted utility. Thus, an R above a strictly positive threshold is required for migration to occur in both panels, but the threshold is lower in the right panel because some of the bride's endowment can be shared with the parents at the time of marriage, reducing the consumption distortion caused by migration.

2. *Migration Decisions.* In the marriage gifts solution, migration does not distort consumption allocation, so Pareto-weighted utility from migration is higher than no migration whenever $R > 0$. However, for households in the autarky or remittances solution, for an R that is ϵ above 0, a household choosing migration would suffer from a suboptimal consumption allocation while gaining negligible resources.

Therefore, in these households, migration will only occur for net returns R above a strictly positive threshold. This means that migration rates are lower than in the first-best case where remittances are costless: families are only willing to incur a worse allocation of resources across generations if the son's migration has high returns.

This solution is illustrated in the left panel of Figure I, which shows parent and son consumption with and without migration over a range of migration returns. In the illustration, the parent and child earn similar incomes, but the parent has a relatively

high Pareto weight, and thus transfers flow from son to parent in the absence of migration. For a return above zero, though migration increases total consumption, it distorts the parent–son allocation by limiting sharing. The kink in the consumption paths is due to the portion of returns over which no remittances are made. As R increases, the family transitions to costly remittances, which reduce the son's consumption by more than they increase the parents' consumption. As a result of the transfer distortion, migration only occurs at a relatively high R.

3. *The Effect of Transfers through Dowry.* A key implication of the model is that a higher d (stronger dowry practice) allows the family to access the son's wife's resources in the first stage before the migration friction materializes. Assigning some of these resources to parents prior to migration by sharing dowry improves the intergenerational allocation of consumption in constrained families and reduces the threshold of R required for migration, as shown in the right panel of Figure I.

III.C. Testable Predictions

The model's first set of implications involve the marriage gifts G, and particularly whether parents retain some of the dowry or provide net gifts to the son. When $d > 0$, in cases where $G < d \cdot E$, we refer to parents as net takers from the son's dowry. This occurs when some resources are appropriated by the groom's parents, such that the marriage gifts the son consumes in the second stage are less than the dowry paid by the bride's family in the first stage.

PREDICTION 1. The net marriage gifts kept by the son in the second stage exceed the dowry received from the family of the bride in some families and do not exceed it in others.

This prediction allows us to explore the distribution of dowry taking in Section IV. While it follows directly from the setup of the model, and puts little restriction on the data, it creates a useful distinction from models where dowry functions exclusively as a groom price with parents as the sole beneficiaries. As we detail in the Online Appendix , in our model whether $G < d \cdot E$ depends on the relative sizes of the son's and parents' weighted marginal utility of consumption in the absence of transfers.

PREDICTION 2. Holding fixed parameters y_{1P}, y_{2K}, and θ, the probability that parents are net takers of dowry will be higher if the son migrates ($m = 1$) than if he does not ($m = 0$).

This prediction occurs for two reasons. First, when the son's resources increase as a result of migration, gifts G^* decrease. Second, if $m = 1$, transfers that could otherwise occur through remittances α now occur through lower G, as this does not incur transfer costs. Note that in an alternative model where migrant sons used dowry to pay for the upfront cost of migration and not to support their parents, we would be less likely to see parents retaining some or all of the dowry on migration, providing an empirical test that can help distinguish our mechanism from other channels.

PREDICTION 3. If $m = 1$, holding y_{1P} and θ fixed, the probability that parents are net takers of dowry is increasing in son's income $y_{2K} + R$. Similarly, holding y_{1P} and $y_{2K} + R$ fixed, the probability that parents are net takers of dowry is increasing in the parental Pareto weight θ.

The prediction indicates that net taking from a son increases in his income $y_{2K} + R$ (because his marginal utility of consumption in the absence of a transfer is decreasing in $y_{2K} + R$) and in the parental Pareto weight θ (because the household places a greater weight on parents' consumption). The prediction focuses on the extensive margin (whether parents are net takers) because, upon migration, higher income for the son and higher Pareto weight for the parents lead to an autarky or a remittance solution, in which $G^* = 0$ and parents are always net takers, as long as there is dowry (i.e., $d \cdot E > 0$). Only in a marriage gifts solution do these variables influence the intensive margin of dowry taking by the parents by increasing G^*.

Distribution factors $\mathbf{z}$ (e.g., the parents' veto power over the son's marriage) can influence the sharing of the dowry and whether parents are net takers by shifting the Pareto weight θ.

PREDICTION 4. Parents who receive remittances from their migrant sons are more likely to be net takers of dowry than those who do not receive remittances.

This counterintuitive prediction stems from the fact that remittances are costly, and therefore will only be given if other means of transfer have been exhausted. Therefore, remittances

reveal the type of household—remittances being sent despite their cost indicate a household where parents have high Pareto weights or marginal utility of consumption relative to sons, and therefore ones where dowry is likely to be retained by parents.[10]

The model also has implications for aggregate migration behavior when d varies exogenously.

PREDICTION 5. Families exposed to a higher d are more likely to have a migrant son.

This occurs because stronger dowry practices allow families to allocate more of the woman's endowment E between parents and sons before migration occurs. Migration makes transferring resources from the son to the parents in the second stage costly. When more of the bride's endowment is given in the form of dowry, it relaxes the constraint on transfers to parents in the first stage, making migration more attractive.

PREDICTION 6. If migration rates are low, a decline in the cost of migration (or equivalently, an increase in the net returns to migration) increases the probability of migration more with higher d.

Because migration rates depend on dowry practices, the migration response to reducing the cost of migration also depends on dowry practices. When migration rates are low, that is, 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 in places where there are higher baseline levels of migration (which stronger dowry practices, a higher d, produce). This is because the density of men on the margin of migrating is greater.[11]

10. An alternative model in which some households face frictions ($\gamma > 0$) and others do not ($\gamma = 0$) could generate the opposite prediction because remittances would be more common among unconstrained households that would not need to share dowry upfront.

11. 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 individuals with the modal returns to migration do not migrate in India is consistent with overall low migration rates, for example, Munshi and Rosenzweig (2016).

III.D. Extensions: Sons and Daughters and Consumption / Savings Decisions

In the Online Appendix, we consider two extensions of our model. The first extension allows families to have multiple sons and daughters (Online Appendix B.3), hence accounting for the effect on families of having to also pay a dowry on the marriage of a daughter. The predictions of our model remain unchanged because paying dowry is incidental to the parents' savings S_1. Hence, the role of dowry practices in promoting migration is unchanged. The second extension allows families to consume and save in stage one and stage two (Online Appendix B.4). This extension also leads to the same predictions as the baseline model.

IV. New Data Collection and Testing Predictions on the Distribution of Dowry

To test the model's first few predictions, we collected two original, distinct survey data sets on gifts given at the time of the wedding and who benefited from those gifts. While other data sets have collected information on the size of dowry payments, these are the first data to our knowledge to measure how dowry is eventually allocated, not just within couples but also across generations. 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. More details for all the data sets, including details on data collection and measurement for the surveys, are provided in Online Appendix B.5. The first data set allowed us to obtain detailed information through in-person interviews with young or middle-aged men. The latter data set, 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 nonmigrants from the same origins.

IV.A. Destination Survey

1. *Background and Summary Statistics.* The Destination Survey data were collected through in-person surveys of migrants and locals in Gurugram (a satellite 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.[12] The sample was stratified to consist of roughly 20% 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 nonmigrants, with the caveat that migrants and nonmigrants are likely to differ in other respects.

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 nonmigrants (our analysis is robust to other age thresholds, including using only those born in Delhi). We focus on those who moved at age 15 or greater because we are interested in cases where the groom made an independent migration decision.[13] Furthermore, we classify individuals mutually exclusively as coresident rather than migrant if they currently live with their parents. This definition of migrant is motivated by our model, where migration introduces a friction for income sharing by physically separating sons and parents. The average migrant in our data left home eight years ago, suggesting that our definition captures permanent migration.

After collecting basic demographic information and details about respondents' (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), we asked who gave and who received the gift, the value of the gift, and who had ownership rights over it, allowing for fractional ownership. More information on these questions is provided in the Online Appendix B.5.

12. 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.

13. 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. In practice, the majority of men migrate without parents or relatives for all ages 15 and up (56% at 15, 75% at 16, 78% at 17, 64% at 18), so the specific choice of cutoff has little effect on the results.

Our key measures of transfers across different parties are constructed as follows:

- *Gross Transfers Made by X*: The total value of transfers that X made to other parties, summing over all categories of gifts on the survey, not including transfers that X was reported to have made but that X now owns.
- *Gross Transfers Received by X*: The total value of transfers across all gift categories that X now owns.
- *Net Transfers to X*: *Gross Transfers Received by X* − *Gross Transfers Made by X*.

That is, the net transfer to the groom's parents is calculated 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, such as the couple and the bride's parents (excluding gifts they "gave" but ultimately own). Groom's parents are net takers ($d \cdot E > G$ in the model) if this net transfer is positive and net givers if it is negative ($d \cdot E \leqslant G$). 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 and coresidence patterns with parents. Online Appendix Table A.1 reports summary statistics from these data. Consistent with the literature (Anderson 2007), dowry is high, roughly 10 times the son's monthly earnings.

2. *Distribution of Gifts and Ownership.* This survey provides the first quantitative evidence on property rights over dowry between parents and children of which we are aware. Using these data, we present an illustration of the ownership of gifts from the bride's side in Figure II, Panel A, which reports the average value of the amount owned by each party of transfers from the bride's or groom's parents. We find that brides only retain property rights over 13.5% of transfers from the bride's parents on average. Grooms, on average, have ownership rights over 40.9% of these marriage gifts, and grooms' parents have ownership over 42.5%.[14] This finding supports our model's approach of examining

14. This does not mean the benefit the bride gets from the dowry is equally limited, as her parents may improve her welfare through a higher earning husband (Anderson and Bidner 2015), or she may receive a commensurate marital surplus share in exchange for the nominal goods she disclaims.

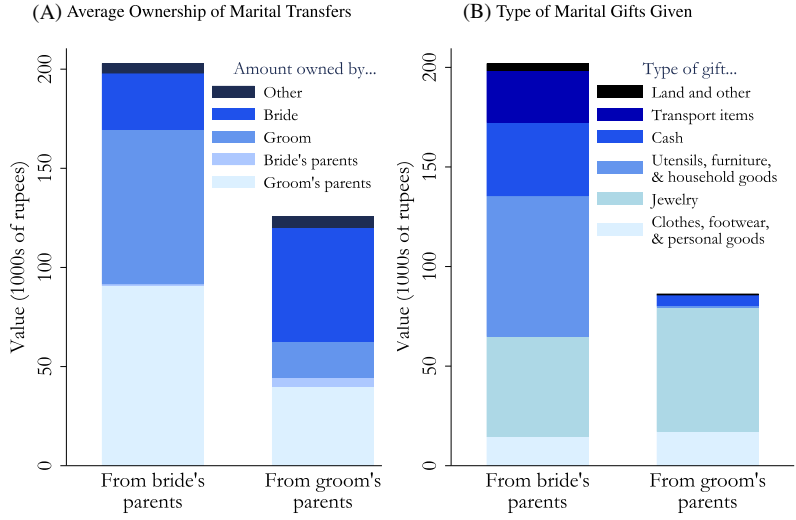

FIGURE II

Ownership of Transfers and Type of Marital Gifts

Panel A shows the ownership of the gross transfers made by the bride's parents to other parties at the time of the marriage, often referred to as dowry in the literature, and from the groom's parents, from the 2018 Destination Survey. We use the survey questions that ask which gifts were given by the bride's parents and who has ownership (rights to sell) over those gifts. The average percentages of transfers from the groom's parents captured by each party are 30.6% by the groom's parents, 18.5% by the groom, 43.1% by the bride, 3.9% by the bride's parents, 3.8% by others. The average percentages of transfers from the bride's parents captured by each party are 42.5% by the groom's parents, 40.9% by the groom, 13.5% by the bride, 0.3% by the bride's parents, and 2.7% by others. Panel B shows the composition of net gifts (removing those where property rights are retained by the giver) by brides' and grooms' parents from the 2018 Destination Survey.

the previously unstudied allocation of dowry between the groom and his parents.

Figure II, Panel A also shows the large amount of gifts given by the groom's parents at the time of the wedding. Unlike those from the bride's parents, a not insubstantial portion of these gifts is actually retained by the groom's parents, according to their son's reports on the property rights over these items. The bride's parents take very little of these gifts, showing the asymmetry in marital transfers: while both sets of parents give, it is only the groom's parents who take. The bride and groom themselves are the main beneficiaries of transfers from the groom's parents, with

the bride retaining a greater share of the property rights over these transfers, perhaps because they are often in the form of jewelry, which we discuss next.

Figure II, Panel B shows the composition of the gifts from the bride's parents and the groom's parents separately. In this breakdown, we remove the portion of these gifts where property rights are retained by the giver and report only the net amounts given. The majority of the gifts from the bride's parents are cash, household items, and jewelry. They also give some transport items (such as motorcycles), clothes, and other personal items. There is very little land given as dowry among our survey respondents. Grooms' parents, on the other hand, mainly give jewelry at the time of the wedding, with a small amount of cash and personal items.

In Online Appendix Figure A.1, to validate our ownership measure, we also present data on how ownership varies with goods' storage location. We separate out jewelry, which is among the most common and valuable items given at the time of marriage and also more likely to be owned by the bride, and pool other types of gifts.[15] Goods are more likely to be stored in the home of the reported owner, though in some cases, the groom reports he has property rights over gifts he nonetheless stores at his parent's home. Items are rarely stored at the bride's parents' house or any other location, and only jewelry is commonly stored in a bank box or sold or mortgaged.[16]

IV.B. Origin Survey

The Origin Survey complements the Destination Survey by gathering information from parents and from a broader range of geographies, allowing us to compare migrants and nonmigrants from the same origin. The surveys were conducted over the phone (as it was collected in the summer of 2020, in the early stages of the COVID-19 pandemic in India), and so have slightly less detailed information and more attrition. We conducted phone

15. Note, we did not collect location data for cash, as it is not stored in a similar manner.

16. We also collect information on bank deposit boxes, which are rare. Of the 30 cases where jewelry was in a bank locker, 37% of the time the reported owner was the groom, 17% it was the groom's parents, and 47% it was the bride. In terms of whose names were on the locker, 77% of the time it was either the groom or both his and his wife's name. The pattern suggests that the name on the bank locker is related to self-reported ownership.

surveys in 34 districts in six Indian states (Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh, and Maharashtra) in partnership with IDinsight (IDI), a global advisory and data analytics research organization. The households contacted were randomly drawn from a preexisting roster of household members whom IDI had surveyed in-person for previous projects conditional on having a household member old enough to have adult children (45–65). These households were, in turn, identified via voter rolls and community health worker registers and randomly drawn from that pool.[17]

We surveyed a total of 2,541 households. Due to our interest in dowry, we restricted the 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.[18] The average migrant son visited parents for only three months cumulatively per year in a normal year, suggesting that we are not merely capturing seasonal migrants. 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 a nonmigrant married son with a 30% probability. After completing this module, we asked the respondents if they would be willing to complete it 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 marriage. Due to the time-limited nature of the phone survey, for specific gift categories, we only asked parents whether that gift type was given to the groom's side and what fraction the groom's parents owned. For this reason, when we present data on the values owned of different categories or ownership by parties besides the groom's parents, we always refer to the Destination Survey. In addition, to obtain a measure of net transfers to the groom's parents, we asked respondents to (i) estimate the total size of gifts they gave at the time

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

18. 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 extra data or cell phone minutes.

of the wedding (across all categories), (ii) the total value of these gifts that they kept, (iii) the total value of gifts given by the bride's side to the groom's side, and (iv) the total value of gifts given by the bride's side that the groom's parents currently owned. Gross transfers received by the groom's parents are then given by the total value of the gifts from the bride's side they kept, while gross transfers made by the groom's parents are given by the value of the gifts they gave minus what they actually still own. This leads to relatively more missingness of the net transfer to groom's parents and net taker variables than in the Destination Survey because calculating these variables in the Origin Survey requires parents to numerically estimate all three values over the phone. Despite this, while the questions are asked in a different way, the definition of a net transfer to the groom's parents is identical across the two surveys. More information on these questions appears in Online Appendix B.5. Alongside asking about gifts, we collected demographic details on the household head, information about their son's income and education, and financial assistance given to/received from their son. Online Appendix Table A.2 reports summary statistics for these data. 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 data sets, it is reassuring that the results are not driven by measurement issues or systematic biases from specific types of respondents.

IV.C. Empirical Tests of Predictions 1–4

We test the model's first set of predictions exploiting the newly collected data's unique information on marriage payment transfers.

1. *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 data sets. In the destination data (where there is a higher share of migrant sons), 45% of grooms' parents take

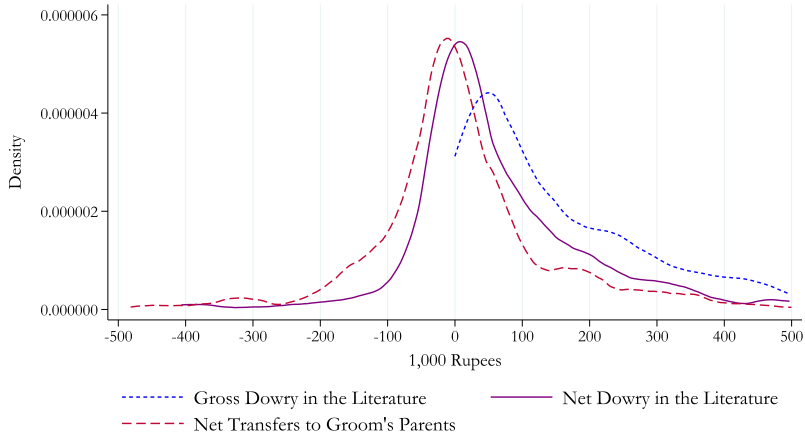

FIGURE III

Distribution of Gross and Net Transfers in the Destination Survey

Distribution of three different measures of dowry payments in the 2018 Destination Survey. Gross Dowry measures the total amount given by the bride's parents to any recipient. Positive numbers indicate outflows from the bride's parents. Net Dowry subtracts the contributions made by the groom's parents to the bride's side from the contributions by the bride's parents to the groom's side. Positive numbers indicate that the bride's parents gave more than the groom's parents, and negative numbers indicate that the groom's parents gave more. Neither of these measures exploit ownership data, which are not typically available in the literature. Finally, Net Transfers to Groom's Parents is a new measure that is only possible to report with data on dowry ownership. It measures the transfers from the bride's parents owned by the groom's parents minus any transfers from the groom's parents given to others. Positive values indicate the groom's parents are net takers, whereas negative values indicate they are net givers.

from the dowry on net (Online Appendix Table A.1). In the origin data, 27% take on net (Online Appendix Table A.2).

Figure III uses the destination data to plot two commonly collected, classical measures in the dowry literature, alongside our new measure of the net transfer taken by the grooms' parents. The first of these measures, the total value of gifts from the bride's to the groom's side, is called "gross dowry" in the literature and is analogous to the left bar in Figure II, Panel A. The second common measure is called "net dowry" and measures the difference between the total values of gifts from the groom's side and the bride's side (the difference between the left and right bars in Figure II, Panel A). Gross dowry is highest and universally positive, whereas net dowry is lower, with some negative mass, and still centered above zero. The net transfer to the groom's parents,

however, is approximately centered at zero, with mass on both sides. This reflects the fact that—consistent with Prediction 1—while a substantial share of grooms' parents do, on net, benefit from their son's dowry, many w 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 in the groom's family. Data on property rights over dowry are needed to understand dowry's implications for consumption across generations.

To further explore the data, in Online Appendix Figure A.2, using the destination data, we plot the inverse hyperbolic sines of the net amount given by the bride's side against the net transfer taken by the groom's parents. Almost all data points are above the x-axis, showing that the practice of dowry is essentially universal. By contrast, about 50% of grooms' parents also make transfers that correlate positively with bride's transfers, and 50% instead receive the transfer from the bride's side, creating a V-shape. Conditional on taking, the amounts taken are sizable, with the average taking parents taking four times GDP per capita.

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

2. *Prediction 2.* We test whether parents are more likely to be net takers from the dowry if the son is a migrant in Table I, columns (1) (Origin Survey) and (3) (Destination Survey). 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 also control for whether the son currently coresides with his parents to account for the fact that property rights may be hard to measure in cases where sons and parents coreside. The omitted category is, therefore, sons that remain in the same village as their parents (Origin Survey), were born in Delhi, or came to Delhi as children with their parents (Destination Survey), but do not currently coreside. We also include a control for net dowry, as defined in Figure III, which helps account for the possibility that taking is

instead driven by the fact that higher-income sons receive higher dowries. We approximate dowry size with net dowry rather than gross dowry because it more closely represents the increase in total available resources to the groom's side of the family from the marriage $d \cdot E$.

To the extent possible, we also include controls for all the parameters held fixed by the comparative statics in Prediction 2. All regressions control for son education fixed effects to proxy the son's resources (e.g., y_{2K} and $y_{2k} + R$), except for when son education is highly correlated with an explanatory variable of interest (occupation score). We control for father education fixed effects to account for the parents' resources (e.g., y_{1P}). In the destination data, to proxy for the parents' Pareto weight θ, we exploit the following question: "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. Although this variable is not available in the origin data, its omission is unlikely to positively bias the relationship between migration and net taking. This is because, in the model, a higher θ reduces the likelihood sons migrate (because distortions to income sharing are more costly) specifically among the households where parents would take the most conditional on migration, weakening the positive association between taking and migration. Even if θ was also correlated with R, this would only bias the results toward our prediction if sons with lower weights in their family have higher net migration returns (and are more likely to migrate), which is counterintuitive. Consistent with the model's prediction, Table I shows that parents of migrants are 8 percentage points more likely to take in the Origin Survey and 22 percentage points more likely to take in the Destination Survey.[19]

To account for the greater missingness of the net taker variable in the Origin Survey, in Online Appendix Table A.3, we perform the same analysis with an alternative measure of taking—the average fraction of gifts owned by the groom's parents. We recover the same patterns as in Table I, columns (1) and (2) with this alternate measure. Furthermore, since focusing on an in-

19. 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.

TABLE I.

PREDICTIONS 2 AND 3: MIGRATION, SES, PARETO WEIGHTS, AND NET TAKING

	Origin survey		Destination survey	
	(1)	(2)	(3)	(4)
	Net taker	Net taker	Net taker	Net taker
Migrant son	0.076**	−0.029	0.218**	0.212*
	(0.038)	(0.059)	(0.086)	(0.117)
Migrant son × ln(son occ. score)		0.199**		
		(0.090)		
Nonmigrant son × ln(son occ. score)		0.014		
		(0.051)		
ln(father occ. score)		−0.048		
		(0.042)		
Migrant son × parents have veto power				0.229***
				(0.076)
Nonmigrant son × parents have veto power				0.221**
				(0.086)
Coresidence and mar. year and age fixed effects	Yes	Yes	Yes	Yes
Son education dummies	Yes	No	Yes	Yes
Father education dummies	Yes	Yes	Yes	Yes
Net dowry quadratic	Yes	Yes	Yes	Yes
Veto control	No	No	Yes	No

TABLE I.
CONTINUED

	Origin survey		Destination survey	
	(1)	(2)	(3)	(4)
	Net taker	Net taker	Net taker	Net taker
Mean of dependent variable	0.283	0.281	0.449	0.449
R-squared	0.049	0.088	0.217	0.217
Observations	1802	1251	552	552

Notes. This table reports the relationship between migration, socioeconomic status, and net-taking behavior in both the Origin Survey (columns (1) and (2)) and the Destination Survey (columns (3) and (4)). The outcome is an indicator variable for whether the grooms' parents are net takers (i.e., those for whom the value of the gifts they control is greater than the value of the gifts they gave). 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. Column (2) does not include son education fixed effects because they measure much the same thing as the occupational score, our key explanatory variable of interest. Column (4) does not include a separate control for veto power because it would be collinear with the veto power interaction terms (the key explanatory variables of interest). Standard errors are clustered at the household level for the Origin Survey. $*p < .10$, $**p < .05$, $***p < .01$.

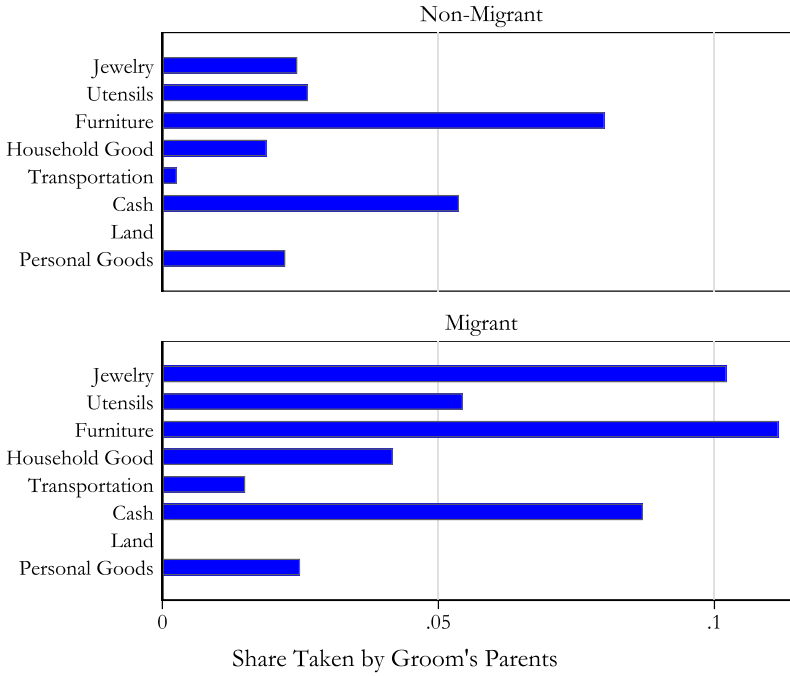

FIGURE IV

Share of Dowry Taken by Item and Son's Migration Status

This figure shows the average value of goods taken by the groom's parents, normalized by the gross dowry, by each dowry item. The data are from the Destination Survey in Delhi. It compares the taking behavior when the son is a migrant to when the son is not a migrant and excludes co-resident sons. Migrants are defined as those who moved to Delhi alone or as an adult and do not reside with their parents.

dicator variable as an outcome ignores interesting variation, in Online Appendix Table A.4 we confirm that the results are robust to using the inverse hyperbolic sine of the amount taken as the outcome (flexibly controlling for net dowry). We use the inverse hyperbolic sine because the value of net transfers to the groom's parents is highly skewed, but there are also many cases where the groom's parents do not receive a positive transfer. In the Origin Survey, parents take 86% more from migrant sons, and in the Destination Survey, they take 250% more.

To understand the types of transfers that drive net taking, in Figure IV, we show the average value of each type of good taken by grooms' parents normalized by the gross dowry for migrants

versus nonmigrants who are not coresident in the Destination Survey.[20] Consistent with the results in Table I, migrants' parents take a larger share of the dowry in almost every category. Reassuringly, the effect on net taking is not an artifact of migrants leaving difficult to move goods like land or furniture with their parents. Rather, consistent with our interpretation of the motive for taking, where dowry provides more liquid resources that can be transferred, migrants' parents take substantially more of the most liquid goods (cash and jewelry). Online Appendix Table A.5 formally tests whether the migrant variable increases the share of total dowry taken in gold and cash and confirms that this is the case. Finally, Online Appendix Table A.6 shows robustness to using the Belloni, Chernozhukov, and Hansen (2014) post–double selection LASSO method to choose from a wide range of potential control variables that may simultaneously influence migration and net taking.

3. *Alternative Explanations.* Although consistent with the predictions of the model, the results in Table I are less consistent with an alternative model in which dowry facilitates migration because it can be used to pay other migration costs such as transportation, or 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. If dowry enabled migration by paying upfront costs, we would expect there to be less dowry left for parents to benefit from when sons migrate. Furthermore, Figure IV shows that migrant grooms' parents take substantially more cash, contrary to what we would expect if cash from the dowry were being used to pay upfront migration costs.

Another potential alternative explanation for this result is that the dowry remains with the migrant's wife, who may stay with the groom's parents when the groom migrates. Migrants' wives remain with the groom's parents in 60% of cases in the Origin Survey and 51% of cases in the Destination Survey.[21] Online Appendix Table A.7 verifies that this is not the case. Parents of

20. This is only possible with the Destination Survey since it requires that individuals reported the values taken for each category separately.

21. This high rate of wives staying with parents may reflect when households are observed in the life cycle. A young migrant's wife may stay with his parents while he establishes himself. We find that the likelihood of a wife staying with parents declines by 1 percentage point with each year of marriage.

male migrants are more likely to be net takers regardless of the wife's location in both surveys.[22]

Finally, one could think that bride's parents are willing to offer more dowry for a migrant son. This explanation is entirely consistent with our theoretical analysis but does not explain the relationship between the groom's parents' taking of dowry and migration. To explain this, it must be that brides' parents wish to facilitate migration for their daughters' welfare and so resolve the grooms' parents' need for old-age support. But this channel is exactly aligned with our model's key mechanism.

4. *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 fathers' and sons' occupations. This provides a more accurate proxy of son and father resources than current earnings because it is less subject to age at the time of the survey, seasonality, the endogenous migration decision, and recall noise than current income measures.[23] We convert this information into occupational scores by matching it to the nationally representative NSS (round 68, conducted in 2011–12) occupational codes. The occupational score is then the median monthly earnings of the occupation. Table I, column (2) tests whether, conditional on the father's occupational score, parents are more likely to take when migrant sons have higher occupational scores. For migrant men, a 100% increase in the son's occupational score increases the likelihood of parents taking by 20 percentage points. In contrast, for nonmigrant 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 trans-

22. Though we do not model the wife's location explicitly, intuitively, there is no clear prediction about the differential effect of being a migrant whose wife accompanies the migrant (rather than staying with his parents). On one hand, a wife who stays may help provide old-age support, substituting for taking the dowry. On the other hand, the wife staying is not exogenous, and may be more likely to occur in cases where there is a stronger tie between the son and his parents or where more old-age support is needed.

23. We use son education as our control for $y_{2K} + R \cdot m$ in the other regressions because it is available in both data sets and substantially less likely to be missing due to nonresponse or the fact the respondent is not currently employed.

fer α to share extra income with parents without resorting to dowry. We note that as in Table I, column (1), we cannot control for the proxy for θ because it is not available in the origin data. However, omitting this control would only positively bias our results in the counterintuitive case that θ (the parental weight) is higher in households where sons have a higher income.

Table I, column (4) tests the second part of Prediction 3. We expect parents to be more likely to take when sons report that parents have veto power. This is indeed the case: when parents have veto power, parents of migrant sons are 22 percentage points more likely to be net takers. Interestingly, this is true for migrant and nonmigrant sons, suggesting that dowry is used to redistribute consumption according to Pareto weights, regardless of migration status. We confirm the robustness of our tests of Prediction 3 to alternative outcome variables (the continuous measure of the amount taken and the share of dowry taken in gold and cash) in Online Appendix Tables A.4 and A.5.

5. *Prediction 4.* The Origin Survey contains information about transfers received by the parents from sons and vice versa. To test Prediction 4, which states that parents who receive remittances from migrant sons are more likely to have taken from the dowry than parents not receiving remittances, we construct an indicator variable for whether a son made net financial transfers to the parents in the year before 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, consistent with the model's somewhat counterintuitive prediction, find a strong positive relationship between net taking and receiving remittances from migrant sons (Table II). Moreover, the results are robust to controlling for income (which we might expect to be correlated with migrant status) flexibly and its interaction with whether the son sends remittances.

V. Migration Predictions

In this section, we test the predictions of the model about the role of dowry practices (d) in enabling migration. These predictions are important for understanding the aggregate effects of the practice of dowry and whether this practice can help facilitate structural change. To test these predictions, we introduce and validate an additional source of variation: the historical strength of

TABLE II.
PREDICTION 4: REMITTANCES AND NET TAKING

	Net taker (1)	Net taker (2)	Net taker (3)	Net taker (4)
Son transfers	0.047	0.002	0.054	−1.362
	(0.031)	(0.036)	(0.034)	(0.914)
Migrant son		−0.023		−0.026
		(0.052)		(0.059)
Son transfers × migrant son		0.176**		0.189**
		(0.075)		(0.085)
Coresidence and mar. year & age fixed effects	Yes	Yes	Yes	Yes
Son education dummies	Yes	Yes	Yes	Yes
Father education dummies	Yes	Yes	Yes	Yes
Income controls	No	No	Yes	Yes
Income interactions	No	No	No	Yes
Mean of dependent variable	0.279	0.279	0.291	0.291
R-squared	0.090	0.096	0.117	0.127
Observations	1098	1098	946	946

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 one if the son made positive net financial transfers to his parents in the year prior to the survey. Income controls include the son's prepandemic earnings (in levels), its square, and his ln(occupational score). Income interactions consist of the same variables interacted with the indicator variable for whether the son sends remittances. Inclusion of these interactions makes the son transfers variable difficult to interpret because it corresponds to the likelihood a son transfers at 0 income. Standard errors are clustered at the household level. $*p < .10$, $**p < .05$, $***p < .01$.

dowry traditions, which positively shocks d. Then we introduce an additional, nationally representative data set, which we use to measure migration.

V.A. A Shifter of Modern Dowry Practices: Historical Dowry Traditions

In our model, d captures the extent to which marriage transfers to the groom's side are available for sharing at the time of marriage. This variable is never directly observed in our data. Furthermore, even if it were, directly using it to test Predictions 5 and 6 would be problematic if d is related to characteristics of the bride and groom, including his migration prospects and the couple's liquidity needs. For these reasons, we instead use a source of variation that is common across all marriages in a given location, irrespective of the spouses' characteristics, and it predates modern economic development, which may vary across locations: the strength of historical dowry traditions. We argue

that couples in districts that historically had stronger dowry traditions will have stronger dowry practices today. Our argument draws on a growing cultural economics literature, which shows that culture has important effects on economic outcomes by establishing "rules of thumb" or "decision-making heuristics" (Nunn 2012, 2022), as well as determining the "rules of the game" (Greif 1993) (e.g., the sanctions for failing to comply with cultural expectations, such as providing a large liquid dowry payment). Indeed, the idea that historical traditions continue to matter today even though the economic environment may have changed matches the findings of the "epidemiological approach," which shows that individuals of different cultural origins make very different decisions (e.g., about fertility or female labor force participation) in the same economic environment (Fernández 2011).

1. *Measure of Historical Dowry Traditions.* We use the methodology and underlying data used to create 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 Murdock (1967) *Ethnographic Atlas*) with maps of the current distribution of 7,500 language groups (362 of these groups are within the district boundaries that we use for India) from the *Ethnologue* (Gordon 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. Online Appendix B.5 provides more details on this process.

Figure V reports the district-level share of the population with traditional dowry according to this measure. The strength of dowry traditions varies in broad regions, and the measure is frequently zero, 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 nonnegligible mass of districts

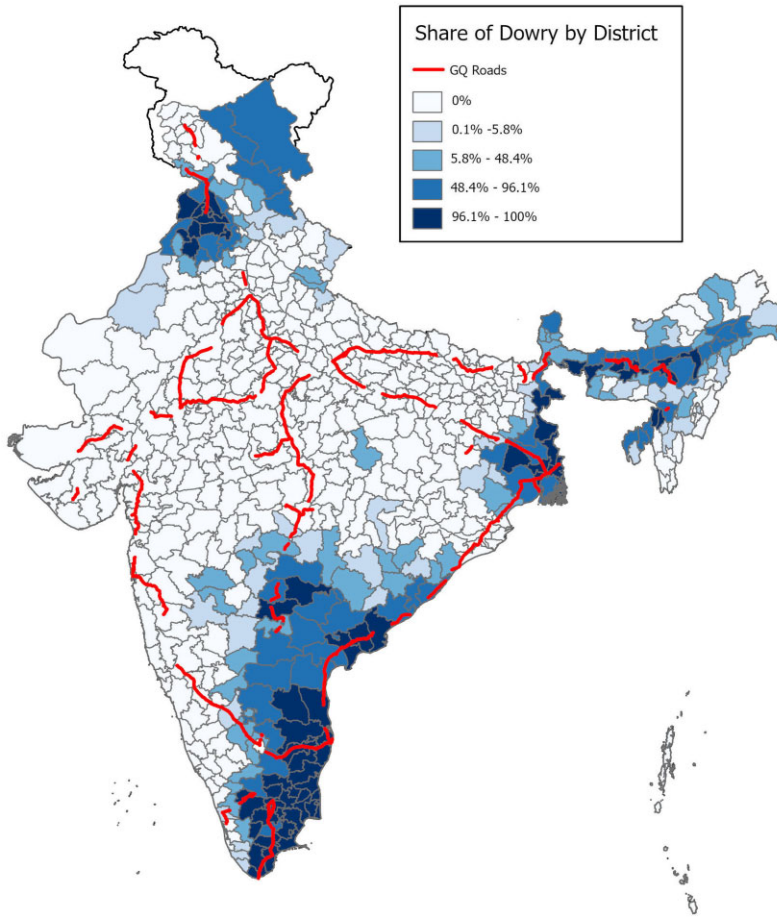

FIGURE V

Share of Population That Traditionally Practices Dowry and Map of GQ and NS-EW Corridors

This figure shows the district-level share of the population with a historical dowry tradition. The data are generated following methods used for the Ancestral Characteristics data 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.

with values just above zero (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 show robustness to other cutoffs.

2. *Geographic Variation and Consistency with Qualitative Data Sources.* The variation in the dowry measure shown in Figure V 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 II 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 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, 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 measure. We validated the ancestral measure by comparing it to qualitative evidence from (i) two summary publications on dowry practices, Goody and Tambiah (1973) and AIDWA (2003), and (ii) 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" (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" (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.[24] The central northern states that are coded as having little ancestral dowry are home to ethnic groups that traditionally practiced bride price.[25]

3. *Quantitative Validation.* We next test whether the data are consistent with stronger historical traditions positively affecting d today. We validate our measure using contemporary measures of dowry sizes from the large-scale 1999 round of the REDS (National Council of Applied Economic Research (India) 1999). An advantage of using the 1999 REDS for validation is that these data were collected right before the highway construction program whose differential effects in districts with stronger versus weaker dowry practices will be used to test Prediction 6. We expect that if traditional dowry positively shocks d, it should be positively related to observed dowry payments ($d \cdot E$ in the model). In Online Appendix Table A.8, we regress log gross and net dowry measures on the historical tradition measure.[26] All specifications control for marriage year fixed effects to account for inflation over time. Columns (1) and (2) show that moving from a historical dowry measure of zero to one is associated with a 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, consistent with historical dowry practices positively shifting d. However, one limitation of this test is that we would also observe a positive result if historical dowry practices positively shock E rather than d. Our next test more directly tests whether historical dowry practices are related to whether transfers are made in a liquid form.

24. Telugu in Andhra Pradesh and Telangana (Dube 1955; Tapper 1987), Bengali in West Bengal and Assam (Fruzzetti 1982; Rohner and Chaki-Sircar 1988; Roy 1975), Punjabi in Punjab (Eglar 1960; Honigmann 1957), Tamil in Tamil Nadu (Beck 1972; Dhanasekaran 1965), and Tibetan in Ladakh (Hermanns and Schuetze 1948; Rockhill 1895).

25. 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).

26. 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 2023).

For this test, we turn to a more geographically widespread data set, the India Human Development Survey (IHDS) (2005/2011), which also allows us to also include state fixed effects. In Online Appendix Table A.9, we test if the historical dowry measure is associated with whether dowry is frequently or ever paid in gold. The IHDS data confirm that the district-level historical dowry measure is associated with a greater likelihood of having dowries paid in gold. Hence, consistent with our interpretation, historical dowry practices are associated with making more transfers via a liquid item.

V.B. NSS: Migration Module

To test Predictions 5 and 6, we obtain nationally representative data on outmigration from a special module included in the 64th round (collected July 2007–June 2008) of India's NSS (Indian Ministry of Statistics and Programme Implementation 2007/2008). This survey covered almost every district in India (588 of 610 districts).[27] All rounds of the Schedule 10 survey 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. By appending the list of outmigrants to the list of current household members in the household roster, we assemble a superset of the roster containing all individuals who ever lived in the household (see Online Appendix B.5 for more details). For our main analysis, we define individuals as migrants if they are reported as having left the household. The listing of outmigrants seems to align with permanent migration (95% of outmigrants left more than a year ago). Nonetheless, as our model focuses on permanent migration, to more precisely capture the model's mechanism, we also report analyses where we define a migrant as someone who left the household more than a year ago and drop recent outmigrants from the data.

27. India now has substantially more districts than it did in 2007–2008. The survey was not universal because areas were exempted due to security concerns, remoteness, or because some areas are inhabited by tribal people who do not wish to be contacted. The excluded areas were the Leh and Kargil districts of Jammu and Kashmir, interior villages of Nagaland that were more than 5 km to a bus route, and inaccessible villages in the Andaman and Nicobar Islands.

Online Appendix Table A.10 reports the means of key socioeconomic characteristics and evaluates whether they systematically vary with historical dowry traditions. We report results from regressions where our explanatory variable 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 related to traditional dowry. Notably, both the share belonging to a scheduled tribe or caste and the share practicing Islam are uncorrelated with traditional dowry after including state fixed effects. Indeed, 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 nonbalanced characteristic conditional on the state fixed effects. In addition, as there is evidence that dowry regions may differ on the caste composition of the population (see Agarwal 1994), even though, conditional on state fixed effects, caste does not seem to be related to the traditional dowry variable, we also show that all the results are robust to caste controls.

V.C. *Prediction 5: Association between Dowry Practices and Migration*

We combine the NSS data with the historical measure of dowry traditions to test Prediction 5, which states that stronger dowry traditions increase the probability of male migration. In Table III, using a sample of men aged 15–45, we regress an indicator variable equal to one 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)). Though 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 one 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

TABLE III.

PREDICTION 5: ASSOCIATION BETWEEN DOWRY TRADITIONS AND MALE MIGRATION

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Dep. var.: Individual migrated								
Dowry (continuous)	0.0257**	0.0451**	0.0358*						
	(0.0101)	(0.0199)	(0.0193)						
Dowry (0.1% threshold)				0.0184**	0.0127	0.0068			
				(0.0086)	(0.0115)	(0.0112)			
Dowry (10% threshold)							0.0213**	0.0296*	0.0246
							(0.0088)	(0.0174)	(0.0175)
Mean of dependent variable	0.244	0.244	0.229	0.244	0.244	0.229	0.244	0.244	0.229
Observations	188,192	188,192	184,322	188,192	188,192	184,322	188,192	188,192	184,322
R-squared	0.001	0.042	0.047	0.000	0.042	0.047	0.001	0.042	0.047
State fixed effects	N	Y	Y	N	Y	Y	N	Y	Y
Year of birth fixed effects	N	Y	Y	N	Y	Y	N	Y	Y
Distance controls	N	N	Y	N	N	Y	N	N	Y
Caste fixed effects	N	N	Y	N	N	Y	N	N	Y
Ethnographic controls	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 men 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 one 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 one if more than 10% of the district population belongs to groups with dowry traditions. The distance controls include 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). Ethnographic controls include controls for the proportion of the district population that historically had plow technology and the proportion that practiced a patrilineal system of inheritance. Standard errors are clustered at the district level. $*p < .10$, $**p < .05$, $***p < .01$.

men aged 15–45 because 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. In addition, 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, ethnographic controls, 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). Our ethnographic controls consist of the percent of the population that are traditionally patrilineal and traditionally had the plow.[28]

Columns (1)–(3) show that the continuous historical dowry measure is positively and significantly related to male migration. Even after controlling for a substantial fraction of the geographic variation in dowry practices with state, year of birth, and caste fixed effects, as well as ethnographic, education, and geographic controls, the positive relationship remains and continues to be marginally significant. For the discrete measures, which leverage less information, the association between traditional dowry and male migration is still positive, though no longer statistically significant when we include 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%.

Online Appendix Table A.11 shows robustness to various cut-offs: continuous dowry, 0.1%, 5%, 10%, 50%, and 75%. Online Appendix Table A.12 shows that the results are robust to defining a migrant as an individual who left the household at least a year before and dropping those who migrated in the last year from the data. In Online Appendix Table A.13, 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 outmigration, supporting the hypothesis that dowry practices can ease migration frictions. One alternative explanation for this finding is that the

28. The plow has been linked to female labor force participation (Alesina, Giuliano, and Nunn 2013), while male inheritance may coincide with the practice of dowry (Botticini and Siow 2003).

dowry is used to pay migration costs. However, combining this result with the results of our survey data indicates that intrahousehold 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.

V.D. Prediction 6: Do Males fom Dowry Districts Migrate More in Response to Highway Construction?

Finally, we investigate how the effect of a reduction in migration costs varies with historical dowry practices. Prediction 6 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. We first introduce the cost shock we will use—two highway expansion programs—and then empirically test the prediction.

1. *The Golden Quadrilateral and NS-EW Highway Expansions.* To test Prediction 6, 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.[29] 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, Goswami, and Kerr 2016) and that better connections to large cities improved economic development (Alder 2016; Khanna 2016) and welfare (Asturias, García-Santana, and Ramos 2018).

29. Three of the four cities (Mumbai, Kolkata, and Chennai) were chosen to be capitals of the British presidencies because they were natural harbors and could be used as ports for trade. There was little economic activity in these three regions before the British, and not much of a preexisting road network. The fourth (Delhi) was a major historical capital of various precolonial empires and was a British cantonment during the Raj.

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 include detailed information on all infrastructure projects in India with a cost greater than 10 million rupees (roughly US$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 V plots the location of the full set of projects we identify.

2. *Test of Prediction 6.*

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 2024). 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 outmigration in districts with stronger versus weaker historical dowry traditions. For our analysis, we transform our cross-sectional data set into a panel at the individual i–year t level for the years between 1996 and 2007. The transformed data would allow for the estimation of the following, "conventional" event study regression separately for individuals from districts with stronger and weaker historical dowry traditions:

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

where y_{iajdt} is an indicator variable equal to one 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.[30] 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 one if in year t, a highway segment had been constructed s years ago in district d. This framework therefore controls for any time-varying shocks at the state level, as well as any individual-level and age-specific time-invariant differences.

30. 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.

Depending on the specification, the controls $\mathbf{X}_{iajdt}$ also include trends for geographic characteristics and cultural features (e.g., patrilineal inheritance and historical plow adoption), caste-by-year fixed effects at the household level, and trends by household consumption.

This conventional approach and its related difference-in-differences regression, which assumes a constant treatment effect across treated units over time, may be problematic. Recent work suggests that researchers must be cautious when estimating the effect of staggered treatments with two-way fixed effects (De Chaisemartin and D'Haultfuille 2020; Callaway and Sant'Anna 2021; Goodman-Bacon 2021; Sun and Abraham 2021). 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 an unsatisfactory control group for later treated units.[31] 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 uses the proposed solution of Borusyak, Jaravel, and Spiess (2024), as their framework adheres most closely to our context. We also show robustness to using the method proposed by Callaway and Sant'Anna (2021), which produces very similar results.[32] We estimate event studies with carefully chosen comparison units (e.g., previously treated units are never used as controls). Given the differential timing of our treatments, this implies that certain units will have more pretreatment periods, while others will be observed longer posttreatment. We include the controls from the event study regression described above.

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

32. We use the doubly robust estimator, as recommended by Callaway and Sant'Anna (2021). Standard errors are calculated using the wild bootstrap and clustered at the district level.

Borusyak, Jaravel, and Spiess (2024) use an imputation-based approach, where they model the nontreated potential outcome using only the control group (in our application, the not-yet-treated districts and the never-treated districts) and extrapolate the nontreated 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 pretreatment period.

We focus on individuals' migration decisions between 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 pretreatment 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, to not pick up how GQ affected dependent (child or old-age) migration.[33] But in all specifications, we also include age fixed effects that account for differential migration rates by age and perform robustness checks where we match the non-GQ sample to the realized age distribution in the GQ districts.

We expect the strongest effects 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.[34] 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 VI reports the results using the methodology of Borusyak, Jaravel, and Spiess (2024). The top panels report results for migration for any reason, and the bottom panels restrict the outcome to be migration for employment-related reasons only.

33. 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.

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

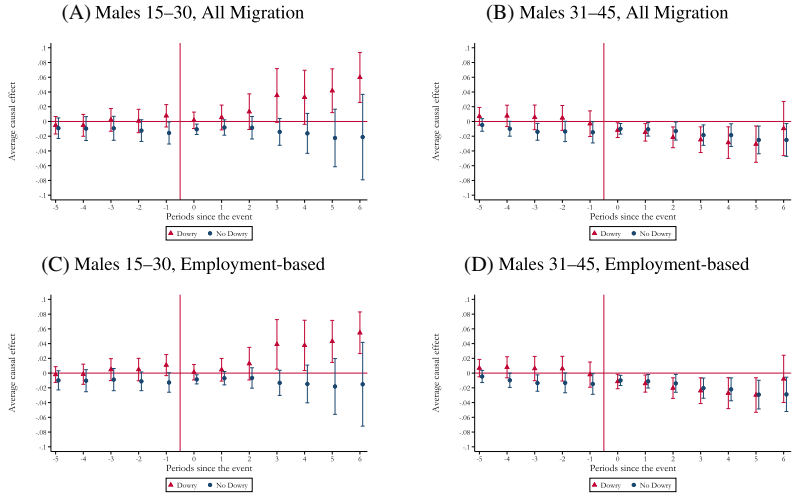

FIGURE VI

Effects of GQ on Male Migration by Historical Dowry Traditions

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 transfer of service/contract, or for proximity to the place of work. In Panels A and C, the sample is of men in the 2007 NSS who were aged 15–30. In Panels B and D, the sample is of men 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, Jaravel, and Spiess (2024) and include individual, age, and state-by-year fixed effects. "Dowry" and "no dowry" denote districts above and below the cutoff of 0.1% of the population historically practicing dowry. Standard errors are clustered at the district level.

Panel A reports the results for men who were 15–30 at the time of the survey (our intensively treated group), and Panel B reports the results for men who were 31–45 (the less intensively treated group). Panels C and D do the same 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 pretrends in migration rates prior to GQ construction.

After receiving the first highway construction project, Panel A shows that there is a large and significant increase in outmigration for prime-age men in dowry regions (districts above the 0.1% cutoff), while the effect on migration for nondowry males is indistinguishable from zero. In contrast, there is no increase in

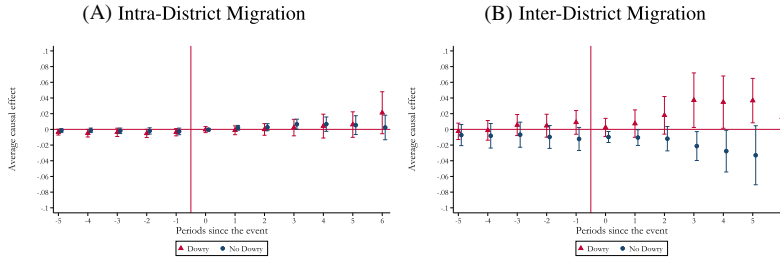

FIGURE VII

Effects of GQ on Young (Age 15–30) Male Intra/Interdistrict Migration by Historical Dowry Traditions Using Borusyak, Jaravel, and Spiess (2024)

This figure shows the event study estimates of the effect of the GQ on migration based on the outmigrant's destination for men in the 2007 NSS who were aged 15–30. In Panel A, the outmigrant's current location is in the same district as their previous household. In Panel B, the outmigrant's current location is not in the same district as their previous household, although it is possible their location is in the same state. All estimates use Borusyak, Jaravel, and Spiess (2024) and include individual, age, and state-by-year fixed effects.

migration for older men (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. The lack of a meaningful response for older groups could also reflect the fact that more youth migration crowds out jobs for older men in nearby destinations. Defining the outcome as employment-based 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 VII, we estimate the effects of the GQ by historical dowry tradition on intradistrict and interdistrict migration separately. The dependent variables are indicator variables for migrating within or out of the district. We find no evidence of a strong effect on intradistrict migration for either group. This is consistent with the fact that the GQ consisted of large, long-distance highways, connecting destinations across district boundaries, and with the fact that nearby migrations may not create the same frictions for optimal income sharing as migrations farther afield. In contrast, our migration effects for the dowry districts are concentrated in interdistrict migrations, where we would expect that the income-sharing frictions (through fewer visits and

remittances, as well as less monitoring) created by migration would be greater. Altogether, these results suggest that dowry practices enable 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.

Robustness.. We conduct a number of robustness checks in Online Appendix Figures A.3 and A.4. First, in Online Appendix Figure A.3, 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 NSS's measure of household expenditures and district-level education attainment interacted with calendar year indicators (Panel B). This is intended to control for any socioeconomic characteristics that may be related to living in a dowry district and would otherwise lead to bias from differential time trends.[35] 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 Panel C, we control for other cultural 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 by interacting them with time indicators. We also control for district-specific sex ratios interacted with time, as sex ratios may be related to dowry practices.

In Panel D, we use a different estimation procedure proposed by Callaway and Sant'Anna (2021).[36] Our qualitative results are

35. We control for broad social group categories—Scheduled Castes, Scheduled Tribes, Other Backward Classes, and General (others)—as the NSS does not record disaggregated caste groups.

36. Callaway and Sant'Anna (2021) recognize that the effects may be dynamic (and vary over time-since-treatment t), and that early treated groups may have different effects from later treated groups (and 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

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.[37] Our results again remain the same.

In Online Appendix Figure A.4, we vary the cutoff for what constitutes a traditional dowry-prevalent district. We report cutoffs of 0.1% (our baseline specification), 1%, 10%, and 25% in the different panels. Each cutoff produces very similar patterns in male prime-age outmigration. In Online Appendix Figure A.5, we report the results using the alternative definition for permanent migration (migrated more than a year ago) and confirm that they are robust. Finally, in Online Appendix Figure A.6, for robustness, we vary the cutoff ages. Instead of splitting the sample at 30 years old, we report splits at 25 and 35 with similar results.

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

VI. Conclusion

This article examines the role the traditional institution of dowry plays in modern India, where, rather than fading out with modernization, it has become nearly universal. We consider the possibility that dowry—a payment from the bride's family accom-

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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 (2021). Standard errors are calculated using the wild bootstrap and clustered at the district level.

37. 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.

panying marriage—may help resolve intrahousehold frictions in migration decisions by providing sons liquidity at the time of marriage. In low-income countries like India, there are wide disparities in economic opportunities across regions, and enabling migration can facilitate aggregate growth and development (Munshi and Rosenzweig 2016). 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 old age. Migration may therefore disrupt traditional forms of old-age support, and future transfers may be costly or uncertain. Accessing dowry through marriage could provide an alternative mechanism for liquidity-constrained sons to make up-front 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 data sets on property rights over dowry, a large representative migration survey collected by the government, ethnographic data on dowry traditions, and variation from a natural experiment. Documenting property rights over dowry for the first time in our survey data, we confirm that some grooms' parents indeed retain a substantial fraction of the dowry, aligning with qualitative evidence of grooms' parents benefiting from dowry. This practice is, however, far from universal, and some grooms' parents make additional net transfers to the new couple, rather than benefiting from dowry. Parents are more likely to retain dowry when sons migrate, and especially when sons' earnings are higher and parents' bargaining power is greater. Consistent with the predictions of the model, parents are also more likely to take dowry from migrating sons who remit, as this indicates a household where sons cross-subsidize parents, rather than the other way around.

Turning to our nationally representative data and ethnographic variation in historical dowry traditions, we find that male migration is higher in places with a strong history of dowry traditions (where dowry payments are also higher today), aligning with the possibility that available liquidity at marriage facilitates sons' migration. Quasi-exogenous declines in migration costs due to highway expansions are linked to greater changes in migration rates in these areas that historically practiced dowry.

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 understanding the ef-

fects of this practice—and how it affects the allocation of labor—important. More broaly, 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 (Fetter, Lockwood, and Mohnen 2022). Indeed, our results suggest that to ensure that individuals can migrate to take advantage of high-paying jobs, policy makers may wish to provide access to sufficient old-age support.

More speculatively, our results may help inform 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. 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.

Supplementary Material

An Online Appendix for this article can be found at *The Quarterly Journal of Economics* online.

Data Availability

The data underlying this article are available in the Harvard Dataverse, https://doi.org/10.7910/DVN/XCNXQL (Bau et al. 2025).

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