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'Arranged' Marriage, Co-Residence and Female Schooling: A Model with Evidence from India

by

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Abstract
We model the consequences of parental control over choice of wives for sons, for parental incentives to educate daughters, when the marriage market exhibits competitive dowry payments and altruistic but paternalistic parents benefit from having married sons live with them. By choosing uneducated brides, some parents can prevent costly household partition. Paternalistic self-interest consequently generates low levels of female schooling in the steady state equilibrium. State payments to parents for educating daughters fail to raise female schooling levels. Policies (such as housing subsidies) that promote nuclear families, interventions against early marriages, and state support to couples who marry against parental wishes, are however all likely to improve female schooling. We offer evidence from India consistent with our theoretical analysis.

Keywords: Arranged marriage, Dowry, Bride price, Female literacy, Marriage markets, Stable marriage allocation.

JEL Classification Numbers: **D10, D91, J12, J16**

Outline

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1. Introduction

Patrilocal marriage practices and cultural norms prevalent in most parts of south Asia would seem to imply that it is her husband's family which stands to retain the major part of any additional gain an educated woman would generate. Hence, men would seem to have a strong incentive to prefer educated women as brides, especially since returns to women's schooling are significant (whether directly, from the labour market, or indirectly, within the household, where the schooling of women may have important positive effects on the human capital of both present and future generations).[1] Marriage markets in south Asia also exhibit widespread presence of dowry, i.e., payments from the bride's family to that of the groom.[2] Then, intuition suggests that, ceteris paribus, parents of educated women should face lower dowry demands. Thus, competitive adjustments in dowry rates, by allowing parents to internalise the returns, should induce them to educate their daughters. Yet, the persistence of low levels of female schooling and available micro evidence on dowry payments both suggest such incentives are neither strong, nor generalized.[3] What explains this apparent market failure?

One clue to the conundrum may lie in the fact that parents in south Asia, especially in the rural areas, typically desire their married sons to live with them in a subordinate capacity. They expect sons, along with their wives, to submit to parental authority in domestic decision-making. Co-residence within such a hierarchical setting can provide significant benefits, both emotional and material, to parents. Marriages are also typically 'arranged': these are contracts negotiated between parents. This suggests, when seeking wives for sons, parents may value characteristics that facilitate the continuation of parental control over sons (and thereby, co-residence) after marriage, i.e., characteristics that reduce the prospect of

[1] See UNDP (1996) and Behrman *et al.* (1999). Basic schooling is likely to improve women's general ability to execute domestic responsibilities. In particular, households with educated wives/mothers typically exhibit better health outcomes for household members and better school performance by children.

[2] See Deolalikar and Rao (1998) and Rao (1993a, 1993b) for India, Lindenbaum (1981) and Esteve-Volart (2004) for Bangladesh. We shall interpret dowry as 'groom-price'. In practice, part of the payment made by the bride's parents may be a pre-mortem bequest, or a ritual gift exchange. These are not relevant to our analysis.

[3] According to Census data, the gender gap in literacy rates in India was 28.84 percentage points in 1991 and 21.70 percentage points ten years later. A 1994 survey of 34,398 rural Indian households spread over 16 states found that the school enrolment rate of males in the 6-16 age range was about 15 percentage points higher than that for females (Cigno and Rosati (2005), pp. 83-84). Analysing data from six villages in south-central India, covering 1923-1978, neither Rao (1993a, 1993b), nor Deolalikar and Rao (1998), nor, indeed, Edlund (2001) could find any evidence that greater schooling of brides is associated with a significant reduction in dowry.

future intergenerational conflict and consequent household partition.[4] Lack of education on part of the bride may constitute such a characteristic. Hence, parents may prefer uneducated brides unless educated brides bring in significantly more dowry. This in turn would reduce parental incentive to educate daughters. Our analysis formalizes this basic intuitive hypothesis, offers empirical support in its favour, and explores its policy implications.

Low levels of female schooling constitute a major policy concern of governments, multilateral aid agencies and NGOs in south Asia. Yet, the impact of the social norm (or institution) of arranged marriage, on parental incentives to educate daughters, has not received much attention.[5] Better understanding of this issue would seem to be of considerable importance in developing policy initiatives to improve female schooling levels. We aim to redress this gap in the literature.

We model an economy with overlapping generations and a competitive marriage market, where parents are altruistic but paternalistic. While co-residence confers benefits, parental control over decision-making also imposes costs on married sons if they live in the parental household. These costs make it rational for couples to form their own households, where they can evade parental control, if their joint income reaches a critical level. Despite their altruism, paternalistic preferences prevent parents from internalising the net gains that accrue to married sons when they separate. Consequently, if possible, parents want to prevent household partition. Education provides an income premium, interpreted broadly as a quantum of resources. However, costs of co-residence vary across households. Some sons would separate from the parental household if, and only if, they have access to the additional resources an educated wife would provide. We call such grooms *flexible* (L). For other grooms, separation is independent of the educational status of their wives. We term such grooms *rigid* (H). It is rational for parents of L grooms to accept educated brides only if such brides bring in higher dowry (as compensation for loss from subsequent household partition).

[4] Caldwell et al. (1983, p.359) indeed find evidence of such strategic thinking on part of parents. Discussing the popular justification for a large age difference between husbands and wives in south India, they put the perception thus. "Where brides are older and closer to the bridegrooms in age, they will probably fit less readily into the extended family, and their emotional bonds with their husbands will probably compete more with the bonds between husbands and their mothers." Intra-household conflicts after marriage constitute a major cause of household partition in south Asia. See for example Foster (1993).

[5] Becker (1981), Zhang and Chan (1999), Edlund (2001), and Botticini and Siow (2002) are primarily concerned with explaining the rationale for dowry. Caldwell, Reddy and Caldwell (1983), Rao (1993a, 1993b and 2000), Deolalikar and Rao (1998), Bhat and Halli (1999), Edlund (2000) and Anderson (2006) focus on 'marriage squeeze' in India, i.e., increased competition for grooms, and its implications for trends in dowry rates. Anderson (2003) explores the connection between caste and dowry inflation. Bloch and Rao (2002) analyse dowry-related violence in India. Gaspart and Platteau (2005) explore the determination of bride price.

Consequently, some parents acquire an incentive to bring up uneducated daughters, even when schools are free and there are no income gains from child labour. H parents, in contrast, will accept uneducated brides only if parents of such women pay higher dowry, since (a) they cannot influence the location decisions of their sons, and (b) they are altruistic. In the steady state competitive equilibrium, all L parents choose uneducated brides, while all H parents choose educated ones. The proportion of educated women in the steady state equilibrium thus turns out to be exactly equal to the proportion of H grooms. In contrast, if grooms themselves were to determine marital partners, then all women would be educated in the steady state equilibrium. This happens because, in our model, grooms benefit from the additional resources educated wives provide. Consequently, they would accept uneducated brides only if such brides compensated them through higher dowry. All parents therefore acquire an incentive to educate daughters in the competitive steady state equilibrium when grooms choose brides.

Our argument implies that, post-marriage, all L grooms will find it optimal to live in the parental household. Only H grooms will separate. Consequently, controlling for other characteristics, one should find married women who live separately from in-laws more likely to be educated than those who reside with their husbands' parents. On the other hand, if co-residence considerations played no role in parental choice of brides for sons, we should not expect any statistically significant association between co-residence and educational status of wives, once we control for other household characteristics. Analysing a data-set from India, we find that, when their husbands have 0-4 years of schooling, co-residence with in-laws indeed has a negative and statistically significant relationship with the educational status of women. Furthermore, for grooms with 0-4 years of schooling, having choice at marriage has a negative and significant effect on the probability of subsequent co-residence. These two empirical findings together lend credence to our theoretical conclusion that lower parental control over choice of wives is likely to lead to choice of better educated wives, and thereby, via movements in dowry rates, to higher female schooling levels. They also appear to contradict any tradition/culture-based hypothesis of generalized hostility or indifference on part of parents or sons towards the prospect of acquiring an educated bride.

Our analysis generates a number of policy implications. Parental control over choice of brides turns out to make the level of female schooling unresponsive to state policy. Relatively small payments to parents, for sending daughters to school, are ineffective in raising female schooling levels. This happens because such changes do not provide incentives to L parents to choose educated brides, unless such brides bring in higher dowry.

Housing subsidies for newly wed couples can however improve female educational attainments. Our analysis also suggests a case for state or civil society initiatives that challenge parental authority in marriage negotiations.

Section 2 sets up the model. Section 3 examines the steady state equilibrium. Section 4 presents empirical evidence consistent with our theoretical conclusions. We conclude with a discussion of some policy implications in Section 5. Proofs are presented in the Appendix.

2. The model

Individuals live for two periods. At the beginning of period 1, each individual is born into a household consisting of parents and one sibling of the opposite sex. The individual reaches adulthood sometime during that period. On reaching adulthood, individuals get married, to persons chosen by their parents, and produce thereafter. We shall interpret 'production' broadly, as including both marketed output and output generated by domestic labour. We therefore think of all individuals as producing, and consuming, a single good. After producing, sons may live with their wives in the parental household, or form separate households before the end of period 1. Individuals lose their parents at the end of the first period, and become parents themselves at the beginning of the second period. Parents produce at the beginning of the period (and thus, before they marry off their progeny).

Individuals may be educated (E) or uneducated (N). Education is acquired through schooling when young. N individuals produce (earn) *w* per period. E individuals produce *s* more than their N counterparts in period 1. Thus, education provides an additional output (income) *s*, which (we assume for convenience) is received entirely in the first period of one's life. A child may or may not be sent to school by parents. Unschooled children grow up to become N adults. To highlight the role of arranged marriage in generating under-investment in female education, we assume (a) schools are free, and (b) parents gain nothing from child labour. The set of all couples belonging to generation $t \in \{...,-1,0,1,...\}$ is $[0,1]\times\{t\}$. By p_E^t, we denote the proportion of girls in generation *t* who are sent to school. Thus, p_E^t also denotes the proportion of educated brides in *t*. The corresponding value for boys (grooms) is denoted by q_E^t.

Educational status (and thus, earning potential) is common knowledge at marriage. At that time, parents of grooms receive some amount, *d*, as dowry from parents of brides. Consumption takes place after married sons have decided whether to reside with parents or to form separate households. Agents cannot borrow. Parents pay, and retain, all dowry.

Given a family, we shall identify the constituent couples in the older and younger generations by P and S, respectively. Consumption can occur only inside a household. In order to set up a household, a couple has to incur a fixed cost, *a*. Intuitively, they have to acquire an indivisible capital asset, assumed, for simplicity, to depreciate fully at the end of the period. At the beginning of the period, parents set up a household, i.e., acquire the indivisible domestic capital asset by investing *a*. Once the S couple has produced, they have to decide whether to continue to live in the parental household, and thereby take advantage of this prior investment by parents, or to form a separate household by spending *a*.

Preferences:

Let m_P, m_S be total consumption in the P and S households, respectively, in the period.[6] We assume that for each couple, preferences can be represented by a single utility function, possibly reflective of a prior process of bargaining and negotiations between the husband and the wife. The essential idea we seek to formulate is that conjugal existence directly promotes internalisation of costs and benefits between husbands and wives to an extent *greater* than between parents and married sons. Thus, our focus will be on preference differences *across*, not within, generations. Preferences of the P and S couples, respectively, are given by:

$$u^P = \left[m_P + m_S\right] + g\left(n\right) \tag{2.1}$$

$$u^s = \left[m_S + m_P\left(1 - k_S\right)\right] \tag{2.2}$$

where $0 < \underline{k} \le k_S \le \overline{k} < 1$. The function g is increasing, with $g\left(0\right) = 0$; n measures the type of husband P's daughter acquires. Ceteris paribus, parents prefer educated grooms. Formally: $n = n_E$ if the groom is educated, $n = n_N$ otherwise; $0 < n_N < n_E$. Thus, P is willing to pay up to $g\left(n_E\right)$ for an E groom, and at most $g\left(n_N\right)$ for an N one.[7]

We interpret this formalization thus. By living with parents in the parental household, the S-couple can economise on household expenses (say by sharing domestic public goods), at the cost of accepting parental control over their behaviour and consumption. Early on, the P couple set up a household, i.e., acquire a house to live in, purchase consumer durables, and organize their activities according to a particular set of preferences. Their son and his wife,

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[6] If S live with parents, then $m_S = 0$, while m_P is simply total consumption by the two couples. If S live separately, then m_P is consumption by P, while m_S is consumption by S.

[7] As Caldwell *et al.* (1983, p.357) note, desirable qualities in a groom in rural India are "…defined to an astonishing degree by the extent of modern education….". We assume that P's income is high enough, so that he is not constrained in his willingness to pay. Allowing sons to pay part of their sisters' dowries complicates the exposition without adding any insight.

i.e., the S couple, acquire different preferences. However, S find themselves constrained in acting according to their own preferences if they live with parents, say because of lack of space, or because of the psychic cost from parental objections and consequent domestic friction. Parents may enforce their own traditional norms of behaviour and consumption on the S couple that the latter resent. Social norms may also require S to turn over most of their own earnings to parents, who then decide how that money is going to be spent. The variable k_S measures the marginal loss to the S-couple due to such control, exercised by parents within the parental household. S can rid themselves of parental control, and allocate their resources in a way that best satisfies their own preferences, if they form a separate household organized according to their own preferences. Total gain from doing so is $k_S I_S$, where I_S is the joint earning of the S couple in the period. However, to do so, they have to forgo the use of domestic public goods in the parental household, i.e., they must spend the amount *a* to purchase capital assets, such as a house and some consumer durables, necessary for setting up a household. Thus, it is rational for S to separate if, and only if [$I_S \geq a / k_S$]. We make the natural tie-breaking assumption - S will indeed separate when this holds with equality.

Parents in our formulation are altruistic but paternalistic. Parents are altruistic in that they put a positive (indeed, equal) weight on the consumption of married sons, but are paternalistic in that they do not take into account the loss suffered by the S-couple due to parental restrictions and filial obligations when co-resident with parents within a hierarchical relationship. Consequently, ceteris paribus, separation is always costly for parents: if S separate, parents lose the equivalent of *a* of their own income. Evidently, it is parental paternalism that generates such a loss for parents. [8]

Intuitively, household-specific characteristics such as the number and composition of siblings, parental assets and education, community norms, etc. may be expected to be important determinants of the extent of inter-generational tensions within the parental household. We model such heterogeneity across families simply by allowing the marginal

[8] We think of these costs as both emotional and material. The gains that parents make, if adult sons live with them in a dependent relationship, include those from being looked after in old age. It has been noted in other contexts that, as they grow older, parents' desire for children's visits usually exceeds the latter's desire to visit them (Konrad *et al*. (2002)). The assumption that separation imposes only a fixed cost on parents simplifies the algebra but is not crucial. We can generalize (2.1) to $u^P = \left[m_P + (1-k_P) m_S \right] + g(n)$ where $k_P \in [0,1)$, without altering our substantive conclusions. Similarly, reverse paternalism on part of S in (2.2) is only for notational simplicity: the marginal loss from parental control, k_S, can apply only to the S couple's own consumption, rather than to the entire consumption in the parental household. Nor is the assumption of equal weights necessary. For convenience of exposition, we rule out the possibility that parents may dissolve their own household and reside in the son's household in a dependent relationship. We discuss this in Section 4.

loss to the S-couple due to co-residence, k_S, to vary across families. Thus, the exogenous variable k_S may vary across families according to some distribution defined over $\left[\underline{k},\bar{k}\right]$. We shall assume that $a/2(w+s) \leq \underline{k}$.[9] Within a family, the value of k_S is common knowledge.

Definition 2.1. A groom is *flexible* (L) if $a/k_S \in (2w+s, 2w+2s]$, and *rigid* (H) otherwise.

We partition grooms into two categories: flexible and rigid. HE will denote a groom who is both rigid and educated, with HN, LE and LN grooms defined analogously. By Definition 2.1, when the groom is flexible, if at most one member of the S-couple is educated, they will find separation prohibitively expensive. However, if both are educated, they will find separation optimal. Thus, an LE son will find it rational to separate only if parents choose an E bride. An LN son will never separate. Rigid grooms are those whose optimal location, post-marriage, is independent of the educational status of their wives, provided they themselves are educated. Since, by assumption, $a/2(w+s) \leq \underline{k}$, for all H grooms, $a/k_S \leq (2w+s)$. In light of our tie-breaking assumption, Definition 2.1 thus implies that, when the household is H, the S couple will necessarily separate when at least one member is educated. We shall denote, by $h \in [0,1]$, the proportion of H grooms. We shall assume that this proportion, h, is invariant over time, i.e., across generations.[10]

We now need to insert the idea that returns to education are significant, but not extremely so, due to lack of complementary inputs such as capital, technology and infrastructure. Formally, then, we assume the following.

A1. $a \in (s, 2s)$.

The marriage market:

Marriage markets are competitive. A parent with a daughter of type $k \in \{E, N\}$ faces a pair of dowry rates $\langle d_{Ek}, d_{Nk} \rangle$, so that he has to offer parents of, say, an E groom an amount d_{Ek}

[9] Thus, we assume *all* S-couples will necessarily separate when both members are educated. This is only for convenience of exposition, and can be easily relaxed without altering our conclusions. See Remark 2.4.

[10] Notice that the distribution of k_S may vary across generations. Indeed, even the assumption that the proportion of H grooms, *h*, is constant over time is for expositional simplicity. See footnote 12.

if he wishes to marry his daughter to that groom. Thus, there's a quadruple $\langle d_{EE}, d_{EN}, d_{NE}, d_{NN} \rangle$ which all parents take as given. A *groom profile* in generation *t* is defined as: $a_g^t = \{(r, s^g(r)) | \, r \in [0,1] \times \{t-1\} \text{ and } s^g : [0,1] \times \{t-1\} \to \{E, N\}\}$. Thus, an individual groom in *t* is characterized by: (a) the couple in the earlier generation he is born to, and (b) his own type. A specific groom profile is just one possible way in which the grooms could be assigned to different types. A *bride profile* in *t* is defined analogously: $a_b^t = \{(r, s^b(r)) | \, r \in [0,1] \times \{t-1\} \text{ and } s^b : r \in [0,1] \times \{t-1\} \to \{E, N\}\}$. A *feasible profile* in *t* is a pair $\langle a_g^t, a_b^t \rangle$. A *marriage allocation for a feasible profile in t,* $\langle a_g^t, a_b^t \rangle$, is a one-to-one and onto mapping from a_g^t to a_b^t. Thus, given a collection of grooms and brides, a marriage allocation is just some way of matching every groom with a bride, and vice versa.

Using (2.1)-(2.2), Definition 2.1 and A1 to compare gains to parents from choosing different types of brides, we then get the following.

Lemma 2.2. *Let A1 hold. Suppose parents receive dowry payments. Then:*

(i) *parents of HE and LN grooms are better off with E brides unless N brides pay at least s more in dowry,*

(ii) *parents of HN and LE grooms are better off with N brides unless E brides pay at least* Φ *more in dowry, where* $\Phi = [a - s] > 0$.

Recall that, by Definition 2.1, regardless of the educational status of their wives, HE grooms will separate post-marriage, whereas LN grooms will not. Parental altruism then implies parents of such grooms will strongly prefer educated brides unless they bring in significantly less dowry. These parents directly internalise the productivity gain an educated woman generates, and thus have to be compensated by at least that amount, *s*, via higher dowry if they are to accept an uneducated bride. Now recall that, by Definition 2.1, both HN and LE grooms will separate if, and only if, married to educated women. Paternalism generated parental self-interest then dictates that parents of such grooms will find educated brides acceptable *only* if they bring in *higher* dowry. Specifically, these parents suffer a net loss of (a-s) by marrying their sons to E, rather than N, women. Hence, they will accept E brides only if such brides compensate them by at least this amount through higher dowry.

Remark 2.3. Suppose grooms chose their own brides, while parents received the dowry payment. From (2.1)-(2.2), Definition 2.1 and A1, it immediately follows that all grooms, regardless of their type, are better off with E brides unless N brides bring in at least *s* more in dowry. Thus, all grooms directly internalise the productivity gains that accrue to an educated wife. Hence, if HN and LE sons were to choose their own brides, while their parents passively received the market determined dowry rate, then, unlike their parents, they would prefer N brides *only* if such brides brought in higher dowry. This observation will provide the key to our claim in Section 3 that it is parental control over choice of wives for sons, and not dowry as such, which generates low levels of female schooling.

Remark 2.4. We have assumed $a/2(w+s) \leq \underline{k}$, so that all sons will separate, post-marriage, if both spouses are educated. If this is relaxed, the H class may include grooms who will never separate, regardless of their own, or their wives', educational status, as their preferences are to a very great extent in harmony with those of their parents. Evidently, altruistic parents will find it optimal to marry such H sons to educated women, unless uneducated women bring in s more in dowry. Our basic conclusion, as summarized in Proposition 3.3 below, will not change. We therefore ignore this case in our formal analysis.

Can parents prevent LE (or HN) sons from separating through strategic transfers rather than choice of wives? It is clear from (2.2) that, since sons are altruistic, a dollar transferred from P to S leaves S's utility unchanged, so long as S stays in the parental household. Thus, parents cannot 'bribe' sons not to separate. We can generalize (2.2) to allow bequests to increase S's utility even if S stays in the parental household. However, so long as altruism (and/or preference divergence across generations) leads to a sufficiently low marginal gain from bequests, the transfer required to induce S to stay would be unaffordable for P. It can be seen that, even in the extreme case where S is completely selfish, this would hold if preferences diverge sufficiently across generations, i.e., k_S is sufficiently close to 1. Analogously, since parents are altruistic (recall (2.1)), sons would not be able to compensate parents adequately for household partition through conditional transfers either, even if such contracts were somehow enforceable (which is itself unlikely). On the other hand, pre-marriage commitments by sons not to separate after marriage face obvious enforcement difficulties. An LE or HN son can credibly commit not to separate after marriage to an educated woman only by taking steps *before* marriage to transfer a sufficiently large part of

his post-marriage income to P. This is ruled out since agents cannot borrow. Thus, intuitively, sons cannot 'bribe' parents to choose educated brides for them because of credit market constraints. Lastly, an LE or HN son will not separate, even if married to an educated woman, if parents can bring the consumption pattern in the parental household sufficiently close to his preferences (i.e., reduce the value of k_s sufficiently). Parents are unable to give up domestic control to the required extent because it would entail drastic changes in their own values and lifestyle, imposing costs that are unacceptably high.[11]

3. Steady state equilibrium

Given dowry rates and a feasible profile, a marriage allocation is stable if no parent strictly prefers a match different from that specified by the allocation. This implies no parent should strictly prefer marrying his son/daughter to a different person. Nor should a parent strictly prefer the person his progeny is actually marrying to be of a *different type*.

Definition 3.1. Given a quadruple of dowry rates, $T = \{d_{ij} \mid i, j \in \{E, N\}\}$, and a feasible profile $\langle a_g^t, a_b^t \rangle$, a marriage allocation M is a *stable marriage allocation corresponding to* $\langle T, \langle a_g^t, a_b^t \rangle \rangle$ iff: (i) for every $\alpha \in a_g^t$, parents of α are at least as well off, with the match M(α), as with any match $\beta \in [0,1] \times \{t-1\} \times \{E, N\}$, and (ii) for every $\alpha \in a_b^t$, parents of α are at least as well off, with the match $M^{-1}(\alpha)$, as with any match $\beta \in [0,1] \times \{t-1\} \times \{E, N\}$.

Equilibrium feasible profiles must be such that brides and grooms can be matched in some way that leaves all parents satisfied, at the price vector for alternative types that they are facing. Thus, a feasible profile of grooms and brides will constitute an equilibrium if, given this feasible profile, we can find at least one dowry vector which has a stable marriage allocation corresponding to it.

Lastly, we need to identify equilibrium properties of the marriage market that are *steady state*, i.e., inter-temporally consistent. This is ensured only if no parent has reason to regret educating, or not educating, his progeny. We can think about this in terms of *perfect foresight* on part of parents. Alternatively, if we assume that parents expect past dowry rates

[11] Behavioural and consumption rigidities inside the household, which generate this inflexibility, are akin to those suggested by Becker (1981) as an explanation for monetary transfers between spouses.

to persist, then, if the feasible profile today is such that parents regret their past choices, then parents in the next generation will make different decisions. This will lead to a different feasible profile and, thereby, a different vector of equilibrium dowry rates. Thus, neither the initial feasible profile nor the initial vector of dowry rates would be inter-temporally stable. A steady state feasible profile therefore implies the existence of a marriage allocation whereby no parent could have done better by having a different type of daughter (whether with the same groom or a different groom), at the going dowry rates. The analogous requirement must hold vis-à-vis sons as well.[12]

Definition 3.2. A feasible profile $\left\langle \hat{a}_g^t, \hat{a}_b^t \right\rangle$ is a *steady state* feasible profile iff, for some quadruple of dowry rates, $T^* = \left\{ d_{ij}^* \mid i, j \in \{E, N\} \right\}$, there exists a stable marriage allocation, M^*, corresponding to $\left\langle T^*, \left\langle \hat{a}_g^t, \hat{a}_b^t \right\rangle \right\rangle$, which has the following property: for every $\alpha \in \left[\hat{a}_g^t \cup \hat{a}_b^t \right]$, there exists no $\beta \in [0,1] \times \{t-1\} \times \{E, N\}$ such that parents of α would be better off if [given T^*, α was of a different type and α was married to β]. M^* will be called a *steady state* marriage allocation.

A steady state feasible profile generates a pattern of schooling choices that allows (i) some dowry vector to persist indefinitely as the equilibrium outcome in every generation, and (ii) that pattern of schooling choices to be reproduced indefinitely, as the aggregate consequence of rational responses by individual parents to that vector of dowry rates.

Proposition 3.3. *Suppose parents choose brides for sons, and retain dowry payments. Let* $h \in [0,1]$ *be the proportion of H grooms, and let* $\left\langle \hat{a}_g^t, \hat{a}_b^t \right\rangle$ *constitute a steady state feasible profile. Let* q_E^* *be the proportion of E grooms, and* p_E^* *that of E brides, that is consistent with* $\left\langle \hat{a}_g^t, \hat{a}_b^t \right\rangle$. *Then, given A1: (i)* $q_E^* = 1$, *(ii)* $p_E^* = h$, *and (iii) all E brides must be married to H grooms in a steady state marriage allocation.*

Proof: See the Appendix.

[12] If *h* changes over time according to some exogenously determined rule (recall footnote 10), instead of being time-invariant, then, evidently, our notion of steady state must intuitively involve perfect foresight. Our conclusions will remain essentially unchanged under this generalization.

By Proposition 3.3, steady state equilibrium vectors of dowry rates generate parental incentives that lead them to educate all sons. Intuitively, this is caused by a combination of parental altruism and the willingness of parents to pay more for educated grooms. However, not all daughters get educated. The proportion of daughters left uneducated is exactly equal to the proportion of L sons. All uneducated daughters are married to educated L grooms when they grow up. Such a match allows parents of grooms to keep the household intact. They could achieve this alternatively by not educating their sons and marrying them to educated women, but choose not to do so because educated grooms command higher dowries. For universal female schooling to be an equilibrium outcome, LE parents would have to accept educated brides. However, they would do so only if such brides brought in higher dowry, in which case parents would not find it worthwhile to educate daughters.[13]

It is useful to clarify the role played by assumption A1 in generating Proposition 3.3. If $[s \geq a]$, altruistic parents of LE grooms would be willing to accept educated brides even if they did not bring in more dowry than uneducated ones (recall Lemma 2.2(ii)). Consequently, all women would be educated in steady state equilibrium. If $[2s \leq a]$, H parents may (though not necessarily) choose not to educate sons, and marry such uneducated sons to uneducated brides in steady state equilibrium. However, given $[s < a]$, all L parents will educate sons and choose uneducated brides. Thus, allowing $[2s \leq a]$ can only reduce the steady state level of female schooling and thus strengthen our argument.

We have assumed that parents of brides are willing to pay more for educated grooms, but are indifferent as to whether the bride will later co-reside with the groom's parents. We can generalize our analysis to allow brides' parents to have a higher willingness to pay for educated grooms who will subsequently separate. It is evident that Proposition 3.3 will continue to hold provided such parents' willingness to pay for separation on part of the groom is less than the net cost imposed on the groom's parents from choosing an educated bride, i.e. less than (a-s). Notice further that the S-couple's net gain from separation, $[2k_S(w+s)-a]$, can be less than this amount. Thus, even if the bride's parents completely internalise the gains to the S-couple from separation, they may still not be willing to pay the dowry premium required to sustain universal female schooling in the steady state.

[13] It is easy to see that steady state feasible profiles must exist. The model generates multiple, including negative, steady state equilibrium vectors of dowry rates. Equilibrium dowry rates must satisfy $d^*_{EE} = d^*_{EN}$. Thus, all parents pay the same dowry in equilibrium, regardless of whether they educate their daughters.

In our model, all men turn out to be educated. This feature serves two functions. First, it allows us to demarcate our argument from standard assortative matching analysis: educationally identical men receive different matches. Second, it highlights our contention that marriage institutions affect parental incentives to educate sons and daughters in different ways. Parental unwillingness to educate daughters can be (at least partly) explained by marriage institutions and co-residence considerations, but these are unlikely to be important factors in inhibiting parental investment in the education of sons. Differences in male education levels are to be explained instead by factors external to this paper, e.g. differences in parental credit constraints, schooling costs, labour market distortions, etc. Recall that, in our model, schools are free and there are no gains from child labour. Introduction of such direct schooling costs, along with differential credit constraints, can be immediately seen as capable of generating differences in male schooling levels. [14] Thus, for purposes of empirical scrutiny in Section 4, we shall think of male schooling levels as exogenously determined.

Notice that it is parental control over choice of brides, not dowry *per se*, that prevents universal female schooling. In light of Remark 2.3, it is easy to see that, if sons chose their own brides, while their parents passively received the market determined dowry payment, then universal female schooling would be the only possible steady state equilibrium outcome.[15] This happens since all grooms are better off with educated brides, and would therefore be willing to accept N brides only if such brides brought in higher dowries. Consequently, all parents would acquire an incentive to educate daughters. Notice that our argument is built essentially on the idea that husbands directly internalise gains from their wives' education *more* than their parents, and would therefore choose *better*-educated women. Intuitively, our hypothesis is not that the gender gap in education would necessarily vanish if men chose their marital partners;[16] only that it may be significantly *reduced*.

[14] During a 1994 survey of 34,398 rural Indian households, about 30% of girls in the 6-16 age group were reported as neither attending school, nor working. The corresponding figure for boys was only about 21% (Cigno and Rosati (2005), p. 84). This suggests school costs and gains from child labour explain parental disinclination to educate sons much more adequately than they explain parental reluctance to educate daughters.

[15] Since parents can only choose the educational status of their sons, but not their wives, the formal definition of steady state equilibrium needs to be altered marginally for this case, but the basic idea remains the same.

[16] Strategic considerations abstracted from in our analysis may conceivably lead men to prefer women somewhat less educated than themselves. Greater education would appear to improve the bargaining strength of wives, and thus their share of domestic consumption. However, domestic consumption opportunities would expand as well. Thus, the net effect on husbands appears to be ambiguous. We view this as an open question.

4. Evidence

The analysis developed in Sections 2 – 3 implies that, controlling for other household characteristics, educational status of the bride should depend systematically on the residence status of the groom. Parents of flexible (L) grooms choose uneducated brides. Post-marriage, such sons remain co-resident with their parents, fulfilling the latter's initial expectations. On the other hand, parents of rigid (H) grooms choose educated brides. Again, post-marriage, location decisions of such sons fulfil their parents' expectations. Thus, only H grooms will live separately from their parents after marriage, while all L grooms will co-reside with their parents. Consequently, only educated wives will be found to reside separately from their in-laws, while all uneducated wives will co-reside with their in-laws. Hence, after controlling for other household characteristics, if women who are found to reside with their in-laws after marriage are also found to be less educated, then this can be construed as evidence consistent with our theoretical analysis. On the other hand, if the relationship between the bride's education level and co-residence turned out not to be statistically significant, this would suggest that, contrary to our argument, co-residence considerations do not play any major role in calculations that underlie parents' choice of the educational status of wives for sons.

The data set that we use is from the Gender, Marriage and Kinship Survey conducted in the two Indian states of Uttar Pradesh (UP) and Karnataka.[17] For purposes of estimation we restrict the sample to married couples, married after 1965, giving us a sample of 739 married couples. The survey was conducted using an extensive three-part instrument (for heads of households, women and the elderly) that examined different aspects of household behaviour, social and economic status and issues relating to marriage and old age support.

The dependent variable in our analysis is the educational status of the wife. Note that the educational status that we will talk about in this section is that at the time of the survey and not at the time of marriage. However in India very few women continue to attend school after marriage, so the educational attainment of a woman is unlikely to change over the course of the marriage. Thus, the observed educational status of the wife can be quite reasonably thought of as the educational level chosen by the groom's parents at the time of marriage. Educational attainment of the wife is defined as a binary variable WIFESCH = 1 if

[17] The survey was conducted under the supervision of Sonalde Desai and Vijayendra Rao and the data were collected by the National Council of Applied Economic Research, Delhi. Previous research using this data (Bloch, Rao and Desai (2004), Rahman and Rao (2004)) has restricted the sample to households residing in Karnataka, as dowry data from UP are suspect. As we do not use dowry data, we use data from both states.

the wife has some schooling and 0 otherwise. The set of explanatory variables includes educational attainment of the husband, age of the woman at the time of marriage, parental educational attainment and the primary occupation of the father of both the husband and the wife, religion and caste of the household, province of residence, marriage cohort and finally whether at least one parent of the husband co-resides with the couple (CORESIDENCE).

The primary variable of interest is this CORESIDENCE dummy. To capture the interaction between the husband's education and co-residence on the education level of the wife, we (i) interact the husband's education level with the co-residence dummy and (ii) split the sample according to the education level of the husband. The husband's education level is defined using a binary variable: HUSBSCH = 1 if the husband has more than primary schooling (5 years or higher) and 0 otherwise.

Table 1 presents sample means. We report both overall sample averages and state specific averages. There are significant inter-state differences in several cases. The fraction of couples co-residing with at least one parent of the husband is significantly higher for UP, the fraction of women that have attained some (positive level of) schooling is significantly higher in Karnataka as is the average number of years of schooling attained by women, while the fraction of husbands with more than primary schooling is significantly higher for UP.

Insert Table 1 here

Table 2 presents the probit regression results for wife's educational attainment. We present the marginal effects and not the actual coefficient estimates as the former are more easily interpretable: these are defined as partial derivatives of the probability of the wife having some education with respect to the individual control variables, holding all dummy variables at zero and all other variables at sample means. For the regression results that we present, we exclude from our sample the couples where the husband is highly educated (10 or more years of schooling). Such men are more likely to have a very strong say in who they marry and they are also likely to marry somewhat better educated women. Parents are more likely to be dependently co-resident with such resource-rich sons. These couples are therefore likely to be behaviourally quite different and in many cases interpretation of the actual results becomes quite difficult if we include them as a part of the sample. [18]

Column 1 in Table 2 presents the results for the full sample (here we include the interaction term CORESIDENCE$\times$HUSBSCH) while columns 2 and 3 present the results for

the sample categorized by HUSBSCH. The non-interacted coefficient estimate associated with CORESIDENCE gives the effect of CORESIDENCE on the education level of wives for less educated husbands (HUSBSCH = 0) while the coefficient estimate associated with the interaction term CORESIDENCE×HUSBSCH gives the differential effect of the husband having more than primary schooling (5-9 years). To obtain the full effect of co-residence on the education level of wives for educated husbands, we need to add the two effects. The marginal effects presented in column 1 show that for a man with at most primary schooling, co-residence is associated with a 13 percentage point reduction in the probability that his wife has some schooling. The difference estimate is positive and the total effect is also positive but not statistically significant. The split sample regressions in columns 2 and 3 essentially tell us the same story: for households where the husband has at most primary schooling, conditional on other household characteristics, CORESIDENCE has a significant negative effect on the education level of the wife. On the other hand, conditional on other household characteristics, the effect of CORESIDENCE on the educational attainment of the wife when the husband has more than primary schooling is positive but not statistically significant.

Insert Table 2 here

Thus, for husbands with at most primary schooling, the empirical results seem to be consistent with our theoretical conclusion. Men with low education are likely to have earnings that are too low for separate residence when their wives are also unschooled. However, with the additional resources an educated wife would generate, such men would be able to afford to live apart from their parents. Parents realize this and choose to marry them to unschooled women. Post-marriage, these resource-poor couples find it rational to live in a subordinate relationship within the groom's parental household, thereby saving on household expenses.

How can one explain the finding that when men have moderate schooling (5-9 years), educational attainment of wives seems to be independent of their residence status? The proportion of L parents is likely to be low in this class. Men with greater education are likely to have higher earnings; consequently, given the marginal loss from parental control, k_S, the S-couple's total loss from subordinate co-residence is likely to be higher. Hence, even if the distribution of k_S is invariant across education classes, a larger proportion of grooms are likely to be rigid (H) in the moderate schooling class. Furthermore, the distribution of k_S

[18] This way we exclude 66 couples from the final estimation sample. We did compute the regressions for the complete sample. The results show that there is indeed evidence of positive assortative matching.

may itself change when men are better educated: such men are likely to acquire preferences that conflict more with those of their parents. Both factors are likely to reduce the proportion of grooms who earn enough to set up a household organized according their own values/preferences *only* if they have an educated wife. Recall that, in our model, all H grooms acquire educated wives. Thus, if grooms with more than primary schooling are overwhelmingly H, women's schooling would be independent of co-residence.

This conclusion may hold even when the proportion of L parents is significant. For simplicity, we have assumed in our model that parents always live independently. However, when married sons have significantly greater resources, some H parents may find it advantageous to live in their son's household in a subordinate, *dependent* relationship. This may impose a cost on parents since they will have to accept, at least partially, lifestyle choices and household rules that conflict with their own preferences. However, gains from sharing household public goods and other resources that their high earning son's household provides may outweigh such costs. Thus, considerations that motivate L sons with uneducated wives to accept subordinate/dependent residence in the parental household may also motivate some H parents to accept subordinate co-residence with better educated married sons. Consequently, the proportion of H parents who dependently co-reside with their (educated) daughters-in-law may be high enough to outweigh the effect of L parents who (independently) co-reside with their (uneducated) daughters-in-law. The data on co-resident households do not however allow us to discriminate between co-resident households organized largely according to parental preferences, and those organized largely according to the preferences of married sons. The estimated relationship between observed co-residence and the educational status of the wife may then turn out to be statistically insignificant for moderately educated men (i.e., 5-9 years of schooling). [19]

To summarize: the evidence presented in Table 2 appears to be consistent with our theoretical findings for men with 4 years of schooling or less. For men with more than 4 years of schooling, co-residence appears to be independent of the educational status of wives.

A secondary implication of our theoretical analysis is that, ceteris paribus, L men who choose their own wives are likely to marry better educated women than men who passively

[19] As mentioned earlier, when we include the couples where the husband has 10 or more years of schooling, we obtain a positive and a statistically significant relationship between CORESIDENCE and WIFESCH. We argue that this represents positive assortative matching in the marriage market for the couples where the husband is highly educated and co-residence with the parents residing with their sons in a dependent relationship.

marry women chosen by parents (recall Remark 2.3). Post-marriage, the former would form independent households, whereas the latter would continue to live with parents. We have already noted that, for less educated men, co-residence is likely to be associated with less educated wives. Suppose now we find evidence for this class that parental choice is more likely to lead to co-residence. Then this can be considered supportive of our hypothesis that lower parental say in bride choice say is likely to be associated with better educated wives.

We therefore estimated the probability of co-residence when the husband has at most primary (0-4 years of) schooling. Co-residence is likely to depend on the age of the woman at the time of marriage, sibling composition of the husband, religion and caste of the household, province of residence, marriage cohort and whether the husband and the wife (independently) had any say in the marriage. The dependent variable in this regression is CORESIDENCE, which is defined as above. The regression results are presented in Table 3. Once again we present the marginal effects and not the coefficient estimates. As suggested by our theoretical investigation, for men with at most primary schooling, having a say in marriage does indeed appear to significantly reduce the probability of co-residence.

Insert Table 3 here

5. Policy and concluding remarks

This paper has explored the connection between the institution of 'arranged marriage' and parental incentives for educating daughters, when dowry rates are flexible and parents are altruistic but paternalistic. We have shown that parental control over the choice of brides can play an important causal role in generating under-investment in the education of daughters. Levels of female education may improve if grooms start choosing their own brides. We have provided evidence from India that appears consistent with our theoretical conclusions.

Governments often offer direct incentives to parents for sending daughters to school. These can be low fees, subsidised school meals, provision of books, uniforms, health care facilities and welfare benefits contingent on attendance, etc. A simple way of capturing such interventions in our framework is to assume the state provides a cash reward to parents, *b*, if they send daughters to school. It can be shown that, given A1, in steady state, $\left[p_E^* > h\right]$ only if $\left[b \geq \Phi > 0\right]$, where $\Phi = (a - s)$. Thus, relatively small 'bribes' will be ineffective. This happens because, if parents are to educate daughters who will subsequently marry L men, the state needs to compensate them for the higher dowry the will then have to pay. Hence, our

analysis suggests that parental authority in marriage decisions regarding sons may make the level of female schooling 'sticky'. State interventions, whether in the form of increasing direct parental returns from schooling of girls, or of subsidizing female education, may turn out to be ineffective in improving female schooling levels.

Interestingly, housing subsidy for newly wed couples, by making it possible for L grooms to separate even with uneducated brides, can remove the source of their parents' bias against educated brides, and thereby improve female educational levels. Thus, policies that promote nuclear households are likely to have a positive impact on female schooling.

Our analysis also suggests that policy initiatives to contest social norms legitimising parental control over marital decisions may improve female schooling levels. Initiatives to discourage early marriages, and to provide legal/administrative support to individuals who marry against parental opposition, may be especially important in this context.

Parental disinclination to educate daughters is likely to be a multi-causal phenomenon. An effective policy response would accordingly entail multiple dimensions. The contribution of this paper lies in highlighting a hitherto neglected aspect, viz., parental control over bride choice. Further empirical examination of our conclusions is clearly warranted. Whether our analysis can be generalized to cover parts of the developing world that exhibit polygamy and payment of bride price remains an important question for future research.

Appendix

Proof of Proposition 3.3:

(i) Suppose there exists an N groom in a steady state equilibrium feasible profile. First suppose this N groom is matched with an N bride. Then, since this implies willingness of parents of the N bride to accept an N match, we must have $\left[d^*_{EN} > d^*_{NN}\right]$. However, in that case the N parent would be better off with an E son, a violation of Definition 3.2, unless the son happens to be H. Hence, if an NN match exists, the groom must be H. Since $(2s > a)$ (by A1), an H parent is better off with an EE outcome rather than an NN outcome unless $\left[d^*_{NN} > d^*_{EE}\right]$. Hence, if an NN match exists, $\left[d^*_{NN} > d^*_{EE}\right]$. However, in that case parents of the N bride would be better off if she was educated and married to an E groom instead, a contradiction. Now consider the other possibility that the N groom is matched with an E bride. Then, since, by Definition 3.2, parents of the E bride should not have reason to regret educating their daughter, we must have: $\left[d^*_{EN} > d^*_{NE}\right]$. However, this implies that parents of

the N groom would have done better by (a) educating their son, and (b) then marrying their (E) son to an N bride: a contradiction.

(ii) Recall that, from Proposition 3.3(i), grooms can only be type E in a steady state equilibrium feasible profile. Suppose $p_E^* > h$. Then some parents of L grooms must accept E brides, which, by Lemma 2.1(ii), yields: $\left[d_{EE}^* > d_{EN}^*\right]$. However, this implies parents of those E brides would have been better off with N daughters: a contradiction. Now suppose $p_E^* < h$. Then some parents of H grooms must accept N brides, which, by Lemma 2.1(i), yields: $\left[d_{EN}^* > d_{EE}^*\right]$. This implies parents of those N brides would have been better off with E daughters: a contradiction.

(iii) Part (iii) follows immediately from Lemma 2.1(ii). ◊

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Table 1: Selected Descriptive Statistics

Variable	Description	Full Sample	Karnataka	UP
CORESIDENCE	= 1 if couple resides with at least one parent of the husband	0.2442	0.1487	0.3704
WIFESCH	= 1 if wife has attained some schooling	0.2945	0.3815	0.1795
HUSBSCH	= 1 if husband has completed primary school	0.3436	0.2565	0.4587
WSCHLYR	Years of schooling for the wife	1.6969	2.2047	1.0256
WFLNDM	= 1 if wife's father had land at marriage	0.5951	0.5409	0.6667
HSLNDM	= 1 if husband's family owned land at marriage	0.6245	0.5754	0.6895
HINDU	= 1 if Hindu	0.8761	0.8599	0.8974
SCSTOBC	= 1 if SC/ST/OBC	0.4233	0.3858	0.4729
WFAGEM1	= 1 if age of wife at marriage less than 15	0.2540	0.1379	0.4074
WFAGEM2	= 1 if age of wife at marriage in the range 15 – 19	0.5755	0.6832	0.4330
WIFECHOICE	= 1 if wife had choice at marriage	0.1104	0.1013	0.1225
HUSBCHOICE	= 1 if husband had choice at marriage	0.2969	0.2522	0.3561
MARRCOH1	= 1 if year of marriage 1965 or before	0.0933	0.0625	0.1339
MARRCOH2	= 1 if year of marriage 1966 – 1975	0.3117	0.3060	0.3191
MARRCOH3	= 1 if year of marriage 1976 – 1985	0.3681	0.4030	0.3219
MARRCOH4	= 1 if year of marriage 1986 or later	0.2270	0.2284	0.2251
HSNUMELDBR	Husband: Number of Elder Brothers Alive	0.9239	1.0345	0.7778
HSNUMYNGBR	Husband: Number of Younger Brothers Alive	1.1129	1.1659	1.0427
HSNUMELDSI	Husband: Number of Younger Sisters Alive	1.0356	1.0625	1.0000
HSNUMYNGI	Husband: Number of Elder Sisters Alive	1.0344	1.0668	0.9915
WFNUMELDBR	Wife: Number of Elder Brothers Alive	1.0883	1.1487	1.0085
WFNUMYNGBR	Wife: Number of Younger Brothers Alive	1.2834	1.2694	1.3020
WFNUMELDSI	Wife: Number of Younger Sisters Alive	1.9607	2.2328	1.6011
WFNUMYNGSI	Wife: Number of Elder Sisters Alive	0.8638	1.0172	0.6610
WFMOTHED0	= 1 if wife's mother is illiterate	0.8577	0.8362	0.8860
WFFATHED0	= 1 if wife's father is illiterate	0.6982	0.7047	0.6895
WFFATHFARMER	= 1 if wife's father's main occupation: farming	0.5693	0.5819	0.5527
HSMOTHED0	= 1 if husband's mother is illiterate	0.9092	0.8836	0.9430
HSFATHED0	= 1 if husband's father is illiterate	0.7951	0.8168	0.7664
HSFATHLABOURER	= 1 if husband's father's main occupation: labourer	0.7374	0.8039	0.6496
WFMALEPROPSHARE	= 1 of only males get property share in wife's family	0.8515	0.8297	0.8803
HSMALEPROPSHARE	= 1 if only males get property share in husband's family	0.9374	0.9353	0.9402

Table 2: Marginal Effects from Probit Regressions for Educational Attainment of the Wife

	Full Sample	HUSBSCH = 0	HUSBSCH = 1
CORESIDENCE	-0.1334***	-0.0933**	0.1042
	(0.0460)	(0.0392)	(0.0952)
CORESIDENCExHUSBSCH	0.3348***		
	(0.0950)		
WFLNDM	0.0678	0.0180	0.2094**
	(0.0490)	(0.0550)	(0.1024)
HSLNDM	-0.1329***	-0.1102**	-0.1693
	(0.0481)	(0.0462)	(0.1197)
HINDU	-0.0354	-0.0509	-0.0798
	(0.0611)	(0.0611)	(0.1695)
SCSTOBC	-0.0732*	-0.0146	-0.1449
	(0.0404)	(0.0429)	(0.1038)
UP	-0.2251***	-0.1723***	-0.5179***
	(0.0364)	(0.0373)	(0.0780)
WFAGEMAR1	-0.0229	0.0016	-0.1608
	(0.0587)	(0.0616)	(0.1294)
WFAGEMAR2	-0.0161	-0.0152	-0.1006
	(0.0513)	(0.0516)	(0.1288)
WFMOTHED0	0.0042	-0.0687	0.1742
	(0.0620)	(0.0771)	(0.1233)
WFFATHED0	-0.1432***	-0.0464	-0.3333***
	(0.0503)	(0.0556)	(0.0982)
WFFATHFARMER	0.0709	0.0850	-0.0561
	(0.0479)	(0.0554)	(0.1085)
HSMOTHED0	-0.0571	-0.0340	-0.1690
	(0.0794)	(0.0855)	(0.1788)
HSFATHED0	-0.2106***	-0.1656**	-0.1592
	(0.0600)	(0.0840)	(0.1020)
HSFATHLABOURER	-0.0244	0.0249	-0.1447
	(0.0466)	(0.0464)	(0.0999)
WFMALEPROPSHARE	0.0216	-0.0181	0.1626
	(0.0542)	(0.0558)	(0.1285)
HSMALEPROPSHARE	-0.1316	-0.1660	-0.1377
	(0.1085)	(0.1241)	(0.1987)
MARRCOH3	-0.0235	0.0446	-0.2135**
	(0.0402)	(0.0436)	(0.0890)
MARRCOH4	0.0187	0.0665	-0.1428
	(0.0500)	(0.0574)	(0.1069)
Observed Probability	0.2764	0.2131	0.4271
Predicted Probability at Mean	0.2367	0.1755	0.4101
Log Likelihood	-328.7250	-210.6036	-99.1004
Wald χ^2	104.93***	66.28***	63.08***
Degrees of Freedom	19	18	18
Number of Observations	673	474	199

Robust standard errors in parentheses

* Significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Marginal Effects from Probit Regression for Co-residence

	HUSBSCH = 0
WFLNDM	-0.0035
	(0.0393)
HSLNDM	0.1032**
	(0.0402)
HINDU	-0.0822
	(0.0623)
SC/ST/OBC	0.0164
	(0.0396)
UP	0.2129***
	(0.0442)
WFAGEMAR1	-0.0013
	(0.0553)
WFAGEMAR2	0.0007
	(0.0483)
HSNUMELDBR	-0.0529***
	(0.0193)
HSNUMYNBR	-0.0060
	(0.0181)
HSNUMELDSIS	0.0049
	(0.0149)
HSNUMYNSIS	-0.0504***
	(0.0175)
WIFECHOICE	-0.1061***
	(0.0355)
HUSBCHOICE	-0.0689*
	(0.0372)
MARRCOH3	0.1087**
	(0.0446)
MARRCOH4	0.1824***
	(0.0621)
Observed Probability	0.2110
Predicted Probability at Mean	0.1680
Log Likelihood	-209.2188
Wald χ^2	69.49***
Degrees of Freedom	15
Number of Observations	474

Robust standard errors in parentheses

* Significant at 10%; ** significant at 5%; *** significant at 1%