

# Why Dowries?\*

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February 2002

## Abstract

When married daughters leave their parental home and their married brothers do not, altruistic parents provide dowries for daughters and bequests for sons in order to mitigate a free riding problem between their married sons and daughters. The theory has predictions on the form of the dowry contract, the exclusion of daughters from bequests, and the decline of dowries in previously dowry giving societies. These predictions are consistent with historical evidence from ancient Near Eastern civilizations, ancient Greece, Roman and Byzantine empires, western Europe from 500 to 1500 AD, the Jews from antiquity to the Middle Ages, Arab Islam from 650 AD to modern times, China, Japan, medieval and Renaissance Tuscany, early-modern England, modern Brazil, North America, and contemporary India.

Keywords: dowries, bequests, bride prices, marriage markets, intergenerational transfers, free-riding, virilocal, medieval, Tuscany.

JEL classification: J1, N3.

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\*We thank Gary S. Becker, Dwayne Benjamin, Lena Edlund, Stefano Fenoaltea, Claudia Goldin, Larry Kotlikoff, Bob Lucas, Robert Margo, Michael Manove, Angelo Melino, Dilip Mookerjee, Mike Peters, Yossef Rapoport, Xiaoming Wei, and seminar participants at the Universities of Bologna, Brescia, British Columbia, Calgary, California Institute of Technology, Chicago, Colorado at Boulder, Harvard (Labor workshop), HIID, Modena and Reggio-Emilia, Northwestern, Padova, Princeton, Rochester, Southern California, Stanford, SUNY, Texas at Austin, Torino, Toronto, Toulouse, Venezia, Wisconsin, Boston University, Washington University, and the workshop on the Family at the University of Toronto for very helpful discussions and suggestions. Nicoletta Baldini provided outstanding research assistance with the Florentine data. Francesco Bonomi created a simple but powerful search program on the Florentine catastro of 1427. Botticini thanks the John M. Olin Foundation (Junior Faculty Fellowship), the National Science Foundation (grant SES-9975086 and CAREER grant SES-9983749), an Arthur H. Cole grant-in-aid from the Economic History Association, a Neu Family Research Award from Boston University, and Ente Einaudi (Rome) for financial support. Siow thanks the Social Sciences and Humanities Research Council (SSHRC) for financial support.

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# 1 Introduction

Parents transfer wealth to their children in many ways. The dowry is distinctive because it is a large transfer made to a daughter at the time of her marriage. Dotal (dowry giving) marriages were common in the Near East, Europe, East Asia, South Asia, and pockets of the Americas. Although the custom has largely disappeared in the western world, it remains popular in South Asia (Rao 1993; Anderson 2001; and Edlund 2001).

The standard economic model of dowries, implicit in the seminal work of Gary Becker (1981), assumes that dowries (and brideprices) are used as pecuniary transfers to clear the marriage market.<sup>1</sup> The model has two predictions. When grooms are relatively scarce, brides pay dowries to grooms; when brides are relatively scarce, grooms pay brideprices to brides. Moreover, a dowry is a component of bridal wealth. As other components of bridal wealth grow, dowries will disappear and may be replaced by brideprices.

While very insightful and adopted by both economists and non-economists, the standard economic model of dowries faces two potential objections.<sup>2</sup> First, if the main purpose of dowries is to clear the marriage market, how do marriage markets clear in societies without dowry or brideprice? In most modern societies that previously had dowries, brideprices did not emerge when dowries disappeared. It is implausible that the value of other components of bridal wealth and/or the relative value of women in marriage rose until the value of dowry and brideprice needed to clear the marriage market were zero and then remained unchanged thereafter. Second, the standard model of dowries cannot account for why in many dotal societies the timing of intergenerational transfers is gender specific, with parents assigning dowries to their daughters and leaving bequests to their sons. This feature of dotal societies has been first noticed by the anthropologist Jack Goody (1973), and his observation has been confirmed in different dotal societies (see the survey on past civilizations in Section 2).

The objective of our paper is to provide a theory of dowries that is consistent with the standard model without being open to the two objections discussed above. At the market level, our model of marriage market clearing follows the standard economic model. We assume that the marriage market, with or without dowries, clears by wealth matching between brides and grooms.<sup>3</sup> From this point of view, our theory of dowries has nothing new to say about the equilibrium determination of bridal wealth. At the individual level, we also conform to the standard model by focussing on the substitution between different components of bridal wealth. However, the standard model of dowries implicitly postulates that pecuniary transfers at the time of marriage are part of the least costly mix of providing bridal wealth.

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<sup>1</sup>General expositions are in Becker (1981), Grossbard-Shechtman (1993), Rao (1993), and Tertilt (2001). Specific models include Boserup (1970), which focuses on the contribution of women in agriculture, hypergamy models, which argue that wives value their husbands' status as well as wealth (e.g. Anderson 2001, and Edlund 2001), and son preference models (e.g. Das Gupta and Li 1999).

<sup>2</sup>See, for example, the works of historians such as Herlihy (1976) and Klapisch-Zuber (1985), or demographers and anthropologists such as Caldwell, Reddy, and Caldwell (1983), and Gaulin and Boster (1990).

<sup>3</sup>In transferable models of the marriage market, complementarity in husband's and bride's wealth is sufficient to generate positive assortative matching in marriage by wealth (Becker). In non-transferable models, wealth matching occurs when husband's and wife's wealth are public goods in marriage (Lam 1988; Peters and Siew (forthcoming)).

This assumption precludes a discussion of the circumstances in which dowries are or are not part of the least costly mix of providing bridal wealth. Such a discussion, though, is relevant for understanding the modern disappearance of the dowry. The novelty of our theory of dowries is the assertion that *the modern disappearance of dowries is due to a change in the environment for producing bridal wealth and not to a change in the relative values of brides versus grooms. Thus brideprices do not have to appear when dowries disappear.* Also, the general absence of pecuniary transfers at the time of marriage in modern industrial societies suggests that these transfers are an inefficient way to redistribute resources between husbands and wives, and not that there is no redistribution between spouses.<sup>4</sup>

We present a specific environment in which dowries are optimal and also discuss when they are not optimal. Following the pioneering work on altruistic bequests by Becker (1981) and strategic bequests by Bernheim, Shleifer, and Summers (1985), we study an intra family incentive problem. Our model begins with the observation that dowries occur primarily in monogamous virilocal societies, where married daughters leave their parental home and married sons do not. We argue that in these societies, altruistic parents use dowries and bequests to mitigate a free riding problem between siblings. Since married sons live with their parents, they have a comparative advantage in working with the family assets relative to their married sisters. Absent any incentive problem, parents should not assign any dowry but rather give the daughters their full share of the estate through bequests. However, if married daughters fully share in the parents' bequests, their brothers will not obtain the full benefits of their efforts in extending the family wealth and, therefore, will supply too little effort. While bequests are more efficient for distributing wealth to daughters, they have poor incentive effects for sons. Thus, parents will want to assign dowries that are large enough, and consequently bequests to daughters which are small enough, to mitigate the disincentive for their sons. Our model is in the spirit of Zhang and Chan (1999). While the point is not developed in their work, they maintain that daughters in virilocal societies may prefer dowries because they will have difficulties in getting their share of the natal families' wealth otherwise.<sup>5</sup>

Our theory suggests that dowry contracts, which may be complicated, should not contain claims on shares of income generated with the bride's family assets. In other words, a married daughter may not be only discriminated against in her parents' bequests as observed by Goody. She may also be excluded from inter vivos claims on income generated from her natal family's assets.<sup>6</sup> However, we will show with data from a premodern economy that the provision of dowries and the exclusion of daughters from bequests do not necessarily indicate that parents value their sons' welfare more than their daughters'.

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<sup>4</sup>Lundberg, Pollak, and Wales (1997), and Chiappori, Fortin, and Lacroix (2002) and the references therein provide empirical evidence of such redistribution.

<sup>5</sup>Their paper focussed on the observation that in some societies, a dowry has to be returned upon failure of the marriage. They show that dowries but not bride prices affect the division of housework between Taiwanese married couples.

<sup>6</sup>The same free riding concern may explain why in early modern England, younger sons who left their natal families to become soldiers (or to join the clergy), received cash gifts rather than bequests (Stone and Fawtier Stone 1984).

The nexus between virilocality and dowries helps us explain the disappearance of dowries in previously dotal societies. Virilocal societies are primarily agricultural economies and/or economies where the gains for children to remain in the family business is substantial. As the labor market in a dotal society becomes more developed, as the demand for different types of workers grow, children are less likely to both hold their parents' occupations and to work for their families. The return to investing in general rather than family-specific human capital also increases. The use of bequests to align work incentives within the family becomes less important. Since it is costly to provide a dowry, the demand for dowry (within the family) will fall as the need to use bequests to align the work incentives of sons falls. Instead of the dowry, parents will transfer wealth to both their daughters and sons as human capital investments and bequests. Therefore, the development of labor markets will be important in reducing the role of dowries. When dowries become an inefficient source of brides' wealth, they will wither. Unlike the standard economic model, we argue that there is no connection between the disappearance of dowries and the appearance of brideprices.<sup>7</sup>

We compare the predictions of our theory vis-a-vis the historical development of dowries, bequests, brideprices, and marriage gifts in various civilizations of the past. Our theory of dowries is consistent with narrative evidence from ancient Near Eastern civilizations, ancient Greece, Roman and Byzantine empires, western Europe from 500 to 1500 AD, the Jews from antiquity to about 1300, Arab Islam from the seventh century to modern times, China, Japan, early-modern England, modern Brazil, and North America. Some of the predictions of the model are also consistent with quantitative evidence from a unique data set of four thousand marriage contracts and many legacies from medieval and early Renaissance Tuscany we gathered at the state archives of Florence. Although it is not the main aim of our paper, we also discuss the absence of dowries and the prevalence of brideprices in contemporary African societies. Lastly, we compare our theory with the recent developments of the dowry system in India, where dowries instead of withering seem to become more important.

Before presenting the model and discussing the evidence, some additional remarks are in order to clarify the limit of our contribution. First, we take virilocality as given and proceed in analyzing dowries and bequests under that assumption. Rosenzweig and Wolpin (1985) and Guner (1998) provide rationales of why agricultural societies are primarily virilocal.

Second, our theory has nothing new to say about the equilibrium determination of bridal wealth, a focus of much of the existing literature. It is also silent on the substitution between dowry and the bride's human capital or labor supply. We focus on the internal organization of the family whereas most of the existing literature on dowries focuses on how families respond to external shadow prices. Thus our model has nothing to say about the efficacy of that research.

Third and most important, our model provides a particular environment in which dowries emerge endogenously. To the extent that virilocality and the associated free riding concern

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<sup>7</sup>We suggest a new motivation for brideprices in polygynous societies. With potential/ actual co-wives competing for resources, a bride may not get her promised share of resources in marriage. A brideprice is an irreversible payment to her and her family. This theory predicts that brideprices will wither but dowries need not arise when polygyny disappears.

apply, we expect to see dowries in that society. However, ours is not necessarily the only environment to support dowries.<sup>8</sup> There are likely to be other roles for dowries related to the organization of intra and inter families transactions. For example, in the spirit of the strategic bequest literature, one might argue that virilocality also means that married sons affect their parents' welfare more than married daughters.<sup>9</sup> Parents may use bequests as a reward to affect their sons' behavior. This reward scheme is not needed for married daughters and so they may get dowries.

This paper is organized as follows. Section 2 describes inheritance patterns and marriage transfers in past societies. The model is presented in section 3. Section 4 discusses narrative and quantitative historical evidence, which is consistent with the predictions of the model. In section 5, the disappearance of dowries is documented for some societies. Section 6 concludes.

## 2 Dowries, Bride Prices, and Bequests: A Comparative-Historical Perspective

In drawing a historical profile of marriage payments and intergenerational transfers, four features of each society are taken into account: *(i)* the prevalence of dowries, bride prices (paid by the groom to the bride's family), or marriage gifts (from the groom to the bride herself), *(ii)* the existence of individual property rights, which determines whether parents can transfer or bequeath property to their children, and the laws and customs regarding inheritance (primogeniture, partible inheritance, exclusion of daughters from bequests), *(iii)* the rules governing marriage (monogamy versus polygamy), and *(iv)* the post-marital residential pattern (virilocal, uxorilocal, neolocal).<sup>10</sup>

A summary of the findings are in Table 1.

[TABLE 1 HERE]

With some exceptions, many past civilizations characterized by dowries were also virilocal and monogamous; husbands often simultaneously gave marriage gifts (or endowments) to their wives. The relative importance of dowries from parents to their daughters and marriage gifts from husbands to their wives greatly varied from time to time.

In some dotal societies, married daughters also received bequests whereas they did not in other societies. Although widespread in isolated communities, dowries were not common in colonial Americas or Australia, while they were being used at the same time in the source countries. Also, dowries are not widespread in contemporary Africa, where brideprices prevail.

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<sup>8</sup>Non-economists also consider other models of dowry (Goody 1973, 1976, 1990; Choinackj 1975, 1990; Hartung 1982; Klapisch-Zuber 1985; Schlegel and Eloul 1988; and Carroll 1991). See Harrell and Dickey (1985) for a survey.

<sup>9</sup>We thank a referee for providing this insight.

<sup>10</sup>A uxorilocal marriage occurs when the groom moves into his bride's household. Neolocal defines those marriages in which the groom and the bride live with neither their families.

We present details of our findings below. Readers may skip to the presentation of the model without loss of continuity.

**Ancient Near Eastern Civilizations, Greece, and Rome.** Dowry (*sheriktum*) and virilocality seem to have coexisted in such ancient civilizations as the Sumerian, Akkadian, and Babylonian in the third and second millennia BC (Glassner 1996, 105–22). Virilocality was the norm: a daughter left her natal family upon marriage. The dowry could consist of land, slaves or jewels, tools, and furniture. At the time of the betrothal, the groom offered a marriage gift (*terhatum*), usually in cash, to the bride's household, who in turn bestowed it to the bride herself together with the dowry. The Hammurabi Code established that the marriage gift should be equal to one *mina* (= 60 *shekels*) for a patrician, and a third of a *mina* for common folks; unlike the dowry, however, it was optional and in later Babylonian times it became less frequent (Jones 1904, 123). If the husband died or divorced his wife, she was entitled to keep both her dowry and the marriage gift.<sup>11</sup> The husband could also bequeath property to his wife, which she could use as long as she did not remarry. Equal bequests were the norm in some regions (e.g. Babylonia), while the eldest son obtained a larger share in other places (such as Assyria). Married daughters were excluded from inheriting the families' estates, unless there were no sons; in contrast, unmarried daughters who lived with their parents received bequests.

Dowries and virilocality were also central features of marriage customs in both ancient Greece and Rome.<sup>12</sup> Even when living in separate houses, married sons kept strong economic links with their natal families. In the Greece described in the Iliad and Odyssey (IX–VIII centuries BC), the groom paid a brideprice (*hèdna*), often consisting of livestock, to the bride household, and offered gifts to the bride in addition to those given by the bride's father. Uxorilocal marriages were not unknown in Homeric Greece; in such cases, the bride's parents did not provide a dowry but had the son-in-law share in the bequests. This was the case of Bellerofonte, son of Glauco, from Epirus, who married one of the daughters of Iobate, king of Lycia. The groom, who moved into his in-laws' household, did not receive the usual dowry, but was bequeathed half of the king's landed property (Leduc 1990, 262). Later, in the Greece of the city-states (VIII–IV centuries BC), the brideprice disappeared and the dowry (*proix*) became the prominent marriage transfer (Sissa 1996). In classical Athens, sons shared equally in their parents' bequests.

In Rome, inheritance laws changed around the second century BC. In early times, most women married *cum manu*: after marriage, they ceased being heirs of their natal households, and their dowries became part of their husbands' estates. At the marriage's dissolution, wives had the right to inherit an equal share of their husbands' property together with their children. In contrast, by the first century BC, most marriages were *sine manu*: even after marriage, daughters were legally subject to the paternal authority and kept inheritance rights in their natal families. Although the husband could manage the dowry, at the marriage's dissolution he had to return it to his wife's family (or directly to his wife if she had been

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<sup>11</sup>If she died childless, her dowry was to be given back to her natal family.

<sup>12</sup>See, among others, Dixon (1986, 111), Saller (1991), and Thomas (1996).

emancipated by her natal household).<sup>13</sup> All children, regardless of gender, were entitled to receive equal bequests unless parents provided differently in their last wills. Unlike in some regions in late medieval Europe, in imperial Rome the provision of a dowry to a daughter did not automatically exclude her from inheriting a portion of his parents' estate.

Marriage gifts from husbands to wives (*donatio ante or propter nuptias*) became widespread in the late period of the empire in the third century AD (Gies and Gies 1987, 22).

**The Hebrew Family from Antiquity to 1300 AD.** Several episodes in the Bible indicate that polygamy was permitted, although it was probably limited to wealthy households, which could support multiple wives. The groom family paid a brideprice (*mohar*) to the bride household, who in turn partly gave it back to the bride herself. At the same time, bride parents provided their daughter with a dowry (*chiluhim*), which consisted of her share of the inheritance from her father (Alvarez-Pereyre and Heyman 1996, 175–77). Unlike the brideprice, whose value was customary, the size of the dowry varied according to the wealth of the bride's household. Papyri documenting the economic and social life of Jews living in Elephantine (Egypt) in the fifth century BC indicate the relative size of dowries and brideprices: most brideprices were worth 5 and 10 shekels, while dowry values ranged from 12 to about 68 shekels (Yaron 1958; Porten 1968, 74, Table 1).

The biblical brideprice later disappeared. During the Mishnah and Talmudic period (200–600 AD), instead of paying a brideprice to the bride's parents, the groom provided a marriage gift directly to the bride (Epstein 1942, 85).

From the tenth through the thirteenth centuries, the wealth of documents from the Cairo Geniza enables one to learn a great deal about the economic and social life of the Jews in the Mediterranean.<sup>14</sup> Virilocality continued to characterize the Jewish communities (Goitein 1978, 38–41, 69). Sons, married or unmarried, often lived with their parents and worked in their families' business.

Jewish religious law established a minimum obligatory gift (*mohar*) from the groom to the bride; this gift amounted to 200 dinars or *zuz* (silver coins) for virgins and 100 dinars for widows and divorcees according to Palestinian practice, and 25 *zuz* and  $12\frac{1}{2}$  *zuz* according to the Babylonian Talmud.<sup>15</sup> The purpose of the obligatory gift was to prevent the husband from arbitrary divorce. In addition to the obligatory gift, the husband had to provide his wife with an additional marriage gift, usually in gold coins. At the time of engagement, the two families decided how much the groom had to give to the bride as first installment of this marriage gift ("early" gift), and how much he had to provide for her as second installment of the marriage gift ("late" gift), to be paid at the termination of the marriage (in the case

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<sup>13</sup>Crook (1986), Saller (1991; 1994, 207), Thomas (1991), and Dixon (1992, 77–87).

<sup>14</sup>As Jews thought that writings on which the name of God might be found should not be destroyed, they deposited thousands of documents dealing with land sales, business contracts, loans, dowry contracts, last wills, charitable gifts, and settlements, in a geniza, a lumber room, in Old Cairo in Egypt. Based on this wealth of documents, Goitein (1967–88) has written an impressive social and economic history of the Jewish and Arab communities in the Mediterranean from the tenth through the thirteenth centuries.

<sup>15</sup>The Talmud indicates that 200 *zuz* were enough to support one person for a year. Also, the 200 *zuz* of the Palestinian practice corresponded to  $8\frac{1}{3}$  gold dinars.

of divorce or husband's death). In addition to these transfers from the groom, the bride also received the dowry from her natal family. A comparison of marriage gifts and dowries seems to indicate that, on average, the dowry the wife received from her natal family was larger than the marriage gift she obtained from her husband (Goitein 1978, Appendix; Friedman 1980, 285–86).

**Western Europe, ca. 500–1200 AD.** The pattern of marriage customs and inter-generational transfers in western Europe in the second half of the first millennium looks like a patchwork reflecting the influences of three heritages: the tradition of Roman law (described above), the customs of the Germanic tribes who conquered the lands once belonging to the empire, and the rules promoted by the Catholic Church, which enforced monogamy and stringent norms regarding incest to impede marriage among close relatives (Wemple 1985, 9).

In ancient times, among Germanic tribes grooms paid brideprices to the bride parents at marriage. In these societies, women, who did farmwork and housework, could not own land or other property, and were excluded from receiving property from their natal families.

The intermarrying of spouses of Germanic and Roman descent favored the merging of opposite heritages and brought strengthened economic rights to women living in the Visigothic reign in Spain, the Frankish kingdom in France and Germany, the Lombard reign in Italy, and the Anglo-Saxon kingdom in England. Yet, the pace at which the process of amalgamation of different traditions occurred, varied from place to place.

Between the sixth and the tenth century, women received wealth transfers from both their paternal families and their husbands (Fossier 1996, 45). At marriage, daughters moved into their in-laws' households and received dowries (under Roman law) or father's contributions (under Germanic law) from their natal families. Moreover, they could receive bequests. The type of property parents were permitted to assign to their daughters, though, differed under the two systems. Under Germanic law, daughters could not inherit land from their natal families. Among the Franks, in cases of intestacy, land could be inherited by male children only, usually through equal bequests; the Salic code enacted by the Merovingian king Clovis in 511 established that daughters could receive equal bequests of money and movable property as their brothers, but could not inherit land (Gies and Gies 1987, 55). Later, in the eleventh century, new provisions authorized female inheritance of paternal land (Guichard and Cuvillier 1996, 353). The restriction regarding the inheritance of real property by daughters from their natal families never existed for those populations of Roman descent or living under Roman law: in this case, all children, regardless of gender were entitled to receive equal shares of the family movable and immovable property.

From their husbands, women gained access to property in various ways. The ancient brideprice of Germanic descent withered and was substituted with the marriage gift given by the groom to the bride herself. For example, the Burgundian code (early sixth century) established that one-third of the brideprice given to the bride household was to be bestowed upon the bride herself. Under Visigothic law, bride parents had the right to manage the brideprice, but upon their death it passed to their married daughter (Wemple 1985, 45). The

Salic code in the sixth century granted the bride full ownership of the marriage settlement brought by the groom. The transformation of the brideprice into the marriage gift reached its completion in the seventh and eighth centuries.<sup>16</sup> Like the *donatio ante/propter nuptias* that grooms assigned to their brides in the late Roman empire, the early medieval marriage gift served the purpose of providing economic support to widows and divorced women. It consisted of two separate components: the *morgengabe*, which the groom offered to the bride the morning after the wedding in recognition of her virginity, and the bridegift or dower, which the husband assigned to his wife during or at the termination of the marriage. Under Germanic law, women were gradually awarded the right to own and inherit real property through marriage settlements. The marriage gift from the husband to the wife, though defined in monetary value, could consist of the ownership or usufructuary rights over land.<sup>17</sup>

The balance between the dowry and the marriage gift gradually shifted. Around the tenth-eleventh centuries, the dowry regained prominence everywhere in western Europe. In continental Europe, by the thirteenth century, the dowry was the main marriage transfer (Violante 1977, 114).<sup>18</sup> The unchanged nominal value of the marriage gift from the groom to the bride through the centuries made this transfer almost symbolic compared to the dowry she obtained from her natal family.<sup>19</sup>

Also, other transfers from the husband to the wife withered. For example, in twelfth-century Genoa, the wife was entitled to receive an endowment in money or valuables from the husband at the time of the marriage, plus one third of her husband's estate at his death. This one-third share (*tercia*) was abolished in 1143, and the dowry she brought from her natal family became the major wealth transfer at marriage (Hughes 1978). The only exception remained England, where the dowry provided by the bride's parents was more than matched by the dower (usufructuary rights) that the husband promised to his wife once widow; common law set the value of the widow's portion at one third to one half of an estate (Gies and Gies 1987, 168).

The reappearance of the dowry in western Europe during the early Middle Ages often coincided with its association and almost identification with female inheritance. In some medieval cities and regions, statutes and codes explicitly stated that the dowry was a substitute for a daughter's claim on her paternal family's estate (Klapisch-Zuber 1985, 216; Fossier 1996, 418). A similar disinheritance of younger sons occurred in those places (such as England)

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<sup>16</sup>Only the Saxons kept the custom of giving the bride's father a substantial sum (Wemple 1985, 45).

<sup>17</sup>Again, the only exception occurred in the Saxon code, which established that the marriage gift could consist only of movable goods (Wemple 1985, 45).

<sup>18</sup>In the later middle ages and the Renaissance, the provision of dowries became a major concern for many families. In some Italian cities in the early Renaissance, town governments even created public funded debts in which parents could invest sums of money at their daughter's birth to provide for a dowry at the time of their daughters' marriage. In Florence, this was the purpose of the *Monte delle Doti* (dowry fund) established in 1425 (Kirshner and Molho 1978; and Molho 1994). In the sixteenth century, similar institutions appeared in Bologna and Naples (Delille 1982; Chabot and Fornasari 1997; and Carboni 1999).

<sup>19</sup>For example, in medieval Tuscany the marriage gift was fixed at half the value of the dowry up to a threshold of 50 lire. A bride bringing a dowry of, say, 26 lire, received 13 lire as marriage gift from the groom. However, two brides—one with a dowry of 3000 lire and the other with a dowry of 100 lire—received an identical marriage gift of 50 lire.

with the custom of primogeniture: male children who joined the army or the clergy were given cash gifts, while the estate was left to the eldest son (Stone and Fawtier Stone 1984).

**Byzantine Empire, ca. 500–1300 AD.** Dowry and post-marital residence appear also strictly interrelated in the lands belonging to the Byzantine empire. What is more intriguing is that dowries in substitution for claims over the natal family's estate were also provided to sons who married off and left their paternal households (Laoui 1998, 151–60). Regardless of gender, a distinction was made between *υπεξουσιοι* (children living in their parents' households) and *εξοπροικοι* (children married off with a dowry and who were not living in their parents' households).

Under Byzantine law, in the thirteenth century all children were entitled to equal bequests in case of intestacy; a testament could provide for different shares. Despite the rules established in the law, the prevailing custom was that unmarried or married children who lived with, worked for, and took care of, their parents, were the heirs; in contrast, those children who married off with dowries were not considered among the *κληρονομοι* (the heirs). Thus, the dowry was not an advance on inheritance but the major share of the parental estate that a daughter or son marrying off obtained. An emperor even codified the disinheritance of married and dowered daughters by abrogating an ancient law, which enabled a married daughter to collate the dowry into the natal family's estate at the time of the parents' death and to seek equal inheritance. According to the emperor, this law "reintroduced by some people for their own profit, created major upheavals and the destruction of numerous and great houses" (Laoui 1998, 159).

Several examples of uxorilocal marriages in peasant families (with grooms moving into the brides' households) are documented in censuses (Patlagean 1996, 476–80); in such cases, the groom received a dowry from his own family and became the heir of the bride's household where he moved into after marriage.

**Arab Islam, 650 AD to Modern Times.** According to the norms established in the Quran, polygamy was permitted, with four being the maximum number of wives a man was legally entitled to marry and financially support. Until the fifteenth century, there is evidence that polygamy was practiced in the countryside, where husbands relied on their wives for both housework and farmwork. In contrast, city dwellers, unless very wealthy, did not practise polygamy because the cost of maintaining a wife in the city was much higher and her contribution to the family income much smaller (Bianquis 1996).

Virilocality seems to have been the norm. In the first nine centuries of Islam, transfers of wealth associated with marriage occurred in both directions. The groom offered a gift (brideprice) to the bride's family in compensation for the loss of a daughter, and he made a promise to provide the *mahr* (dower or marriage gift) to the wife during and/or at the termination of the marriage. The bride's family also provided a dowry for their daughter at the time of her marriage (Coulson 1978).

Norms of inheritance established that goods forming a family's estate had to be divided into twenty-four *carats*, and each heir was entitled to a given number of shares, with daughters

receiving half the share assigned to their brothers. When receiving a dowry, though, a daughter was usually excluded from the inheritance if her brothers were alive at the father's death (Bianquis 1996).<sup>20</sup>

The coexistence of dowries (from the bride's parents to the bride) and marriage gifts (from the groom to the bride) is still a feature of many contemporary Muslim countries (Quale 1988, 242).

**China.** At the same time when in Europe the dowry was reemerging as the major wealth transfer at marriage, in Sung China (960–1279 AD) dowry payments grew in importance with respect to the marriage gifts conveyed by the groom's family (Ebrey 1991, 97–132). In the Sung period, hereditary aristocracy disappeared and a new social order was established based on the acquisition of academic titles and careers in the civil service (Cartier 1996, 511).

Unlike in the Spring and Autumn periods (770–453 BC), when the elite practiced polygyny, brides received dowries, and grooms paid brideprices, monogamy became legally enforced in the early imperial period during the Han dynasty (206 BC –220 AD) (Thatcher 1991, 25–57). During the T'ang dynasty (617–907), aristocratic grooms paid substantial brideprices (in land, livestock, or silk) to bride families. A family instructions manual written around the sixth century emphasized that

In the present age, when marriages are arranged, some people sell their daughters for the betrothal gift or buy a wife by making a payment of silk. They compare the ancestry [of the two parties], calculate down to the smallest sum, demand much and offer little, exactly like bargaining in a market.<sup>21</sup>

In 657, the emperor Kao-tsung established a ceiling on brideprices and restricted the use of these gifts: from then on, the bride's family had to assign the goods forming the brideprice to the bride in addition to the dowry they provided.

Three centuries later, in Sung China the dowry from the bride's family became the major marriage payment across all social and economics groups. The link between dowries and post-marital residence is similar to the one observed in other civilizations. Daughters received dowries when they married and left their natal households; at the same time, in uxorilocal marriages the son-in-law who moved into the bride's household received a dowry from his natal family consisting of gold and silver, fields, and houses, and shared in the bride family's bequests (Ebrey 1991, 106). Uxorilocal marriages were often motivated by the need to have more labor available. For example, in families with no sons or sons too young who could

<sup>20</sup>To both prevent excessive partition among heirs and to avoid confiscation by the ruler, though, the institution of *waqf* (property held in mortmain) became more and more widespread in Muslim lands in the Middle Ages. With a *waqf*, the owner "froze ownership of his estate without usufruct so that it could not be sold, given away, transmitted through inheritance or confiscated". The revenues from the *waqf* were to be given to the owner's descendants and relatives (family *waqf*), or for charitable purposes, such as gifts to the poor, and to maintaining a bath house or a mosque (charitable *waqf*) (Bianquis 1996, 644).

<sup>21</sup>Quote taken from Ebrey (1991, 98). Silk was commonly used as currency at that time.

not work yet, uxorilocal sons-in-law provided their in-laws with labor and took care of the estate.<sup>22</sup>

Dowries were considered a share of the family property but married daughters were not excluded from receiving bequests (Ebrey 1993, 107). Daughters (married and unmarried) also became the residual heirs when no brothers survived. When male siblings survived, they received equal bequests.

In contemporary China, there seems to be a divergence between urban and rural environments. In cities, both grooms and brides contribute to the constitution of a conjugal fund; their parents often help them with the expectation that they will receive old age support. In contrast, although both dowries and brideprices exist in rural communities, brideprices are much larger than dowries. One explanation for this asymmetry is that in villages, unlike cities, families try to cope with the increasing migration of their children to cities by paying brideprices in order to attract brides for their sons and ensure the availability of long-term family labor (Siu 1990; Das Gupta and Li).

**Japan.** The history of marriage payments and intergenerational transfers in Japan also indicates a close link between post-marital residence and the direction of wealth transfers.

In the antiquity and Middles Ages, uxorilocal residence (*mukoirikon*) was very common: the husband lived with the wife's parents during an initial period until at least the birth of the first child (Beillevaire 1996, 533). Children of either sex were entitled to receive bequests, although the share of landed property bequeathed to daughters was usually smaller than that assigned to sons (Beillevaire 1996, 533).

By the end of the Kamakura period (1185–1333) and especially from the fifteenth century on, post-marital residence became predominantly virilocal. At the same time and until during the entire Edo period (1600–1867), male primogeniture became legally enforced. Younger children and daughters were excluded from inheriting shares of the family estate. Married daughters were entitled to receive trousseaux. Younger sons had two options: either they kept living in their eldest brother's houses as bachelors (in this case, their eldest brother had to provide for their maintenance), or they could become the principal heirs in other households by being adopted. Adoption became increasingly popular in Japan: by adopting a son-in-law (*yōshi*) and making him the universal heir, parents with no sons ensured the continuation of their lineages (Beillevaire 1996, 542–50).

Even in recent times, in uxorilocal marriages where the groom moves into his bride's household, he brings his contribution, which closely resembles a dowry, and from then on he is no longer entitled to share in the bequests of his natal family (Quale 1988, 247).

**India and Pakistan.** The historical origin of the dowry system in India has been traced to the Hindu marriage among high castes in North India (Srinivas 1984; and Lardinois 1996a, 566). Until the end of the medieval period, *Brāhma* marriage practiced by high castes

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<sup>22</sup>A nice case cited in Ebrey (1993, 237) is the one of a Chinese man with a three-year old son, who left 30 percent of the estate to his son and 70 percent to his uxorilocal son-in-law who managed, and worked on, the estate.

involved the giving of a daughter together with a dowry from the bride family to the groom family, whereas in the *Asura* marriage common among lower castes a brideprice was paid by the groom to marry the bride. During the colonial period, marriages with dowries became the only legally accepted form of marriage among all social groups and castes (Caplan 1993; Madan 1993; and Sheel 1999). In North India, virilocality was and still is the norm (Karve 1993, 60–62).

Brideprices are also common in South India among the people speaking the languages of the Dravidian family. The Dravidian kinship region is also characterized by an incidence of cross-cousin marriages varying anywhere from 10 to 54 percent (Dumont 1993; and Trautmann 1993a, 1993b). In cross-cousin marriages, a man marries his mother's brother's daughter, or his father's sister's daughter, or his elder sister's daughter. Thus, exchange of daughters and marriage among close kin is the preferred pattern in South and central India among Dravidian cultures whereas it is strongly opposed in the Hindu marriage in North India. Notice that among the Dravidians practicing cross-cousin marriages, virilocality is not such a predominant feature (Karve 1993, 62–67).

In 1956, a law established that Hindu women were entitled to an equal share with their brothers in their parents' property. Also, in 1961, dowries were outlawed (Quale 1988, 257). Yet, despite being outlawed, dowries remain very popular in India. However, on this issue, it is very important to clarify a possible misunderstanding. The anti-dowry legislation concerns the dowry, not the *stridhana* (Caplan 1993, 361; Sharma 1993; and Menski 1998). The latter includes the goods, such as clothes and jewelry that the bride receives from her own natal family and over which she maintains ownership rights; the *stridhana* represents her pre-mortem inheritance from her natal family in consideration of the fact that she will not receive any bequests at her parents' death. From this point of view, the *stridhana* is the equivalent of what we called "dowry" in other civilizations. In contrast, in India the goods forming the "dowry" become the property of the groom and his family. The contemporary problems related to dowries in India has to do with the increasing size of the dowry, that is, of the goods that the groom family demands at the time of marriage; this is what the anti-dowry legislation tried to curb, without success so far.

To sum up, when talking about dowries, one has to be very careful in comparing past societies and contemporary India because property rights over the goods provided by the bride's family are very different. In most past societies, the wife retained the ownership over her dowry; in India, the wife holds property rights over the *stridhana*, but not over the dowry.

Among Muslims in Pakistan, virilocality is the norm and it is customary for a married daughter who received a dowry from her parents not to inherit shares of her natal family's estate to which she would be legally entitled. In order to prevent the goods assigned as dowry to go to outsiders, cross-cousin marriages in which a man marries his father's brother's daughter are particularly encouraged (Donnan 1993, 311, 321).

**Africa.** A notable exception to the pattern of virilocality and dowries is represented by contemporary African societies in which virilocality appears associated with brideprices instead of dowries. Data on hundreds of cultures we coded from the *Ethnographic Atlas* by

George P. Murdoch (1967) confirm this pattern (Table 2).

[TABLE 2 HERE]

Of the 131 African societies with brideprices, 110 are also virilocal. However, unlike the past societies described above, which were mostly monogamous, most African societies with brideprices are characterized by polygyny (79.4 are polygynous societies, 16.8 are characterized by limited or occasional polygyny, while only 3.8 percent are monogamous cultures).

Also, seven percent of the societies with brideprices and virilocality have collective instead of individual property rights. In this context, dowries cannot exist simply because parents cannot transfer wealth to their children, regardless of gender.

### 3 A Model of Dowries

Consider a family with two children, a son and a daughter, in a virilocal society. After marriage, the son continues to live and work with his parents. After marriage, the daughter leaves her natal household and moves into her parent-in-laws household.

The parents have one unit of initial capital to allocate between their two children. Let  $x$  be the share of capital allocated to the son. This allocation to the son is unobservable by outsiders because the son lives with his parents and thus his capital is intermingled with his parents' assets.  $1 - x$  is the share of initial capital that is allocated to the daughter in the form of a dowry. Given their initial capital allocations, each child can choose to either work,  $e = 1$ , or shirk,  $e = 0$ . If a child with initial capital  $z$  chooses effort  $e$ , then his or her gross wealth is  $(1 + e)z$ . The cost of effort is  $(1 + e)z$  for the son and  $\beta(1 + e)z$  for the daughter. We assume  $\beta \geq 1$  because the son, living with his parents, has family specific skills in working with family assets and his parents can also help him in his work.<sup>23</sup> It also represents liquidation cost if the family has to sell assets to transfer wealth to the daughter. The cost of effort is proportional to the amount of capital allocated because the child can do other things with his or her time.<sup>24</sup>

Since the son is living with his parents, the gross wealth that he produces cannot be separated from his parents' wealth. The parents may give to their daughter some of the gross wealth created by the son in the form of a parental bequest. In contrast, because the married daughter has left home, her parents cannot expropriate and give to the son any of her gross wealth. Thus there is a fundamental asymmetry in terms of parental control over the children's gross wealth.

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<sup>23</sup>This assumption is in the spirit of Rosenzweig and Wolpin (1985) model, which explains the comparative advantage of sons who live with their parents in working the family farms as a consequence of land-specific returns to experience associated with weather variability. Outsiders, such as a married daughter and her husband, do not have the same family specific skills. The same argument can apply to crafts and trade activities whenever family specific skills are important in a given business.

<sup>24</sup>We have also investigated the case where the cost of effort to the daughter is  $(\beta + e)z$ . Here  $\beta$  does not affect  $e$ . The qualitative predictions of this model are the same as those in the text. A referee pointed out that another formulation is to discount her return to effort relative to her brother rather than increase her relative cost of effort as we have done. The qualitative predictions again are similar.

Given the son's initial capital  $x$  and effort  $e_s$ ,  $y_s = (1 + e_s)x$  is the *gross* wealth that he produces. Since he is living with his parents, we interpret  $y_s$  also as his parents' estate. If he does not receive the entire estate upon the death of his parents, his parents have bequeathed some of his wealth to his sister. Let  $b$  be the share of gross wealth that is retained by him as his inheritance from his parents. Then his *net* wealth is

$$w_s = b(1 + e_s)x$$

In addition to influencing his consumption, his net wealth  $w_s$  also affects whom he is likely to marry and his utility from that marriage. In this paper, we assume that there is assortative matching by wealth in the marriage market.<sup>25</sup> Let  $h(w_s)$  denote the wealth of the woman whom he is able to attract. When there is positive assortative matching in marriage market equilibrium,  $h'(\cdot) > 0$ . His utility from marriage will depend on his own wealth,  $w_s$ , and the wealth of his spouse,  $h(w_s)$ . Since his spouse's wealth depends on his wealth, the son values his net wealth using the indirect utility function  $U(w_s)$  where  $U(\cdot)$  is increasing and concave. Thus his utility is:

$$V(b, x, e_s) = U(b(1 + e_s)x) - x(1 + e_s)$$

His sister will get a bequest of  $(1 - b)(1 + e_s)x$  from her parents. With her dowry,  $1 - x$  and effort  $e_d$ , her *gross* wealth is  $y_d = (1 + e_d)(1 - x)$ . Her *net* wealth is

$$w_d = (1 - b)(1 + e_s)x + (1 + e_d)(1 - x)$$

The wealthiest spouse that she can attract is  $h^{-1}(w_d)$ . Her utility from marriage will depend on her own wealth,  $w_d$ , and the wealth of her spouse,  $h^{-1}(w_d)$ . For analytic convenience, let her also value her net wealth,  $w_d$ , with the same indirect utility function  $U(\cdot)$ . Her utility is:

$$v(b, x, e_d) = U((1 - b)(1 + e_s)x + (1 + e_d)(1 - x)) - \beta(1 - x)(1 + e_d)$$

Assuming that parents value the welfare of both their children, let parental utility be:

$$V(b, x, e_s) + v(b, x, e_d) \tag{1}$$

To analyze the potential conflicts between parents and their children, let

**Assumption 1**

- (i)  $U' > \beta$
- (ii)  $\frac{U'}{2} < 1$

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<sup>25</sup>Existence of equilibrium in wealth matching marriage models with parental investments is shown in Siow and Zhu (1998); and Peters and Siow (forthcoming).

In order to analyze the relevance of Assumption 1, consider allocation A where the entire initial capital is allocated to the son, the son exerts effort and the final gross wealth is divided equally between the son and the daughter. Let allocation B be where the entire initial capital is allocated to the son, he exerts no effort and the final gross output is divided equally between the children.

Inequality (i) above implies that, for any dowry and fixed bequest, the daughter will prefer to exert effort rather than not. Since the cost of effort is higher for her than her brother, for any initial capital allocation, he will also exert effort if he keeps all his final gross output. With inequality (i), parental utility is higher under allocation A rather than allocation B. That is, the welfare from effort is higher than the welfare from shirking. The parent will prefer the son to work on all the initial capital (because he has a lower cost of effort) and to divide the final gross wealth equally between the children. Equal division of final wealth is efficient because it equates the marginal utility of consumption between the two children.

However, the implication of inequality (ii) is that the son will prefer to shirk if he only gets half the gross wealth from his effort. That is, he will not work hard if he has to share equally in the bequest with his sister. Thus the second inequality shows the free riding problem between brother and sister. The parents cannot implement allocation A if the son can choose his own effort.

The objective of the parents is to maximize children's welfare represented by equation (1) taking into account the strategic behavior of their children.<sup>26</sup> This game has four stages. In the first stage, the parents allocate capital between the children. In the second stage, the daughter chooses her effort level. She chooses her effort first because (i) daughters receive their dowry upon marriage and they marry earlier than sons, and (ii) the parents may not let the son have full control over his share of capital until the parents retire. In the third stage of the game, the son chooses his effort level.<sup>27</sup> Lastly, the parents choose the bequests. We will solve for the subgame perfect Nash equilibrium of this game.

**Proposition 1:** *Let  $\beta > 1$ . In the subgame perfect Nash equilibrium, the equilibrium choice of  $x$ ,  $x^*$ , satisfies  $\frac{1}{2} < x^* \leq \frac{2}{3}$ . Both children exert effort in equilibrium. The equilibrium choice of  $b$ ,  $b^*$ , satisfies  $\frac{3}{4} < b^* < 1$ . Equilibrium parental utility is:*

$$W^*(\beta) = U(1) - 2x^* + U(1) - 2\beta(1 - x^*)$$

Proof: See Appendix. ■

Proposition 1 states that, anticipating strategic behavior by their children, the parents should allocate some of the initial capital to the daughter as a dowry. The daughter receives more than a third but less than half of the initial capital as a dowry. After the children choose their optimal effort levels, the parents will optimally choose their bequests. The son receives more than three quarters of the estate. In fact, the daughter may receive no bequest. Propo-

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<sup>26</sup>There is also a free riding problem between brothers. Free riding might explain primogeniture and the custom of cash payments to sons who joined the military or church in some past European societies.

<sup>27</sup>There is no pure strategy equilibrium in simultaneous effort levels for some allocations of capital. The mixed strategy equilibrium in this context is not plausible given the difference in the ages of marriage between sons and daughters.

sition 1 rationalizes Goody's observation that daughters receive their inheritance primarily in the form of dowries whereas sons receive theirs primarily in the form of bequests.<sup>28</sup>

Although  $W^*(\beta)$  is the best the parents can achieve, this equilibrium allocation of resources by the parents is inefficient. The daughter exerts effort to increase her wealth even though it is less costly for the son to do so. Allocation A generates more utility for the parents. However, due to the strategic behavior of both parents and their children, it is not implementable. Instead under the equilibrium allocation, the parents provide the daughter with a sufficiently large dowry such that they will not want to redistribute too much wealth away from their son *after* he exerts effort. Under this circumstance, both the son and the daughter will provide effort.

Proposition 1 also implies that final net wealth of both the daughter and the son are the same. This implication is due to our assumption, for analytic convenience, that the indirect utility functions for net wealth are the same for both children. In general, if children have different indirect utility functions for net wealth, equality of net wealth does not follow.

In some dotal societies, by custom and/or law, parents are restricted from granting bequests to their daughters. Then all parents can do to affect their children's welfare is the initial division of capital.

**Proposition 2:** *A custom and/or legal restriction disinheriting daughters may increase parental welfare.*<sup>29</sup>

The trade off behind Proposition 2 is as follows. Without disinheriting daughters, parents can equate wealth across their children. As  $\beta$  increases, the efficiency cost of dowry increases and parents prefer to give smaller dowries. However, there is a minimum dowry size below which the son will shirk. If daughters are disinherited, parents do not worry about a minimum dowry size but have to deal with the inequality of wealth between their children instead.

We may summarize the above discussion as follows. Since bequests are chosen after children choose their effort levels, the children recognize that altruistic parents may use bequests to redistribute wealth among the children. Anticipating this redistribution, the children may free ride on each other's effort. To deter this free riding, parents will provide dowries to daughters even though daughters are less efficient in using the capital than sons. Bequests to daughters will be smaller than that for sons. Daughters may even be disinherited. However, the size of the bequest to a daughter is not necessarily informative about parental valuation of their daughter and son.

Our theory also explains the timing of the dowry. The transfer is made when the daughter marries and leaves home, that is, when she no longer contributes to increasing her parents' wealth.

The inability of the parents not to change bequests *after* they observe the output of the children is critical. If parents can commit, they should give all the initial capital to the son, and write a will such that the son will get no bequest if he does not exert effort and he gets half the output if he exerts effort. Again, allocation A can be implemented if parents can commit to punishing their son for shirking.

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<sup>28</sup>When  $\beta = 1$ ,  $x^* = \frac{1}{2}$  and  $b^* = 1$ .

<sup>29</sup>See the proof of this Proposition in the Appendix of our working paper (\*\*\*\*\*).

### 3.1 Predictions

To sum up, our model generates some testable predictions.

**Prediction 1: Virilocality and Dowries.** In virilocal societies with individual property rights, in which parents can transfer wealth to their children, dowries will emerge to mitigate a potential free-riding problem among siblings.

In general, regardless of gender, parents will provide lump-sum transfers to those children who marry off and leave the paternal household.

In contrast, in uxorilocal societies where the groom moves into his in-laws' household and contributes to increase their wealth, bride's parents do not provide their daughter with a dowry but make the son-in-law share in the bequests.

**Prediction 2: No Income Sharing in Dowry Contracts.** When dowries are used to provide incentives for sons to work, it is important that dowry contracts do not unravel the incentive effect. Since families may be liquidity constrained and parents worry about the treatment of their married daughter by the in-laws, a dowry contract may be complicated. It may contain deferred payments and state contingent payments. The contract may also contain clauses as to the disposition of the dowry when and how the couple separates. However, if our explanation is correct, a dowry contract should minimize the sharing of profits generated with the family assets after the bride leaves her natal household. The dowry contract should not include shares of revenues generated from the bride family's assets. A dowry contract, which establishes that the dowry will be paid with, say, one third of the profits generated from the bride family's business will dissipate the work effort of her brother.

**Prediction 3: Exclusion of Daughters from Bequests.** In virilocal societies, daughters will receive most of the wealth transfers from their parents through dowries and not through bequests.

**Prediction 4: Parental Valuation of Daughters and Sons.** While daughters can be excluded from parental bequests when receiving dowries, they are not necessarily discriminated against their brothers if the size of dowries is similar to what the brothers receive as bequests. In other words, the small bequests (if any) received by daughters in dotal societies is not an indication of discriminatory treatment of daughters versus sons.

**Prediction 5: Simultaneous Giving of Dowry and Marriage Gift to the Bride.** Our model does not preclude the simultaneous giving to a bride of a dowry from her parents and a marriage gift from the groom.

## 4 Discussion

The predictions of the theory are now discussed with respect to the historical cases.

## 4.1 Virilocality and Dowries

The survey presented in Section 2 largely supports the nexus between dowries and virilocality. First, it has been shown that in societies so far apart from each other both geographically and temporally, such as the ancient Near Eastern civilizations, ancient Greece and Rome, the Byzantine empire, the Jews from antiquity to about 1300, Arab Islam, Sung China, India, Japan, and medieval and early modern Europe, dowries and virilocality were strictly interlinked.

Second, in the Byzantine empire children who moved out of their natal households, *regardless* of gender, received dowries and were excluded from bequests (Laoui 1998, 151–60). The same free riding concern may explain why in medieval and early modern England, younger sons who left their natal families to become soldiers (or to join the clergy), received cash gifts rather than bequests (Gies and Gies 1987, 169; Stone and Fawtier Stone 1984). In medieval and Renaissance Italy, daughters who became nuns and sons who entered monasteries also received dowries (Botticini 1999). From the viewpoint of incentives and the free riding problem, children who joined the monastic life were similar to those who married off and left their natal families: in both cases, their parents gave dowries to those who left and made the children who stayed the heirs.

Third, evidence from ancient Greece, the Byzantine empire, Sung China, and Japan during the Edo period indicates that in uxorilocal marriages, when the groom moved into his in-laws household and contributed to increase the bride family's wealth, bride parents did not provide a dowry to their daughter but made the son-in-law share in the bride family's bequests.

Fourth, there is a negligible number of neolocal societies (the bride and groom set up their own household), which have the custom of dowry. According to the ethnographic data from Murdoch (1967), these are the Cheremis of Finnic descent in the 1890s, and the Hutsul (eastern Slavs) around 1900. Nine neolocal cultures have brideprices, and in eight neolocal societies there are no transfers occurring at marriage.

Fifth, the absence of dowries in the Dravidian kinship region in India may be explained by the features of post-marital residence and marriage patterns there. Cross-cousin marriages are a very common pattern, which means that marriage often occurs among close kin in which gift-giving associated with a daughter's marriage is not required (Trautman 1993b). Moreover, unlike the Hindu marriage pattern, virilocality is not the norm among the Dravidians practicing cross-cousin marriages (Karve 1993, 60–62).

Perhaps the most glaring exception to virilocality and dowries is in contemporary sub-Saharan Africa. Whether the exception is due to the polygynous nature of many African societies, the type of agricultural practices as discussed by Boserup, or the lack of private property rights over land or cattle is unclear.

## 4.2 No Income Sharing in Dowry Contracts

To minimize distortional effects on sons' incentives to work hard with their family assets, dowry contracts should not contain any income sharing provision. We are able to document

this feature of dowry contracts in three societies quite far apart from each other: ancient Athens, the Jews in the Mediterranean basin in the ninth–thirteenth centuries, and medieval and Renaissance Tuscany.

Dowry contracts did not have income sharing clauses in ancient Athens (Table 3).

[TABLE 3 HERE]

Dowries consisted of cash, rents of houses, or interest payments from mortgages. In the cases cited by the famous Athenian orators Lisias, Iseus, and Demosthenes, profits from land and other commercial enterprises in which the effort of the bride's brothers affected the outcome, did not appear as part of the bride's dowry.

No income sharing was also a characteristic of dowry contracts among the Jewish communities in the Mediterranean, as reported in the documents from the Cairo Geniza (Goitein 1978).<sup>30</sup> Table 4 indicates the composition of dowries provided by Jewish fathers living in numerous countries in the Mediterranean in the tenth–twelfth centuries.

[TABLE 4 HERE]

Almost in all documents, the dowry consisted of clothing, bedding, jewelry, copper, and furniture; cash was not a frequent item, while a third of the documents listed houses or portion of houses as part of the dowries. Yet, no marriage contract contained the clause that the dowry should be paid with a share of the profits generated from the bride family's business.

More systematic evidence is available from medieval and Renaissance Florence, where virilocality was the norm. Table 5 reports data on about four thousand dowry contracts we collected at the states archives of Florence.

[TABLE 5 HERE]

Most dowries were paid in cash, or consisted of clothing, bedding, and furniture. In the thirteenth century, a tiny proportion (0.9 percent) of urban dowries consisted on land holdings. The proportion increased to 8.4 in the decades across the Black Death of 1348, and then it declined to 3.5 percent in the early fifteenth century. In each period, a negligible percentage of contracts contained income sharing clauses.

Table 6 reports even more detailed information on dowry contracts in the smaller Tuscan town of Cortona between 1415 and 1436; for most of these contracts, the bride's and groom's households have been matched in the 1427 Florentine *catasto*—a census and property survey of the Florentine domains.<sup>31</sup>

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<sup>30</sup>We are very grateful to Yossef Rapoport for suggesting us to look into Goitein (1978) for data on Jewish marriage contracts from the Cairo Geniza.

<sup>31</sup>Marriage contracts written by notaries provided information on the size of the dowry, its composition, terms of payments, the names of the bride, the groom, and their respective fathers, and the place of residence. The deeds record marriages in the Tuscan town of Cortona and forty-four villages in its countryside between 1415 and 1436. At that time, Cortona was the sixth most populous town in the Florentine territories. We

[TABLE 6 HERE]

In Cortona only two out of 328 marriage contracts contained a clause involving a profit sharing arrangement.<sup>32</sup> In one of the two contracts, the groom was entitled to the revenue from two land plots cultivated by the bride's family. The rarity of income sharing clauses was not due to the lack of knowledge of share contracts. In both trade and in agriculture, share contracts were well known in medieval and early Renaissance Tuscany (Ackerberg and Botticini, forthcoming). However, in the context of dowry contracts, income sharing agreements were rare.

The evidence from ancient Athens, the Jewish communities in the Mediterranean in the high Middle Ages, and medieval and Renaissance Tuscany supports the argument that dowries mitigated a potential free riding problem by not including profit sharing arrangements with the brides' families' assets.

Of course, dowry contracts helped solve other problems. More than half of the Cortona matched contracts had clauses entailing deferred payments. A typical specification was the bride's household promising to pay one-third of the dowry after the first year of the marriage, one-third after two years, and the remaining one-third after three years. Deferred payments offered three advantages. The bride's parents may be liquidity constrained. Also, consistent with Zhang and Chan (1999), deferred payments provided incentives for the groom's family not to mistreat their daughter-in-law. Lastly, the bride's family could avoid paying the dowry if she died during childbirth.

The absence of income sharing clauses in dowry contracts in past societies is apparently at odds with the evidence on marriage choices and risk sharing from some contemporary developing countries. For example, Rosenzweig and Stark (1989) have shown that in rural India, when the bride's family faces adverse income shocks, the groom's family aids the bride's family. In such village economies, parents strategically place their daughters in marriage to provide insurance for both families. However, at a closer look, there is no contradiction between our finding of no income sharing in dowry contracts in past societies and risk sharing through marriage in contemporary India. The absence of income sharing clauses in dowry contracts in past civilizations does not mean that the groom's and bride's family did not share income risk at all.<sup>33</sup>

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then matched these bride's and groom's households recorded in the marriage contracts with the corresponding households in the Florentine catasto of 1427, which supplied information on the wealth, occupation, number of children, and percentage of sons living in the bride's and groom's households, and ages of the spouses (and their parents'). Out of 328 marriage contracts, 222 couples could be matched to their paternal households in the contemporary census.

<sup>32</sup>The two contracts, which allowed for a profit sharing arrangement, are in ASF, Notarile Antecosimiano 18908, unnumbered fol., and 18910, fol. 390r.

<sup>33</sup>Notice also that Rosenzweig and Stark do not analyze dowry contracts, as they explicitly recognize (p. 907, footnote 3). Thus, we do not know to what extent the Indian rural households surveyed provide/receive dowries. Moreover, in one of the three villages considered (Shirapur), the great majority of marriages are cross-cousin marriages. This is an important feature because it has been shown that in the Dravidian kinship region where cross-cousin marriages are very common, dowries are not the norm.

### 4.3 Exclusion of Daughters from Bequests

Proposition 1 predicts that daughters receive their inheritance primarily in the form of dowries whereas sons receive theirs primarily in the form of bequests. Daughters are more likely to receive bequests when there are no brothers. In this case, the free riding problem does not exist and parents make their daughters inherit the family estates.

Two types of evidence support this prediction. Narrative evidence indicates that in various societies daughters obtained no dowries but got bequests when there were no brothers. For example, a document from Barqa, Lybia, dated 990, preserved in the Cairo Geniza indicates that the bride, being the sole heiress, received no dowry (Goitein 1978, 373). In ancient Near Eastern civilizations, such as the Babylonian in the second and third millennia BC daughters also became heirs when there were no surviving brothers.

Micro data we gathered from a sample of last wills written in medieval and Renaissance Florence supply systematic evidence that parents rarely transmitted their wealth to daughters via bequests (Table 7).<sup>34</sup>

[TABLE 7 HERE]

In the thirteenth century, twenty-five percent of the Florentine testators having sons and daughters left bequests to their daughters. Two centuries later, the percentage was 21 percent. In those instances in which parents left bequests to daughters, the size of the bequest to a daughter was small with respect to the dowry she got at the time of her marriage. Thus, the timing of intergenerational transfers in medieval and Renaissance Tuscany provides support to our model: daughters most often obtained their shares of their natal families' wealth through dowries and not through bequests.

### 4.4 Parental Valuation of Daughters and Sons in Dotal Societies

Historians have maintained that since dowries disinherit women, they bring an unequal distribution of family wealth among female and male siblings (Cohn; Hughes; and Klapisch-Zuber). However, they have not presented systematic evidence to substantiate such a claim. The problem has to do with the type of evidence required to compare dowries and bequests in a given household. Dowry contracts indicate only the amount of the dowry; there is no way to know how many siblings a bride had, or how wealthy her family was. Last wills inform us about how a testator assigned his property, but they rarely provide the value of the family estate.

Fifteenth-century Tuscany is a fortunate case because the 1427 Florentine *catasto* (census) enables one to match brides, grooms, and testators in such a way that it is possible a systematic comparison between the size of dowries assigned to daughters and the bequests

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<sup>34</sup>In the Florentine statutes of 1322–25, in case of intestacy male descendants (sons, and in their absence, grandsons, brothers, and nephews) had priority in receiving the family estate with respect to daughters and other female descendants. However, the statutes granted testamentary freedom: a testator could leave his estate to both his sons and his daughters if he/she wished (Bellomo 1961; Kirshner 1985, 1991; Gregory 1987; Kuehn 1991).

to their brothers. We find that the existence of dowries, by itself, did not prevent daughters from receiving roughly an equal, or higher, share of their parental wealth.

[TABLE 8 HERE]

In our sample of marriage contracts for Cortona the median dowry (70 gold florins) was larger than the median share of family wealth per child (53 gold florins). Even if parents did not leave any bequests to their daughters in Cortona, this data suggests that sons did not receive disproportionately larger shares of parental wealth. As for medieval and Renaissance Florence, which according to some historians was the worst place for a woman to live, with the simultaneous analysis of dowry contracts and the Florentine *catasto* of 1427 we found that the median dowry was 500 florins and the median share of family wealth per child was 468 florins.

There is an alternative theory of dowries in the spirit of the strategic bequest literature, which is consistent with Goody's observation and virilocality.<sup>35</sup> Due to virilocality, the married son still has to look after his parents. If parents defer most of the wealth transfer to their son as a bequest, this conditional bequest would ensure that the son takes appropriate care of his parents. Since the married daughter does no longer look after her parents, there is no need to defer the wealth transfer to the daughter. We agree with the need to discipline the son to ensure that parents obtain the appropriate level of care. However, if this was the main motive for bequests to sons in dotal societies, the "expected" bequests to sons seem small relative to the dowries their sisters obtained. If married daughters did not have to care for their parents after marriage and married sons continued to do so, why were dowries so large relative to bequests for sons in early Renaissance Florence and Cortona?

That dowries should be substantial relative to bequests (for either sons or daughters) is unique to our model. The standard economic model of dowries does not have such an implication. If our model is incorrect, there should be societies that systematically gave small dowries. The survey of the societies in Section 2 indicates that this was not the case.

#### 4.5 Simultaneous Gift Giving

As shown in Table 1, simultaneous giving to brides of dowries from their natal families and marriage gifts from grooms occurred in Sumerian, Assyrian and Babylonian civilizations, Homeric Greece, late Roman empire, the Jews from antiquity to medieval times, Germanic populations between 500-1000 AD, Arab Islam from 650 AD to modern times, western Europe in the Middle Ages and the early modern period, and Tang and Sung China. If dowries are purely pecuniary transfers to clear the marriage market, this simultaneous gift giving would be difficult to explain. Within the context of our model, simultaneous gift giving means that both the groom and the bride are contributing to the marital partnership at the time of marriage.

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<sup>35</sup>We thank a referee for this insight.

## 4.6 Sibling Effects

In an earlier draft (\*\*\*\*\*), we also ran some dowry value regressions using the Cortona sample discussed earlier. After controlling for the wealth and occupation of the father, the age of the bride, and the number of siblings, dowry value increased significantly when the bride had relatively more brothers. We interpret this result as providing support for the hypothesis that the groom anticipated lower natal bequests to his wife when she had relatively more brothers. With fewer or no brothers, the free riding problem is less relevant. On the other hand, after controlling for groom's family characteristics, dowry value did not increase when the groom's family had more children or had relatively more sons. There was no gain, and potentially a loss, to a bride who married into a family with more children or relatively more sons.

## 5 Wither Dowries?

A theory of dowries has to explain its disappearance in previously dotal societies. The nexus between virilocality and dowries helps us explain the withering of dowries. Virilocal societies are primarily agricultural economies and/or economies where the gains for children to remain in the family business is substantial. As the labor market in a society becomes more developed, as the demand for different types of workers grow, children are less likely to work in the same occupations as their parents. They are also less likely to work for their families. The use of bequests to align work incentives within the family becomes less important. As the labor market develops, the value of human capital investments also rises. Since it is costly to pay a dowry, the demand for dowry within the family will fall as the need to use bequests to align the work incentives of sons fall. Instead of assigning dowries, parents will transfer wealth to both their daughters and sons as human capital investments and bequests. Therefore, the development of labor markets will be important in reducing the role of dowries.

Moreover, as the labor market develops and sons work outside the family business, the gains from living in an extended family become smaller. Instead of virilocal households, sons are also more likely to set up their own, neolocal, households when they marry. Again, the use of bequests for sons to align their work incentives decreases. Thus the role of dowries as a mechanism to mitigate the free riding problem among married children also declines.

When dowries become an inefficient source of brides' wealth, they will disappear. Unlike the standard economic model of dowries, we argue that there is no connection between the disappearance of dowries and the appearance of brideprices.

We present evidence from North America and Brazil to support our theory regarding the disappearance of the dowry. We also discuss the case of India, where dowries have not disappeared despite modernization.

**The North American Experience.** While dotal marriages occurred in isolated communities in colonial North America, it was not a widespread practice (Shammas, forthcom-

ing).<sup>36</sup> For example, in Connecticut in the late eighteenth century, between 46 and 67 percent of married daughters were assigned *inter vivos* transfers, likely at the time of their marriage, from their natal families. In the 1820s, only 40 percent received such transfers, often consisting of bedding and cooking tools, and far less than the daughters' shares in their natal families' estates (Ditz 1986).

From the point of view of intergenerational transfers, a father's death greatly exceeded in importance the marriage of children. British American fathers left their estates to their children, but they commonly did so in their wills or according to the intestacy provisions of their colony (Shammas, Salmon, and Dalhin 1997). For example, seventeenth-century New England community studies indicate that very little *inter vivos* transfer of land to sons occurred (Vickers 1994).

The contrast between the European pattern of dotal marriages and the North American experience, which received the emigrants from the old world, can be explained in light of our theory of dowries. North America during colonial times was an immigrant society. By definition, first generation immigrants were not working with their parents' assets in the home country and the free riding problem does not apply. In later times, the colonies and early United States enjoyed the highest level of internal migration in its history between the late 1760s and the first third of the nineteenth century (Shammas, forthcoming, chapter 4). The settlement of North America meant that many individuals left their parental homes to settle in new territory, again violating the virilocal assumption needed for a dotal society.

Also, with the emergence of corporate capitalism in the nineteenth century, which lead to the separation between ownership and control, sons were less likely to work in the family business and parents were less concerned about transmitting intact the family farm or firm to their children (Shammas, Salmon, and Dalhin 1997).

**Brazil.** The insightful study by Muriel Nazzari (1991), who analyzes probate records of wealthy, propertied, testators and studies the evolution of dowries in São Paulo, a coastal community in Brazil, from 1600 to 1900, provides additional evidence supporting our theory. In the period under study, all children were legally entitled to equal shares of the estate of the deceased parent. A daughter who had a dowry had the option of "returning" the dowry to the estate and asking for her share of the reconstituted estate. Thus probate records explicitly or implicitly (when daughters did not share in the estate) accounted for dowries paid.

In the seventeenth century, most daughters of property owners received a dowry at marriage. In the middle of the eighteenth century, 9 percent of property owners allowed their daughters to marry without a dowry. In the nineteenth century, three quarters of property owners allowed their daughters to marry without a dowry. Dowry values also fell through the centuries. While few daughters in her sample "returned" their dowries to their parents' estates in the seventeenth century, more daughters did so in the eighteenth century and they all did in the nineteenth century.

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<sup>36</sup>We thank Carole Shammas for her willingness to share with us her forthcoming work on the history of the household in North America. The references to the works by Ditz and Vickers we cite in the text are taken from chapter 4 of the forthcoming book by Shammas.

In the seventeenth century, wealthy Paulistas derived most of their wealth from agriculture. Most married sons lived with, and worked for, their parents. Gold was discovered in the interior of Brazil in the eighteenth century. According to Nazzari (1991, 165),

“The great patriarchal power over adult offspring that was the rule in seventeenth-century São Paulo gradually diminished. In the eighteenth century sons migrated, transported mules and oxen to the mines, or plied long-distance trade, making it more difficult for their fathers to control them. With the growth of individualism in the nineteenth century, sons became even more independent of their fathers in their business lives, and both sons and daughters were acquiring freedom in the selection of a marriage partner. Such freedom was itself a consequence of the decline of the practice of dowry.”

While her theory of dowries is different from ours, Nazzari’s selection of the economic forces that led to the decline of dowries in São Paulo is consistent with our argument. By the time (nineteenth century) most daughters chose to “return” their dowries, the use of bequests to align work incentives within the family was largely irrelevant.

**India.** Dowries are still widely popular in South Asia. In the past fifty years, in both North and South India, the custom of the dowry has spread to social and economic groups that did not have it in earlier times; at the same time, dowry values have undergone a sharp increase (Sharma 1993; and Lardinois 1996b, 293). Notice that when talking about dowry in contemporary India, one refers to the goods that the groom and his family demands to the bride family at the time of the marriage, over which the bride retains no ownership. This has nothing to do with the *stridhana*, the goods (clothes, jewelry, etc.) that the bride’s family gives to the bride and over which she has property rights. This distinction is very important because it clearly separates India from the past civilizations we surveyed; in these past societies, the dowry referred to the real property, movables, and cash that the bride’s family transferred to the bride and over which she retained ownership.

With this distinction in mind, Caldwell, Reddy, and Caldwell (1983) have put forward two explanations for dowry inflation in India: (i) the marriage squeeze hypothesis, and (ii) hypergamy (increased demand for more socioeconomically successful husbands). The marriage squeeze hypothesis maintains that due to population growth and the gender age gap at marriage, marriageable men are scarce relative to marriageable women. The econometric evidence on this hypothesis is not conclusive (Edlund 2000; Rao).

Our interpretation of the Indian case is close to the hypergamy hypothesis. Our theory predicts that urbanization and modernization in India will eventually eliminate the use of dowries. However, urbanization (and the consequent modernization) is proceeding slowly in India (Mills and Becker 1986). In 1901, 89 per cent of the population lived in rural communities. In 1981, 76.3 per cent of the population continued to live in rural communities, and net rural to urban migration contributed less than 19 percent to the total growth in the Indian urban population between 1971 and 1981 (Mohan 1985; Rosenzweig and Stark, 906). India was and still is primarily a rural and virilocal society.

While urbanization and modernization was slow, there is a substantial difference in living standards between rural and urban regions. Mohan showed that the urban-rural ratio in per capital domestic product increased from 1.83 in 1950 to 2.56 in 1970. Given the slow pace of urbanization, there is a large return for a rural bride to be able to marry an urban groom. As Caldwell, Reddy, and Caldwell (1983, p. 347) emphasize,

“Parents desire their daughters to marry educated men with urban jobs, because such men have higher and more certain incomes, which are not subject to climatic cycles and which are paid monthly, and because the wives of such men will be freed from the drudgery of rural work and will usually live apart from their parents-in-law. In a sellers’ market, created by relative scarcity, there was no alternative but to offer a dowry with one’s daughter.”

Consistent with this explanation, one finds that in South India, especially in Madras, in the 1930s the practice of dowry spread firstly among the Brahman community where men gained early access to European education and salaried employment in the public sector (Lardinois 1996b, 295). Moreover, all over India, new opportunities to earn cash wages in factories, government jobs and white collar occupations have been secured more by men than women (Sharma 1993, 349). Therefore, even in the urban context, brides’ potential contribution to family income has become relatively smaller when compared to prospective grooms: once again, the hypergamy theory may explain the expansion and intensification of the practice of dowry occurring in recent decades.

Evidence from contemporary China provides further support to the hypergamy theory. During the 1940s characterized by war and disorder, many tenant farmers in the villages managed to acquire land from their landlords and became rich. These newly wealthy households in the villages arranged marriages with elite families in towns; in doing so, they provided larger and larger dowries (Siu 1990, 16–17).

According to our theory regarding the disappearance of dowries, dowry inflation is likely to be transitory and driven by the slow pace of urbanization in India and the income differences between the two sectors. As urbanization proceeds and modernization takes place, the relative supply of educated grooms should increase and the urban-rural income differences should fall. Dowry inflation should eventually disappear.<sup>37</sup> The Indian experience suggests that in a transitional society, from virilocal/rural to neolocal/urban, the relative values of some grooms may rise and the use of dowries may expand before withering away.

Our explanation for dowry inflation does not concern castes directly. The caste system may reinforce the custom of dowry in two ways. First, to the extent that higher castes urbanize earlier and lower castes do so later, dowry inflation will evolve from higher to lower castes. Second, as castes are often defined by occupations, individuals from a given caste find it difficult to leave their occupation because they cannot leave their caste; sons are more likely to follow their fathers’ occupations. Thus, the existence of the caste system in India can make the transition from virilocal to neolocal society (and the consequent disappearance of dowries) slower with respect to other developing economies.

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<sup>37</sup>Notice that since 1961, dowries are illegal in India but the ban is unenforced.

Although the Indian experience does not contradict our model, we are agnostic as to what the correct model is. Anderson (2001) has an alternative hypergamy model where modernization and caste inheritance rules interact to generate an increase in the relative values of high caste grooms and dowry inflation.

## 6 Concluding Remarks

We presented a particular environment, virilocality and the associated free riding problem, in which dowries emerge endogenously. We show that there is support for the model in historical and contemporary records. However, there is no reason to believe that our environment is the only rationale for dowries. Instead, the spirit of the paper is to break the straightjacket of the standard economic model to consider other rationales for dowries and bride prices.

Our model also brings out a link between virilocality and wealth transfers within and across families. There are other implications of this link. For example, there is often confusion about who gets the dowry, the groom's natal family or the newly weds. But in a virilocal society, this distinction is hard to make. Whether daughters are discriminated against in bequests in virilocal societies is also hard to determine. What share of the parents' estate is due to the efforts of their sons? If this share is not known, how can one tell from a will whether parents favor their sons or daughters? How much of the bequest is a return to the son for looking after his parents?

## 7 Appendix

### Proofs

In the final stage of the game, given final gross wealth of the son,  $y_s = (1 + e_s)x$ , and final gross wealth of the daughter,  $y_d = (1 + e_d)(1 - x)$ , the parents will choose the optimal share of bequest  $b^*(e_s, e_d, x)$  such that:

$$\begin{aligned} U'(b^*(1 + e_s)x) &= U'((1 - b^*)(1 + e_s)x + (1 + e_d)(1 - x)) \\ \implies b^*(1 + e_s)x &= (1 - b^*)(1 + e_s)x + (1 + e_d)(1 - x) \quad \text{if } y_s > y_d \\ &= \frac{(1+e_s)x+(1+e_d)(1-x)}{2} \end{aligned} \quad (2)$$

$$b^* = 1 \text{ if } y_s \leq y_d$$

Given effort levels,  $x$  and  $b^*(e_s, e_d, x)$  as summarized by (2), the children's payoffs are described by the following normal form representations:

For  $x \leq \frac{1}{3}$ ,

		<i>Son's</i>	<i>payoffs</i>
		$e_s = 1$	$e_s = 0$
<i>D.'s payoff</i>	$e_d = 1$	$U(2(1 - x)) - 2\beta(1 - x), U(2x) - 2x$	$U(2(1 - x)) - 2\beta(1 - x), U(x) - x$
<i>payoff</i>	$e_d = 0$	$U(1 - x) - \beta(1 - x), U(2x) - 2x$	$U(1 - x) - \beta(1 - x), U(x) - x$

For  $\frac{1}{3} < x \leq \frac{1}{2}$ ,

		<i>Son's</i>	<i>payoffs</i>
		$e_s = 1$	$e_s = 0$
<i>D.'s payoff</i>	$e_d = 1$	$U(2(1 - x)) - 2\beta(1 - x), U(2x) - 2x$	$U(2(1 - x)) - 2\beta(1 - x), U(x) - x$
<i>payoff</i>	$e_d = 0$	$U(\frac{1+x}{2}) - \beta(1 - x), U(\frac{1+x}{2}) - 2x$	$U(1 - x) - \beta(1 - x), U(x) - x$

For  $\frac{1}{2} < x \leq \frac{2}{3}$ ,

		<i>Son's</i>	<i>payoffs</i>
		$e_s = 1$	$e_s = 0$
<i>D.'s payoff</i>	$e_d = 1$	$U(1) - 2\beta(1 - x), U(1) - 2x$	$U(2(1 - x)) - 2\beta(1 - x), U(x) - x$
<i>payoff</i>	$e_d = 0$	$U(\frac{1+x}{2}) - \beta(1 - x), U(\frac{1+x}{2}) - 2x$	$U(\frac{1}{2}) - \beta(1 - x), U(\frac{1}{2}) - x$

For  $\frac{2}{3} < x \leq 1$ ,

		<i>Son's</i>	<i>payoffs</i>
		$e_s = 1$	$e_s = 0$
<i>D.'</i> <i>s</i>	$e_d = 1$	$U(1) - 2\beta(1-x), U(1) - 2x$	$U(\frac{2-x}{2}) - 2\beta(1-x), U(\frac{2-x}{2}) - x$
<i>payoff</i>	$e_d = 0$	$U(\frac{1+x}{2}) - \beta(1-x), U(\frac{1+x}{2}) - 2x$	$U(\frac{1}{2}) - \beta(1-x), U(\frac{1}{2}) - x$

For each range of  $x$ , we solve for the subgame perfect Nash equilibrium in effort levels and the optimal choice of  $x$  in a series of lemmas.

**Lemma 1** For  $x \leq \frac{1}{3}$ , the equilibrium effort levels for the son and daughter are 1 and 1 respectively. The equilibrium payoff for the parents is:

$$U(2x) - 2x + U(2(1-x)) - 2\beta(1-x)$$

Proof: Due to assumption A(i), it is a dominant strategy for the son to work hard. Likewise for the daughter. ■

**Corollary 2** For  $x \leq \frac{1}{3}$ , maximum parental utility, obtained at  $x = \frac{1}{3}$ , is:

$$r_1 = U\left(\frac{2}{3}\right) - \frac{2}{3} + U\left(\frac{4}{3}\right) - \frac{4\beta}{3}$$

**Lemma 3** Consider  $x$  which satisfies  $\frac{1}{3} < x \leq \frac{1}{2}$ , let  $x^\#$  solves  $U(x^\#) - x^\# - (U(\frac{1+x^\#}{2}) - 2x^\#) = 0$ . For  $x < x^\#$ , let  $k(x) = U(2(1-x)) - 2\beta(1-x) - (U(\frac{1+x}{2}) - \beta(1-x))$ . If  $k(x^\#) < 0$ , let  $k(\hat{x}) = 0$ . For  $x^\# > x > \hat{x}$ , the daughter will shirk and the son will work in equilibrium. In all other circumstances, both children will choose equilibrium effort levels of 1.

If the daughter works, the son will optimally choose to work. If the daughter shirks, the son will shirk if  $x > x^\#$ . Otherwise he will work. Anticipating the son's best response, the daughter will choose to work if  $x > x^\#$ . If  $x < x^\#$ , she will work if  $k(x^\#) > 0$ . If  $k(x^\#) < 0$ , she will choose to work if  $x < \hat{x}$  and not otherwise.

**Corollary 4** For  $\frac{1}{3} < x \leq \frac{1}{2}$ , maximum parental utility, obtained at  $x = \frac{1}{2}$ , is:

$$r_2 = U(1) - 1 + U(1) - \beta$$

**Lemma 5** Consider  $x$  which satisfies  $\frac{1}{2} < x \leq \frac{2}{3}$ , let  $\bar{x}$  solves  $U(1) - 2\bar{x} - (U(\bar{x}) - \bar{x}) = 0$ . Let  $\tilde{x} = \min(\bar{x}, \frac{2}{3})$ . For  $x < \tilde{x}$ , the equilibrium effort levels for the son and daughter are both equal to 1. Otherwise the equilibrium effort levels are both equal to 0.

Proof: Let  $x < \tilde{x}$ . Then if the daughter exerts effort, the son will also exert effort. If the daughter shirks, the son will also choose to shirk. Given the best responses of the son, the daughter will choose to exert effort. If  $x > \tilde{x}$ , it is a dominant strategy for the son to shirk. Then it is also optimal for the daughter to shirk.

**Corollary 6** For  $\frac{1}{2} < x \leq \frac{2}{3}$ , maximum parental utility is:

$$r_3 = U(1) - 2\tilde{x} + U(1) - 2\beta(1 - \tilde{x})$$

**Lemma 7** For  $\frac{2}{3} < x \leq 1$ , the equilibrium effort levels for the son and daughter are both equal to 0. The equilibrium payoff for the parents is:

$$U\left(\frac{1}{2}\right) - x + U\left(\frac{1}{2}\right) - \beta(1 - x)$$

Proof: For  $\frac{2}{3} < x \leq 1$ , it is a dominant strategy for the daughter to shirk. Given that the daughter has shirked, it is also optimal for the son to shirk. ■

**Corollary 8** For  $\frac{2}{3} < x \leq 1$ , maximum parental utility, obtained at  $x = 1$ , is:

$$r_4 = U\left(\frac{1}{2}\right) - 1 + U\left(\frac{1}{2}\right)$$

$r_2 > r_1$ .  $r_2 > r_4$ . Finally,  $r_3 > r_2$  and we get proposition ?? ■

Table 2  
Post-Marital Residence, Polygyny, and the Transfer of Real Property  
in African Societies with Brideprices

	Post-marital residence	
Parents transfer property to <sup>a</sup>	Virilocal	Else <sup>d</sup>
Male children	51.8	19.0
Other family members <sup>b</sup>	29.0	66.7
None <sup>c</sup>	7.2	4.7
All children	0.0	9.5
All children (smaller share to daughters)	11.8	0.0
<i>N</i>	110	21
	Extent of polygyny	
Societies with polygyny	79.4	
Societies with occasional/limited polygyny	16.8	
Societies with monogamy	3.8	
<i>N</i>	131	

Source: George P. Murdoch. Ethnographic Atlas. Pittsburgh: University of Pittsburgh Press, 1967.

Notes: The numbers in the columns are percentages. Murdoch coded information on 862 societies from the five continents. For these cultures various ethnographic variables are coded, such as the mode of marriage, marital residence, community organization, settlement pattern, linguistic affiliation, the existence of slavery, etc. However, to avoid including two or more societies whose cultures are very similar since they are derived from a recent common source, the 862 societies are grouped into 412 clusters, whose cultures are genetically closely related. The information in Table 2 refers to the clusters.

<sup>a</sup> The transfer of property includes both inter vivos transfers and bequests.

<sup>b</sup> "Other family members" include: uncles, aunts, cousins, brothers, and nephews of the individual who transfers property.

<sup>c</sup> This group includes those societies where land is held collectively (e.g., tribal or clan land). In this instance, individuals cannot transfer real property because they do not have individual property rights on assets. In these eight societies, the transfer of movable property (such as cattle) occurs in the following way: in three cases, movable property is transferred to male children only, in four cases to other family members, in one case no information is provided.

<sup>d</sup> "Else" includes all other post-marital residence patterns, such as uxorilocal, neolocal, ambilocal, and avunculocal marriages.

Table 3: Dowry Contracts in Athens, V-IV Centuries B.C.

Orators mentioning dowry contracts	Number of daughters	Goods forming the dowry <sup>a</sup>
Lisias	2	40 minas ?
	2	30 minas 30 minas
	1	1 talentum
Iseus	2	20 minas 20 minas
	1	1000 drachmas
	1	rent from a house (40 minas)
	1	25 minas
	?	20 minas 20 minas
	?	50 minas
Demosthenes	1	2 talenta
	1	1 talentum or 80 minas
	?	1 talentum
	?	100 minas (?)
	2	rent from a house (= 40 minas) 40 minas

Source: Leduc (1991), page 293.

Note: In the case of two daughters, each row in the cells in the third column refers to the dowry of one of the two daughters.

<sup>a</sup> One talentum was worth 60 minas, one mina was worth 100 drachmas.

Table 4: Dowry Contracts Among Jews in the Mediterranean, 933–1186 A.D.

<i>Contract characteristics</i>	Percentage of contracts
Payment (movables)	91
Payment (cash)	5
Payment (houses)	29
Payment (land holdings)	1
Profit sharing clause	0
<i>N</i>	61

Sources: We reconstructed these data from the marriage contracts reported in Goitein (1978), pp. 364–93.

Note: Goitein (1978) reports information on about 300 marriage contracts and other records regarding marriage payments. Only 61 of these documents list in details the type of goods forming the dowry.

Table 5: Dowry Contracts in Florence, 1260–1435

Years	1260–99		1340–60		1420–1435	
	Urban	Rural	Urban	Rural	Urban	Rural
<i>Contract characteristics</i>						
Payment (movables)	2.8	0.4	15.6	15.4	14.6	19.4
Payment (cash)	96.1	99.2	91.1	94.9	95.7	94.6
Payment (houses)	4.8	1.2	6.7	2.5	4.5	0.9
Payment (land holdings)	0.9	1.2	8.4	6.4	3.5	1.7
Profit sharing clauses	0.0	0.0	0.2	0.5	0.6	0.1
Median dowry <sup>a</sup>	181.8	136.3	197.3	65.7	885.6	146.8
Average dowry <sup>a</sup>	406.3	161.8	574.6	94.1	1643.0	181.5
Annual wage of skilled workers <sup>a,b</sup>	182	—	175 <sup>c</sup> 214 <sup>c</sup>	—	258	—
<i>N</i> (total = 3925)	105	261	464	348	1298	1449

Sources: State Archives of Florence, Notarile Antecosimiano, 409 volumes of notarial contracts.

Note: “Urban” refers to marriages where at least one of the two spouses resided in the city of Florence.

“Rural” refers to marriages where both spouses lived in villages in the Florentine countryside.

<sup>a</sup> All figures are in constant (1420-35) lire (the money of account). We converted the values of dowries in gold florins (the circulating currency together with silver coins) into the corresponding values in lire by using the conversion rates provided by C. de la Ronciere, Prix et salaires à Florence au XIV siècle, p. 517, table 86; P. Spufford, Money and Its Use in Medieval Europe, p. 296, Graph III; C. Cipolla, The monetary policy, pp. 63–68; R. Goldthwaite and G. Mandich, Studi sulla moneta fiorentina, pp. 85–100.

<sup>b</sup> Data on Florentine wages were kindly supplied to us by Paolo Malanima. The figures indicate annual average wages. See also Malanima (1999; 2001).

<sup>c</sup> 133 and 219 were the annual average wages in the decades 1340–1350 and 1350–1360, respectively.

Table 6: Dowry Contracts in the Tuscan Town of Cortona, 1415-1436

Contract characteristics	All contracts		Matched contracts	
	Percentage	Shares <sup>d</sup>	Percentage	
Payment(movables)	16.4	0.03	13.0	
Payment (cash)	86.2	0.75	91.8	
Payment (houses; shops)	12.5	0.01	7.2	
Payment (land holdings)	45.7	0.21	40.5	
Deferred payments	53.0	—	58.5	
Contingent payments <sup>a</sup>	21.3	—	23.8	
Profit sharing	0.6	—	0.9	
Other terms <sup>b</sup>	8.8	—	4.5	
Average dowry <sup>c</sup>	114.8		124.3	
Median dowry <sup>c</sup>	64		70	
<i>N</i>	328		222	

Sources: State Archives of Florence, Catasto and Notarile Antecosimiano.

<sup>a</sup>The majority of contingent payments were contingent upon the groom's request. That is, the contract explicitly provided that a portion of the dowry was to be paid "when the groom will ask for it."

<sup>b</sup> Some marriage contracts specified other terms: in some instances, a portion of the dowry had to be paid by someone else than the bride's parents (a charity, a relative, etc.).

<sup>c</sup> Figures are in gold florins. The values for all contracts (first column) are calculated for the 292 contracts that provided the value of the dowry.

<sup>d</sup> Average $\left(\frac{\text{value of type of payment}}{\text{value of total dowry}}\right)$ .

Table 7: Bequest Behavior Toward Daughters in Florence, 1260–1435

Households with both sons and daughters			
Time period	Testators leaving bequests to daughters	Testators not leaving bequests to daughters	$N^a$
1260–1299	25%	75%	20
1420–1435	21%	79%	85

Sources: State Archives of Florence, Notarile Antecosimiano, 300 volumes of notarial deeds.

<sup>a</sup> So far we coded all (59) last wills for the period 1260–1299. As indicated in the table, 20 testators had both sons and daughters. Meanwhile, we coded about 325 last wills of urban testators for the period 1420–1435 (about 30 percent of the last wills available for this time period). Of these 325 last wills, 85 testators had both sons and daughters.

Table 8: Dowries to Brides and Bequests to Bride's Siblings in Tuscany, 1420–1435

Town	Median dowry to the bride (in gold florins)	Median “bequest” to bride’s siblings (in gold florins)	<i>N</i>
Cortona	70	53	222
Florence	500	468	315

Sources: State Archives of Florence, Notarile Antecosimiano.

Notes: The median “bequest” to the bride’s siblings has been calculated in the following way: we matched the bride’s household in the dowry contract with the corresponding household in the Florentine census of 1427. From there we obtained information regarding the bride household’s wealth and the number of siblings. We then divided the wealth by the number of siblings: this is an estimate of the bequest to each of the bride’s siblings. Also, notice that all figures are in gold florins. We chose to present all values in gold florins instead of lire (the money of account) because the data on wealth (and, consequently, the estimated bequests) were given in gold florins in the Florentine catasto of 1427.

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