

# WHY DOWRIES?

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## SUMMARY

Dotal marriages were common in Europe, East Asia and the Americas, but they remain widespread in South Asia and parts of Mediterranean Europe. 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. In an insightful essay, Goody (1973) proposed that the dowry is a *pre mortem* inheritance to the bride. That is, a daughter obtains a large wealth transfer from her parents as her dowry whereas a son obtains his as a bequest. His observation has been confirmed in different dotal (dowry giving) societies. We develop a theory of dowries that explains Goody's observation. Our work builds on Becker's seminal research on marriage markets, summarized in Becker (1991), and the research program on economics of the family (Rosenzweig and Stark 1997).<sup>1</sup>

A theory of dowries has to articulate the role of wealth in marriage. Abstracting from non-pecuniary considerations, the expected wealth that a bride or groom bring into a marriage is largely a public good within the marriage. There are two benefits to an individual by having more wealth when he or she enters the marriage market. Own wealth is a direct contribution to own welfare. Moreover, since the wealth of the spouse is a public good in the marriage, more own wealth allows the individual to match with a wealthier spouse and gain higher utility. Thus each female uses her own wealth to compete with other females to marry as wealthy a male as she can attract. Likewise, each male uses his wealth to marry as wealthy a female as he can attract. In a marriage market equilibrium with household public goods, there is assortative matching by wealth levels.

The standard model of the dowry, as a spot price that clears the marriage market, fits into the above wealth matching framework. Its users often note the substitutability between the dowry and a bride's other attributes in determining her expected wealth contribution in marriage (e.g. Boserup 1970; Rao 1993). Still, the question of dowry is brought out in sharp relief in the above description of the marriage market. There are many ways for parents to transfer wealth to their children. Within a dotal society, why use dowries for daughters and bequests for sons? Why are dowries used in some societies and not in others?

## WHY DOWRIES?

The custom of dowries is costly to the family. If it is efficient for parents to transfer resources to their children at the time of marriage, they should do so. If it is not efficient for them to transfer resources to their children at the time of marriage, they should be able to choose otherwise. The custom of bequests for sons and dowries for daughters, independent of the circumstances of the family, is economically costly. There is a lot of anecdotal evidence about the burdens faced by families that have to raise dowries to marry off their daughters. Dowries were substantial relative to the wealth of the early Renaissance Tuscan households.

What is the benefit of this custom? In virilocal societies, married daughters leave their parents' home whereas married sons continue to live with their parents. Consider a family with one son and one daughter.

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<sup>1</sup> Given the limited space available, only a brief version of the paper is presented here. The entire paper is available on our Web Pages (<http://econ.bu.edu/botticini> and <http://128.100.177.36/siow>).

When the daughter marries, she leaves home, moves in with the groom's family and stops working with her parents' assets. The son, single or married, continues to work with the family assets. In such a case, giving the son exclusive right to the bequest aligns the son's incentive to work to increase his family's wealth. If the bequest is divided between the son and his sister, there is a free riding problem. The son does not get the full benefit of his effort since the benefit is shared with his married sister. Altruistic parents want to allocate resources to both their son and their daughter. Due to this free riding problem, these parents will allocate a bequest to their son and give a lump sum transfer to their daughter. The transfer to a daughter is at the time of her marriage, when she leaves her parental home. Before that, she is working within the family.

The form of the dowry is also important. 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 not allow the married daughter to share in the profits generated with the remaining family assets. A profit-sharing arrangement will dissipate the work efforts of her brother. In other words, a married daughter is not only excluded from her parent's bequests as observed by Goody. She is also excluded from inter vivos shares of revenues generated from the family's assets. Potential exceptions are those cases in which the son-in-law moves in with her family after the marriage or if an asset is not managed by her brother.

Thus our explanation for dowries is that, in virilocal societies, they are the optimal solution to the tradeoff between family wealth creation and distribution faced by altruistic parents. The free riding problem also exists between brothers. It is mitigated by parents who monitor the activities of the sons that reside with them.

#### WITHER DOWRIES?

A theory of dowries has to explain its disappearance in previously dotal societies. As the labor market in a society becomes more developed, as the demand for different types of workers grows, children are less likely to work in the same occupation 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. Since it is costly to pay a dowry, the demand for dowry within the family will fall as the need to use bequests exclusively for sons to align work incentives falls. Instead of the dowry, parents will transfer wealth to both their daughters and sons as bequests. Therefore, the development of labor markets will be important in reducing the role of dowries.

Moreover, as labor markets develop and sons work outside the family business, the gains from living in an extended family fall. Instead of virilocal households, sons are also more likely to set up their own, neolocal, households when they marry. Here again, the use of bequests exclusively for sons to align their work incentives falls. Thus the role of dowries also falls. The transition from a virilocal to a neolocal society should coincide with the decline of dowries.

Lastly, if non-dowry transfers, including investments in human capital, become more profitable, dowries will also fall. Parents may prefer to make most of their inter vivos transfers to their children in the form of human capital investment rather than as dowries.

#### DOWRY DETERMINATION

Consider a family with a daughter who is about to marry. The daughter receives a dowry  $D$  at a cost to the family of  $x(D)$ ,  $x_D > 0$ ,  $x_{DD} > 0$ .

The daughter also receives non-dowry transfers,  $Z$ , which may be in the form of investment in her human capital, other inter vivos transfers, or bequests. Some of  $Z$ , such as investment in her human capital, have already been paid by the time of marriage. The rest will be paid after the marriage. The non-dowry transfers are transformed into non-dowry wealth by  $N(Z, \$_j)$  (with  $N_Z > 0$ ,  $N_{ZZ} < 0$ ,  $N_{\$_j} > 0$ ,  $N_{z\$_j} > 0$ ).  $\$_j$  is family specific. It denotes the efficiency with which parents transform non-dowry transfers into non-dowry wealth to their daughter. For example, holding the number of siblings constant, if the family has many sons, she may not expect to get much non-dowry wealth.  $\$_j$  is low in this case.

The daughter's total expected wealth evaluated at the time of marriage is:

$$W^f = D + N(Z, \$_j) \tag{1}$$

In order to figure out how much total resources will be transferred to the daughter, we have to consider the nature of the marriage market. When a couple with wealth  $W^f$  and  $W^m$  marry each other, each person will obtain in marriage  $(W^f + W^m)/k$ , where  $1 < k < 2$ . So the gains from marriage are a public good. There is no transfer between husbands and wives nor between their families. Given the technology of the gains from marriage, a daughter with wealth  $W^f$  will always want to marry the wealthiest male who is willing to marry her. Let  $W^m = h(W^f)$  be the wealthiest groom that a daughter with wealth  $W^f$  can attract.  $h(W^f)$ , the matching function for brides, is determined by marriage market clearing. In general,  $h_{W^f} > 0$  for individuals who marry, and we will assume  $h(W^f) = a + bW^f$ ,  $b > 0$ .

Let  $E_f$  be the wealth endowment of the bride's household, which is to be divided between the parents and their daughter. Their utility depends on their own consumption,  $C_f = E_f - x(D) - Z$ , and the welfare of their daughter in the marriage. Let  $V(C_f, \mathcal{G}_f)$  denote their utility from own consumption and  $\mathcal{G}_f$  be the marginal utility of parents' own consumption. Taking the various constraints into account, the parents' optimization problem is:

$$U^f = (E_f, \mathcal{G}_f, \mathcal{G}_d) = \max_{D, Z} V(C_f, \mathcal{G}_f) + (W^f + h(W^f))/k \quad (2)$$

Let  $D^*(E_f, \mathcal{G}_f, \mathcal{G}_d)$ ,  $N^*(E_f, \mathcal{G}_f, \mathcal{G}_d)$ , and  $W^{f*}(E_f, \mathcal{G}_f, \mathcal{G}_d)$  be the values of  $D$ ,  $N$  and  $W^f$  that solve (2). Standard comparative statics show that the dowry,  $D^*$ , increases as parental wealth increases; it decreases as the marginal utility of parental consumption shifts up, and it decreases as the efficiency of non-dowry transfers increases. For example, if the family has many children, the marginal utility of parental consumption should shift up and dowries should fall. Holding the number of siblings constant, an increase in the number of brothers who will receive most of the bequests causes the efficiency of non-dowry transfers to daughters fall.

Dowries should increase as the number of brothers among the siblings increases. This prediction is a non trivial implication of Goody's observation. Some historians argue that parents in medieval dotal societies transferred more wealth to their sons than to their daughters. A naive application of this argument implies that the dowry should fall when the fraction of sons in a family increases. Our model implies that the dowry should instead rise precisely because daughters are concerned about being excluded from parental bequests. Similarly, non-dowry wealth,  $N^*$ , increases as parental wealth increases. It decreases as the marginal utility of parental consumption shifts up, and increases as the efficiency of non-dowry transfers increases.

The groom's parents solve a similar utility maximization problem. Given the marriage production function, he will want to marry the wealthiest woman who is willing to marry him. Let the wealthiest bride that a groom with wealth  $W^m$  can attract be  $W^f = g(W^m)$ .  $g(\cdot)$  is related to  $h(\cdot)$  as follows. A condition of marriage market clearing is  $h(W^f) = g^{-1}(W^f)$ . The left-hand side shows the wealthiest man who is willing to marry a woman of wealth  $W^f$ . The right-hand side shows the lowest wealth man who is able to marry a woman of wealth  $W^f$ . When this equality holds, marriages are stable in the sense that if men are assigned to wives by  $g(\cdot)$ , no man and woman in the society will both strictly prefer to leave their current spouses to marry each other. Finding the equilibrium function  $g(\cdot)$  in this class of models is non trivial. Here, we will assume that equilibrium exists and that the equilibrium function is linear. In this marriage market, there is assortative matching by wealth levels.

## IMPLICATIONS FOR DOWRY VALUE REGRESSIONS

Economists have estimated dowry value regressions where dowry values are regressed on brides' and grooms' characteristics. While it is straightforward to interpret the estimates of an ordinary least squares (OLS) regression of dowry values on brides' characteristics alone, the interpretation of the estimates of a regression of dowry values on brides' and groom's characteristics is more problematic. The component of the groom's wealth that is not correlated with grooms' characteristics (and that ends up being in the error term) will be positively correlated with the bride's wealth due to assortative matching and therefore with the bride's characteristics. Due to these biases, the OLS estimates of the dowry regression in which both the

bride's and groom's characteristics are included should be interpreted with caution. From the point of view of testing the theory, estimating dowry values on brides' characteristics alone is more straightforward.

#### THE TUSCAN MARRIAGE MARKET, CIRCA 1427

The data for our empirical work come from notarial deeds and the Florentine *Catasto* (census) of 1427 housed at the State Archives of Florence. 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. The Florentine *Catasto* of 1427 supplied information on the wealth and occupation of the household head, the number of children and percentage of sons (or daughters) living in the bride's and groom's households, ages of the spouses (and their parents') for the households found in the notarial acts. Out of 328 marriage contracts, 222 couples could be matched to their paternal households in the contemporary census. Dowry values in the matched sample were marginally larger. The median dowry in the matched sample was 70 florins, more than a third of the median parental household wealth. Since the average annual labor earnings of a male worker in Florence in 1427 was 14 florins, the median dowry in Cortona amounted to five years of a typical worker's labor earnings.

#### DOWRY VALUE REGRESSIONS

Table 1 presents OLS estimates of the dowry value regressions. The regressions provide evidence on Goody's observation, independent of our particular interpretation of his observation.

In column 1, the dependent variable is the log of the nominal value of the dowry. It is regressed on brides' characteristics alone. The estimated elasticity of dowry value with respect to family wealth is .40 and it is precisely estimated. In general, the estimated coefficients on the wealth proxies are consistent with our model as well as with other models of dowry determination.

Consistent with our theory as well as others, an additional sibling reduced the bride's dowry by 6 percent. This coefficient is precisely estimated. The estimated coefficient on the fraction of sons has the right sign but a wide standard error. Thus there is weak support for Goody's and our hypothesis. This evidence is stronger in the level specification (column 2). There are two alternative explanations for the positive estimates. First, parents may have favored daughters over sons. However, this runs against the standard view of historians that families favored sons over daughters. Second, the positive estimates are also consistent with an alternative hypothesis that there were increasing returns in wealth with respect to the number of sons. When a family had more sons, the wealthier family transferred part of this increased wealth to the daughters in the form of larger dowries. Column 2 presents the estimated coefficients with the level of the dowry as the dependent variable. These estimates provide additional support for our model.

Columns 3 and 4 provide results from OLS regressions of dowry values on brides' and groom's characteristics. The estimated coefficients on the log of the bride's family wealth, her father's non-agricultural profession dummy variable, the urban variable and the number of siblings in her family have the wrong signs. As discussed earlier, this discrepancy is not unexpected due to the biases predicted by the theory. The estimated coefficient on the fraction of male siblings that she had, 0.021, is qualitatively consistent with the theory but is imprecisely estimated.

In terms of the groom's characteristics, the estimated coefficients on measures of his family wealth and family demographics are consistent with the predictions of the model. Given the biases predicted by the theory, the estimated coefficients underestimate the true impact of the groom's characteristics on dowry value. Thus, other than for the signs of the estimated coefficients, there is little point in dwelling on the point estimates themselves. An additional groom's sibling reduced the dowry that the bride's household was willing to pay. The estimated coefficient on the fraction of sons in the groom's family is -.046. When the groom's family had more sons, the bride's parents were not willing to pay a larger dowry. Although imprecisely estimated, the sign is consistent with our model. It is not consistent with the hypothesis that there were

increasing returns in wealth with respect to the number of sons. The estimated signs of the coefficients on the groom's family demographics, in both the number of siblings and the fraction of sons, show that medieval households forecasted the resources that their daughters would have access to after they married. The value of dowries were affected by these forecasts. The “wrong” signs for most of the bride's characteristics in columns 3 and 4, provide evidence of selection that was predicted by the theory.

The “wrong” signs on most of the bride's characteristics in the regression with the couple's characteristics are similar to the results obtained by Edlund (1997) with modern Indian micro data. The theory and evidence from our results and Edlund's suggest dowry value regressions on bride's and groom's characteristics have low statistical power. In summary, the dowry value regressions provide support for Goody's observation.

#### A VIRILOCAL SOCIETY

We will now discuss evidence for our interpretation of Goody's observation. Our model assumes that dotal societies are virilocal societies. The *Catasto* also provides evidence on residency patterns of parents and their married children. Medieval and early Renaissance Tuscany, including Cortona, was a virilocal society. A tiny percentage of grooms lived in their brides' households, while almost all the brides left their paternal households after the marriage. In the *town* of Cortona, out of 898 households, 0.33 percent of grooms coresided with their brides' households and in her *countryside*, out of 1121 couples, 1.07 percent of grooms did so. This coresidency pattern was typical of other Tuscan towns in this period: in Florence itself, in 1427, only two grooms out of 9,780 households coresided with their brides' households (Herlihy and Klapisch 1978, 651). Besides primarily coresiding with their paternal households, seventy-five percent of grooms in the Cortona matched sample had the same occupation as their fathers. In the countryside, the continuity between a father's occupation and his sons' occupation was the rule. In the town of Cortona, some grooms practised a different profession than their fathers, but these were the exceptions.

#### DOWRY CONTRACTS IN CORTONA

Dowry contracts may be complex; they may contain installments, state contingent payments, and terms as to the disposition of the dowry in the case of divorce or when one spouse predeceases the other. However, to be consistent with our argument, a dowry contract should not allow the married daughter to share in the profits generated with the remaining family assets.

It is possible to classify the Tuscan marriage contracts according to (i) the type of goods forming the dowry (cash, houses, shops, land holdings, and movable objects such as clothes, linen, and furniture), and (ii) the terms of payments. The features of the dowry contracts in early Renaissance Cortona provide support to the argument that dowries solve a free riding problem. Two out of 328 marriage contracts contained a term involving a profit-sharing arrangement. This rarity 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. For example, Tuscan landlords and peasants often used share contracts in agriculture. However, in the context of dowries, profit-sharing agreements were rare.

#### THE DECLINE OF DOWRIES IN SÃO PAULO

In general, there is little data on the decline of dowries in a society due to the large time span of historical data needed to track its decline. An exception is Nazzari (1991) who studied the evolution of dowries in São Paulo, a coastal community in Brazil, from 1600 to 1900.

In the 17<sup>th</sup> century, most daughters of property owners received a dowry at marriage. In the middle of the 18<sup>th</sup> century, 9 percent of property owners allowed their daughters to marry without a dowry. In the 19<sup>th</sup> century, three quarters of property owners allowed their daughters to marry without a dowry. The value of the dowries also fell through the centuries. In the 17<sup>th</sup> 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 18<sup>th</sup> 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 19<sup>th</sup> century, sons became even more independent of their fathers in their business lives. Thus the economic forces that led to the decline of dowries in São Paulo is consistent with our theory.

TABLE 1: DOWRY VALUE REGRESSIONS (ROBUST STANDARD ERRORS IN PARENTHESES)

Dependent variable (N = 222)	1 log(dowry)	2 dowry	3 log(dowry)	4 dowry
post-1427 marriage	.0956 (.0585)	21.17 (12.15)	.0359 (.0512)	15.42 (10.78)
f 1 <sup>st</sup> marriage	-.2550 (.1244)	-78.76 (28.10)	-.2541 (.1565)	-91.47 (29.52)
f age	.0464 (.0210)	7.076 (3.427)	.0241 (.0225)	6.244 (3.732)
f age <sup>2</sup>	-.0009 (.0004)	-.1836 (.0699)	-.0004 (.0005)	-.1741 (.0793)
f father's age	-.0023 (.0031)	-.3983 (.5244)	-.0021 (.0026)	-.0455 (.4851)
f family's log wealth (wealth in levels for regr. 2 & 4)	.4017 (.0268)	.0253 (.0033)	.2582 (.0265)	.0208 (.0028)
f father non-agriculture prof.	.0897 (.0858)	56.80 (16.47)	.1101 (.0698)	47.80 (14.85)
f urban	.5390 (.0686)	63.57 (11.01)	.1723 (.0988)	19.29 (13.01)
f no. of siblings	-.0614 (.0115)	-11.11 (2.971)	-.0358 (.0118)	-8.012 (2.512)
f fractions of sons	.1392 (.1078)	42.95 (22.97)	.0209 (.0948)	14.08 (21.16)
m 1 <sup>st</sup> marriage	—	—	.0771 (.1069)	13.06 (26.93)
m age	—	—	.0206 (.0138)	3.901 (2.492)
m age <sup>2</sup>	—	—	-.0001 (.0002)	-.0380 (.0366)
m father's age	—	—	-.0047 (.0028)	-.5493 (.4806)
m family's log wealth (wealth in levels for regr. 2 & 4)	—	—	.1732 (.0265)	.0179 (.0051)
m father non-agricultural prof.	—	—	.1126 (.0722)	41.86 (14.19)
m urban	—	—	.2891 (.0993)	24.40 (12.29)

Dependent variable ( $N = 222$ )	1 log(dowry)	2 dowry	3 log(dowry)	4 dowry
m no. of siblings	—	—	-.0285 (.0122)	-5.515 (3.173)
m fraction of sons	—	—	-.0465 (.1287)	-59.82 (30.86)
R <sup>2</sup>	0.7649	0.5445	0.8385	0.6638
$\sqrt{\text{MSE}}$	0.3964	72.64	0.3358	63.77

Sources: Florence, State Archives, Catasto 213, 214, 215, 216, 252, 253, 254; Notarile Antecosimiano 1143, 1144, 1145, 1146, 5441, 10038, 18905, 18906, 18907, 18908, 18909, 18910, 18911, 18912, 18913, 18914.

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