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Abstract

Although there are numerous studies of the dowry phenomenon in India, research pertaining to the custom in the rest of South Asia is sparse. The aim of this paper is to study dowry payments in Pakistan. Several interpretations for dowry are distinguished using a simple theoretical framework and the predictions of this model are tested using recent data from Pakistan. The investigation concludes that despite religious and cultural differences, the phenomenon of dowry in Pakistan appears to occur for reasons which are similar to those in India. That is, in rural areas it seems to be the more traditional pre-mortem inheritance, whereas in urban areas the payment has transformed into a groomprice.

JEL Classification Codes: J12, J16, D10

Keywords: Dowry, Marriage, Gender, Household

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1. Introduction

There exists a large body of research aimed at explaining the dowry phenomenon in India[1]. In contrast, to my knowledge, there has been no research on dowry payments in Pakistan and the aim of this paper is to investigate these payments.[2] An exploration of how dowry payments have evolved through time is not feasible due to limitations of the data; instead I focus on their current role in Pakistan.

The paper develops and empirically distinguishes between three different theories of dowry. The various explanations for dowry are synthesized into the following categories: (1) a transfer of wealth to the groom's household to pay for a high quality groom; (2) a compensation payment to the groom's household for receiving a bride who is an economic liability; and (3) a pre-mortem inheritance given to the bride. We do not know from the data, which simply reports the amount of dowry, which motive parents had for transferring the payment nor whose hands the payment fell into. These are the questions which are asked in this paper. By the use of a simple model, which integrates the three roles for dowry, we are able to empirically distinguish between the different roles of dowry and hence uncover which of these motives is, in fact, the cause of dowry payments in modern-day Pakistan.

The following section briefly outlines the predominant explanations for the existence of dowries. In Section 3, a simple matching model of marriage to illustrate the various roles of dowry payments is provided. The data used in this study are described in Section 4. The method of estimation is given in Section 5 after which the estimation results are discussed. Section 7 concludes.

2. Motivation for Dowry

A woman in Pakistan is entitled by law at marriage to: (i) a dowry and marriage gifts from her parents; and (ii) a dower (*mahr)*, a bridal gift from the groom which is generally intended to provide some insurance for her in the case of divorce (see Patel 1979, Korson and Sabzwari 1984, and Afzal et. al. 1973). Further, Pakistani women have the right to inheritance and ownership

[1]For examples in the economic literature, see Rao (1993a and 1993b), Deolalikar and Rao (1990), and Edlund (1996). Within the sociological and anthropological literature, see, for example, Paul (1986), Caplan (1984), Billig (1992), Chauhan (1995), Caldwell et. al. (1983), Srinivas (1984), Upadhya (1990), and Epstein (1973).

[2]In general, research directly pertaining to the custom of dowry in the rest of South Asia is relatively sparse. A notable exception is the study by Lindenbaum (1981) which investigates the transition from bride-price to dowry of a predominantly Muslim community in rural Bangladesh.

of property. According to Muslim Personal Law (*Shariat*), daughters are entitled to a half of the share which a son inherits from his father. It is noted, however, that the dowry she receives at the time of marriage is usually considered her pre-mortem inheritance, which is typically less than she is entitled to under the law (see Donnan 1988 and Patel 1979).

A natural question to ask in the exploration of Pakistani dowries is how this custom differs from those in India where the severe social consequences of rising dowries have motivated a large body of research aimed at explaining the phenomenon.[3] Importantly, modern-day dowry payments in India are distinct from the traditional custom of bride-wealth (*stridhan*) which is a parental gift to the bride (see for example, Paul 1986). Traditionally, the groom could share this gift during the marriage, but ultimately the wife had property rights over it. The modern dowry payment, on the other hand, consists of wealth transferred to the groom and his parents from the bride's parents, with the bride having no ownership rights over the payment. This modern arrangement is referred to as 'groom-price' and its amount increases dramatically in accordance with the 'desirable' qualities of the groom.[4]

Reports of both increasing dowries (see Sathar and Kazi 1988) and dowers (see Korson and Sabzwari 1984 and Afzal et. al. 1973) in Pakistan do suggest that, as in India, marriage payments have been inflating.[5] However, the role of dowry payments in Pakistan has not been studied. In particular, it is unclear whether dowry in Pakistan has prevailed as a transfer to the bride which remains her property throughout the marriage (and thus functions as a pre-mortem inheritance), or whether, as in India, the custom has transformed into a groom-price.

More generally, the convention of dowry typically appears in complex societies with substantial socio-economic differentiation, and class stratification.[6] Moreover their marriage practices are typically monogamous, patrilineal, and endogamous, i.e., men and women of equal status marry

[3]The total cash and goods involved are so large that the dowry payment can lead to impoverishment of the bridal family. This has a devastating effect on the lives of unmarried women who are increasingly considered stringent economic liabilities. For example, the custom of dowry is often linked to the practice of female infanticide. Other repercussions include extreme abuse of women as exemplified by terms like "bride-burning" and "dowry-death" becoming commonly used. The links to dowry inflation have been drawn by sociologists; for example, Kumari (1989), Chauhan (1995), McCoid (1989), Pawar (1990), Lata (1990), and Pathak (1990) address these issues.

[4]See, for example, Upadhya (1990), Caplan (1984), Billig (1992), Srinivas (1984), and Bradford (1985) for a discussion of the occurrence of a groom-price in India. See Caldwell et. al. (1983), Rao and Rao (1980), Billig (1992), Caplan (1986), and Hooja (1969) for evidence that the size of the dowry payment correpsond with qualities of the groom.

[5]In efforts to reduce excessive expenditures for weddings, the Dowry and Bridal Gifts Act of 1976 was imposed by the Pakistani parliament. This law placed limits on the value of dowry and dower.

[6]See, for example, Jackson and Romney (1973), Harrell and Dickey (1985), and Gaulin and Boster (1990).

(Gaulin and Boster 1990). As a result, dowry has often been considered a payment for closer political, economic, class, or ethnic alliances valuable to the bride's family in order to preserve the status of the family into subsequent generations (see, for example, Hoch 1989).[7] Gaulin and Boster (1990) have suggested that monogamous societies with significant and large differences in wealth among men, dowry is simply a means of female competition for desirable, wealthy husbands. Both of these interpretations of dowry, for the purposes here, fall into the first category of dowry listed in the introduction, termed groom-price. As already mentioned, this role for dowry has been emphasized in the recent literature of modern-day dowry payments in India. Others have observed that in societies where dowry has occurred, women were considered an economic burden since a wife performed little or no income-producing work for the household. The second interpretation of dowry therefore links the payments to the productivity of women and treats bride-price and dowry payments as opposites. In societies where women are economically productive, a bride-price payment is made to their families to compensate for the loss of a worker. If women do not contribute to household income, dowry is paid to the groom's family as a compensation for an unproductive member.[8] However, the most common form of dowry is a pre-mortem female inheritance where women retain ownership of her gift during marriage, and can reclaim it for her own welfare if the marriage is dissolved (see, for example, Goody 1976 and Hughes 1985). This third definition of dowry is therefore associated with societies in which inheritance flowed to both sons and daughters. In several countries, dowry as a pre-mortem inheritance given to women was written into the constitution, as was traditionally the case in Pakistan. The aim of the next section is to develop a model which embeds and distinguishes these three potential roles for dowry payments in a matching model of marriage.

[7]The interpretation of dowry as a medium of acquiring status is a widespread view, see, for example, Tambiah (1973) and Comaroff (1980). Dowry payments are often thought to facilitate hypergamy; that is, when families of lower social status marry their daughter into a family of superior status.

[8]Boserup (1970) was the foremost to link the brideprice and dowry clearly. She distinguished between the two types of society on the basis of agricultural techniques. Societies marked by shifting cultivation are characterised by widespread participation of women in agricultural labour, therefore women are more valued and hence bride-price is practised. In societies marked by plough cultivation, women do less work than men, the status of women is lower and hence dowry is practiced.

3. Model

For the purposes here, I will only focus on dowry payments at the time of marriage. Therefore, bequests, to either sons or daughters, after marriage are not considered and neither are marriage transfers in the opposite direction, i.e., from the groom's side. The data do not include such information and the theoretical distinction between dowries and bequests has been analysed by Botticini and Siouw (2000). The most important distinction between the different roles of dowry described above is the (often unwritten) ownership right of the payment. The notion of paying for a groom is very distinct from giving to the bride. To this end, I assume that total amount of resources devoted to a daughter's marriage, denoted by Z, is divided into two potential components: the portion paid directly to the daughter (inheritance) and the portion paid directly to the groom's family, represented by d.

Since Pakistani marriages are typically arranged by the families of the groom and bride, assume that the utilities of the bride and her family are grouped together and similarly for the groom. The utility that a bride and her family receive from her marriage is represented by:

$$U = u(Z - d) + \gamma(y_b + y_g) \tag{3.1}$$

where $u(\cdot)$ is concave and $0 \square \gamma \square 1$. The direct net benefit of marriage is that a woman consumes a proportion γ of total couple income, $y_b + y_g$. Individual incomes $y_b(e_b)$ and $y_g(e_g)$ are non-decreasing in their arguments, the education (or human capital) levels of the bride and groom respectively. Note that assuming linearity in the direct contribution to marriage instead of concavity does not alter the results. The budget constraint of the bridal family is:

$$Y_B \geq Z + pe_b \tag{3.2}$$

where Y_B is the total amount of household income allocated to a given daughter, and pe_b are the resources allocated to the investment in her human capital. Y_B is an exogenous variable.

The utility that a groom and his family receive from the marriage is given by:

$$V = v(Y_G + d) + (1 - \gamma)(y_b + y_g) \tag{3.3}$$

where $v(\cdot)$ is concave and Y_G is the groom's family household income after investing in the groom's human capital, e_g. This household income enters directly into the utility because in patrilocal

societies such as Pakistan, upon marriage the bride leaves her household to join that of her groom. Therefore, unlike the bride and her family, the groom and his parents pool resources after marriage. For simplicity, it is assumed that the bride does not directly share in these pooled resources, rather her direct benefit from the marriage is only through her husband's income. This assumption is made to distinguish between a dowry payment made to the groom and his family and a transfer made directly to the bride. If instead, the bride directly benefited from the income of the groom's family, Y_G, none of the results would be significantly altered.

The utility of the bridal family if their daughter does not marry is represented by:

$$\overline{U} = u(Y_B - pe_b) + y_b \tag{3.4}$$

and for the groom's side it is:

$$\overline{V} = v(Y_G) + y_g \tag{3.5}$$

Brides and grooms prefer to marry than remain single if the following participation constraints are satisfied:

$$U \geq \overline{U} \tag{3.6}$$

$$V \geq \overline{V} \tag{3.7}$$

Assume that brides and grooms are respectively ranked in order of their economic value, that is, $y_{b_1} \square y_{b_2} \square \cdots \square y_{b_n}$ and $y_{g_1} \square y_{g_2} \square \cdots \square y_{g_n}$. Denote the dowry payment a bride ranked j offers a groom ranked i by $d_{i,j}$. In equilibrium a bride of rank j marries groom ranked i if and only if she does not prefer to be matched with any other groom, i.e., the following incentive compatibility constraint holds:

$$u(Z_j - d_{i,j}) + \gamma(y_{b_j} + y_{g_i}) \geq u(Z_j - d_{k,j}) + \gamma(y_{b_j} + y_{g_k}) \tag{3.8}$$

for all $i \neq k$. Similarly a groom of rank i marries bride of rank j if and only if:

$$v(Y_{G_i} + d_{i,j}) + (1-\gamma)(y_{b_j} + y_{g_i}) \geq v(Y_{G_i} + d_{i,k}) + (1-\gamma)(y_{b_k} + y_{g_i}) \tag{3.9}$$

for all $j \neq k$.

3.1. Equilibrium Dowry Payments

Since brides' utility falls with dowry, brides' participation constraint restricts the maximum level of dowry. Substituting (3.2) into (3.1), this constraint implies:

$$u(Y_B - pe_b - d) + \gamma(y_b + y_g) \geq u(Y_B - pe_b) + y_b \tag{3.10}$$

Conversely, the grooms' participation constraint restricts the minimum level of dowry that brides can offer:

$$v(Y_G + d) + (1 - \gamma)(y_b + y_g) \geq v(Y_G) + y_g \tag{3.11}$$

Brides must therefore offer a dowry payment which at least satisfies:

$$d \geq h(\gamma y_g - (1 - \gamma)y_b | Y_G) \tag{3.12}$$

where $h'(\cdot) > 0$. The above implies that dowry payments are positive if a bride consumes (γy_g) more than she contributes $((1-\gamma)y_b)$ to a marriage. We assume that brides can afford this payment so that bride participation constraints are satisfied.[9] Holding all else constant, for a higher Y_G, (3.11) is satisfied for a higher d, due to concavity.

Marriages are monogamous; one bride matches with one groom.[10] Dowry payments in the marriage market adjust to satisfy equilibrium conditions such that grooms and brides who are matched do not prefer to be married to anyone else, i.e., incentive compatibility constraints (3.8) and (3.9) must hold. When some potential spouses are preferred, and brides and grooms respectively have identical preferences over potential spouses, the only stable equilibrium is positive assortative matching, i.e., brides and grooms of similar rank marry.[11] This is because higher ranked brides and grooms will always be able to outbid those of a lower rank since they have wealthier fathers.[12]

In equilibrium, same ranked grooms and brides will marry and equilibrium dowry payments are such that brides of rank i offer to their spouses just enough to outbid lower ranked brides. Taking as given their equilibrium dowry payment, $d_{i-1,i-1}$, the highest payment a lower ranked bride will offer a groom of rank i makes her indifferent between a groom of her own rank and one

[9] This assumption is in accordance with the fact that almost all women marry in Pakistan.

[10] There is no polygamy in the data.

[11] This is a well known result in the two-sided matching literature; see, for example, Becker (1991) and Lam (1988) for the case of transferable utility and Gale and Shapley (1962) for the case of non-transferable utility.

[12] Concavity in the utility function is also needed for this result.

ranked above. Therefore the following incentive compatibility condition holds in equilibrium for $i-1$ brides:

$$U^{i-1}(y_{g_{i-1}}) = U^{i-1}(y_{g_i}) \tag{3.13}$$

where $U^j(y_{g_i})$ is the utility of a bride ranked j from marrying a groom ranked i. This condition can be represented, without loss of generality, by:

$$d_{i,i-1} - d_{i-1,i-1} = f(\gamma(y_{g_i} - y_{g_{i-1}})|Y_{B_{i-1}}) \tag{3.14}$$

where $f'(\cdot) > 0$. Given concavity, this difference in dowry payments, $d_{i,i-1} - d_{i-1,i-1}$, is increasing in $Y_{B_{i-1}}$.

To support an assortative matching equilibrium, grooms will not accept an offer from lower ranked brides if the following incentive compatibility constraint holds:

$$V^i(y_{b_i}) \geq V^i(y_{b_{i-1}}) \tag{3.15}$$

where $V^i(y_{b_j})$ is the utility of a groom ranked i marrying a bride ranked j. This condition can be represented, without loss of generality, by:

$$d_{i,i} - d_{i,i-1} \geq k((1-\gamma)(y_{b_i} - y_{b_{i-1}})|Y_{G_i}) \tag{3.16}$$

where $k'(\cdot) > 0$. Given concavity, this difference in dowry payments $d_{i,i} - d_{i,i-1}$ is increasing in Y_{G_i}.

In equilibrium, brides of rank i offer a dowry payment, $d_{i,i}$, such that (3.15) holds with equality and (3.13) is satisfied. Using (3.14) and (3.16) equilibrium dowry payments satisfy:

$$d_{i,i} - d_{i-1,i-1} = f(\gamma(y_{g_i} - y_{g_{i-1}})|Y_{B_{i-1}}) - k((1-\gamma)(y_{b_i} - y_{b_{i-1}})|Y_{G_i}) \tag{3.17}$$

This difference in dowry payments is greater the larger is the marginal benefit to brides marrying relative to grooms, i.e., $\gamma(\dot{y_{g_i} - y_{g_{i-1}}}) > (1-\gamma)(y_{b_i} - y_{b_{i-1}})$, and also the more differentiated grooms are relative to brides, i.e., $\dot{(y_{g_i} - y_{g_{i-1}})} > (y_{b_i} - y_{b_{i-1}})$. Both of these implications are very likely in a patriarchal society such as Pakistan where the employment of women is frowned upon and hence women are not only entirely dependent on men, but also are relatively homogeneous in terms of quality compared to men. Additionally this difference in dowry payments, $d_{i,i} - d_{i-1,i-1}$, is increasing in both $Y_{B_{i-1}}$ and Y_{G_i}.

In equilibrium, higher ranked grooms receive higher dowry payments because of their greater marketable traits. Because the lowest ranked grooms are of the least desirable quality, this lowest payment need only satisfy participation constraints, i.e. condition (3.12). Therefore,

$$d_{1,1} = h(\gamma y_{g_1} - (1-\gamma) y_{b_1} | Y_{G_1}) \tag{3.18}$$

and (3.17) holds for all grooms ranked i, for $2 \square i \square n$. Because dowry payment to all higher ranked grooms are larger than $d_{1,1}$, participation constraints are necessarily satisfied for all grooms. Given that brides are paying just enough to outbid the brides ranked just below, i.e., those poorer, they can always afford this payment and hence the participation constraint for a given bride is always satisfied, i.e., the upper bound on dowry payments is not reached.

4. Roles of Dowry

The above model encompasses the three roles of dowry. Condition (3.12) reflects the compensation component where the dowry payment is positive if a bride consumes more than she contributes to a marriage. Condition (3.17) reflects the groom-price component, where dowries are higher the greater the competition amongst brides for desirable grooms. Finally, $Z - d$ is the inheritance component, which is the amount of wealth which falls directly into the hands of the bride.

If we assume that it is always worthwhile for a bride to marry than remain unmarried then the bridal family always offers the payment, d, to satisfy incentive conditions, however, they never offer more than is required. The inheritance payment is equal to the residual income allocated to a daughter's marriage after paying for her groom the amount d for a given level of her human capital, e_b (and hence her income y_b), and the quality of her groom, y_g. In other words, this amount is positive, if the marginal return to paying more for a groom is zero.

Using conditions (3.17) and (3.18), and substituting backwards, the payment to the groom and his family, d, can be represented by:

$$\begin{aligned} d_{i,i} &= h(\gamma y_{g_1} - (1-\gamma) y_{b_1} | Y_{G_1}) && (4.1) \\ &\quad + \sum_{k=1}^{i-1} f(\gamma(y_{g_{k+1}} - y_{g_k}) | Y_{B_k}) - k((1-\gamma)(y_{b_{k+1}} - y_{b_k}) | Y_{G_{k+1}}) && (4.2) \end{aligned}$$

where (4.1) is the compensation payment part of dowry and (4.2) is the groomprice component.

The inheritance component of dowry, denoted D_i, can be expressed as:

$$D_i = Z_i - d_{i,i} = Y_{B_i} - pe_{b_i} - d_{i,i} \tag{4.3}$$

In the data, we have information on both the incidence of dowries and the value of these payments. We can use the above model to generate testable implications for both of these variables. We only observe the probability that a dowry was paid and the total transfer of dowry, both of which likely embed all three roles for dowry, as is the case in the above model. However, the model allows us to uncover which is the prominent reason for transferring a dowry, by generating distinct predictions for each role of dowry. We first turn to the predictions for the incidence of the dowry phenomenon.

4.1. Prominence of the different roles of dowry

The model predicts that which of these roles is prominent depends on the wealth distribution of bride and groom families, and the relative groom and bride heterogeneity. To analyse these different situations, consider three cases. We can think of them as three different stages of development. In the early stages (or pre-development stage), all individuals are poor and in turn grooms and brides are homogeneous in terms of economic value. In a later stage some individuals become richer. Depending on the relative returns to male and female human capital, either richer parents invest more in both their daughters and sons or only in their sons. In the former case, both potential brides and grooms become increasingly heterogeneous in terms of economic value, or in the latter case, only grooms become more heterogeneous as members of society become wealthier when the returns to female human capital are very low. The implications for dowry payments in these three stages of development are characterised as follows.

Case 1: Brides and Grooms are Homogeneous

Suppose all brides and grooms are homogenous, i.e., $y_{b_i} = y_{b_j}$ and $y_{g_i} = y_{g_j}$ for all $i \neq j$. In this case:

$$d = h(\gamma y_g - (1-\gamma) y_b | Y_G) \tag{4.4}$$

$$D = Y_B - pe_b - h(\gamma y_g - (1-\gamma) y_b | Y_G) \tag{4.5}$$

Brides pay only what they require for a groom, i.e., payment d satisfies participation constraint for grooms. The remaining income available for a bride $(Y_B - pe_b - d)$ is given as inheritance. In this

case, we can observe a compensation payment, d, and an inheritance, D, but we do not observe a groomprice. Note that if brides and grooms are of equal worth in a marriage, i.e., $\gamma y_g = (1-\gamma)y_b$, then only an inheritance payment is observed.

Case 2: Brides are Homogeneous and Grooms are Heterogeneous

In this case, there is no ranking of brides, all brides are identical. The payments each groom, ranked i, denoted, d_i, receives is:

$$d_1 = h(\gamma y_{g_1} - (1-\gamma)y_b | Y_{G_1}) \tag{4.6}$$

and

$$d_i = h(\gamma y_{g_1} - (1-\gamma)y_b | Y_{G_1}) + \sum_{k=1}^{i-1} f(\gamma(y_{g_{k+1}} - y_{g_k}) | Y_{B_k}) \tag{4.7}$$

for $1 < i \square n$. The inheritance given directly to brides, for $1 \square i \square n$, is equal to:

$$D_i = Y_B - pe_b - d_i \tag{4.8}$$

Brides either match with a lower quality groom, make a lower payment to grooms and receive a higher inheritance, or they match with a higher quality groom, make a higher payment to the groom and his family and receive a lower inheritance. Since all brides are identical, they must have identical utility levels in equilibrium. For the lowest type groom, we can observe a compensation payment (if $\gamma y_g > (1-\gamma)y_b$), for all the higher ranked grooms we observe a groomprice component. For the brides matching with the lower type grooms, we could also observe an inheritance payment, but for those matching with the higher type grooms, we will not. This follows because same quality brides are competing amongst themselves for different quality grooms, the highest price (to the highest quality groom) will be bid up to the point where brides are indifferent and may well exhaust their income constraint.

Case 3: Brides and Grooms are Heterogeneous

In this case, there is also a ranking of brides and assortative matching implies that same ranked brides and grooms match. Equilibrium dowry payments are represented by the following:

$$d_{1,1} = h(\gamma y_{g_1} - (1-\gamma)y_{b_1} | Y_{G_1}) \tag{4.9}$$

and

$$\begin{aligned} d_{i,i} &= h(\gamma y_{g_1} - (1-\gamma) y_{b_1} | Y_{G_1}) \\ &\quad + \sum_{k=1}^{i-1} f(\gamma(y_{g_{k+1}} - y_{g_k}) | Y_{B_k}) - k((1-\gamma)(y_{b_{k+1}} - y_{b_k}) | Y_{G_{k+1}}) \end{aligned} \tag{4.10}$$

for $1 < i \square n$. Inheritance transfers, for $1 \square i \square n$, are:

$$D_{i,i} = Y_{B_i} - pe_{b_i} - d_{i,i} \tag{4.11}$$

This case is similar to the prior case except that payments to the grooms are lower in the sense that relative bride quality can substitute for part of the transfer to grooms. Additionally, in this case, the inheritance component of dowry will also be observed even for the higher quality matches. This follows because, higher quality brides need only outbid lower quality brides for their desired groom. As lower quality brides are poorer, the payment that is required does not exhaust the income available to the higher quality brides and hence there are leftover funds available to transfer to their daughter directly. Therefore there is always an inheritance component to dowry, since brides are paying less than what they can afford to outbid the lower types. This is the central difference between Cases 2 and 3.

Using these three cases, we can characterise testable predictions with regards to the prominence of one role of dowry relative to another.

Conjecture 1. *Dowry as a compensation payment is more prominent when both brides and grooms are homogeneous and when there is inequality between the economic value of the bride and groom of a given couple. This will occur when the relative returns to female human capital are relatively low and when average wealth is low, with most families at the low end of the distribution.*

Conjecture 2. *Dowry as an inheritance is more prominent the more equality there is between brides and grooms, both when there is heterogeneity amongst brides and grooms and when there is not, i.e., when relative groom and bride heterogeneity is small. It is more prominent when average wealth is high and when the returns to female human capital are relatively high.*

Conjecture 3. *Dowry as a groomprice is more prominent when there is greater heterogeneity amongst grooms relative to brides, and the more unequal brides and grooms are in terms of relative*

economic value. It is more prominent when average wealth is high and when the relative returns to female human capital are low.

4.2. Predictions for the value of dowry

The three cases outlined above highlight some conditions under which each of the roles of dowry are prominent. They provide testable predictions on the occurrence of dowry. We now turn to the comparative statics of the model to derive testable implications on the value of dowry. To do this, we use the expressions from the most general case of the model, Case 3, where we allow for income heterogeneity amongst brides and grooms. From expression (4.9), we see that the compensation payment, d, is increasing in y_{g_1} and decreasing in y_{b_1} (and hence e_{b_1}) and Y_{G_1}, i.e., d is changing with the characteristics of the lowest quality match. Substituting (4.9) and (4.10), into (4.11), we see that the inheritance payment, $D_{i,i}$, is increasing in Y_{B_i} and Y_{G_1} and decreasing in Y_{B_j}, for $1 \leq j \leq i-1$, and Y_{G_j}, for $2 \leq j \leq i$. The payment is also decreasing in all y_{g_j}, for $1 \leq j \leq i$. The inheritance payment is increasing in e_b if $(1-\gamma)y_b'(e_b) > p$, otherwise it is non-increasing. When grooms become more heterogeneous than brides, a groomprice (expression (4.10)) is observed and this payment, $d_{i,i}$, is increasing in the relative quality of grooms and decreasing in the relative quality of brides, represented by $y_{g_{k+1}} - y_{g_k}$ and $y_{b_{k+1}} - y_{b_k}$ respectively for $1 \leq k < i$. The payment is also increasing the more heterogeneous are grooms relative to brides, i.e., the larger is $(y_{g_{k+1}} - y_{g_k}) - (y_{b_{k+1}} - y_{b_k})$ where $1 \leq k < i$. The groomprice, $d_{i,i}$, is increasing in both the income of poorer bridal families, i.e., Y_{B_j} where $1 \leq j \leq i-1$, and in the wealth of all groom families Y_{G_j}, for $1 \leq j \leq i$. We now have the following predictions.

Conjecture 4. *Dowry as a compensation payment increases with groom quality relative to bride quality of the couple. It increases with groom family income and is unaffected by bridal family income.*

Conjecture 5. *Dowry as an inheritance transfer increases with bride family income and decreases with that of the groom. The transfer decreases with the quality of grooms, and increases in brides' economic value. It increases in bride's eduction if the marginal returns to brides education on the marriage market are higher then the marginal cost.*

Conjecture 6. *Dowry as a groomprice increases with grooms' relative quality and decreases with*

brides' relative quality. It is higher the more heterogeneous grooms are relative to brides. The payment increases with groom family income and is unaffected by that of the bride. It does, however, increase with both average bride and groom family wealth in the marriage market.[13]

5. Estimation

The theoretical analysis provides testable implications for both the prominence of dowry (Conjectures 1 to 3) and the value of dowry (Conjectures 4 to 6) for each role of dowry. I therefore examine the various models of dowry by estimating two main equations: the probability that a dowry is paid, and the value of dowry. The probability that a dowry is paid is represented by the following:

$$P = \beta_P X_P + \varepsilon_P \tag{5.1}$$

where P is equal to one if a dowry is paid and equal to zero otherwise. The vector X_P contains the determinants of the occurrence of dowry discussed in Conjectures 1 to 3, that is, measures of groom and bride heterogeneity, the relative returns to female and male human capital, and average household income.[14] In addition to these, variables are included to proxy for customs and traditions which may or may not allow for dowry to be transferred. The vector also contains a variable which represents the demographic environment, generally known as the marriage squeeze ratio, which is equal to the relative supply of potential brides and grooms since population growth is believed to lead to the existence of the dowry custom.[15]

The value of dowry, denoted D, is represented by the following equation:

$$D = \beta_D X_D + \varepsilon_D \tag{5.2}$$

The vector X_D contains predominantly individual and family characteristics which pertain to the determinants of the value of dowry summarized in Conjectures 4 to 6. For a given match i these

[13]In the model it is assumed that brides and grooms do not directly benefit from the parental wealth of their respective spouses. If instead, grooms and brides, and their families, directly benefited from the wealth status of their in-laws, then the predictions for the wealth of the groom's family would not be altered, but those for the bride's family would. In particular, dowry as a compensation and groomprice payment would decrease with bridal family wealth. It will be seen that this relationship is not found in the data.

[14]Dowry payments are typically associated with economic development, see, for example, Jackson and Romney (1973), Harrell and Dickey (1985), and Gaulin and Boster (1990). Chauhan (1995), Paul (1986), Srinivas (1984), Epstein (1973), Billig (1992), and Upadhya (1990) link the dowry phenomenon in South Asia with modernsiation.

[15]That dowry is the response to demographic change where men marry younger women, resulting in an excess supply of brides, has long been suggested (Hughes 1985). Rao (1993a and 1993b) and Caldwell et. al. (1983), for example, cite population growth as the primary reason for dowry payments in South Asia.

include: groom and bride quality, y_{g_i} and y_{b_i}; groom relative to bride quality $(y_{g_i} - y_{b_i})$; groom quality relative to other grooms $(y_{g_i} - \overline{y}_g)$, where $\overline{y}_g$ reflects the average quality of grooms; bride quality relative to other brides, $(y_{b_i} - \overline{y}_b)$, where $\overline{y}_b$ reflects the average quality of grooms; bride and groom family wealth, Y_{B_i} and Y_{G_i}; bride's education, e_{b_i}; and the average parent income, $\overline{Y}$. In addition, a measure of groom and bride relative heterogeneity is included (as Conjecture 6 suggests). A compensation payment is increasing in $(y_{g_i} - y_{b_i})$ and Y_{G_i} and unaffected by all other variables. A groomprice payment is increasing in $(y_{g_i} - \overline{y}_g)$, Y_{G_i}, and $\overline{Y}$, decreasing in $(y_{b_i} - \overline{y}_b)$, unaffected by Y_{B_i}, and increasing in groom relative to bride heterogeneity. An inheritance is increasing in Y_{B_i} and e_{b_i} (potentially) and has the opposite relationship (relative to a groomprice payment) with all other variables. Note that in the model y_g and y_b broadly represent the total value that a groom and bride respectively bring to a marriage. In the estimations, variables, in addition to actual earnings, will enter to proxy for this contribution to marriage like education and household labour input.

Alternative to the above, it could be assumed that $X_P = X_D$ and the two equations (5.1) and (5.2) would be estimated as one equation. In such a tobit estimation, it would be implicit that a zero dowry payment is equivalent to no dowry transferred. This procedure seems somewhat restrictive given that the absence of the dowry custom can be a separate phenomenon from merely paying a very low dowry. In other words, there likely exists a type of switching mechanism from the custom of no dowry to paying dowry. To address this issue, the estimations of the event that a dowry is paid and the value of dowry are analysed independently.

5.1. Sample Selection

Before estimating equations (5.1) and (5.2), there are sample selection issues to address. In particular, there are two selection processes which affect the sample of women who paid a dowry: first, not all women eligible for the dowry question responded, and second, some who did respond did not pay a dowry. The latter selection rule is represented by equation (5.1) and the former is as follows:

$$R = \beta_R X_R + \varepsilon_R \tag{5.3}$$

where R is an index function such that $R > 0$ if an eligible women did respond to the dowry question and $R \square 0$ otherwise. It is most plausible that women did not respond to the dowry question principally because of confusion with respect to the eligibility criteria. Women were asked to respond to the dowry question, only if they had married within the past five years. As a result, it is likely that women who married recently answered the question but those who married earlier, but were eligible, did not. In essence, the selection process excludes some women who married earlier.

Since the aim of the paper is to investigate the role of dowry payments in present-day Pakistan, that some women who married earlier were omitted from the sample should not bias the estimates. It may be the case, however, that women did not respond to the dowry question because their parents did not give a dowry. This is perhaps suggested by the fact that ethnic variation is a determinant of brides' response rate, where the incidence of dowry is plausibly a function of social norms which vary across ethnic groups, but confusion with regard to the eligibility criteria is less likely to vary by groups and more likely to be individual specific. In this scenario the two selection processes are not independent. To this end, the inverse Mills' ratio from a regression of the response rate, equation (5.3), is computed and enters into the estimation of the probability of paying a dowry, equation (5.1). The year each female married is used to identify the selection rule into the dowry sample, i.e., the probability that an eligible woman answered the dowry question. It is possible that the custom of dowry has changed through time, and that a retrospective survey on dowry could capture some of these effects. However, because the time period is so short, i.e., five years, it is unlikely that changes in the custom of dowry would be reflected during those five years and thus significantly affect the estimations of (5.1) and (5.2).

The estimation of the value of dowry will account for both of the above sampling issues, that is whether or not women responded to the dowry question and whether or not they in fact paid a dowry.

5.2. Endogeneity

The possible determinants of dowries, discussed in Section 4, are not necessarily exogenous. More specifically, the education and work activity of brides are such variables. Parents of girls plausibly must decide, when their daughters are young, whether to invest more in their daughter's education,

or save for her dowry. These variables are then simultaneously determined, although the investment in education occurs prior to the transfer of dowry. The labour input of women could either be predetermined before marriage according to characteristics of the groom's household, or be the result of negotiations during the marriage bargain. That is, bridal parents bargain to lower their daughter's labour input by offering a high dowry payment. Or alternatively a large dowry may confer higher status upon a bride within the household of her in-laws and as a result she is required to work less. Hence a bride's labour input is probably endogenous to dowry determination.

To address these problems of endogeneity, regressions in which the education of brides and their labour input are the dependent variables are run prior to the dowry estimations. Additionally, it is also the case that the labour input of brides is in turn related to their education and because we are considering a marriage market, the direction of causality is again not straightforward. On the one hand, a highly educated bride may be able to bargain for fewer labour hours within the household. On the other hand, it may also be the case that the labour input of brides is predetermined according to household characteristics, and households with a low female labour demand attract highly educated brides. To this end, an equation for brides' education, E, is first estimated and in turn the predicted values from this regression enter into the estimation of the labour activity of brides. The education of brides is represented by the following:

$$E = \beta_E X_E + \varepsilon_E \tag{5.4}$$

The vector X_E contains the literacy rate of the bride's area of origin and personal characteristics of her parents; in particular their income and her mother's education since (as seen from the correlation results) a mother's education has a greater influence on her daughter's education relative to her son's.

The literacy rate for the woman's area of origin is used to identify the education effect in other equations. Presumably, parents are more likely to educate their daughters in an area where female literacy is high. Since 44% of brides have migrated, for almost half of the observations this literacy rate is distinct from the one in the areas where the couple resides. The average literacy rate is computed using the regional variation in the larger LSMS sample. This produces 50 different literacy rates to correspond to the birth place of brides. Of the brides who did migrate, 4% are from areas in Pakistan which were not included in the larger sample, the literacy rate for this region

was predicted from the 1981 Pakistan Census using rates for 1981 and 1991 from other districts in the vicinity.[16]

The number of children that a bride has and the total number of female household members are used to identify the effect of bride's labour input. Incidentally, neither of these variables are strongly correlated with household income (0.02 and 0.16 respectively). The total hours worked by brides, H, are represented by the following equation:

$$H = \beta_H X_H + \beta_{HE} \widehat{E} + \varepsilon_H \tag{5.5}$$

where $\widehat{E}$ is the predicted value from the estimation of equation (5.4). The vector X_H includes the female labour force participation rate, type of household, number of female household members, number of children, and household income. Since a bride's total labour value includes caring for the children, we would expect that her total labour hours are positively related to the number of children she has. If a family uses female labour in household production, it is likely that the demand for individual female labour is lower, the greater the total number of females in the household.

As discussed earlier, there is an additional status component to female labour, that is, women who work for income are considered lower status. To address this issue, a probit estimation of the probability that a bride works in an income-generating activity is also evaluated and depicted as follows:

$$W = \beta_W X_W + \beta_{WE} \widehat{E} + \varepsilon_W \tag{5.6}$$

where W is an index function such that $W > 0$ if a bride does work in an income-generating activity and $W \square 0$ otherwise. The vector X_W contains the female labour force participation rate, type of household, number of female household members, and household income. The number of children is left out of the above estimation since it is easily argued that this variable is endogenous to whether or not women work outside of the home.

An alternative approach to estimating H and W is to separate the hours worked inside the home from those contributing to an income-generating activity. However, the restriction of summing the two types of hours together in a regression on the value of dowry is accepted using an F-test and the predicted probability that a bride contributes directly to household income is included into the

[16]Ideally data from 1981 would better correspond to the literacy rate when brides in 1991 were of school age. However, given present limitations, estimations using such data is infeasible.

estimations instead.[17]

As a result of the above discussion, the main estimating equations of (5.1) and (5.2) are better represented by:

$$P = \gamma_0 X_P + \gamma_1 \widehat{E} + \gamma_2 \widehat{H} + \gamma_3 \widehat{W} + \gamma_4 \lambda_R + \varepsilon_P \tag{5.7}$$

and

$$D = \alpha_0 X_D + \alpha_1 \widehat{E} + \alpha_2 \widehat{H} + \alpha_3 \widehat{W} + \alpha_4 \lambda_R + \alpha_5 \lambda_P + \varepsilon_D \tag{5.8}$$

where λ_R and λ_P are the inverse Mills' ratios from the estimations of equations (5.3) and (5.1) respectively and $\widehat{E}$, $\widehat{H}$, and $\widehat{W}$ are the predicted values from the estimations of (5.4), (5.5), and (5.6) respectively.[18]

6. Data

The household level data used in this study are from the Living Standards Measurement Study (LSMS) of Pakistan, collected in 1991 under the direction of the World Bank and the Government of Pakistan. The sample is divided equally between Pakistan's urban and rural areas, with provincial shares approximating population shares. The data contain detailed information on the education, income, and all labour activity of individuals. Approximately 4700 households were surveyed, however information on dowries was requested only from females who had married in the past five years. This leaves a female sample eligible for the dowry question of roughly 1300. Approximately 800 of those females responded to the dowry question and of those, roughly 700 received a dowry from their parents, and reported the value and contents of the transfer.

The distribution of the dowry sample across provinces and between rural and urban areas very closely matches that of the entire LSMS sample (discrepancies of at most 7%). For all the estimations, rural and urban areas are analysed independently to allow for the fact that the dowry phenomenon may exist in these distinct areas for different reasons. The survey defines urban areas as all settlements with a population of 5000 or more in 1981. The means and standard deviations of the variables used in the analysis of the dowry sample, (those women who responded to the dowry question,) are listed in Table 1 below. There are 25 observations which were excluded

[17] The F-statistic approximates zero and hence the restriction is accepted at all levels of significance.

[18] It will be seen in the estimations that the two sample selection rules (5.3) and (5.1) are in fact independent, i.e., λ_R is insignificant in the estimation of (5.7). As a result, λ_R and λ_P can enter into the estimation of (5.8) independently, where λ_P is the inverse Mill's ratio from the estimation of (5.7) without λ_R as a regressor.

from the sample. Eleven of these are considered outliers and the remaining fourteen eliminated observations are brides who came from outside of Pakistan to marry.[19] These marriages could have been arranged by families to re-establish lost connections or for another reason. In any case, the implications of these arrangements on marriage payments is unknown and likely not to be a random selection process.

	Urban		Rural	
Variable	**Mean**	**S. D.**	**Mean**	**S. D.**
Bride paid a dowry	0.88	0.33	0.86	0.34
Value of dowry	31956	38968	21476	59568
Bride literate	0.41	0.49	0.14	0.34
Bride's education level	3.53	4.61	1.03	2.50
Bride works in income-generating activity	0.11	0.32	0.42	0.49
Bride's earnings	445	535	247	244
Bride's total hours of work	39.8	28.1	46.7	34.9
Groom literate	0.69	0.46	0.49	0.50
Groom's education level	6.27	5.13	3.93	4.33
Groom works on family farm	0.01	0.12	0.34	0.47
Grooms works in family enterprise	0.36	0.48	0.13	0.34
Groom works in agriculture	0.003	0.05	0.03	0.17
Grooms works in non-agriculture	0.52	0.50	0.41	0.49
Groom's earnings	2109	2045	1373	718
Groom's total hours of work	45.3	26.4	40.0	24.7
Bride's parents income (predicted)	74403	33460	60464	26191
Household income	76345	92921	56427	158193

Table 1 - Summary statistics of dowry sample

The average hours per week reported in the table are conditional on individuals working.[20] Monthly individual income of the bride and groom are only their earnings from wage labour, and the reported values are conditional on their working outside the home.[21] Annual household incomes, on the other hand, do include revenue from a family farm or enterprise in addition to

[19]Of the outliers: one reported a dowry equal to approximately 80 times the mean, and 22 standard deviations above the mean; others listed hours of work per week greater than 168; one had a household income equal to roughly 150 times the mean and 25 standard deviations above the mean; and three others had a household income equal to zero. The majority of brides which were dropped migrated from India; a few others from Bangladesh, Afghanistan, and elsewhere.

[20]Total hours worked is the sum of hours per week in each activity including household work for females. Bride's household activities include: fetching water; gathering firewood; animal care/grazing/herding; preparing dung cakes; milking animals/making ghee; taking meals to field workers; going to the market; grinding flour or musking rice; cooking/baking/washing dishes; cleaning the house/laundry/ironing; stitching/embroidery for household use; child care and teaching.

[21]Earnings from work outside of the home include cash and in kind payments. All income variables are in 1991 rupees. There are approximately 25 rupees to the dollar.

total wage income from all family members. Because it is always the case that brides join the household of the groom upon marriage, the income of the bride's parents is not available in the data as only the groom's household, where the bride lives, is surveyed. However information on each woman's parents' education, occupation, and geographical location is known. I subsequently estimated the household income for all households in the entire sample of the data (3000 households once eliminating those with household heads and their spouses of an unreasonably young age to be parents of an adult child) using education, occupation, and geographical location of the household head and his spouse as the determinants of income. Coefficients from this estimation were used to form the predicted values of a bride's parents' annual income.

Almost all individuals, 95%, in the sample are Muslim. The majority of families live in extended households, only 13% form nuclear households. This greatly contrasts with the total LSMS sample, where over half of the households are nuclear. This is expected, however, given the selecting criteria of the dowry sample which requests information only from women who married in the past five years. The probability that this event occurred is substantially higher in extended households where, by definition, the number of potential adult couples surpasses the single adult couple in nuclear households. Household type is controlled for in the estimations.

A very large proportion of the sample, 87%, paid a dowry. Dowry payments are always positive (there was no question asked about transfers from the groom's side, i.e., dowers or bride-prices), and the variation in the payments is substantial, (the standard deviation is roughly double the mean). The table below lists the averages and percentiles of absolute dowry payments and as a proportion of annual household income.[22]

	Value of Dowry			$\frac{\textbf{Dowry}}{\textbf{Household Income}}$		
	Total	**Rural**	**Urban**	**Total**	**Rural**	**Urban**
Average	26806	21476	31939	1.65	2.05	1.27
25th percentile	6000	5000	10000	0.16	0.17	0.15
50th percentile	14500	10350	18000	0.37	0.39	0.35
75th percentile	31000	22000	40000	0.85	0.96	0.77

Table 2 - Summary statistics of dowry payments

In general, average dowry payments are significantly higher than median dowry payments, thus reflecting that only a small proportion of families give very large dowries. Dowry payments are

[22]The value of dowry if in 1991 rupees. The contents include: agriculture land, jewelry and currency, household effects, and other goods and property.

higher in urban areas; however as a proportion of grooms' household income they are greater in rural areas.

Household income in the sample is higher in urban areas than in rural, where median incomes are approximately half that of urban incomes. Similarly, the average income of grooms is roughly twice as high in urban areas than in rural areas. On average, 27% of brides work in an income generating activity where they generally engage in household production and only 6% work outside the home. This participation rate for women is significantly higher in rural areas, than in urban areas. Women are more likely to work on family farms than in businesses. If we consider correlations between the respective characteristics of brides and grooms, we see that, as would be anticipated, the education and age of marriage of brides and grooms is strongly correlated with the education and income of their respective parents. It appears that the education of mothers has a greater influence on that of their daughters than sons (a correlation value of 0.50 for daughters and 0.34 for sons). Highly educated brides are more likely to stay at home (as opposed to engaging in an income generating activity), although if they do work, it is usually in the non-agricultural sector. For the most part, brides who have wealthy parents do not work at all, aside from work within the home. Well educated grooms have higher earnings and are engaged in the non-agricultural sector.

To uncover patterns of matching, the following table lists correlations between characteristics of grooms and brides

	Groom							
Bride	Educ.	Earnings	Farm	Entp.	Agric.	Non-Ag.	Parents' Inc.	Age. marr.
Education	0.52	0.17	-0.16	0.18	-0.08	-0.04	0.13	0.24
Earnings	-0.00	-0.05	0.04	0.03	0.05	-0.06	-0.00	-0.03
Family Farm	-0.22	-0.10	0.36	-0.12	0.02	-0.06	-0.12	-0.13
Enterprise	-0.06	-0.00	-0.05	0.03	-0.02	-0.03	-0.02	0.00
Agriculture	-0.11	-0.07	0.08	-0.02	0.20	-0.10	-0.08	-0.15
Non-Agric.	-0.00	-0.04	-0.02	0.05	0.06	-0.07	0.01	-0.00
Home	0.21	0.12	-0.30	0.09	-0.11	0.09	0.07	0.15
Parents' income	0.42	0.17	-0.21	0.15	-0.04	0.01	0.13	0.16
Age. marr.	0.23	0.08	-0.05	0.05	-0.04	-0.00	0.04	0.43

Table 3 - Traits and work activities of spouses

There is positive assortative matching (individuals of similar traits marry) with respect to age at marriage and education of spouses. The high correlation value on education could cause concern

in the estimations where both bride and groom education are included. However, as described in Section 5.2, brides' education is instrumented for in the estimations. A bride who does not work for income is typically married to a wealthy, highly educated groom who does not work in the agricultural sector. Additionally, the income of brides is negatively related to all positive traits of grooms thus confirming that women who work outside the home only do so because the household faces severe financial difficulties. Related correlations yield that a bride who works in family production or outside of the home is likely to be married to a groom who works in family production or agriculture. Although brides residing in wealthy households typically do not participate in an income-generating activity, they do, however, work within the home and these labour hours are only slightly negatively related (a correlation equal to -0.11) to the income of the household.

There are substantial differences between the rural and urban areas in terms of economic development and male and female inequality. These differences are listed in Table 4 below. The variables are computed by taking averages across geographic regions from the entire LSMS sample (36,000 individuals). This procedure produces 303 possible values corresponding to the different sampling locations (151 rural areas and 152 urban areas). The economic variables relevant to the conjectures of Section 3, include relative male and female hourly wages (where average wages are equal to zero if no individuals earn a wage in the area and relative wages are equal to the female wage subtracted from the male wage) and the relative heterogeneity in quality between grooms and brides. To reflect quality, I calculate the relative heterogeneity in both years of education and weekly earnings. To capture the degree of relative heterogeneity, I compute the respective standard deviations of the distributions across men and women and then subtract the female standard deviation from that of the males.[23] In the survey, men and women were both asked how many daughters and sons they would like to have if they could start their families over again. The relative preference for daughters compared to sons for women and men are listed. A value of less than one reflects a gender bias in favour of sons. Using population numbers, a 'marriage squeeze' variable is constructed which is equal to the ratio of females of marrying age (15 to 20) to males of marrying age (20 to 25); a value greater than one reflects an excess supply of brides.

[23]The sample of men and women are of comparable ages to those in the dowry sample; between 20 and 40 for men and between 15 and 35 for women.

Variable	Urban		Rural	
	Mean	**S.D.**	**Mean**	**S.D.**
Relative agric. wage	0.0144	0.159	-0.0944	0.659
Relative non-agric wage	7.192	8.092	5.668	5.959
Male formal LFP	0.268	0.101	0.235	0.095
Female formal LFP	0.044	0.046	0.0964	0.125
Relative educ. heterogeneity	0.615	1.306	2.055	1.59
Stan. dev. male education	4.53	0.9	4.0	1.12
Stan. dev. female education	3.92	1.4	1.96	1.59
Avg. male education	6.44	2.60	4.05	2.11
Avg. female education	4.10	2.83	1.17	1.33
Relative earnings heterogeneity	253.53	296.66	158.35	91.78
Stan. dev. male earnings	311.25	324	179.4	85.3
Stan. dev. female earnings	57.72	68	21.1	28.8
Avg. male earnings	246.28	214.25	152.88	93.55
Avg. female earnings	19.96	27.38	9.68	16.26
Male preference for daughters	0.938	0.501	0.81	0.14
Female preference for daughters	0.922	0.148	0.97	0.34
Marriage squeeze	1.303	0.736	1.33	0.58

Table 4 - Economic and gender inequality indicators

In general, men earn more than women, as seen by the positive relative wages. The negative value for relative rural agricultural wages is due to the relatively high participation rate for women in that sector (8% of rural women work in agriculture and 4% of rural men do, where the very low participation rates for both genders are due to the fact that most individuals do not engage in wage labour instead they work on the household farm). The relative heterogeneity of male and female education is higher in rural areas, reflecting more equality in education between men and women in urban areas. The opposite holds true for earnings, where there is much greater inequality between men and women in urban areas. If we consider the standard deviations alone, we see that the means of those in the urban areas are almost double those in rural areas with the exception of male education where the mean is almost equal across the areas. These results correspond to the supposition that heterogeneity is an outcome of development where the degree of heterogeneity is substantially higher in urban areas. Additionally if we assume that opportunities for education typically predate employment opportunities, then we might suspect that the difference in heterogeneity between urban and rural areas is much larger for income than for education, as is the case for male education. In general, there is a preference for sons over daughters. Men's bias for sons is noticeably smaller compared to women's in rural areas. There appears to be an excess

supply of potential brides (approximately 30%) and the number does not vary substantially across rural and urban areas.

7. Results

7.1. Responded to Dowry Question

The results of a probit estimation of (5.3), the probability that an eligible female answered the dowry question, are listed in Table 5 below. The LSMS surveys are administered such that female interviewers conduct the interviews with female members of the household. Thus, information about the status of women and the various activities they undertake is obtained directly from the women themselves rather than from the male members of the household. Given that the response rate of the general female questionnaire is almost perfect, it is probably not the case that women did not respond to the dowry question because of their status within the household, which means that variables which reflect the status of women relative to their husbands should not influence brides' decision to respond to the dowry question. Individual traits of the eligible females may alter the response rate since it is conceivable, for example, that less educated women were less likely to understand the eligibility criteria. Ethnic dummy variables (Punjabis, Baloch, Sindhis, Muhajirs) enter into the estimation to proxy for a social custom that may prohibit women from answering the dowry question for fear of embarrassment, or alternatively because confusion with respect to the eligibility criteria was more severe in particular regions.

Variable	**Coefficient**	**S.E.**	$\frac{\partial F}{\partial X}$	**t-statistic**
Rural	-0.03	0.13	-0.01	-0.24
Sindhis/Muhajirs	-0.55	0.13	-0.21	-4.21
Punjabis	-0.003	0.12	-0.001	-0.03
Baloch	-0.46	0.17	-0.18	-2.66
Household income	0.000	0.00	0.00	0.61
Bride literate	0.11	0.18	0.04	0.62
Bride's education level	-0.005	0.02	-0.002	-0.22
Bride works in family production	-0.19	0.10	-0.07	-1.88
Bride works outside the home	-0.28	0.16	-0.11	-1.69
Bride migrated for marriage	0.17	0.09	0.07	1.82
Bride from rural area	-0.10	0.13	-0.04	-0.75
Family is nuclear	0.14	0.09	0.05	1.54
Groom's education level	0.013	0.01	0.005	1.35
Groom works in agriculture	0.26	0.22	0.10	1.17
Groom works in non-agriculture	0.06	0.11	0.02	0.56
Groom works in family business	0.11	0.12	0.04	0.93
Groom's income	0.000	0.00	0.00	1.07
Married for one year	-0.28	0.16	-0.11	-1.76
Married for two years	-0.30	0.16	-0.12	-1.93
Married for three years	-0.36	0.16	-0.14	-2.27
Married for four years	-0.59	0.15	-0.23	-3.82
Married for five years	-1.11	0.16	-0.42	-6.87
Constant	0.75	.19		3.87
Observations	1087			
$\overline{R}^2$	0.11			

Table 5 - Probit estimation of probability of answering dowry question

The results show that individual characteristics of both grooms and brides are insignificant determinants of the response rate. The ethnicity dummies do alter the response rate significantly. From the results, it is clear that years of marriage is a most important determinant of whether or not a woman responded. The dummy variables representing the number of years married before the survey year (1991) are negatively related to whether a female responded, that is, those females married earlier (i.e., for more years) were less likely to respond to the dowry question, hence providing support for the conjecture that the lack of response was caused by confusion over the eligibility criteria.

7.2. Bride's Education

The results from the estimation of a bride's education, equation (5.4), are reported in Table 6 below. Aside from the literacy rate of the bride's area of origin, personal characteristics of her parents also enter, in particular their income and her mother's education since (as seen from the correlation results) a mother's education has a greater influence on her daughter's education relative to her son's.

Variable	Coefficient	S.E.	t-statistic
Bride's parents' income	0.00003	0.00001	1.950
Bride's mother is literate	3.74	0.53	7.065
Female literacy rate	10.26	1.66	6.163
Bride from rural area	0.35	0.43	0.822
[Bride's parents' income]^2	0.00	0.00	0.055
Constant	-1.70	0.78	-2.196
Observations	649		
$\overline{R}^2$	0.36		

Table 6 - OLS estimation of bride's education

As would be expected, the main determinants of a woman's education are her parents income, her mother's education, and the female literacy rate. Being from a rural area is an insignificant determinant, once controlling for female literacy in the region. Higher order terms of bride's parents' income enter negatively and insignificantly. If the predicted values of bride's education (for varying levels of parental wealth) are plotted against parental income, we see that the relationship is linear. Therefore at higher levels of wealth, it seems that parents continue to invest in their daughter's education.

7.3. Bride's Labour Input

There is an important distinction between women working in an income-generating activity and those who only work within the home. Perhaps the critical difference is manifested in the social status associated with the two activities. On the other hand, in poorer families, women who also contribute to the household income in the case of necessity could be highly valued in marriage negotiations. In the analysis, the hours of work in these two types of activities are not separated, instead, to isolate the status component of female labour, the probability that a bride contributes directly to household income is considered.

The results from a probit estimation of the probability that a bride works in an income-generating activity, equation (5.6), are listed in Table 7 below. The estimation includes the female labour force participation rate, i.e., the proportion of women who earn a wage outside the home, in the area where the bride resides. This variable is computed using the regional variation of the entire LSMS sample (36,000 individuals) which produces 300 possible values corresponding to the different sampling locations.

Variable	**Coefficient**	**S.E.**	$\frac{\partial F}{\partial X}$	**t-statistic**
Bride's education (predicted)	-.1136	.0409	-.0295	-2.779
Household Income	-3.14e-06	1.21e-06	-8.17e-07	-2.603
Number of female members	-.127	.0417	-.0331	-3.050
Family farm	1.271	.1485	.344	8.555
Family business	.3571	.1346	.0951	2.654
Female labour force participation rate	1.553	.5888	.404	2.637
Rural	.244	.1598	.0636	1.526
Constant	-.9739	.1977		-4.927
Observations	678			
Pseudo R^2	.28			

Table 7 - Probit estimation of bride working in income-generating activity[24]

This labour force participation rate turns out to be a significant and positive determinant of whether or not a bride works in an income-generating activity. As would be anticipated, when the family has household production, either a family farm or business, a bride is significantly more likely to contribute labour to the enterprise. The number of female household members, household income, and the education of the bride all have negative coefficients and enter the estimation significantly. Residing in a rural area is positively related to the probability that a bride contributes to family income but is insignificant.

A tobit estimation of brides total weekly hours of labour, equation (5.5), includes the same independent variables.[25] The results are reported below:

[24]The potential endogeneity of bride's education is dealt with using a two-stage estimation approach. The reported $\overline{R}^2$ from the instrumenting equation is 0.36.

[25]The tobit model estimated is a Type 1 tobit according to Amemiya (1985) taxonomy. It is estimated using the TOBIT command in STATA.

Variable	Coefficient	S.E.	t-statistic
Bride's education (predicted)	0.65	0.58	1.12
Household Income	-0.000024	0.00001	-2.26
Number of children	3.56	0.85	4.19
Number of female members	-5.48	0.77	-7.10
Family farm	5.96	3.03	1.97
Family business	1.67	2.63	0.64
Female labour force participation rate	-3.85	13.43	-0.29
Rural	5.74	3.26	1.76
Constant	51.1	3.79	13.48
Observations	649		
Pseudo R^2	0.02		

Table 8 - Tobit estimation of bride's work hours

We see that the determinants of brides total labour are different from those which influence her decision to work in an income-generating activity however. In particular, the number of children a woman has is significantly and positively related to her labour hours. The other important determinants are household income and the number of female members which, similar to above, are negatively related to the bride's labour input. Additionally, brides work more hours if the family has a farm. The remaining variables enter into the estimation insignificantly. It may be worth noting, however, that when the two types of labour hours are separated, the coefficients of a bride's education and the labour force participation rate have opposite signs in the independent estimations. That is, brides' education is related significantly and positively to their household labour and the labour force participation rate enters negatively and significantly. In an estimation of brides' labour hours into an income generating activity, the opposite relationships ensue.

Recall from the previous section that the predicted values from the above probit and tobit estimations, represented by $\widehat{W}$ and $\widehat{H}$ respectively, will enter into the estimations of the probability of whether a bride receives a dowry, equation (5.7), and the value of dowry, equation (5.8). The predicted labour hours from the tobit estimation which are negative were assigned to zero for the estimations.

7.4. Dowry Paid

The results from a weighted least squares estimation of the probability of a bride paying a dowry, equation (5.7), are listed in Table 9 below. In each case an unweighted linear probability model was initially estimated, from which the predicted values of the dependent variable were used to

compute the weights for the subsequent regression.[26] The inverse Mills' ratio from estimation of the first selection rule, of whether or not a bride responded to the dowry question, is included in the estimation.

The variables which pertain directly to Conjectures 1 to 3 are relative wages, relative heterogeneity, and average income. Dowry as a compensation payment (Conjecture 1) is prominent when there is homogeneity (i.e., negatively related to heterogeneity), relative wages are high, and average income is low. Dowry as an inheritance (Conjecture 2) is more likely when there is equality between brides and grooms (i.e., negatively related to heterogeneity), relative wages are low, and the population is wealthy. Dowry as a groomprice (Conjecture 3) is more likely when heterogeneity is large, relative wages are high, and the population is wealth.

Variables which reflect the quality of grooms and brides and their respective households are also included to test for the possibility that dowry payments are transferred only amongst families highly positioned in society. It can be argued that the wealth of the groom family is an endogenous determinant of the value of dowry (where from Table 2 we see that dowry forms a significant proportion of household annual income). To this end, total food expenditure enters into the estimations to proxy for the wealth level of the groom's household. It is worth noting that the results are unchanged if household income enters in instead. Since dowries may occur only in households with particular work patterns between the men and women, the labour activities of brides and grooms are considered. Variables which may affect marriage customs, and therefore dowries, also enter the estimation; these include whether or not the couple form a nuclear family, if the bride migrated for marriage, and the relative preference for daughters of both men and women. Ethnic dummy variables enter into the estimation to proxy for variation in social custom which may or may not allow for dowry to be transferred. The included categories are the Punjabis (56% of the sample), Pakhtuns (15% of the sample), and Baloch (7% of the sample).[27] The Punjabis form a stratified society where they are typically divided into *qaums.* These *qaums* are based on occupational spe-

[26]The weights used are given by $w_i = [\widehat{y}_i(1-\widehat{y}_i)]^{\frac{1}{2}}$, where $\widehat{y}_i$ is the predicted dependent variable from an unweighted estimation of the linear probability model. For some observations the predicted probability exceeded one (by at most 0.2) and in these cases the predicted value was assigned to 0.99 for the estimation. This procedure decreased the average predicted probability by at most 0.009. There does not appear to be a single predictor which is causing these very high probabilities. Since the average probability of paying a dowry is very high, at 87%, there is substantial scope for higher values of the education and income levels to perfectly predict the occurrence of dowries.

[27]See Blood (1995) and Wilber (1964) for descriptions of these different ethnic groups which are primarily concentrated in their home provinces. See also Klein and Nestvogel (1992) for an analysis of women in Pakistan.

cialization which gives each group its name and position in the social hierarchy. The Pakhtuns form one of the largest tribal groups in the world. They are organized into clans with an intense egalitarian ethos. Central to their identity is the adherence to a male centered code of conduct. The Baloch are also a tribal population who are typically pastoral nomadic. In contrast to the other societies, lineages play a minimal role and marriage patterns embody substantial flexibility. The left out category forms an ethnically diverse group which is typically educated and resides in the province of Sindh. Additionally, the demographic variable, known as the marriage squeeze, enters into the estimation and represents the ratio of potential brides to grooms.

	Urban		**Rural**	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Groom's parents' food expenses	6.72e-05	3.68e-05	3.36e-06	2.19e-05
(Groom's parents' food expenses)^2	-6.54e-09	3.41e-09	2.32e-11	3.63e-10
Bride's parents' income	-4.12e-06	2.49e-06	-1.07e-07	3.28e-06
(Bride's parents' income)^2	1.57e-11	1.18e-11	-1.90e-12	2.23e-11
Groom's education	.0093	.0047	.0106	.00585
Groom's earnings	-7.35e-06	1.48e-05	-3.17e-05	3.44e-05
Groom works on family farm	-.0287	.161	-.0341	.0631
Groom works in family enterprise	.00206	.051	-.0583	.0771
Bride's education	-.00191	.015	.00915	.0387
Bride's total hours of work	.00156	.0027	.00106	.00324
Bride works for income	-.244	.177	-.0650	.1513
Pay heterogeneity	-.0205	.018	-.0409	.0152
Educ. heterogeneity	-.000115	7.27e-05	-.00037*	.00026
Average income	8.73e-07	6.21e-07	-2.15e-07	5.21e-07
Relative non-agric wages	-.00113	.0027	.00113	.00431
Relative agric wages			.0595	.0614
Baloch	-.315*	.0781	-.361*	.125
Pakhtuns	-.0506	.0836	-.00642	.117
Punjabis	.0215	.0588	-.0591	.0836
Male preference for daughters	.108*	.0498	.530*	.199
Female preference for daughters	.0557	.1789	-.0520	.0590
Bride migrated for marriage	.0319	.046	.1222*	.0488
Marriage squeeze	-.0181	.0277	-.0317	.0416
Nuclear family	.0582	.0692	-.0647	.0734
Inverse Mill's ratio	-.230	.385	.389	.3034
Constant	.6854*	.310	.864*	.3303
Observations	321		290	
$\overline{R}^2$	.15		.125	

Table 9 - Linear probability estimation of the probability of giving a dowry[28]

The inverse Mill's ratio from the regression of the response rate to the dowry question is insignificant. In other words, the probability of answering the dowry question is unlikely to be correlated with the probability of paying a dowry.[29]

We see that very few of the variables relevant to Conjectures 1 to 3 are significant determinants of the probability of giving a dowry. Relative heterogeneity in earnings is an insignificant determinant, whereas that of education is significant and negatively related to paying a dowry in rural areas. In other words, the more equal is the degree of heterogeneity in education across brides and grooms, the more likely a dowry is paid. This result is in accordance with the inheritance role for dowry, as described in Conjecture 2, however, none of the other predictions of that conjecture are supported. In general, economic variables do not seem to explain much of the variation in the prominence of dowries. It is the case that a very high percentage (approximately 87%) of the sample paid a dowry and hence there is not much variation to explain. However, on the other hand, as we will now see, social customs do seem to play a strong role in explaining the prominence of dowry payments in both rural and urban areas.

Ethnic variation is an important determinant of whether or not a dowry was paid at marriage or not. Being of Baloch ethnicity significantly lowers the probability that a dowry is given. As already noted, these are typically nomadic tribal people, and perhaps even more importantly their marriage and kinship patterns are relatively flexible. Ideally, a man should maintain close ties with relatives in his father's line, but in practice most relations are left to the discretion of the individual and it is quite typical for lineages to split and fragment.[30] It is interesting to note, that this result echos conclusions elsewhere in the literature on marriage payments, where typically the custom of dowry is found in stratified societies where maintaining class and ethnic alliances with one's in-laws is of utmost importance.[31] Usually bride-price is found in societies which are relatively

[28] An asterix following the coefficient denotes significance of the variable the 5% level. The weighted least squares method for the linear probability model of paying a dowry was used. Bride's education, the probability that a bride works for income, and brides' total work hours are assumed endogenous. The method of two-stage least squares is used to deal with this problem. The $\overline{R}^2$ of the instrumenting equations are 0.36, 0.28, and 0.02 respectively.

[29] It should be noted that the significant determinants of the probability that a dowry is paid all remain significant when the inverse Mill's ratio is omitted from the estimation. The coefficients on the significant variables are altered by, on average, one half of a standard error, (no parameter estimates changed by more than 0.8 of a standard error), when the inverse Mill's ratio is included in the estimation.

[30] See, Blood (1995).

[31] See Goody (1976), Harrell and Dickey (1985), Gaulin and Boster (1990), and Jackson and Romney (1973) for

homogeneous, egalitarian, and tribal.[32] This data does not contain information on bride-prices but the low occurrence of the dowry custom amongst the Baloch may be consistent with such a custom.

Curiously, of all the variables which vary by geographical location, only the preference for daughters by men is a significant determinant of whether or not brides receive a dowry. This variable enters into the estimation positively. This relationship is independent of the income effect, where generally it is believed that there is less of a male bias in higher income areas since the average income in the area is also included in the regression. Additionally, the relative population of females is controlled for by the marriage squeeze variable.

Brides who migrated for marriage are significantly more likely to receive a dowry in rural areas. From the total number of brides who migrated, 92% did so for the purposes of marriage. Of those who migrated for this reason, 44% went from rural areas into rural areas, 28% from rural areas into urban areas, 23% from urban areas into urban areas, and the remaining 4% moved from urban areas into rural areas. When these different possibilities enter into the estimation separately, the only one that is significant is brides migrating from one rural area into another. This tentatively rules out the importance of brides moving to wealthier regions, i.e., urban areas, to marry into families of superior status.[33] One explanation for this result perhaps lies in the traditional custom of cross-cousin marriage in Pakistan, where kinship groups are likely to reside within close proximity. There is evidence that this custom is on the decline; however, in some localities it remains an influence in the marriage selection process, especially in rural areas.[34] Dowry payments have a particular role in the reciprocity relationships embedded in this traditional institution and hence are more likely to occur where the custom is practiced.[35]

That a bride joins a nuclear family is an insignificant determinant of whether or not she pays

the association between dowry and wealth differentiation.

[32]See Goody and Tambiah (1973) for a discussion of brideprice.

[33]It is quite plausible that whether or not a bride migrated for marriage is an endogenous determinant of the probability that a dowry was paid and of the value of that payment. This may well be the case if we think that women who can afford a high dowry are able to consider a larger pool of potential grooms, than just the ones at home, to find her match. Given this, we would expect to find that women migrate to the city only if they can afford a husband there and hence the existence of dowry payments should be associated with women who migrate from rural to urban areas. Additionally, it should be the case that higher dowry payments are positively associated with the probability that a woman migrates for marriage. However, neither of these relationships is found in the data (see tables 14 and 15 in the Appendix for the result for the value of dowries). Therefore, I will not consider this variable to be endogenous in the estimations of the paper.

[34]See, for example, Korson (1971), Pastner (1979) and (1981), Donnan (1988), Wahab and Ahmad (1996), and Shami et. al. (1994).

[35]See, for example, de Munck (1990), Donnan (1988), and Eglar (1960).

a dowry. Nonetheless, given that the selection procedure over samples extended households, this may be a more important determinant than the estimation results reveal. The main concern is that dowry may function differently within nuclear households compared to extended households, particularly because the formation of the former is usually considered a sign of modernisation, or the transformation into a more modern family structure. However, performing a Chow test using the divided sample between nuclear and extended households in the estimation of the value of dowry, it is not possible to reject the hypothesis that the two regressions are the same.[36]

7.5. Value of Dowry

The results from the regressions on the value of dowry, equation (5.8), are listed in Tables 10 and 11 below for urban and rural samples respectively. The central components of the estimations are characteristics which pertain to the determinants of dowries in Conjectures 4 to 6. These include the quality of the bride and groom which is represented by their education, income, and labour activity. Since individual earnings are only reported for those individuals who work for a wage, dummy variables which are equal to one if the groom works primarily in his household farm or business are also included in the estimations. Conjectures 4 to 6 also place predictions on the wealth level of the brides' and grooms' parents, the average wealth level of all other competing parents (represented by average household income), and relative groom and bride heterogeneity in quality. Not only are the individual traits potentially important in absolute terms, but it is also possible that their relative status affects dowry payments. In particular, dowry payments increase in the relative quality between the groom and bride in Conjecture 4, whereas dowry payments change with the absolute values in Conjecture 5 and with the relative quality of grooms and brides relative to all grooms and brides respectively in Conjecture 6. Because the correlation between the absolute and relative values of these variables is very high, they enter into separate estimations. The first column of results in the two tables below includes the absolute values, the relative quality between the bride and groom are in the second, and the relative quality of the bride and groom with respect to all brides and grooms respectively are in the third column.

Of all the general characteristics that were important in determining the probability that a dowry was paid (Table 9), only ethnicity is also a significant determinant of the value of dowry.

[36]The F-statistic is equal to 1.20 and is less than the critical value at all significance levels.

To this end, the other general characteristics are not included in the estimation on the value of dowry, and, in particular, male preference for daughters and whether or not a bride migrated for marriage are used to instrument for the probability that a dowry was paid in the first stage of the estimation. See Table 13 in the Appendix for an estimation on the value of dowry when these general characteristics are included, together with years of marriage, which, as already discussed, is used to instrument for the estimation of whether or not individuals responded to the dowry question. Furthermore, for the urban sample below, the inverse Mill's ratios from both sampling estimations are not included because they are not significant determinants, as is seen in Table 12 in the Appendix. This is not the case for the rural sample, where the inverse Mill's ratio from the estimation of the response rate is significant and therefore included in the estimations of Table 11.

Variable	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**
Household food expenses	12.22*	3.16	13.90*	3.107	14.85*	3.087
(Household food expenses)^2	-.0011*	.000325	-.0012*	.000325	-.0012*	.00032
Bride's parents' income	-.0287	.1758	.0607	.173	.1018	.172
(Bride's parents' income)^2	9.58e-07	7.58e-07	1.10e-06	7.63e-07	1.16e-06	7.52e-07
Groom's education	1459.22*	393.153				
(Groom's educ. - avg. educ.)					1119.62*	435.827
Bride's education	997.924	1098.14				
(Bride's educ. - avg. educ.)					-2868.86*	826.581
(Groom's educ. - Bride's educ.)			1272.605*	383.75		
Groom's earnings	5.35*	1.205				
(Groom's pay - average pay)					5.70*	1.252
(Groom's pay - Bride's pay)			5.191*	1.196		
Groom works for family farm	29602.73	16977.9	30013.26	17138.53	31710.27	16903.55
Groom works for family bus.	10903.16*	4200.2	11817.21*	4186.19	12035.8*	4066.44
Bride's hours of work	139.75	200.38	237.04	198.01	343.84	198.003
Bride works for income	-2506.724	15997.13	-10988.02	15747.63	-14668.93	15639.17
Educ. Heterogeneity	-1466.43	1521.98	-1810.77	1529.92	233.60	1683.72
Pay Heterogeneity	16.222*	7.0771	15.29*	7.143	13.93*	7.128
Average income	.03325	.0442	.0355	.0446	.01126	.0454
Baloch	418.75	8686.89	-4879.40	8412.59	-3428.57	8312.44
Pakhtuns	5387.66	6221.96	1733.81	6026.85	2702.74	5938.18
Punjabis	24641.84*	4073.18	23793.93*	4093.03	23453.85*	4034.06
Constant	-40626.11*	13352.28	-43513.38*	13430.51	-49707.29*	13723.9
Observations	307		307		307	
$\overline{R}^2$	0.433		0.422		0.437	

Table 10 - OLS estimation of the value of dowry for the urban sample[37]

All three of the estimations show that grooms' household wealth is an important positive determinant of the value of dowry paid in urban areas. Both lower and higher order terms enter significantly, and show that the relationship seems slightly concave. The quality of the groom, in both absolute and relative terms, is positively and significantly related to the value of urban dowries. This result is reflected in both the earnings and education of grooms. On the other hand, bridal parent income does not significantly affect the value of dowry. This result, together with the positive impact of groom quality, rules out the inheritance role for dowry payments, as prescribed by Conjecture 5. The importance of the quality of the groom and his household, together with the positive significance of relative heterogeneity in earnings provides strong support for the groomprice role of dowry payments in urban areas. In fact, the third estimation below almost perfectly supports Conjecture 6 (groomprice), where additionally brides relative attributes are negatively and significantly related to the value of dowry. Dowry as a compensation payment is not necessarily ruled out by the estimations (as the predictions of Conjecture 4 are supported in the second estimation), however, this role for dowry cannot explain the importance of heterogeneity and the relative status of grooms and brides with respect to other grooms and brides respectively. Whereas dowry as a groomprice payment suggests that dowry payments should be increasing in the relative quality of the groom and bride with respect to each other, as is evident from equation (4.10). We see that higher dowries occur amongst the Punjabis. This result is also consistent with the groomprice hypothesis since, as already mentioned, the Punjabis are the most stratified society of all the groups, and hence relative status and the degree of heterogeneity are more likely to play a role in the marriage market of such a society. Moreover, this relationship is consistent with other findings in the literature on marriage payments where increasing dowries are usually associated with stratified societies where preserving status through marriage is of utmost importance.[38]

[37] An asterix following the coefficient denotes significance of the variable at the 5% level. Bride's education, the probability that a bride works for income, and brides' total work hours are assumed endogenous. The method of two-stage least squares is used to deal with this problem. The $\overline{R}^2$ of the instrumenting equations are 0.36, 0.28, and 0.02 respectively.

[38] See, for example, Hoch (1989) and Gaulin and Boster (1990).

Variable	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Household food expenses	7.028*	2.82	7.88*	2.85	7.82*	2.82*
(Household food expenses)^2	-9.59e-05*	4.4e-05	-1.09e-04*	4.4e-05	-1.1e-04*	4.4e-05*
Bride's parents' income	-2.62*	.382	-2.65*	.388	-2.61*	.388*
(Bride's parents' income)^2	1.66e-05*	2.25e-06	1.93e-05*	2.02e-06	1.93e-05*	2.10e-06*
Groom's education	1301.63	741.27				
(Groom's educ. - avg. educ.)					1246.80	822.80
Bride's education	9650.13*	4006.49				
(Bride's educ. - avg. educ.)					-1967.13	2811.65
(Groom's educ. - Bride's educ.)			873.04	738.03		
Groom's earnings	-10.86*	4.758				
(Groom's pay - average pay)					-13.28*	5.13*
(Groom's pay - Bride's pay)			-10.035*	4.72		
Groom works for family farm	3132.84	8741.67	3711.18	8760.75	2276.70	8760.16
Groom works for family bus.	22258.73*	10839.35	23118.19*	10993.15	21830.24*	10860.05*
Bride's hours of work	336.39	409.21	436.85	413.73	469.83	411.33
Bride works for income	-16615.84	19183.37	-24883.75	19289.28	-25582.94	19201.35
Educ. Heterogeneity	-1939.32	2022.75	-2078.61	2045.18	-1143.46	2529.83
Pay Heterogeneity	70.65	50.53	52.77	51.15	56.36	52.45
Average income	.0832	.102	.0882	.104	.094	.104
Baloch	14296.2	22914.4	10062.59	23160.2	8424.03	23031.97
Pakhtuns	3732.31	11852.15	1977.24	12054.05	1762.48	12015.67
Punjabis	1093.23	11219.36	6597.10	11272.76	5916.88	11237.8
Inverse Mill's Ratio λ_R	135789.7*	49995.28	147368.7*	50554.97	147549.8*	50223.7*
Constant	119548.3*	35603.17	126247.3*	35881.38	125087*	36023.19*
Observations	256		256		256	
$\overline{R}^2$	0.452		0.434		0.439	

Table 11 - OLS estimation of the value of dowry for the rural sample

In contrast to the urban sample, in addition to the wealth of the groom's household, brides' parents' income is a significant determinant of the value of dowry. Both lower and higher order terms enter significantly, and show that very high income parents pay high dowries. The degree of heterogeneity does not significantly affect the value of rural dowries. The results in the first column provide direct support for the inheritance role of dowries where, in addition to the effects of parental wealth, groom's earnings enter negatively and bride's education enter positively. The compensation role of dowry is rejected by the results in the second estimation. Likewise, the negative impact of groom's relative and absolute earnings (columns one and three), rejects the groomprice role for rural dowry payments. The Inverse Mill's ratio from the estimation of the response rate of the dowry question is positively and significantly related to the value of dowry. This implies, that in

rural areas, women who received (or paid) higher dowries were more likely to respond to the dowry question.

8. Conclusion

To my knowledge, this is the first empirical investigation, of dowry payments in Pakistan. In the literature on marriage payments, dowry is posited to have several potential roles and the aim of this paper was to identify which of these roles was relevant to present-day dowry payments in Pakistan. The results of the empirical analysis support the groom-price explanation in determining the value of these payments in urban areas, whereas dowries serve the role of a pre-mortem inheritance in rural areas. Since the traditional custom of dowry in Pakistan is considered an inheritance to daughters, it appears that this custom still persists in rural areas whereas, like in India, the custom has evolved into a groomprice payment in urban areas.

On the other hand, the occurrence of dowries appears to be less a result of economic forces, and more a function of cultural norms. This is suggested by the fact that ethnicity is an important determinant of the incidence of dowries. Moreover, the probability that brides' parents paid a dowry is not significantly related to the status of either brides or grooms or their families. Rather, traditions rooted in tribal cultures and the practice of cross-cousin marriage may be a more important influence. It appears as though a higher status for women from the perspective of men, reflected in their relative preference for daughters, is positively associated with the occurrence of dowry payments. This would seem to suggest, that from the male perspective, the institution of dowry is not considered detrimental to either women or themselves.

9. Appendix

Variable	Urban		Rural	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Household food expenses	8.08*	3.46	7.08*	2.76
(Household food expenses)^2	-6.37e-04	3.5e-04	-9.62e-05*	4.34e-05
Bride's parents' income	.0254	.208	-2.57*	.360
(Bride's parents' income)^2	7.91e-07	8.53e-07	1.65e-05*	2.16e-06
Groom's education	1135.93*	462.08	1282	788.43
Bride's education	1111.47	1163.93	9298.48*	3879
Groom's earnings	7.16*	1.64	-10.90*	4.69
Groom works for family farm	32813.77	17829.72	2701.35	8768.82
Groom works for family bus.	13518.2*	4795.96	21624.06*	10700.75
Bride's hours of work	65.0	227.59	308.04	401.96
Bride works for income	7457.04	17984.64	-15690.6	18976.9
Educ. Heterogeneity	-1435.13	1675.51	-1955.62	1971.80
Pay Heterogeneity	22.73*	8.02	68.32	49.25
Average income	.0268	.048	.094	.10
Inverse Mill's Ratio λ_R	22403.12	30517.6	133920.4*	40487.41
Inverse Mill's Ratio λ_P	76745.09	49495.23	-11610.59	63136.46
Constant	10789.08	22771.82	115743.8*	37028.09
Observations	287		256	
$\overline{R}^2$	0.369		0.456	

Table 12 - OLS Estimation of the value of dowry with Inverse Mill's ratios[39]

[39] An asterix following the coefficient denotes significance of the variable at the 5% level. Bride's education, the probability that a bride works for income, and brides' total work hours are assumed endogenous. The method of two-stage least squares is used to deal with this problem. The $\overline{R}^2$ of the instrumenting equations are 0.36, 0.28, and 0.02 respectively.

Variable	Urban		Rural	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Household food expenses	9.24*	3.50	6.39*	2.93
(Household food expenses)^2	-7.93e-04*	3.5e-04	-8.28e-05	4.56e-05
Bride's parents' income	-.130	.186	-2.22*	.364
(Bride's parents' income)^2	1.32e-06	8.15e-07	1.43e-05*	2.15e-06
Groom's education	1423.90*	434.03	1345.67	742.11
Bride's education	1472.45	1178.89	11790.71*	3868.52
Groom's earnings	7.54*	1.64	-8.44	4.75
Groom works for family farm	33991.44	17996.14	958.07	8911.91
Groom works for family bus.	15388.71*	4757.55	17880.87	10919.53
Bride's hours of work	24.87	242.95	148.65	463.59
Bride works for income	5972.29	16494.53	-9821.65	19874.51
Educ. Heterogeneity	-2264.01	1686.0	-2785.0	1961.22
Pay Heterogeneity	17.45*	7.60	94.13	50.32
Average income	.044	.047	.1132	.10
Male daughter preference	-2220.63	3678.91	16046	24582.35
Female daughter preference	-5432.65	11854.6	6211.77	9278.98
Bride migrated for marriage	154.85	3982.57	9356.83	6264.58
Years married	515.14	1272.43	-1687.75	2149.13
Constant	-13480.14	19154.05	26608.6	37181.33
Observations	287		256	
$\overline{R}^2$	0.358		0.436	

Table 13 - OLS Estimation of the value of dowry with sampling instruments

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