Center for Studies in Demography and Ecology

How Much Gold Will You Put On Your Daughter?

A Behavioral Ecology Perspective on Dowry Marriage

by

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Abstract

This paper presents and evaluates a model of South Asian marriage costs based on the logic of Embodied Capital theory[1]. The model links both cross-sectional and temporal trends in marriage expenditures to an increase in per-child investment related to increasing participation in a wage-labor economy. The model predicts that expected relationships will differ based on the functions of different aspects of marriage costs as either property transfers or displays of wealth, and on the gender of the child that marriage costs are paid for. Trends in three types of marriage costs are examined, including costs of gold, costs of wedding functions, and total marriage costs. Five specific predictions are tested using retrospective data collected[2] as part of my dissertation research in the city of Bangalore, India, which includes over 1,100 marriages that span the time period from 1940-2002.

I find that dowry marriages are more common among wealthier and better educated families and more recently in time, while bride-price marriages are restricted to poorer and less educated families earlier in time. Furthermore, I find that educational characteristics are better predictors of transfer elements of marriage costs while wealth characteristics are better predictors of display elements of marriage costs across several types of analyses. Additionally, I find that only transfer elements of marriage costs show evidence of inflation over time while display elements show no change or even mild deflation. Finally, I briefly compare my predictions and findings to those of other authors relating to the topic of dowry inflation.

[1] Kaplan, Hillard. 1996. A theory of fertility and parental investment in traditional and modern human societies. *Yearbook of Physical Anthropology* 39:91—135.

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INTRODUCTION

The economics of marriage in South Asia has received much attention in the literature of cultural anthropology, demography, and economics because Indian weddings are remarkable for the very large sums spent on gifts, property transfers, and lavish wedding-related functions (e.g. Caplan 1984, Harrell and Dickey 1985, Ifeka 1989, Roulet 1996, Srinivas 1984, Upadhya 1990 Anderson 2003, Botticini and Siow 2002, Caldwell, Reddy, and Caldwell 1983, Dickemann 1979, 1980, Edlund 2001, Sharma 1993). Moreover, many authors have argued that the sums spent on weddings, appear to be increasing over time in conjunction with increasing economic development, a phenomenon termed "dowry inflation" in the literature. Despite the interest in the literature, however, quantitative investigations relating to marriage costs in South Asia are rare and often problematic (e.g. Singh 1996). Moreover, the few rigorous analyses that do exist are based on data which was not collected for the purpose of such studies, and thus leave many questions unanswerable (e.g. Rao 1993a and 1993b, Deolalikar and Rao 1998, Anderson 2004).

More specific to my interests in this dissertation, in the evolutionary anthropology literature a few models address the question of why and when dowries are paid (e.g. Dickemann 1979, Gaulin and Boster 1990), but none of the published models are easily adaptable to explaining the situation in modern South Asia. Dickemann's model, for example, attempts to explain the phenomenon of dowry inflation, but as her explanation relies on the historical practice of polygyny it is therefore not relevant in modern India where polygyny is not only illegal among most groups, but even in practice is very rare. On the other hand, Gaulin and Boster's broad model of female-female competition predicts that dowry will be given in monogamous, stratified societies and, though it has been tested cross-culturally has not been applied to the details of variation or change in marriage costs within a single culture. Thus there has been no systematic explanation of the dowry marriage system in South Asia that incorporates an evolutionary perspective.

The goal of this paper is to rectify this omission by applying the logic of embodied capital theory from evolutionary anthropology to the economics of marriage in modern urban South India to attempt to explain both cross-sectional relationships and also shed some light on changes over time. My model will draw on the work of Kaplan (1996) that links economic parameters with measures of fertility and parental investment, and specifically describes the conditions affecting parental investment strategies in market economies. By treating marriage costs as a form of parental investment, this model allows me to make five general predictions. Specifically, the embodied capital approach allows the use of individual and family characteristics to predict (1) the likelihood that dowry marriage will be practiced, (2) the size and

types of marriage costs that will be paid, (3) the relationship between desired spouse characteristics and marriage costs, (4) the relationship between actual spouse characteristics and marriage costs, and (5) which aspects of marriage costs should change over time.

Analyses will be conducted using my dissertation dataset, which between parents and children includes more than a thousand marriages spanning over 60 years and which was collected specifically with this type of analysis in mind. My analysis will focus on three types of marriage costs, each of which reflects a different aspect of parental motivation and thus should be expected to have different cross-sectional predictors and different patterns of change over time. The three types of marriage costs addressed in this paper are gold transfers, costs of marriage-related functions, and total marriage costs. The results stress both the complexity of motivations that affect marriage costs in South India and the important differences between the types of marriage costs which transfer wealth between families and those types of marriage costs which are alienated from both families as part of a social display.

I begin by describing the South Asian dowry marriage system as it exists in modern times as well as its recent history in South India. I then give a summary of Kaplan's embodied capital theory, followed by a discussion of why marriage costs can be treated as a form of parental investment, and a summary of three different aspects of Indian marriage costs and their respective functions. After this I develop an embodied capital model of marriage costs and outline several predictions that can be derived from it. I then summarize the dataset and model parameters to be used in my analysis, followed by a detailed synopsis and discussion of my results. This will be followed with further discussion regarding the limitations and implications of my research. Finally, following a summary of my findings, I will conclude by arguing that a behavioral ecological approach to dowry marriage makes an important contribution to the debate on this issue by both providing (a) a workable explanation of the recent changes in the dowry marriage phenomenon in South Asia and (b) successfully linking the phenomenon to evolutionary theory.

THEORETICAL AND ETHNOGRAPHIC BACKGROUND

Indian Marriage and the Indian Dowry System

Indian marriage practices are very diverse, and differ widely among members of different religions, castes, geographic regions, languages, and social classes in terms of the content of the ceremony itself, the types and amount of gifts or marriage payments given, and who is considered an acceptable marriage partner (Srinivas 1984, Upadhya 1990). There are, however, several factors that are common to virtually all marriages in India and might be said to form a paradigm for Indian marriage.

First, almost all marriages are arranged primarily by the parents or close relatives of the bride and groom. Even if the bride or groom have significant input into the choice of partner, the marriage negotiations are usually conducted by the parents or relatives, and parental approval is necessary for a marriage to be socially accepted in the community (Upadhya 1990). Second, Indian marriages have traditionally been endogamous in terms of caste, sub-caste, religion, and language group (Upadhya 1990). While sub-caste boundaries have become markedly less important in urban areas in recent times, marriage outside one's larger caste or religious group is still unusual and potentially scandalous, and may entail the removal of parental economic support. Even in the most progressive households with whom I interacted, a preference for marriage within the caste, language, and religious group is still voiced. Third, Indian society traditionally prescribes different social roles for men and women in relation to marriage and the family (Boserup 1970, Goody and Tambiah 1973, Goody 1976, Srinivas 1984) which are impacted by their marriages. Generally, women are expected to leave their natal home at marriage and to live thereafter with the family of the groom to whose customs and interests they are expected to adapt. Moreover, most brides do not work after marriage and in some groups it is still considered taboo for women to work outside the home. Men, on the other hand, are expected to continue living with and/or supporting their parents and to undertake primary responsibility for supporting their wife and children. Although educational and job opportunities are becoming increasingly accessible to women, the effects of these traditional norms still have repercussions in terms of both parental investment and marriage market decision-making.

Fourth, traditionally among the elite, but increasingly commonly among all social groups, weddings are lavish social occasions the costs of which are borne predominantly by the family of the bride (e.g. Goody and Tambiah 1973, Srinivas 1984). Very large expenditures may be made housing, feeding, entertaining, and gifting large numbers of family members and other guests, often for several days at a stretch. Fifth, marriages frequently entail significant transfers of wealth (whether in the form of household goods, gold jewelry, clothing, property, or cash) from the family of the bride to the family of the groom, and, to a lesser degree, in the opposite direction (e.g. Goody and Tambiah 1973, Srinivas 1984). This property may or may not be used by the bride or groom themselves, but is usually under the ultimate control of the parents of the groom. These transfers occur primarily at the time of (or just subsequent to) the wedding, but may begin at the time of the engagement and continue for years after the marriage ceremony. It is these wealth transfers, or some portion thereof, which are usually referred to collectively as dowry. Expensive weddings and large dowries put pressure on the families of girls, who must either spend years saving or borrow significantly to be able to compete for desirable grooms.

Though the expenses are less extreme, families of boys must also plan ahead to be able to spend large sums that will be expected of them at the time of a son's wedding.

While these practices have reportedly been common among upper-caste Hindus for centuries, among many groups the adoption of dowry marriage is a relatively recent phenomenon. Among lower caste groups as recently as the 1970s it was common for the groom's family to pay all or most of the wedding expenses, and sometimes even to pay a bride-price (usually in the form of cows, sheep, goats or small parcels of land) to the to the family of the bride (e.g. Srinivas, 1984). One elderly Scheduled Caste informant told me that there was a saying in her caste in the early part of the 20th century that if there were no appropriate relative available parents of boys had to "wear out three pairs of sandals" looking for a bride for their son. She explained that this was a way of highlighting the difficulty of finding marriageable girls in their community at that time, and of explaining the reasons why bride-price was paid. Whatever the cause of this original condition, the situation has radically shifted since that time. Increasingly families have adopted the practice of dowry marriage, especially when they have sons with desirable characteristics—a good education, a steady income—who will attract good offers in the marriage market. When bride-price marriages are practiced nowadays they tend to take place in circumstances where the groom's family is not in a position to command resources for their son (because he is disabled or unemployed, for instance), and thus offer to pay to make certain that their son will marry.

Anthropological Models of Dowry Marriage and Dowry Inflation

As suggested above, the ethnographic literature provides extensive qualitative evidence both that marriage costs have increased within groups that traditionally practiced dowry marriage and that castes and social classes which traditionally did not have these practices have adopted them (e.g. Srinivas 1984, Caplan 1984, Harrell and Dickey 1985, Ifeka 1989, Upadhya 1990, Roulet 1996, and others). There has been significant interest in the anthropological literature regarding these two apparently interrelated questions, specifically: (a) why are marriage costs and dowries rising?, and (b) why is the practice of dowry marriage being adopted by those who traditionally had different practices? These phenomena are generally viewed as parts of the same trend, often referred to collectively as "dowry inflation", which has been widely discussed in the anthropological literature. In these articles, there are two broad categories of explanations which appear: those that link the phenomena to rapid population growth and a resulting marriage squeeze for daughters, and those that link it to economic development and the growth of a market economy.

The first of these explanations is elaborated by Caldwell, Reddy, and Caldwell (1983). They suggest that dowries have risen because there has been a change in recent decades from a surplus of potential husbands to surplus of potential brides. It is socially important in India that women marry men several years older than themselves. Under typical mortality patterns, there is usually a small surplus of marriageable women given the number of marriageable men. Under conditions of rapid population growth, however, such as that which characterized India for much of the latter half of the 20th century, this surplus becomes exaggerated. The authors argue that such an imbalance between the numbers of marriageable men and marriageable women, known as a marriage squeeze, may have resulted in increased competition between the families of young women for appropriately-aged men, which could have led to inflation in the marriage costs paid by the bride's family. This hypothesis has been supported by the work of Rao (1993a), who applied district-level sex ratio estimates to local data on dowry. Rao's conclusions, however, have been criticized by Edlund (2000), who claims that her analysis of the same data does not replicate Rao's results. While these ideas are important and deserve further testing, in this paper I will focus on the second type of explanation.

Of the several authors who have linked Indian marriage change to economic development, M. N. Srinivas has been one of the most influential. Srinivas was a very prominent Indian sociologist, often known as the father of Indian sociology though he trained under A. R. Radcliffe-Brown and E. E. Evans-Prichard as a structural functionalist anthropologist (Madan 2001). Srinivas (1984) uses a distinction between traditional and modern dowry systems to describe why the dowry system has changed. He argues that dowry was traditionally part of the *kanyadan* system of marriage practiced exclusively by land-owning members of high castes, and more commonly in the north of India. This system involved the "gift of a virgin" by a family of lower status to one of higher status; the bride was accompanied by a dowry composed of clothing, jewelry, and household goods. Under this system, the giving of a dowry, though conventional, was seen as voluntary. Srinivas argues that the modern dowry system differs from the traditional in that larger amounts of money are involved (either as gifts or as cash) and in that the payment is requested (the common Indian English term is "demanded" which is somewhat misleading to non-Indians as these typically do not take the form of outright demands) by the groom's family as a pre-condition to the marriage (i.e. if the dowry is not paid on time or in full, the wedding may not take place). While traditional dowries often remained at least nominally the property of the bride, in modern settings much of the dowry becomes the acknowledged property of her in-laws and may or may not be used to the direct benefit of the bride herself, or even the groom. In fact, some authors argue that modern dowries are often used to make dowry payments for the groom's sisters (Caplan 1984, Srinivas 1984).

Specifically, Srinivas argues that this change from a traditional system to a modern one is an "outcome of the growth of the capitalist economy and the consequent emergence of a class system based on wealth" (Upadhya 1990, p. 33). Within this class system, capital, education, and high-paying jobs are relatively scarce and husbands with these attributes are considered desirable and command higher dowries. Srinivas argues that as more people become involved with or dependent on market capitalism, the practice of dowry marriage will become more widespread. This view is also supported by the work of Caldwell, Reddy, and Caldwell (1983) who provide some quantitative evidence to support their point. The authors also suggest that the practice first developed among the upper castes because these were the first groups to obtain access to education and the urban job market.

A distinct but related explanation is offered by Harrell and Dickey (1985), who argue that dowry is both a form of diverging inheritance (as defined by Goody [1976]), meaning inheritance is given to both sons and daughters) and a means of public display of wealth and status. Further, the authors argue that dowry should occur in situations where there is social stratification (this is important for Goody's notion of diverging inheritance) and where there is utility to public displays of wealth. The latter condition is satisfied when there is unequal status among marrying families, this unequal status is determined at least in part by economic wealth, and there is competition for wealth and status because access to each varies over time (i.e., there is economic mobility). Specifically, Harrell and Dickey predict that dowry should be more associated with urban, commercial classes and/or upper classes within any particular area.

Under this model, dowry inflation or deflation will be caused by changes in the stratification or status competition system. For example, dowry is expected to spread in connection with the spread of a market economy and the consequent association of status with wealth. The authors argue that there is evidence that this has occurred in both Japan and Serbia, where dowry-giving began in the towns and spread to the countryside as access to market-related status goods became more widespread. Finally, if a wealth-based stratification system declines, then the disappearance of dowry is predicted. As an example they give the Guangdong area of China after the collectivization of agriculture.

All of the conditions specified by Harrell and Dickey's model obtain in the South Indian situation, either currently or in the past. Traditionally, only the upper classes (members of the priestly and princely castes) gave dowry. The slow incorporation of India into a wage-labor economy began under the British in the early 1800's, picked up speed dramatically in the 20th century, and reaches most Indians today. Ethnographic accounts frequently argue that dowry-giving has spread along with education and

market-related wealth into the land-owning and eventually the peasant castes which traditionally gave bride-price (e.g. Srinivas 1984; Caldwell, Reddy, and Caldwell 1983; Caplan 1985; Roulet 1996).

Embodied Capital Theory

In a set of important articles, Kaplan (Kaplan et al 2002, Kaplan and Lancaster 2000, Kaplan 1996, Kaplan et al 1995), drawing on the work of Becker (Becker 1991, Becker et al 1990, Becker 1975) and basic tenets of behavioral ecology, argues that in allotting resources to having and raising children, parents should optimize their total lifetime allocations in order to maximize investment in their grandchildren. To do this, parents must optimally apportion their resources among investments in number (quantity) of children and the embodied capital (quality) of those children. Under Kaplan's model, embodied capital includes "strength, immune function, coordination, skill, [and] knowledge, all of which affect the profitability of allocating time and other resources to alternative activities such as resource acquisition, defense from predators and parasites, mating competition, parenting and social dominance" (Kaplan, 1996:95). Put more simply, embodied capital can be *any* physical capacity, skill, or level of knowledge that increases a child's expected lifetime income, defined as the cumulative value of the child's time allocated to competing life activities. Lifetime income can thus be measured in terms of calories, cows, cash, or any other salient currency that humans in different environments use to fund their survival and reproduction. Kaplan's concept of embodied capital is derived from Becker's concept of human capital (Becker 1975), but has been broadened to incorporate aspects of health, growth and development, traditional knowledge, and subsistence skills that are meaningful measures of "quality" in non-market economies. More familiar "quality" measures, such as education, which are of greater salience in market economies are still appropriate to consider under this rubric.

In a detailed paper, Kaplan (1996) presents a general model of parental investment and fertility. This model has several key propositions:

(a) Optimal levels of investment in child quality are determined by the relationship between investments (e.g. time, food, medical care, education or other skills training) and outcomes (e.g. height, weight, immune function, return rate to hunting, wage rate) in a particular environment.

(b) Investment in the quality of each child should continue until the rate of returns to investment begins to diminish, at which point investment should be directed towards another child.

(c) Fertility will be a consequence of the optimal investment in child quality; if returns to investment diminish early then larger family sizes will result.

(d) The diversity of life histories in different societies results from ecological variation in the shape of the relationship between investments and outcomes.

In behavioral ecology, parental investment is typically understood to be any type of investment, whether in terms of resources or care, which increases one child's survival or ability to reproduce at the cost of parental ability to invest in other offspring (Trivers 1972). In his 1996 paper Kaplan considers two types of parental investment, in survival and in embodied capital and gives a detailed discussion of how his model applies to foraging populations. The second part of the paper, however, addresses the question of the demographic transition and the application of the model to wage-labor economies. In such societies, parental investment still includes basic survival-related elements such as food, shelter, and health care, but the largest and most variable aspect of investment is often in embodied capital (in most cases education), specifically the skills necessary to obtain employment in competitive labor markets. In his paper Kaplan outlines several important conditions which should strongly guide parental investment strategies in market economies:

(a) Increases in the rate of returns to one type of investment will not only increase expenditure on it but will also have the same directional effects on other types of investments. Better public health infrastructure, for example, will not only increase investments in child health (because the improved likelihood of survival increases the return rates on such investments) but also, though to a lesser degree, increase investments in embodied capital as it is more likely that the child will survive to make use of it.

(b) In competitive labor markets, especially those with technological growth, the rate of returns to parental investment in embodied capital does not begin to diminish until very high levels. This leads to an increase in optimal per child investment among those who have access to education and skills-based employment. See Figure 1, adapted from Kaplan (1996), for a comparison of returns to investment in different types of economies. [1]

(c) Embodied capital investment is time-intensive and dependent on the investor's level of skill. Stated another way, people with higher levels of embodied capital (i.e. more-educated parents) will be more efficient at investing in the education of their own children (i.e. have higher rates of returns to investments) than will those with lower levels of embodied capital. Thus more-educated parents will have higher levels of per-child investment compared to others in the same economic and cultural environment. This relationship is shown in Figure

[1] The increase in per-child parental investment also leads to a decrease in fertility, a factor which predicts the demographic transition. See Kaplan (1996) for a complete discussion.

2, adapted from Kaplan (1996), which compares the marginal return rates to investment in a child's embodied capital of parents who are endowed with more or less embodied capital themselves. [2]

Kaplan's model thus provides a framework that should allow us to predict relative levels and types of investment given the embodied capital and economic resources of the parents and the children they are investing in. However, an analysis limited to direct investments in survival and embodied capital does not adequately represent the parental investment landscape of urban India. Differences in survival-related investments are moderate and difficult to measure while, as I have discussed in detail in Chapter Two, investments in education are far more variable and more closely related to parental characteristics. Moreover, a third type of parental investment—that in marriage costs—is vital to the understanding of investment strategies in South Asia. Expenditures on marriage costs are large in comparison to family income, vary with the characteristics of the parents, and can be of great importance in ensuring the long-term stability and resource access of children and the grandchildren they produce. However, because education, labor market participation, and marriage-related traditions costs vary by a child's gender, the marriage cost investment strategies for daughters and sons should be considered separately.

Marriage Costs as Parental Investment

Investment in daughters takes the form of investment in some combination of education and marriage costs. From the perspective of embodied capital theory, educating daughters has three major rationales. First, it may improve a daughter's chances in the marriage market, as better-educated grooms often demand better-educated brides. Second, education may enable a woman to get a job. If this is the case, her income, which will generally be under the control of her parents before she is married, may be used by them to help defray the costs of her marriage. After marriage, her income will ultimately be under the control of her husband or her in-laws who, especially in the case of well-educated grooms, may prefer their brides to have jobs. Third, a more-educated woman should be more efficient at endowing her own children with education and other forms of embodied capital. While Kaplan's theory would allow the education levels of both husband and wife (as well as other relatives in the household) to work together to achieve this goal, in fact a mother's education may be more important than a father's as she is likely to spend more time with her children than he is, especially when they are young.

In Indian society, it is virtually necessary to give a lavish wedding complete with costly gifts to assure that one's daughter marries, especially if she is to be married in a socially acceptable manner and

[2] This feature allows Kaplan (1996) to predict the negative relationship between fertility and wealth found in some post-demographic transition societies.

to a socially acceptable groom. Although investment in marriage costs is not of direct economic benefit to her family, it is in keeping with Kaplan's model to treat costs associated with a marriage as parental investment in a daughter if they will affect her lifetime income in the sense that she will share in the benefits of her husband's income and often that of his family, and thus her ability to reproduce successfully and invest in the quality of her offspring in turn. Moreover, since the quality of a woman's spouse will also have a direct effect on the quality of her children, it is in the best interests of a woman's parents to procure her an educated spouse, with a high-status job and good income, who will be able to provide the necessities as well as a good education and high marriage costs for his children in turn. In this sense, any aspect of marriage costs that serves to attract a more-educated or wealthier groom may function as a "purchase" of increased parental investment power.

P on dowry: those portions of a daughter's marriage costs which are transferred to either the daughter or the groom in the form of gifts of gold or saris can be conceptualized as a form of dowry (Goody and Tambiah 1973), meaning a transfer which flows from the bride's parents to the newly-married couple or members of their new household. While in South Asia it is not clear than brides maintain much control over their dowries (e.g. Caplan 1985), from an embodied capital perspective it is not important that she have such control—simply that those resources contribute to the pool that will be used in the long run to make investments in grandchildren.

In urban India, the primary form of investment in sons is in education. The provision of education for sons is of paramount importance because sons remain socially tied and economically responsible to their family of birth. Males are still expected to be the primary or exclusive breadwinners of the family; if a woman works after marriage she will often earn less than her husband, take time off when she has small children, and be expected to follow her husband if he should need to move. Furthermore, a son's income is often under the ultimate control of his parents, with whom he will very often continue to live after he is married. In addition, an educated son with a good income is in great demand in the marriage market, able to command a large dowry from his bride's family. For these reasons, investment in the education of sons is of direct economic and social benefit to his parents.

Parents also invest in the marriage costs of their sons, though the amount is usually significantly less than is invested in the marriage costs of daughters. The groom's family is obliged to give costly gifts to the wedding party, and may be responsible for hosting one or more marriage functions. These gifts and functions must be of a style that is appropriate to the status of the bride's family and the style in which the bride's family is celebrating the wedding. If a bride has wealthy parents or a large income, the wedding is likely to be lavish, and the groom's family has little choice but to match the style or lose face, a

consequence which may have negative implications for his own marriage as well as his siblings' marriage prospects. From an embodied capital perspective, son's marriage costs are probably less crucial than are daughters' in affecting a child's long-term income. However, an educated bride will certainly contribute to the embodied capital attainments of her children, and an employed bride will bring in income that may be used for many types of parental investment. Consequently, we should expect that sons' marriage costs should be lower than daughter's marriage costs but should still be linked to the level of embodied capital and real capital endowments of the son and his bride.

Those portions of a son's marriage costs which are transferred to his bride in the form of gifts of gold and saris can be conceptualized as a form of "indirect dowry" (Goody and Tambiah 1973), meaning a transfer which flows from the groom's parents to the bride rather than to her parents (as is the case with bride price). In the Indian situation, indirect dowry may or may not act as a true property transfer because the in-laws who give it will have significant economic and social control over the bride after her marriage, especially as she will commonly live with them. However, these property transfers must be made for the parents of the groom to be seen as acting in good faith and thus for the marriage to take place. Moreover, the saris and gold which form the primary components of indirect dowry are likely to remain at least the nominal property of the bride after marriage and will be used by her to signal the status of her new family when she attends weddings or other important social functions with them in the future.

Types of Marriage Costs and Their Respective Functions

One of the complicating factors in the study of marriage costs is that there are numerous expenditures made by the families of both brides and grooms in relation to a marriage over a period of months or more, and it may be difficult from both practical and theoretical perspectives to disaggregate them into meaningful categories.

One way of categorizing such costs is to focus on where the wealth being spent is going. Using this logic marriage costs can be broken down into two main categories: (a) expenditures on gifts which are transferred primarily to the bride, the groom, or members of their families, and (b) expenditures on marriage functions which are transferred primarily to individuals or businesses involved in the wedding industry. Another way to categorize marriage expenses is by focusing on their probable function. Most discussions of dowry focus on the *transfer* function of wedding gifts (e.g. Goody and Tambiah 1973, Edlund 2001, Botticini and Siow 2003), often conceptualized as a type of pre-mortem inheritance for daughters. However, several authors (e.g. Harrell and Dickey 1985; Bloch, Rao, and Desai 2004) have argued that many of the expenditures on weddings in dowry systems serve a *display* function which helps

the family compete for social status. My informants often told me that marriage expenditures served the functions of ensuring that the bride was well-treated in the home of her in-laws and in ensuring or promoting good marital prospects for her siblings and other close relatives.

In this paper I will combine a focus on destination with a focus on function to define aspects of marriage costs which can be expected to be affected differently by economic development. My analyses will focus on three types of marriage costs, each of which attempts to capture a different type of parental motivation for investment in the wedding.

The first variable, cost of gold, is conceived of as a proxy for dowry/indirect dowry or, more generally, transfers from one family to another. Though there are several other types of transfers which may take place in addition to gifts of gold, gold is an excellent proxy for total transfers because it is universally given, politically uncomplicated to discuss, and likely to be proportional to other transfers. Gold prices are also well-documented over time, which means that it is comparatively easy to compare the value of gold transferred at weddings held in very different years.

Gold is given to both brides and grooms at weddings. It is also given by people of different caste and religious backgrounds, by people of different economic means or levels of socioeconomic status, by people who were married recently as well as those who were married decades or centuries in the past, and by the families of sons as well as the families of daughters. Gifts of gold are commonly discussed in relation to the wedding even years after the fact, which means that people are likely to remember the amounts transferred even decades in the future. Gifts of gold are not politically problematic in the way that cash dowries have become in recent decades, which means that people are willing to discuss amounts quite openly without concerns about the interviewer's political scruples or legal issues. Amounts of gold are moreover typically part of marriage negotiations and, since they are a standard portion of marriage costs, are typically set at a level which reflects the general amount of transfers that will occur.

Other types of transfers between families fall short in one or many of these dimensions. Cash, for example, is not given by all social classes or all caste groups or at all points in time. Moreover, the discussion of cash gifts is problematic due to relatively recent Indian anti-dowry laws and elements of social disfavor. Consumer goods such as furniture, appliances, and vehicles were not given by all groups in the past and are liable to gift-giving fads. For example, it was standard in the 1960s for middle class families of daughters to give the groom a bicycle whereas nowadays bicycles would only be given in very simple weddings among poor families. Silver is also commonly given at weddings, but the practice is only normative among Brahmins and transfers may only occur in one direction. Moreover, silver is not

seen as mandatory and thus amount fluctuate widely without clear relation to the means of the family or the characteristics of the bride or groom.

Gold transfers are often explicitly negotiated by the parents of the bride and groom when the marriage is being arranged. This is especially true for the gold transfers to be made by the bride's parents. I was told by my informants that a key question in marriage negotiations is "How much gold will you put on your daughter?" If the bride's family does not give a high enough answer to begin with, negotiations may stall until they increase their offer. Because the likelihood of a particular match's being agreed to hinges on these offers, gold transfers can be considered a direct type of embodied capital "purchase." Gold transfers by the parents of the groom are often less-strictly negotiated, but are seen as contingent on the gold being transferred by the parents of the bride, the bride's characteristics, the groom's characteristics, and the desire to impress one's relatives, in-laws, or other wedding guests. Thus gold transfers on the occasion of sons' weddings are related to both concerns about embodied capital attainment (of the bride and her future offspring) and to concerns about the display of wealth.

The second type of marriage costs that will be considered in this paper is function costs. This variable includes expenditures on rent for a fashionable wedding hall, several meals for dozens or hundreds of guests, elaborate floral decorations for both the wedding hall and the vehicles used by the wedding party, small gifts of favors to distribute to wedding guests, fees for traditional wedding musicians for the ceremony and pop singers for the reception, fees for wedding photographers and videographers, travel and accommodations for the groom's relations, and various other miscellaneous expenditures. This variable is used as a proxy for display expenditures, as the amounts spent are entirely alienated from the families of both parties to the marriage.

Function costs for daughters are also part of marriage negotiations, in which the parents of the prospective groom may put pressure on the parents of the bride to agree to rent a large or fashionable wedding hall as well as agree to accommodate a large number of wedding guests. Once again, if appropriate parameters are not agreed to then negotiations may break down and the match not made. On the other hand, the parents of the bride may have their own motivations for display at the wedding and thus exceed the requested parameters. For these reasons, expenditure by the bride's parents on function costs may be directly linked to embodied capital considerations (through the attainment of a high-quality groom and the probable effect of this on grandchildren) as well as to display-related considerations. On the other hand, expenditure by the groom's family on functions is typically much less constrained by negotiation as they are usually only expected to pay for optional side functions which are much smaller in scale than the wedding itself. Although there is some expectation that these functions will match the style

of the wedding, as they primarily take place after the wedding itself it is unlikely that there will be any impact of the making of the match. Moreover, in some groups expenditures of this sort may actually be made out of cash transfers from the bride's family prior to the wedding. Thus function costs for a son are primarily, if not exclusively, related to motivations for display on the part of the family.

The third type of marriage cost that will be discussed in this paper is total marriage costs. As its name suggests, this variable aggregates all expenditures—on gold, on functions, on gifts to relatives, etc.—into one measure. The goal is to capture the important composite or overall effects of variables of interest on marriage expenses. Because total marriage costs includes both display and transfer elements, it will also allow us to look at the proportional effects of each of these elements. We will also be able to account for other effects not captured by our proxies for either transfers (cost of gold) or displays (function costs). As this variable was used in Chapter Two, some of its characteristics are already known. However, the analysis here includes parents' marriages as well as children's and covers twice as large a span of time. Moreover, total marriage costs are used here as an outcome variable whereas in Chapter Two they were used as a predictor of child and spouse characteristics.

Total marriage costs are included in this chapter as a measure of the ability of a family to leverage capital to meet all marriage-related goals, including both transfers and displays. They are also included to measure the relative strength of different types of motivations in comparison to one another. Assuming that both transfer and display elements are reasonably large components of total marriage costs, then both embodied capital-related motivations and display-related motivations should have visible effects on how much is spent; if one aspect is more important that the other, however, then this should also be evident in the results.

While this operationalization can be useful, it is complicated by the fact that some types of wedding expenses are capable of serving both transfer and display functions. A key example is gold jewelry, which is usually given to both the bride and the groom during each of the major marriage-related ceremonies and which is worn by them thereafter. Gold in the form of necklaces, earrings, bangles, rings, or other jewelry is given to the bride in substantial quantities by both her parents and the parents of the groom, while gold in the form of rings, chains, or watches is usually given to the groom by the bride's parents or close relatives. In India, gold is only used in relatively pure form (22-24 carats) and thus serves as both a means of displaying wealth and a form of storing and/or transferring capital. Many families have substantial amounts of wealth in the form of gold, and gold in the form of jewelry can be bought and sold based on the global price of gold at jewelry shops in every town and city. While gold jewelry is frequently kept for long periods of time and worn on appropriate social occasions, it is also

commonplace for families to exchange older pieces for newer ones to give as gifts or to sell gold in times of need. This means that a gift of gold at a wedding has value both as a public *display* of wealth in that it will be exchanged and displayed publicly (which cash, for instance, might not be) and also as a wealth *transfer* because it will retain its value over time (unlike, for instance, clothing or furniture) and may be exchanged for other forms of gold or for cash virtually at will.

This difficulty is not limited to gold, however, and would apply to most, if not all, forms of transfers. However, I do not believe that this criticism negates the division between transfer and display expenditures. Function costs and other display proxies clearly differ from gold and other types of transfers in that the entire amount of function costs is alienated from the families who are party to the marriage, instead winding up in the pockets of proprietors of the many businesses which cater to the wedding industry. So while the "transfer" designation may be incomplete for gifts of gold, there is a clear difference between the types of marriage expenditures which result in the exchange of items of real value between the families of the marriage partners (such as gold transfers) and those expenditures which only enrich third parties (such as function costs). I will assume this distinction throughout this paper; when discussing "transfer" costs I will refer to those costs which involve an actual transfer of valuable goods and when discussing "display" costs I will be referring to only those costs which have no such element.

An Embodied Capital Model of Marriage Costs

Since marriage costs can be viewed as a type of parental investment, then the embodied capital approach to parental investment can be combined with knowledge of the South Indian social and economic milieu to construct a model of how and when different types of marriage costs should be paid. Given the logic of Kaplan's 1996 model and especially its application to wage-labor economies, we should be able to predict (a) the family and individual characteristics that predict the practice of or adoption of dowry marriage, (b) which family and individual characteristics will predict large or small expenditures, (c) the relative effects of different family and individual characteristics on different types of marriage costs based on their different functions, and (d) how marriage costs expenditures should change over time under conditions of increasing economic development. I first describe the general logic of the model. I then discuss five specific predictions that can be derived from it, following each with a detailed discussion of the logic that leads to it. A summary of these predictions and their implications for the three different types of marriage costs can be found in Table 1.

General Model: The increased participation in a wage-labor economy which has occurred in South India over the last several decades (Srinivas 1984) has caused returns to investment in children to increase and therefore per-child investment, including investment in marriage costs, to increase among all those who are affected by economic development. Levels of marriage cost expenditures should be dependent on both the characteristics of the parents and the child as well as on the characteristics of the spouse and his or her parents, as all will have a part in determining the level of investment in grandchildren. These effects should be stronger and occur first among those who have already obtained marketable education and skills, and should spread along with economic development into groups who previously had very low levels of per-child investment. As educated grooms and/or brides and the ability to economically compete for them become more common, grooms and brides with still higher levels of education or wealth will remain comparatively scarce and thus able to command still higher marriage costs. This process will continue until strong gradations of quality no longer exist or until the market has become so saturated with qualified people that other qualities become comparatively more important.

Prediction 1: Increased integration into a wage-labor economy, as evidenced by higher levels of education and wealth, will be associated with an increased likelihood that the custom of dowry marriage will be practiced.

An embodied capital perspective allows us to predict that as opportunities for education and market employment spread, the people affected by those trends will be motivated to increase investment in their children, which may take the form of greater marriage costs and/or dowries for both daughters and sons. However, current Indian society contains people at various degrees of integration (see Chapter Three) and who thus have various levels of ability (indexed by wealth vs. fertility) and motivation (indexed by education or other embodied capital level) to invest in children. Furthermore, the Indian social context contains several social and historical constraints which may affect how individuals will choose to allocate this increased investment. Specifically, the social context includes traditions of men as primary market-related producers, patrilocal residence, male-biased inheritance at death, and dowry marriage as an existing practice among social elites. With these social realities in place, increased motivations to invest in children may have asymmetrical results with respect to the gender of children (see Chapter One) in that parents are likely to educate sons more than daughters and spend more to ensure them a good occupation, while they are likely to allot much larger marriage costs to daughters especially in the hopes of aiding their ability to (a) compete for an educated and market-employed groom as suggested by Srinivas (1984), and (b) to help them with the direct costs of investment in grandchildren.

Thus, we can predict that higher levels of education and/or wealth should be associated with a greater likelihood that parents will observe the asymmetrical practice of dowry marriage by paying greater marriage costs for their daughters than they do for their sons. We can also predict that non-dowry marriages should take place among poorer, less educated people and earlier in time than dowry marriages.

Prediction 2:

(a) Higher levels of market-related parental and child characteristics, such as education and wealth, will be associated with higher dowries and marriage costs.

(b) Education will be a better predictor than wealth for types of marriage costs which are most closely linked to EC investment.

Prediction 2(a) is similar to, but retains an important distinction from Prediction 1, namely that it discusses the amount of marriage costs to be paid rather than simply the likelihood of practicing dowry marriage. Kaplan argues that in wage-labor economies returns to investment in children do not diminish until relatively high levels, thus increasing optimal per child investment. If marriage costs are viewed as a form of parental investment, then they should increase with market integration as measured by either education or wealth. While it seems intuitive to argue that marriage expenditures will increase with wealth, some authors (e.g. Botticini and Siow 2002) have argued that in the presence of a human-capital based market economy parents should switch investment from marriage costs to other forms of investment such as the embodied capital of children. One of the implications of this is that increased wealth may cause investment in marriage costs to decrease. In contrast, the Embodied Capital approach predicts that both education and wealth should increase levels of parental investment, including marriage costs—education because parents have an increased motivation to invest (increasing payoffs to investment in education), and wealth because they have greater resources to invest with.

An important tenet of Kaplan's model is that an increasing market for education-based labor is responsible for increasing returns to investment in education in wage labor economies. However, another implication of Kaplan's model is that an increase in one form of investment will cause concomitant increases in other forms of parental investment, though usually of a lesser degree. We can thus predict that if the returns to investment in education are increasing more rapidly than the returns for other kinds of PI, then it should cause concomitant increases in marriage cost investment which are proportionally greater than those caused by other factors. Thus, in comparison, education should be a better predictor of marriage costs expenditures than wealth.

Under this model, different types of marriage cost expenditures have different functions and should have different responses to education and wealth. Simple correlations across the board should be positive for all types of marriage costs. However, educational variables should be better predictors than wealth variables of gold transfers because these are linked to future EC investment through both the spouse's characteristics they help obtain and the potential for their use towards direct investment in grandchildren. In contrast, wealth should be a better predictor of function costs and other display elements than education unless there is a direct link between function costs and spouse characteristics. Finally, both education and wealth variables should be good predictors of total marriage costs as this variable subsumes both transfer and display elements. The relative importance of each will rely on the comparative proportions of each as compared to total marriage costs as well as the characteristics of any unspecified portions of the same.

Prediction 3: Greater importance placed on a spouse's education will be associated with higher expenditures on transfer types of marriage costs, while greater importance placed on a spouse's wealth will be associated with higher expenditures on display types of marriage costs.

This prediction argues that the reported importance placed on various potential spouse characteristics (education, income, family wealth) will be related to the pattern of marriage cost expenditures made. While knowing what people actually do is primary, knowing what their desires are can also be illustrative in that they provide a somewhat independent measure of strategic motivation from that of observed behavior. If a respondent says that education in a spouse was a strong priority, given Prediction 2 one can hypothesize that this interest in EC may be associated with increased expenditures on gold transfers or other EC-related marriage costs such as function costs for brides. Conversely, if a respondent ranks spouse's income or family wealth as a high priority, one can hypothesize that this will be associated with increased expenditures on those types of marriage costs likely to attract a wealthy spouse, namely total marriage costs and/or function costs. Put another way, we can predict that embodied capital-related motivations are driving decision-making about gold transfers while wealth-related motivations are driving decisions about total marriage costs and the costs of functions.

Prediction 4:

(a) High quality market-related spouse or spouse's family characteristics, such as education and income, will be associated with higher dowries and other types of marriage costs.

(b) Spouse's and spouse's parents' education will be better predictors than wealth for types of marriage costs which are most closely linked to EC investment.

If marriage costs are viewed as a form of parental investment the purpose of which is to insure a good spouse for one's child, then parents should be willing to pay higher marriage costs of all types for spouses with higher-quality characteristics. However, as in Prediction 2(b) above, different types of marriage costs may be more effective at attracting spouses with different characteristics. Specifically, an embodied capital approach suggests that, if returns to embodied capital investment are increasing, then those with high levels of EC will themselves have increased motivation to attract spouses who also have high levels of EC. While in principal any type of marriage cost could fulfill this role, given Prediction 2(b), the most likely form of marriage cost investment to attract spouses with high levels of EC is expenditures on transfers, as they will have long-term effects not only on the characteristics of the spouse but also on the characteristics of grandchildren (since the transferred wealth will stay in the family). For this reason, transfer types of marriage costs should be most predictive of educational characteristics of the spouse and/or his or her parents. On the other hand, expenditures on display types of marriage costs such as function costs should be better predicted by spouse and spouse's parents' wealth variables because displays simply index available resources without making direct contributions to the EC or wealth of future generations. Expenditures on total marriage costs may be predicted by either education or wealth variables, depending on the particular proportions of transfers and displays as part of total marriage costs and on the particular functions of miscellaneous marriage costs.

Prediction 5:

(a) Increases in EC-related types of marriage costs, such as gold transfers, will occur faster than income inflation while increases in display-linked types of marriage costs will not.

(b) Gold transfers or other EC-linked forms of marriage costs will increase as a proportion of total marriage costs over time while display-linked types of marriage costs will not.

All else being equal, increasing levels of wealth will cause increases in marriage cost expenditures, but this increase will match that of inflation and should therefore be negated by inflation controls. On the other hand, if returns to EC investment are increasing then parents should have increasing motivations to invest in the EC of their children both directly and indirectly through marriage costs. As previously discussed, Kaplan posits that in some wage-labor economies the investment-outcome curve for education is actually increasing at the margin through some portions of its range. If he is correct, then expenditures on education and marriage costs related to EC attainment should increase faster than inflation, and thus

should rise even when inflation is adjusted for. This relationship may result either due to (a) increased participation in a growing wage-labor economy (such as has been occurring in rural and peri-urban India in the last few decades) or (b) increasing returns to EC investment within an already-established market economy (also true for much of urban India).

Moreover, this explanation also allows us to predict that EC-related types of marriage costs should inflate, but that marriage costs elements not linked to EC investment (either through a spouse's characteristics or through the ability to invest in grandchildren) will not. Furthermore, if this is true then we can predict that gold transfers or other EC-linked types of marriage costs will increase as a proportion of marriage costs over time while display-linked types of marriage costs will not.

A possible confounding factor is that a similar effect to that of Prediction 5(a) may be produced by the decrease in fertility over time. With increasing integration into a wage-labor economy, Kaplan argues that optimal levels of parental investment should increase and fertility should decrease. Since the resources available to a family should grow at the rate of inflation, and the number of children they have to divide it among is shrinking, the level of investment in marriage costs should increase faster than inflation. However, this formulation does not allow us to draw distinctions between the different types of marriage costs discussed in Prediction 5(a) nor to discuss the likely change in their relative proportions posited in Prediction 5(b). Nonetheless, I will be able to test to see if it is the increasing returns to educational investment or the decrease in fertility that better predicts inflation in marriage costs, or if both play similar roles.

DATA AND METHODS

Dataset

Detailed information on marriage expenditures was collected for the key respondent, his or her spouse, and all of their married children. The analyses presented in this chapter utilize data from 1132 of these marriages, including 534 marriages of sons and 598 marriages of daughters. Marriages in the sample took place between 1940 and 2002, with the majority of the parents' marriages taking place from 1940-1970 and the majority of the children's marriages taking place from 1971-2002. Non-Hindus and those from social classes other than those discussed in this paper were excluded from analysis.

Model Parameters: Marriage Cost Variables

Descriptive statistics for several marriage cost variables can be found in Table 2. The *Amount of Gold* variables represent the weight of gold given to the bride or the groom in grams. The *Cost of Gold*

variables were constructed by multiplying the weight of gold given in grams by the price of gold in Rupees during the year of marriage. *Functions Costs* is the Rupee amount reported as being spent on all wedding-related functions combined. *Total Marriage Costs* is the Rupee amount reported as being spent on all marriage-related gifts and functions combined. All cost variables are given in 1940 Rupees; it was decided to deflate price values rather than inflate them for comparison to keep the numbers smaller and easier to manage.

All marriage cost variables were adjusted for general price inflation using information from the Statistical Abstract of India which is available from the early 20th century through the present. Data for the years 1940-1948 come from the Working Class Cost of Living Index numbers for Madras. Data for the years 1949-1959 come from the Working Class Consumer Price Index for Bangalore. Although the names of the indices changed over time, they were figured by the same offices and published in the same government documents. Furthermore, I could find no evidence that the means of calculation had changed substantially. Data for Madras was used for the period 1939-1948 because no data were available for Bangalore prior to 1949. The Madras index was chosen as being the most likely of the available cities to reflect trends in Bangalore. Madras is located only 234 km from Bangalore and the two cities share many South Indian historical and cultural circumstances. Given the expected problems of accuracy at such a remove in time, the added differences between cities are not expected to be great, and the potential problems of adopting this strategy were seen as preferable to dropping not only 58 marriages but also ten years' time span from the sample.

Two separate indices exist for the years 1960 to the present, the Consumer Price Index for Industrial Workers (CPI-IW) and the Consumer Price Index for Urban Non-Manual Employees (CPI-UNME). Based on this information, two separate indices were constructed and used to deflate cost variables for analysis. Both indices use the same data, described above, for the years 1939-1959, while Deflation Index One used the CPI-IW data for the period 1960-present and Deflation Index Two used the CPI-UNME data. Variables adjusted by both indices were used in initial analyses. The results were compared, and both were found to yield very similar results. Based on careful consideration of the data from which the two separate indices were constructed, it was decided that the CPI-UNME index was more appropriate for my dataset as it was strictly urban and included a wider range of occupations than the CPI-IW which included much information from smaller towns and was limited in terms of the types of jobs indexed, including very few white-collar jobs. Thus variables adjusted by Deflation Index Two were used to perform the remainder of the analyses in this paper. Table 2 includes variables adjusted with

Deflation Index Two and, for comparison, Deflation Index One. Please see Figures 3 and 4 for a graphical comparison of the same data values as adjusted by the two deflation indices.

The average price of gold in grams was constructed using gold price information from the Statistical Abstract of the Indian Union 1950-1970, the Reserve Bank of India Handbook on the Indian Economy 2002/2003, and the World Gold Council and KITCO Bullion Dealers websites. Information for the years 1940-2001 comes from the periods July 1939-June 1940 through July 2000-June 2001 and is based on information provided by the Bombay Bullion Association Ltd. (BBAL) to the Reserve Bank of India. Information for the period July 2001-June 2002 was not available because such information had ceased to be provided by the BBAL, therefore the price was reconstructed using price information from the London market (London PM Fix) which is provided in U.S. Dollars, the standard conversion between troy ounces (the international market weight standard) and grams (the Indian market standard weight), and the average exchange rate between dollars and rupees during 2002. Gold price information can be found in Table 3.

Finally, the variable *proportion cost of gold* was constructed by dividing the total cost of gold by the total marriage costs while the variable *proportion function costs* was constructed by dividing the function costs by the total marriage costs.

Model Parameters: Individual and Family Characteristics

Several variables reflecting the characteristics of the parents, children, spouse, or spouse's parents also appear in many analyses. Descriptive statistics for these variables can be found in Tables 4 and 5. *Father's occupational rank* is an ordinal variable ranging from one to twenty. It was created based on a hierarchical listing of occupations by average income using data from that portion of the sample (parents, their children, and their childrens' spouses; N=1684) for which income data were available. *Father's occupational rank* is used as a proxy of family wealth. It was used instead of *parents' resources* (discussed and used in Chapter Two) because it is available for the entire sample whereas *parents' resources* is only available for the children's marriages, which represents a substantial decrease in both the size and the time depth of the sample. *Child's income* is used in these analyses in preference to *child's occupational rank* because income data is available for most of this portion of the sample; *spouse's income* is also used here for the same reason. Finally, *spouse's father's occupational rank* is used to index spouse's family wealth as occupation was the only data available. Please see Table 3B attached to Chapter Three for details of the coding of the occupational rank variable.

The variables *parents' education* and *child's education* appear in these analyses, with the variable *parents' education* being operationalized as father's education plus mother's education. Education here is coded in culturally meaningful units, each representing a level of academic attainment or about 2 years of schooling. This method of coding has been described in detail in Chapter Three, where it is summarized in Table 3C. Also used in a limited fashion in these analyses are the variables *child's spouse's education* and *spouse's parents' education*, which were coded in the same way.

Side paid more is a categorical variable indicating which family bore most of the expenses for the marriage. There were three possible categories in the survey: (1) groom's side, (2) bride's side, and (3) both sides fairly equally. Despite its inclusion having been suggested to me by respondents themselves during survey pre-testing, there were comparatively few respondents (N=88) who chose the third category, so these cases were excluded and the variable was treated as binary for most analyses.

Year of marriage is a key variable which appears frequently in my analyses. This variable was nearly always given by the respondent, but in cases where it was not it was calculated using the respondent's reported age at marriage, current age, and the year in which the survey was conducted (almost always 2002).

The variables *importance of education*, *importance of income*, and *importance of family wealth* all indicate the degree to which a respondent thought that the attribute was important in selecting an appropriate spouse for themselves or their children, in general rather than in reference to their eventual spouse. Each of these variables was coded as a categorical variable with three states: (1) very important, (2) somewhat important, and (3) of little/no importance. This variable is included to provide a measure of motivations and strategic thinking.

Finally, the variables *number of children* and *proportion of daughters* (number of daughters divided by number of children) are included in some analyses as controls.

RESULTS AND DISCUSSION

Details of each analysis and discussion of the results can be found below. A summary of results for all tests of predictions can be found in Table 16 at the end of this chapter.

Prediction 1. Prediction 1 states that higher levels of integration into a wage-labor economy will be associated with an increased likelihood that the custom of dowry marriage will be practiced (i.e. the bride's side will bear more of the expenses of the wedding). Results related to this prediction can be found in Tables 6, 7, and 8.

In Table 6, the variable side paid more was averaged for each class and the results were compared using a t-test. These analyses indicated that the bride's side was significantly more likely to pay more for the wedding in the professional class and the business class than in the working class. Both the professional class and the business class have significantly greater average education and wealth (see Table 4) than members of the working class, who have jobs that are less closely tied to education or capital.

Table 7 compares means of several variables which have been divided on the basis of the side paid more variable, with means for bride-price marriages (those in which the groom's side pays more of the expenses) being compared to means for dowry marriages (those in which the bride's side pays more of the expenses) using t-tests. The results indicate that marriages paid for by the bride's side took place among more well-educated, wealthier families as well as later in time. Moreover, among such marriages, daughter's families in my sample gave significantly more valuable gifts of gold, paid more for wedding-related functions, and spent far more overall on the marriage than they did among marriages in which the groom's side paid more. Also among dowry marriages, son's families gave higher-valued gifts of gold but paid lower function costs and total marriage costs than they did among marriages in which the groom's side paid more.

Finally, Table 8 contains results of logistic regression analyses in which parents' education, father's occupational rank, and year of marriage were regressed on the dependent variable side paid more both singly and jointly. Both the variables parents' education and father's occupational rank were very positive and significant at the p=.001 level when regressed against side paid more alone, and clearly positive and significant or near significant when they are included along with the other variables. These results imply that wealthier and better educated families are more likely to practice the custom of dowry marriage. Neither education nor wealth appears to be a better predictor than the other across the entire sample; while father's occupational rank is certainly more significant, the coefficient on parents' education is very similar. Within classes, education appears to be a better predictor than wealth, as might be expected given Chapter Two's contention that different social classes face different socioecological niches; the effects of wealth may swamp those of education when looking at the sample as a whole but the effects of education are stronger when smaller, more homogenous groups are examined. The inclusion of child and child's spouse characteristics in the model does not change the overall results, though it does decrease the importance of educational variables as the effect is split between them (probably due to their high correlation).

Overall, these findings support Prediction 1 by implying that individuals and social classes which are more market-integrated are more likely to follow the custom of dowry marriage as opposed to that of bride-price marriage which was traditional in some South Indian groups in the past (e.g. Srinivas 1984, ethnographic interview data). There is a clear, positive correlation between year of marriage and dowry marriage in the entire sample when education and wealth are not controlled, indicating change towards dowry marriage over time. However, controlling for these variables negates the relationship and thus we can speculate that the adoption of the practice of dowry marriage is related to increasing education and income in the population. This relationship is much less pronounced in within classes than it is between classes, suggesting that within-group movement has not been as important to this phenomenon as between-group movement.

Prediction 2. This prediction asserts (a) that higher levels of market-related parental and child characteristics will be associated with higher marriage costs, and (b) that education will be a better predictor of EC-related marriage costs while wealth will be a better predictor of display-related marriage costs. Scatter plots of cost of gold, total marriage costs, and function costs by parents' education and father's occupational rank can be found in Figures 5a-10b. Analyses related to Prediction 2 can be found in Tables 9 and 10.

Table 9 shows results of OLS regressions of education and wealth variables (both singly and together) on three types of marriage costs: total cost of gold, total marriage costs, and function costs. Year of marriage is controlled for in all regressions to negate the effects of secular trends in any of the variables. Both parents' education and father's occupational rank have clear positive, significant effects on total cost of gold for the entire sample of both sons and daughters, and for most class strata. When the effects of the two variables are compared, however, it becomes clear that parents' education is a much better predictor of the cost of gold given at a daughter's wedding while both education and wealth are good predictors of the cost of gold given at a son's wedding. These results make sense if we remember the function of gold expenditures at daughter's weddings versus those of sons. In the case of daughters gold is transferred from one family to another, while in the case of sons gold is given mainly to the bride who will join the groom's family and thus effectively (and often only nominally) changes hands within the same family which gave it. Thus, cost of gold for a daughter is a true transfer to the groom and/or his family and should be correlated with embodied capital of the parents as it is an investment in the EC of a daughter's husband and her children. However, cost of gold for a son may be part generational transfer (and thus potentially motivated by the desire to improve EC of the bride or the grandchildren) but it is also part display as the gold is not effectively leaving one household for another, and is thus theoretically

related to the degree of available resources. This joint function is reflected in the joint importance of education and wealth in determining the cost of gold to be given.

The results for total marriage costs appear to show a similar, dual pattern for both sons and daughters. Both education and wealth variables have significant, positive effects both individually and when put in the same model together. The effects of wealth appear to be moderately stronger than those of education for both genders, and stronger overall for daughters than for sons. All of these results make sense in the light of ethnographic evidence; total marriage costs combine transfer and display elements and thus should be affected by both EC-related investment motivations and by simple resource access. Transfers make up less than half of total marriage costs in most strata (see the summary statistics for the variable *proportion cost of gold* in Table 2), so we should expect the effects of education to be somewhat more moderate than those of wealth. And, finally, total marriage costs spent on daughters is significantly larger than the amount spent on sons, which may be the root of the stronger effects as families of daughters are under more social and economic pressure to pay high costs and thus will be more strongly limited by their resources and motivations than would be true if the overall amounts involved were lower, as they are for sons.

Function costs for both daughters and sons are also positively and significantly predicted by both education and wealth when each of these variables is regressed on it alone. With both independent variables in the model, however, son's function costs are only significantly predicted by father's occupational rank, a finding which makes sense if we recall that such expenditures have very little impact on the embodied capital or long-term well-being of the son or the grandchildren that will result from his marriage, as his bride will come to live with him and/or his parents and their children will be raised in an environment largely provided by his income. These expenditures may have value (and thus motivation) as displays to other members of the family's kin network or potential spouses of the son's siblings, but there are few concrete EC-related consequences attendant on spending a modest amount. For daughters, on the other hand, we once again see that both education and wealth are significant predictors of function costs even when they are both in the model. This finding is consistent with the purpose that function costs are likely to fulfill in a daughter's marriage; they are negotiated as part of the decision and a certain amount is agreed upon and expected to be spent in order to obtain the groom. If the agreed-on obligations are not fulfilled, then various negative consequences may result—from ill-treatment of the daughter by her husband and/or in-laws to the refusal of the groom's family to follow through with the marriage. Thus the parents of daughters have real embodied capital-related motivations to spend large amounts on wedding functions insofar as the quality of the groom is attendant on these expenditures. Parents of

daughters may also have separate display motivations similar to those of the son's parents; in fact these motivations may be stronger because of the vulnerability of their daughters after marriage. Thus the stronger effects of father's occupational rank on daughter's function costs makes sense as does the even stronger effects of parents' education.

Table 10 shows the results of the expanded versions of the regressions in Table 9, with child's education and income added as regressors (along with number of children and proportion daughters as controls) to test the applicability of Predictions 2(a) and 2(b) to child's as well as parents' characteristics. In general, the pattern of results is very similar to those described for Table 9 above, with both child's education and income having a positive relationship with all types of marriage costs. However, while son's income frequently figured as a significant predictor, daughter's income never did. On the other hand, daughter's education was a significant predictor of marriage costs in some social classes while son's never was. These results are consistent with the social roles of men and women in Indian society in that men will normally be employed after marriage while women will frequently stay at home with their children.

In general, effect sizes for parents' characteristics are larger than those for children's characteristics and the relative importance of education versus wealth variables matches that described for parents' characteristics in Table 9. Specifically, parents' education was the most important predictor of the cost of gold transferred at daughter's weddings in keeping with the EC-related importance of this type of cost. Parents' education continues as an important predictor for total marriage costs and function costs for daughters, but father's occupational rank is also significant for these outcome variables. Daughter's education is also significant in the working and professional classes where women are more likely to work and EC is likely to be an important determinant of income. For son's marriages, cost of gold was significantly predicted by both parents' education and wealth in keeping with the dual function of gifts of gold at son's marriages. Both total marriage costs and function costs, however, were predicted by either parents' wealth or son's income or both, in keeping with their function as display elements with only tenuous links to EC acquisition in either this or future generations.

Taken together, these results support Prediction 2(a) because they imply that more educated and wealthier people give consistently higher-valued dowries, pay larger total marriage costs, and spend larger amounts on wedding-related functions. The results also support Prediction 2(b) as they imply that education is a better predictor of EC-linked marriage costs while wealth is a better predictor of marriage costs which are linked primarily to functions of display. If a type of marriage costs has both functions they both education and wealth variables are typically significant predictors.

Prediction 3. This prediction argues that the reported importance placed on various potential spouse characteristics (education, income, family wealth) before a match was found will be related to the pattern of marriage costs expenditures made in relation to the wedding that actually took place. Specifically, greater importance placed on education (as a proxy for general EC) will predict larger expenditures on transfers and other EC-related costs (such as function costs for daughters) while greater importance placed on wealth characteristics will predict larger expenditures on display-related costs such as total marriage costs and function costs for sons. Table 11 contains the results of OLS multivariate regressions showing the effects of importance variables on the three types of marriage costs discussed in this chapter; all regressions in this table are controlled for parents' education, father's occupational rank and year of marriage.

The results for both sons and daughters clearly show that the importance of spouse's education is, as predicted, a positive and significant predictor of cost of gold, while the wealth-related importance variables are non-significant and often negative. For total marriage costs of sons, both importance of spouse's education and importance of family wealth are significant, implying that son's families are willing to spend more money on a marriage to a more educated spouse from a wealthier family as is consistent with the joint motivations of total marriage costs. Total marriage costs for daughters are predicted by the importance of both spouse's income and family wealth, a finding which is consistent with the findings of Chapter Two that high marriage costs help to procure a wealthier groom (at least in the professional and business classes).

Sons' function costs are significantly predicted by the importance of family wealth across categories and by the importance of spouse's income in the business class. The only deviation from this expected pattern is the importance of spouse's education in the working class, another finding consistent with the results of Chapter Two that members of the working class may use marriage costs to procure educated spouses and vice versa. Daughter's function costs are significantly predicted by the importance of family wealth, another finding consistent with Chapter Two and with the predictions of this chapter which stress the link between wealth and display aspects of marriage costs.

Among daughters, the lack of a predicted positive relationship between the importance of education and expenditures on total marriage costs and function costs may be related to the findings of Chapter Two that education is used to pay for education in the marriage market while wealth is used to pay for wealth. These findings do not imply that finding an educated spouse is unimportant to these daughters or their families, simply that it is not an important determinant of how much these families are

willing to pay in overall marriage and function costs because both parents' and daughter's education are the attributes most likely to attract an educated groom.

While the meaning and interpretation of the independent variables in these analyses is somewhat difficult to determine, these results appear to imply that stated motivations do line up with actual expenditures in a manner consistent with the theory outlined in this paper. Specifically, they suggest that embodied capital-related motivations are driving decision-making about gold transfers while wealth-related motivations are driving decisions about total marriage costs and the costs of functions.

Prediction 4. This prediction is similar to Prediction 2 except that it applies to child's spouse and spouse's family characteristics. It suggests that high-quality market-related characteristics will be associated with higher marriage costs, and that the relative importance of education and wealth variables will be linked to the function of the particular type of marriage cost. Analyses related to Prediction 4 can be found in Tables 12, 13, and 14. Table 12 contains results of OLS multivariate regressions of spouse and spouse's parents' characteristics (including controls for number of children, proportion of daughters, and year of marriage) on cost of gold, total marriage costs, and function costs. Tables 13 and 14 contain the results of multiple regressions including the full set individual and family characteristics variables including child's, parents', spouse's and spouse's parents' education and wealth, as well as various control variables, on the same three types of marriage costs.

For son's marriages, cost of gold is, as expected, most strongly predicted by the bride's parents' education overall and in all groups except the working class where the best predictor is the bride's education. On the other hand, both sons' total marriage costs and function costs are most strongly determined by the bride's father's wealth overall and among members of both the working and business classes. This is also an expected result. The best, though non-significant, predictor in the professional class is the bride's parents' education, which may reflect the importance of educated daughters-in-law in this class given their embodied-capital intensive means of subsistence.

Daughter's gold transfers are, unexpectedly, most strongly correlated with the groom's income and, in some groups, with the groom's father's occupational rank. The same pattern also holds true for daughter's total marriage costs and function costs where it is an expected result. The relative unimportance of educational variables as predictors of cost of gold has several possible explanations. One possibility is that groom's and groom's parents' educations are so tightly correlated that the effect is diffused over the two and thus the effects of both appear non-significant. A second possibility is that while negotiated gold transfers may be predicted by the education of the bride and her parents, they have the goal of obtaining a more generally high-quality groom. Groom quality, however, may be defined by

jointly by several characteristics which may be procured somewhat differently. Thus, as suggested by Chapter Two, the educational portion of a groom's quality may be paid for by the daughter's education, while the gold itself may actually work more directly to obtain a groom with a higher income. A third possibility is that the lack of child or parent characteristics in this model renders the analysis unrealistic; this explanation will be tested with the data in Table 14.

The results in Tables 13 and 14 contain full models with all of the major variables included. The downside of this is that there are so many strongly correlated variables included that there are few significant results, though it is possible that there might be if there were a larger sample size. However, the results can still be compared for their signs and relative magnitudes.

The full model results for sons in Table 13 contain few surprises. The cost of gold given at a son's marriage is once again most strongly influenced by the bride's parents' education, with more moderate influence of both the son's education and the father's occupational rank. This importance of education in determining gold transfers is consistent with the embodied capital framework which suggests that more-educated women should be more desirable as wives in an EC-intensive economy because of their theoretically greater efficiency at investing in the education of their own children. Moreover, a woman's education comes with her when she marries and exists as a renewable source of utility, either in terms of income or educational investment.

Also as expected, sons' marriage costs are most strongly correlated with wealth variables, specifically the son's income, the bride's father's occupational rank, and the son's parents' occupational rank. A very similar pattern also holds true for son's function costs. As discussed before, these aspects of son's marriage costs are largely display-based and have little effect on long-term EC. Thus they should be related to both the wealth of the son and his family, as well as the wealth of the bride's family as they have some obligation to match the style of the wedding which the bride's family is paying for.

The full model results for daughters are contained in Table 14. Once again, the patterns here are not surprising given previous results. The best predictor of daughter's gold transfers is groom's income, while groom's parent's education, groom's father's occupational rank, and parents' education are also moderately influential (strongly so in some social classes). This is in contrast to the results for total marriage costs and function costs in which wealth variables are always better predictors than educational variables. For total marriage costs, groom's income is the best predictor and father's and spouse's father's occupational ranks are tied for second place. For function costs, groom's income is once again the most influential variable, but groom's father's occupational rank is also important.

These finding are consistent with the fact that daughters leave their parents' household at marriage and become part of their husbands' household to be supported largely, if not entirely, by them for the rest of her life. Thus, while education and the possible increases in efficiency that come with it are of interest to her, her interest in the wealth of her in-laws is stronger than the interest exhibited by her brothers in the wealth of theirs. Thus while education is important in determining the level of marriage costs that a family is willing to pay, it appears that the most direct object of these payments is the wealth of the daughter's future household. The other major object, the groom's education, as previously argued, is likely to be at least partly 'paid for' by the education of the daughter herself.

Though somewhat complex, these results clearly support Prediction 4(a)'s contention that the value of marriage costs should increase with the quality of the spouse and that of his or her family. In relation to Prediction 4(b), these results suggest that while transfer and display functions of marriage costs are not as clearly distinct as in previous analyses (specifically those related to Prediction 2), consistent patterns are still visible. Moreover, these analyses make clear the different motivations shaping the marriage costs of daughters versus sons. The fact that sons are generally more focused on the education the bride and her family while daughters are focused on the wealth of the groom and his family is consistent both with an embodied capital perspective and with an ethnographic understanding of the subject. If the ultimate goal of investment in marriage costs is the quality of grandchildren produced, then these patterns are entirely understandable.

Prediction 5. Prediction 5(a) states that inflation in EC-linked types of marriage costs will occur faster than income inflation, while Prediction 5(b) states that EC-linked marriage costs will increase as a proportion of total marriage costs over time. Scatter plots of cost of gold, total marriage costs, and function costs by year of marriage can be found in Figures 11a-13b, while linear regression results can be found in Table 15. In these analyses, year of marriage is regressed on five measures of marriage costs (cost of gold, total marriage costs, function costs, proportion cost gold, and proportion function costs) using various combinations of control variables which are noted in footnotes to the table.

The cost of gold variable shows clear results of inflation for both sons and daughters as well as with all sets of control variables in place. The control for family wealth does not affect this relationship nor does the addition of a control for the number of children in the family. However, the introduction of parents' education and child's education as controls does cause the relationship to become weaker and less significant. These results suggest that increases in education over time may be partly responsible for the inflation in gold transfers. Moreover, the reductive effects of the education controls are stronger for daughters than for sons, which would also be expected given our prediction that gold transfers for

daughters are more closely linked to EC investment (in terms of the characteristics of the groom and the grandchildren) than they are for sons. The smaller magnitude and relative lack of significance of the coefficient for professional class daughters corroborates this interpretation; this group would have been the most educated and would have paid the highest gold transfers in the past, and thus we would predict might experience the lowest rate of inflation.

One important point to note here is that the gold transfers by the groom's family (indirect dowry) are inflating at least as much as are the transfers from the bride's family (dowry). This effect is rarely (if ever) described in the literature, but is entirely consistent with an embodied capital model of marriage costs. If embodied capital on the part of the child and his or her parents is part of what motivates such investment, and human capital and/or income on the part of the child's spouse and spouse's parents is part of the object of such transfers, then we should expect both daughters and sons to be the motivators and the objects of such investment. Parents of daughters may need to transfer gold as part of the negotiated dowry for obtaining a particular groom, but parents of sons will also need to transfer gold to their future daughter-in-law to show their ability and willingness to invest in her and her children once she becomes a part of their family. As the education and income of both sons and daughters and their prospective spouses increases, related gold transfers should also increase. While it is true that sons' incomes are higher and more certain than those of daughters (many of whom will not work or will work in less lucrative jobs), it is also true that daughters are frequently educated nearly as much as their brothers and moreover will have a major role in the care and education of their children. From the perspective of human capital theory, this role will be increasingly important as livelihoods become more and more heavily dependent on education (see Behrman et al 1999 for an example of the application of this idea in economics).

The results for son's total marriage costs reflect a consistent, moderate level of deflation both across the entire sample and within classes, though the trend is strongest and most significant in the working class. The results for daughter's total marriage costs show similar deflation for the working class but only reflect a negative relationship in the professional and business classes after education controls are in place. This is consistent with the inflation of cost of gold if the overall marriage costs are sufficiently diluted by non-transfers, which is likely since gold transfers only comprise on average 25% (daughters) to 35% (sons) of total marriage costs (see Table 2). Once again, controlling for fertility has little effect on the results but controlling for education variables increases the strength of deflation in almost every stratum suggesting that human-capital related motivations may be acting against (and thus decreasing the appearance of) an overall deflationary trend.

Function costs show little significant change over time for either sons or daughters. Coefficients are negative for sons and for working class daughters, but positive for professional and business class daughters until education is controlled for. While this matches the pattern for total marriage costs just discussed, the magnitudes are so small that it is only safe to conclude that there has been neither inflation nor deflation in function costs for sons and a modest amount of deflation in function costs for daughters. There is an apparent contradiction here as we might expect some inflation in the negotiated aspects of daughter's function costs. It is difficult, however, to determine how to interpret such results. It is possible that such moderate deflation is simply an artifact of exaggerated inflation related to the numbers from which the deflation indices were constructed, and which is stronger for women than for men because of the greater amounts of money involved. It is also possible that while function costs are in fact related in some degree to the EC of the daughter's family and the characteristics of the groom (as has previously been discussed) that this relationship is weaker than that of inflation and thus results in the moderate deflationary trend we see in these results. Whatever the cause, however, it is clear that neither total marriage costs nor function costs share in the strong inflationary trend visible for gold transfers.

While the embodied capital model does not predict whether non-transfer, non-EC-related marriage costs will go up, down, or remain the same it should be mentioned that this finding is surprising in that much of the literature including significant ethnographic sources (e.g. Srinivas 1984, Caplan 1985, Harrell and Dickey 1985) suggest that marriage displays become more ostentatious over time. Many of these studies, however, do not distinguish between transfer and display elements of marriage costs and thus do not address the possibility of the separate trends in each.

The results for proportion cost of gold corroborate the findings for cost of gold and total marriage costs, and support Prediction 5(b) which contends that gold transfers should increase as a proportion of marriage costs over time. Since embodied capital investment, and the wealth-related rewards for it, are increasing over time, it is to be expected that EC-related forms of marriage costs would increase proportionately when compared to other forms of marriage costs. The results indicate marked increases in the overall sample as well as among working class and business class sons and daughters, with more moderate increases among professional class sons. The only group that does not partake in this general trend is professional class daughters, a group which would have had the strongest tradition of bride's-side marriage payments and large gold transfers in the past and thus should be expected to experience the smallest proportional increase in this aspect of marriage costs. Controlling for fertility results in little change in the results, while controlling for educational variables actually improves the relationship in

several strata and significantly decreases it in none. Once again, this finding suggests that embodied-capital considerations may be instrumental in mediating this relationship.

Finally, proportion function costs shows very little change over time in any stratum. This finding is consistent with previous results which indicate that function costs do not inflate and at most keep up with inflation. The one exception is business class daughters, where controls increasingly improve the relationship between year of marriage and proportion function costs. Given the relatively small sample size in this stratum, it is possible that this finding is a fluke. It is also possible that the trend would be significant given a larger sample. In fact, in one model iteration in which spouse characteristics were added as controls along with family and child characteristics, the coefficient increased to 0.313 with a p value of 0.095. Inflation in the function costs of business class daughters would square well with the enormous social display common at business class weddings, a custom which some ethnographic reports (i.e. Caplan 1985, Sharma 1993) report to be increasing. This trend may also be related to the fact that the business class's economic strategy involves large amounts of monetary capital (see Chapter Two for a detailed discussion) and that not just transfers but also displays of wealth may be especially important in attracting a suitably wealthy husband.

Overall, the results contained in Table 15 lend support to both Predictions 5(a) and 5(b) by indicating that EC-linked types of marriage costs, most notably gold transfers, are inflating over time both individually and in proportion to overall marriage costs. Moreover, my results suggest that these changes are linked to increases in education more strongly than to increases in wealth or decreases in fertility. All of the analyses presented were also run using full complements of controls, including child's characteristics, spouse's characteristics, and spouse's family characteristics. However, the addition of these controls usually only produced minor changes in the relationships presented.

FURTHER DISCUSSION AND LIMITATIONS OF RESEARCH

One potential problem with the findings of this paper is that the inflation seen in the cost of gold could simply be due to strong social conventions about the amount of gold to be given. Thus, the secular increase in the price of gold would cause effective inflation in gold transfers without there being any kind of intentional desire to increase the level of investment in children. This argument is difficult to refute directly, but has several lines of evidence against it. First, I have no ethnographic information to suggest that there are clear, widespread customs related to the amount of gold given at weddings. In contrast, many of my informants told me that larger amounts of gold are commonly given to both brides and grooms in modern weddings than was true at the time that they got married (usually 20-50 years ago).

Moreover, scatterplots of the amount of gold given show only limited evidence of lumping (at multiples of 100) when plotted against either parents' education or father's occupational rank (see Figures 14a-15b), a finding which could be explained by recall bias or a tendency to report round numbers as easily as by social convention in gold transfers. Second, careful examination of the coefficients suggests modest levels of inflation rather than none; regression results can be found in Table 17 and a scatterplot of the unadjusted relationship in Figures 16a and 16b. The uncontrolled correlation is significant for both sons and daughters and remains so for sons even after family wealth is controlled for, while the relationship for daughters retains a p value of 0.096. When broken down by class the results become more complex. There is clear evidence for inflation in the business class, but not in the other class groups though the coefficients are positive. Given the relatively small sample sizes used in these analyses, especially when stratified by class, it is possible that these small effects would become significant with a larger sample size. Finally, the idea of standard gold amounts does not explain the consistently stronger correlation of the variable cost of gold with education variables than with wealth variables. Moreover, controlling the amount of gold regressions for education variables completely nullifies the significance of year of marriage for all genders and social classes suggesting that it is increases in education which are mediating the effect over time. These relationships suggest some causal effect related in a specific way to embodied capital rather than a simple rule of thumb.

A limitation of the study described in this paper relates to display costs. The embodied capital approach gives us the ability to predict the relative size of dowry transfers, the relative importance of embodied capital and wealth considerations in determining the type of marriage costs to be invested in, and the likeliest aspects of marriage costs to inflate over time. However, the embodied capital approach does not clearly explain either the large size of display aspects of marriage costs—equal or greater than the cost of gold transfers—or why display costs should show evidence of deflation over time. The explanations for these phenomena are likely to be found in other types of models which directly address the motivations and methods for status competition, such as costly signaling theory from evolutionary biology (e.g. Smith and Bliege Bird 2000; Sosis 2000, 2003) or the theory of conspicuous consumption from microeconomics (e.g. Bloch., Rao, and Desai 2004). My informants told me on many occasions that one reason that people held such large weddings was that many other matches were either made or potentiated by such events. This can take place through networking as (a) marriageable sons and daughters are on display at such events and (b) their parents can take advantage of a ripe field of potential connections as many of the attendees will be of the same caste and/or social class. Attendance at a lavish wedding, or even the discussion of it through the grapevine at a later date, can also attract potential

spouses who desire to be allied with a family who has the resources to pay for the display as well as the connections to stock the hall full of impressive guests (such as doctors, software engineers, government ministers, film stars, or American anthropologists). It is a limitation of the embodied capital approach that it does not directly answer these types of questions, however, I plan to address them in future papers.

SUMMARY AND CONCLUSIONS

The embodied capital model presented in this paper links various aspects of the economics of marriage in South India to changes in optimal parental investment strategies which Kaplan (1996) connects with the development of wage-labor economies. Specifically, I argue that in South Asia some aspects of marriage costs can be viewed as forms of parental investment because they (a) affect the quality of a child's spouse, which in turn influences his or her effective lifetime income and thus ability to invest in children, and (b) may directly impact the ability to invest in children if they include elements, such as gold, that retain their monetary value over time. Other types of marriage costs, on the other hand, appear to be predicted primarily by wealth variables and neither directly help to ensure a high-quality spouse nor result in wealth transfers to the bride or groom and thus, while predictable, are difficult to fully explain using embodied capital theory.

The findings presented in this chapter can be summarized as follows. The results related to Prediction 1 suggest that dowry marriage is most likely to occur among those with more education and wealth and later in time, a finding which implies that the adoption of dowry marriage in South India may be related to market integration. The results for Prediction 2 indicate that higher levels of market-related parent and child characteristics are associated with the payment of higher marriage costs. When the effects of education and wealth variables is compared, however, it is generally found that education is a better predictor than wealth for types of marriage costs most closely linked to embodied capital investment, such as gold transfers and function costs for the bride's family. Display-related marriages costs, such as function costs for the groom's family, are typically better predicted by wealth variables, while types of marriage costs that reflect both transfers and displays are significantly predicted by both education and wealth characteristics. The results associated with Prediction 3 imply that the importance placed on a spouse's education (embodied capital) is associated with higher levels of transfers, while the importance placed on a spouse's wealth is clearly more important in predicting the costs of marriage-related displays. Prediction 4's results suggest that higher levels of market-related spouse and spouse's family characteristics are associated with higher marriage costs overall, but that the relative importance of education and wealth variables is most strongly related to the role of the spouse after marriage, with

spouse's educational variables predicting gold transfers for sons while spouse's income is the major predictor across marriage cost types for daughters. Finally, the findings connected with Prediction 5 indicate that increases in gold transfers occur faster than inflation and are related to increases in education rather than decreases in fertility. On the other hand, total marriage costs and function costs do not increase faster than inflation, and in fact show modest decreases in some strata, an effect which may also have some relationship to education. Moreover, gold transfers increase as a proportion of total marriage costs over time while function costs do not; this suggests that increases in transfers may be responsible for the observed phenomenon of dowry inflation rather than increases in social display.

While somewhat complex, when taken together these findings suggest a key distinction between different types of marriage cost expenditures based on their apparent functions, with transfers being linked to embodied capital endowments and while displays are related to levels of family and/or spouse wealth. Moreover, the different social positions of men and women produce noticeably different strategies in marriage cost investment for each, especially related to the role of men as breadwinners for their families and of women as conduits for the movement of wealth and embodied capital investment. Finally, while class differences are not key factors for understanding the ideas presented in this paper, the class-related findings corroborate the overall results as they clearly reflect the different marriage practices which have prevailed in each group historically.

While the analyses presented have certain limitations, as a whole the results in this paper suggest that an embodied capital approach is quite useful in helping to explain both cross-sectional relationships and temporal trends in marriage cost expenditures in South India. In addition to its explanatory efficacy, however, the embodied capital model is a useful contribution to the literature for two further reasons. First, it clearly links several disparate aspects of marriage change in South Asia, including the adoption of dowry marriage, the different functions of distinct types of marriage costs, and the inflation in certain aspects of marriage costs over time. Second, the model adds an evolutionary component, the logic of parental investment as a motivator of marriage costs, to a debate that has previously lacked this element.

In extension of this research, it would be appropriate to compare the predictions of the embodied capital approach to predictions generated by other models from cultural anthropology, demography, and economics. It would also be useful to formalize this model and to test its implications for other social and ecological circumstances. I plan to work on analyses of these sorts in the future.

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Table 1. General and specific predictions of the Embodied Capital approach to South Indian marriage costs, including a brief explanation of the logic behind each.

General Predictions	Dependent Variable(s)	Specific predictions by type of Marriage Costs		
		Cost of Gold (proxy for dowry/indirect dowry or property transfers)	**Total Marriage Costs** (comprising transfers, displays, and miscellaneous expenditures)	**Function Costs** (proxy for display expenditures)
1. Increased integration into a wage-labor economy, as evidenced by higher levels of education and wealth, will be associated with an increased likelihood that the custom of dowry marriage will be practiced.	Side Paid More	N/A	N/A	N/A
2(a). Higher levels of market-related parental and child characteristics, such as education and wealth, will be associated with higher dowries and marriage costs. 2(b). Education will be a better predictor than wealth for types of marriage costs which are most closely linked to embodied capital investment.	Cost of Gold Total Marriage Costs Function Costs	Though both should be positive, educational variables should be better predictors than wealth variables because transfers are strongly linked to embodied capital investment through both the spouse's characteristics and the potential for direct investment in grandchildren.	Both education and wealth variables should be good predictors as this variable subsumes both transfer and display elements. The relationship between the two will rely on the comparative proportions of transfer, display, and other elements.	Wealth will be a good predictor as it indexes available resources. Education will be an important predictor only when there is a direct link between function costs and embodied capital-linked spouse characteristics.
3. Greater importance placed on a spouse's education will be associated with higher levels of transfer types of marriage costs, while greater importance placed on a spouse's wealth will be associated with higher levels of display types of marriage costs.	Cost of Gold Total Marriage Costs Function Costs	The importance of education should best predict the amount of gold transfers because it indexes embodied capital-linked marriage market motivations.	Both importance of education and importance of wealth variables could be good predictors depending on what spouse characteristics high marriage costs allow one to obtain in the marriage market.	The importance of income and/or family wealth should be most predictive of the willingness to pay high function costs because they index wealth-related marriage market motivations.
4(a). Higher levels of market-related spouse or spouse's family characteristics, such as education and wealth, will be associated with higher dowries and marriage costs. 4(b). Spouse's and spouse's parents' education will be better predictors than wealth for types of marriage costs which are most closely linked to embodied capital investment.	Cost of Gold Total Marriage Costs Function Costs	Educational variables should be better predictors than wealth variables because of the increasing returns to EC investment.	Both education and wealth variables should be good predictors as this variable subsumes both transfer and display elements.	Wealth variables should be better predictors than education variables because they index available resources.
5(a). Increases in embodied capital-linked types of marriage costs, such as gold transfers, will occur faster than income inflation while increases in display-linked types of marriage costs will not. 5(b). Gold transfers or other embodied capital-linked forms of marriage costs will increase as a proportion of marriage costs over time while display-linked types of marriage costs will not.	Cost of Gold Total Marriage Costs Function Costs Proportion Cost of Gold Proportion Function Costs	Inflation in gold transfers are predicted due to (a) increased participation in India's growing wage-labor economy and (b) increasing returns to embodied capital investment in such economies. Since other types of marriage costs will not increase, gold transfers should become proportionally larger.	Inflation in total marriage costs is predicted only if the inflating elements (those linked to EC investment) are proportionally more important than other (i.e. display) elements of marriage costs.	Inflation in function costs is not predicted unless there is a strong, direct link between these costs and spouse characteristics. Since inflation is not expected in function costs, their proportion of total marriage costs will not change or may decrease slightly due to rising costs of transfers.

Table 2. Descriptive statistics for various aspects of marriage costs adjusted by Deflation Index Two and Deflation Index One.

	Working Class			Professional Class			Business Class			Entire Sample		
Sons' Families	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**
DEFLATION INDEX TWO:												
Cost of Gold to Bride (1940 Rupees)	58.11	102.64	138	145.87	194.53	230	269.32	428.50	67	137.04	236.51	435
Cost of Gold to Groom (1940 Rupees)	57.67	63.18	23	63.19	42.33	50	65.29	41.86	10	61.91	48.39	83
Total Cost of Gold (1940 Rupees)	65.81	106.89	142	152.32	192.54	241	274.96	425.55	68	143.57	234.25	451
Function Costs (1940 Rupees)	207.23	425.68	139	300.25	564.04	261	521.76	987.62	81	310.67	630.61	481
Total Marriage Costs (1940 Rupees)	504.44	778.17	159	905.66	1203.50	286	1316.77	1625.92	89	854.71	1210.00	534
Proportion Cost of Gold	0.42	0.77	140	0.33	0.46	241	0.35	0.38	68	0.36	0.57	449
Proportion Function Costs	0.51	1.44	134	0.28	0.29	258	0.36	0.69	80	0.36	0.85	472
Total Amount of Gold (grams)	15.35	21.39	142	31.10	39.41	241	45.51	59.57	67	28.28	39.96	450
DEFLATION INDEX ONE:												
Cost of Gold to Bride (1940 Rupees)	50.29	88.140	138	124.32	164.17	230	227.13	353.99	67	116.67	197.60	435
Cost of Gold to Groom (1940 Rupees)	46.84	50.39	23	52.74	34.58	50	55.04	35.48	10	51.38	39.28	83
Total Cost of Gold (1940 Rupees)	56.46	90.94	142	129.59	162.45	241	231.88	351.52	68	121.99	195.64	451
Function Costs (1940 Rupees)	185.88	381.60	139	261.07	502.62	261	467.26	896.29	81	274.06	566.78	481
Total Marriage Costs (1940 Rupees)	458.31	716.97	159	795.08	1076.73	286	1170.23	1489.64	89	757.33	1092.96	534
Daughters' Families	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**
DEFLATION INDEX TWO:												
Cost of Gold to Bride (1940 Rupees)	97.31	145.79	129	327.37	440.90	254	258.33	402.08	53	250.91	386.08	436
Cost of Gold to Groom (1940 Rupees)	50.07	48.83	45	64.25	58.38	72	31.87	32.30	12	56.29	53.89	129
Total Cost of Gold (1940 Rupees)	106.52	148.59	139	329.99	436.33	266	238.54	386.79	59	251.42	379.68	464
Function Costs (1940 Rupees)	442.98	694.84	150	1244.92	1658.75	331	2447.83	4048.51	78	1197.58	2095.42	559
Total Marriage Costs(1940 Rupees)	1077.61	1722.83	167	2544.66	2692.38	350	5709.64	7473.03	81	2563.67	3808.85	598
Proportion Cost of Gold	0.33	0.49	138	0.22	0.32	265	0.14	0.22	59	0.24	0.37	462
Proportion Function Costs	0.40	0.27	147	0.49	0.43	330	0.39	0.22	78	0.45	0.37	555
Total Amount of Gold (grams)	24.70	27.17	139	58.59	71.31	264	51.63	72.79	59	47.50	63.39	462
DEFLATION INDEX ONE:												
Cost of Gold to Bride (1940 Rupees)	83.30	119.35	129	276.57	370.015	254	221.29	336.37	53	212.67	323.58	436
Cost of Gold to Groom (1940 Rupees)	42.58	39.14	45	53.67	47.72	72	27.05	25.57	12	47.32	43.76	129
Total Cost of Gold (1940 Rupees)	91.10	121.22	139	278.62	366.12	266	204.29	323.65	59	212.99	318.06	464
Function Costs (1940 Rupees)	398.74	633.89	150	1065.18	1455.15	331	2158.55	3581.73	78	1038.91	1848.14	559
Total Marriage Costs (1940 Rupees)	975.48	1597.65	167	2175.58	2318.23	350	5035.04	6532.37	81	2227.75	3328.54	598

Table 3. Average Price of Gold in Rupees Per Gram for the years 1940-2002.[a, b]

Year	Price per Gram (Rupees)	Year	Price per Gram (Rupees)	Year	Price per Gram (Rupees)
1940	3.5	1961	11.5	1982	171.9
1941	3.6	1962	12.1	1983	172.3
1942	3.8	1963	11.8	1984	185.8
1943	4.9	1964	11.2	1985	198.4
1944	6.6	1965	6.9	1986	212.5
1945	6.1	1966	7.8	1987	232.4
1946	6.9	1967	8.4	1988	308.2
1947	8.6	1968	15.7	1989	317.5
1948	9.2	1969	16.0	1990	322.9
1949	9.8	1970	18.0	1991	345.2
1950	9.9	1971	18.5	1992	429.8
1951	9.7	1972	20.0	1993	410.4
1952	9.4	1973	24.2	1994	453.2
1953	7.5	1974	36.9	1995	466.7
1954	7.4	1975	51.9	1996	495.8
1955	7.6	1976	54.5	1997	507.1
1956	8.2	1977	55.0	1998	434.7
1957	9.0	1978	63.8	1999	426.8
1958	9.3	1979	79.1	2000	439.4
1959	9.6	1980	115.9	2001	447.4
1960	10.4	1981	152.2	2002	484.0

[a] Information in this table is from Statistical Abstract of Indian Union 1950-1970, the Reserve Bank of India Handbook on the Indian Economy 2002/2003, and the World Gold Council and KITCO Bullion Dealers websites.

[b] Information for the years 1940-2001comes from the periods July 1939-June 1940 through July 2000-June 2001 and is based on information provided by the Bombay Bullion Association Ltd. to the and is based on information provided by the Bombay Bullion Association Ltd. to the Reserve Bank of India. Information for the period July 2001-June 2002 was not available because such information had ceased to be provided by the BBAL, therefore the price was reconstructed using price information from the London market (London PM Fix) which is provided in U.S. Dollars, the standard conversion between troy ounces (the international market weight standard) and grams (the Indian market standard weight), and the average exchange rate between dollars and rupees during 2002.

Table 4. Summary Statistics for education, occupation, and income variables.

	Working Class			Professional Class			Business Class			Entire Sample		
Sons' Families	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**
Parents' Education (Level)	1.20	2.15	156	7.35	4.43	276	5.19	4.07	88	5.14	4.67	520
Father's Occupational Rank	5.02	3.58	159	15.21	4.14	286	20.19	2.50	89	13.01	6.65	534
Child's Education (Level)	2.95	2.14	157	6.48	1.80	283	5.89	1.71	88	5.33	2.45	528
Child's Income (2002 Rupees)	4451.--	4074.--	159	16645.--	36985.--	286	15421.--	10326.--	89	12810.--	27997.--	534
Spouse's Education (Level)	1.82	2.10	155	5.39	2.23	282	4.78	1.99	88	4.24	2.67	525
Spouse's Income (2002 Rupees)	634.--	1809.--	158	3184.--	16081.--	276	1051.--	3409.--	88	2052.--	11869.--	522
Spouse's Parents' Education (Lv)	1.08	2.16	159	6.12	4.68	219	5.48	4.95	60	4.43	4.69	408
Spouse's Father's Occ. Rank	6.33	4.74	129 139	14.32	5.46	223	16.23	4.59	60	11.96	6.48	422
Daughters' Families	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**
Parents' Education (Level)	1.60	2.57	160	7.43	4.15	341	5.44	4.02	78	5.55	4.53	579
Father's Occupational Rank	4.95	3.59	167	14.94	4.31	350	19.17	2.13	81	12.72	6.36	598
Child's Education (Level)	2.00	2.23	165	5.44	2.22	346	4.74	2.04	81	4.38	2.66	592
Child's Income (2002 Rupees)	580.--	1781.--	167	2690.--	5655.--	350	1370.--	4844.--	81	1922.--	4859.--	598
Spouse's Education (Level)	3.20	2.53	166	6.26	2.09	346	6.20	1.80	81	5.39	2.58	593
Spouse's Income (2002 Rupees)	8857.--	29138.--	152	13363.--	14264.--	332	19776.--	15360.--	76	13010.--	19811.--	560
Spouse's Parents' Education (Lv)	1.98	3.06	45	6.60	5.24	147	7.64	4.65	22	5.74	5.17	214
Spouse's Father's Occ. Rank	7.37	5.34	46	14.42	6.04	149	15.50	4.02	22	13.03	6.43	217

Table 5. Summary Statistics for family and individual characteristics.

	Working Class			Professional Class			Business Class			Entire Sample		
Sons' Families	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**
Side Paid More	2.39	0.91	156	2.74	0.63	281	2.84	0.48	85	2.65	0.73	522
Year of Marriage	1978.63	14.49	159	1984.48	15.33	286	1981.34	15.55	89	1982.21	15.31	534
Importance of Education	1.25	0.53	154	2.14	0.82	272	1.79	0.82	89	1.81	0.84	515
Importance of Income	1.31	0.64	154	1.28	0.62	269	1.18	0.56	89	1.27	0.62	512
Importance of Family Wealth	1.67	0.88	153	1.76	0.83	269	1.92	0.84	89	1.76	0.85	511
Number of Children	3.54	1.68	154	3.56	1.73	278	3.66	1.85	87	3.57	1.74	519
Proportion of Daughters	0.27	0.23	154	0.31	0.24	278	0.26	0.24	87	0.29	0.24	519
Daughters' Families	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**	**Mean**	**Standard Deviation**	**N**
Side Paid More	2.35	0.92	165	2.76	0.60	344	2.79	0.52	80	2.65	0.72	589
Year of Marriage	1977.67	14.31	167	1985.62	14.10	350	1978.06	14.44	81	1982.38	14.70	598
Importance of Education	1.66	0.81	163	2.44	0.78	339	2.37	0.77	79	2.21	0.86	581
Importance of Income	2.09	0.96	163	2.53	0.74	339	2.60	0.73	79	2.41	0.83	581
Importance of Family Wealth	1.61	0.88	163	1.90	0.86	338	2.17	0.88	79	1.85	0.89	580
Number of Children	3.85	1.86	163	3.69	1.75	344	3.43	1.91	76	3.70	1.80	583
Proportion of Daughters	0.55	0.21	163	0.59	0.23	343	0.53	0.22	76	0.57	0.22	582

Table 6. Results of T-tests comparing the means of the variable *side paid more* between social classes (Prediction 1).						
Working Class Mean	**Professional Class Mean**	**Business Class Mean**	**T statistic WC to PC**	**T statistic WC to BC**	**T statistic PC to BC**	**Results**
2.34	2.75	2.81	-8.303***	-6.191***	-1.248	PC and BC > WC

Table 7. T-test results comparing the characteristics of bride-price (groom's side pays more) versus dowry (bride's side pays more) marriages (Prediction 1).

Variable	Mean for groom's side paid more (Std. Dev.)	Mean for bride's side paid more (Std. Dev.)	T statistic [a]	Results
Sons' Marriages				
Parents' education	2.14 (3.48)	5.74 (4.60)	-7.891***	Groom's Side < Bride's Side
Father's occ. rank	7.97 (5.95)	13.80 (6.45)	-7.834***	Groom's Side < Bride's Side
Year of marriage	1977.06 (13.63)	1983.08 (15.63)	-3.492***	Groom's Side < Bride's Side
Total cost of gold	83.72 (212.02)	156.82 (240.37)	-2.603*	Groom's Side < Bride's Side
Total marriage costs	1012.90 (1435.85)	822.44 (1180.99)	1.104	No difference
Function costs	552.61 (863.93)	246.67 (545.99)	2.880**	Groom's Side > Bride's Side
Cost of gold to bride	79.04 (212.21)	150.02 (243.76)	-2.492*	Groom's Side < Bride's Side
Cost of gold to groom	69.32 (53.36)	61.81 (48.68)	0.334	No difference
Daughters' Marriages				
Parents' education	2.60 (3.28)	6.08 (4.59)	-8.283***	Groom's Side < Bride's Side
Father's occ. rank	7.74 (5.89)	13.45 (6.12)	-8.160***	Groom's Side < Bride's Side
Year of marriage	1977.66 (14.61)	1983.10 (14.67)	-3.157**	Groom's Side < Bride's Side
Total cost of gold	123.96 (230.03)	280.74 (405.72)	-4.341***	Groom's Side < Bride's Side
Total marriage costs	1216.29 (3033.72)	2853.22 (3867.09)	-4.369***	Groom's Side < Bride's Side
Function costs	521.89 (2188.43)	1354.67 (2148.19)	-2.948**	Groom's Side < Bride's Side
Cost of gold to bride	126.16 (242.55)	276.33 (409.91)	-3.766***	Groom's Side < Bride's Side
Cost of gold to groom	37.00 (29.13)	61.88 (57.78)	-3.032**	Groom's Side < Bride's Side

[a] Significance level is indicated as follows: * at the .05 level, ** at the .01 level, and *** at the .001 level.

Table 8. Multiple logistic regression results for various predictors of the dependent variable side paid more (Prediction 1).

	Working Class	Professional Class	Business Class	Entire Sample
	Sons' Marriages			
Independent Variable(s)	Beta [a]	Beta	Beta	Beta
Parents' Education	0.221*	0.217***	0.151	0.233***
Father's Occupational Rank	0.103	0.210***	0.193	0.137***
Year of Marriage	0.019	0.018	0.044	0.024**
Parents' Education	0.147	0.145*	0.059	0.119*
Father's Occupational Rank	0.061	0.122	0.021	0.086***
Year of Marriage	0.013	0.009	0.036	0.011
	Daughters' Marriages			
Independent Variable(s)	Beta	Beta	Beta	Beta
Parents' Education	0.088	0.196***	0.123	0.214***
Father's Occupational Rank	0.114*	0.143**	0.019	0.148***
Year of Marriage	0.012	0.015	0.095	0.024**
Parents' Education	-0.013	0.154*	-0.061	0.092
Father's Occupational Rank	0.111	0.069	-0.180	0.102***
Year of Marriage	0.008	0.005	0.117	0.009

[a] Significance level is indicated as follows: * at the .05 level, ** at the .01 level, and *** at the .001 level.

Table 9. Results of OLS multivariate regression showing the comparative effects of parental education and wealth variables on three aspects of marriage costs (Predictions 2a and 2b).

		Working Class	Professional Class	Business Class	Entire Sample
Sons' Marriage Costs					
Dependent Variable	**Independent Variables** [a, b]	**Beta** [c, d]	**Beta**	**Beta**	**Beta**
Cost of Gold	Parents' Education	0.339***	0.293***	0.449***	0.318***
	Father's Occupational Rank	0.182*	0.265***	0.001	0.301***
	Parents' Education	0.310***	0.194*	0.450***	0.191**
	Father's Occupational Rank	0.062	0.156*	0.007	0.196***
Total Marriage Costs	Parents' Education	0.169*	0.124	0.279*	0.234***
	Father's Occupational Rank	0.143	0.080	0.086	0.239***
	Parents' Education	0.132	0.116	0.275*	0.120*
	Father's Occupational Rank	0.090	0.013	0.091	0.173**
Function Costs	Parents' Education	0.021	0.146*	0.155	0.143**
	Father's Occupational Rank	0.045	0.122*	0.020	0.163***
	Parents' Education	0.007	0.118	0.155	0.059
	Father's Occupational Rank	0.036	0.042	0.010	0.127*
Daughters' Marriage Costs					
Dependent Variable	**Independent Variables** [a]	**Beta**	**Beta**	**Beta**	**Beta**
Cost of Gold	Parents' Education	0.329***	0.277***	0.112	0.349***
	Father's Occupational Rank	0.186*	0.195***	0.003	0.247***
	Parents' Education	0.311**	0.242**	0.119	0.302***
	Father's Occupational Rank	0.032	0.054	-0.021	0.067
Total Marriage Costs	Parents' Education	0.400***	0.343***	0.465***	0.378***
	Father's Occupational Rank	0.374***	0.293***	-0.094	0.353***
	Parents' Education	0.271**	0.241***	0.512***	0.214***
	Father's Occupational Rank	0.244**	0.154*	-0.190	0.227***
Function Costs	Parents' Education	0.275**	0.286***	0.363*	0.329***
	Father's Occupational Rank	0.286***	0.188***	-0.062	0.284***
	Parents' Education	0.170	0.256***	0.398**	0.212***
	Father's Occupational Rank	0.205*	0.046	-0.138	0.166**

[a] All regressions in this table have been controlled for **year of marriage** to account for secular trends in education and wealth.
[b] Variables within the same row are included in the same model; those separated by row lines are in separate models.
[c] Significance level is indicated as follows: * at the .05 level, ** at the .01 level, and *** at the .001 level.
[d] Standardized betas are used in this table to ease comparison between variables.

Table 10. Results of OLS multivariate regression showing the comparative effects of parental and child education and wealth characteristics on three aspects of marriage costs (Predictions 2a and 2b).

		Working Class	Professional Class	Business Class	Entire Sample
Sons' Marriage Costs					
Dependent Variable	**Independent Variables** [a]	**Beta** [b, c]	**Beta**	**Beta**	**Beta**
Cost of Gold	Parents' Education	0.160	0.142	0.351*	0.146*
	Father's Occupational Rank	0.067	0.172*	0.089	0.186**
	Son's Education	0.072	0.075	0.202	0.074
	Son's Income	0.243**	0.004	-0.102	0.006
Total Marriage Costs	Parents' Education	0.115	0.068	0.287	0.106
	Father's Occupational Rank	0.129	0.033	0.005	0.175**
	Son's Education	-0.003	0.066	-0.136	0.016
	Son's Income	0.066	0.106	0.362***	0.111*
Function Costs	Parents' Education	0.055	0.100	0.153	0.089
	Father's Occupational Rank	0.036	0.036	-0.042	0.120
	Son's Education	-0.062	0.014	-0.056	-0.054
	Son's Income	0.027	0.144*	0.293*	0.122*
Daughters' Marriage Costs					
Dependent Variable	**Independent Variables** [a]	**Beta**	**Beta**	**Beta**	**Beta**
Cost of Gold	Parents' Education	0.310*	0.227*	0.054	0.291***
	Father's Occupational Rank	-0.040	0.038	-0.072	0.033
	Daughter's Education	0.079	0.094	0.089	0.084
	Daughter's Income	0.116	-0.046	0.001	-0.003
Total Marriage Costs	Parents' Education	0.201	0.157*	0.510***	0.219***
	Father's Occupational Rank	0.186*	0.102	-0.210	0.179**
	Daughter's Education	0.198*	0.176*	0.098	0.067
	Daughter's Income	-0.076	0.055	0.053	0.035
Function Costs	Parents' Education	0.062	0.168*	0.377*	0.184**
	Father's Occupational Rank	0.127	-0.009	-0.154	0.141*
	Daughter's Education	0.269*	0.143	0.055	0.060
	Daughter's Income	-0.058	0.102	-0.055	0.036

[a] All regressions in this table have been controlled for **number of children**, **proportion of daughters**, and **year of marriage**

[b] Significance level is indicated as follows: * at the .05 level, ** at the .01 level, and *** at the .001 level.

[c] Standardized betas are used in this table to ease comparison between variables.

Table 11. Results of OLS multivariate regression showing the effects on three aspects of marriage costs of variables indexing the importance of potential spousal traits in arranging a child's marriage (Prediction 3).

		Working Class	Professional Class	Business Class	Entire Sample
Sons' Marriage Costs					
Dependent Variable	**Independent Variables** [a]	**Beta** [b, c]	**Beta**	**Beta**	**Beta**
Cost of Gold	Importance of Spouse's Education	0.104	0.097	0.295*	0.133*
	Importance of Spouse's Income	-0.040	-0.065	0.099	-0.007
	Importance of Spouse's Family Wealth	0.012	-0.045	-0.054	-0.018
Total Marriage Costs	Importance of Spouse's Education	0.139	0.156*	0.077	0.146**
	Importance of Spouse's Income	-0.008	0.060	0.176	0.052
	Importance of Spouse's Family Wealth	0.065	0.081	0.142	0.084*
Function Costs	Importance of Spouse's Education	0.187*	0.032	0.140	0.072
	Importance of Spouse's Income	0.059	0.026	0.264*	0.078
	Importance of Spouse's Family Wealth	0.067	0.095	0.169	0.103*
Daughters' Marriage Costs					
Dependent Variable	**Independent Variables** [a]	**Beta**	**Beta**	**Beta**	**Beta**
Cost of Gold	Importance of Spouse's Education	0.151	0.146*	0.011	0.128*
	Importance of Spouse's Income	0.003	0.037	-0.041	0.015
	Importance of Spouse's Family Wealth	-0.019	-0.087	-0.117	-0.068
Total Marriage Costs	Importance of Spouse's Education	0.062	0.114	0.044	0.047
	Importance of Spouse's Income	0.113	0.071	0.252*	0.100*
	Importance of Spouse's Family Wealth	0.080	0.060	0.186	0.120**
Function Costs	Importance of Spouse's Education	0.049	0.071	0.072	0.042
	Importance of Spouse's Income	0.104	0.069	0.181	0.081
	Importance of Spouse's Family Wealth	0.109	0.097	0.116	0.115**

[a] All regressions in this table have been controlled for **parents' education**, **father's occupational rank**, and **year of marriage**.
[b] Significance level is indicated as follows: * at the .05 level, ** at the .01 level, and *** at the .001 level.
[c] Standardized betas are used in this table to ease comparison between variables.

Table 12. Results of OLS multivariate regression showing the comparative effects of bride's and groom's personal and parental education and wealth characteristics on three aspects of marriage costs (Prediction 4).

		Working Class	Professional Class	Business Class	Entire Sample
Sons' Marriage Costs					
Dependent Variable	**Independent Variables** [a]	**Beta** [b, c]	**Beta**	**Beta**	**Beta**
Cost of Gold	Bride's Education	0.107	0.104	-0.164	-0.018
	Bride's Income	0.026	0.072	0.112	0.056
	Bride's Parents' Education	0.030	0.201*	0.526*	0.313***
	Bride's Father's Occupational Rank	0.023	-0.023	0.132	0.069
Total Marriage Costs	Bride's Education	-0.026	-0.004	0.061	-0.013
	Bride's Income	-0.024	0.053	-0.076	0.015
	Bride's Parents' Education	-0.068	0.185	-0.091	0.125
	Bride's Father's Occupational Rank	0.349***	-0.077	0.367	0.173*
Function Costs	Bride's Education	0.119	-0.015	0.063	-0.017
	Bride's Income	-0.117	0.067	-0.011	0.023
	Bride's Parents' Education	-0.086	0.110	0.053	0.065
	Bride's Father's Occupational Rank	0.187	0.004	0.236	0.162*
Daughters' Marriage Costs					
Dependent Variable	**Independent Variables** [a]	**Beta**	**Beta**	**Beta**	**Beta**
Cost of Gold	Groom's Education	0.392	-0.062	0.162	0.004
	Groom's Income	-0.367	0.305**	0.228	0.242**
	Groom's Parents' Education	-0.276	-0.025	0.702	0.156
	Groom's Father's Occupational Rank	0.378	0.278*	-0.363	0.153
Total Marriage Costs	Groom's Education	-0.335	0.059	0.441	0.024
	Groom's Income	0.592*	0.296***	0.705***	0.463***
	Groom's Parents' Education	0.111	0.077	0.036	0.026
	Groom's Father's Occupational Rank	0.287	0.220	0.461*	0.193*
Function Costs	Groom's Education	-0.498*	0.090	0.287	0.054
	Groom's Income	0.845***	0.108	0.569**	0.346***
	Groom's Parents' Education	0.047	-0.032	-0.019	-0.067
	Groom's Father's Occupational Rank	0.195	0.244	0.378	0.250*

[a] All regressions in this table have been controlled for **number of children**, **proportion of daughters**, and **year of marriage**

[b] Significance level is indicated as follows: * at the .05 level, ** at the .01 level, and *** at the .001 level.

[c] Standardized betas are used in this table to ease comparison between variables.

Table 13. Son's Marriage Costs—Full model.
Results of OLS multivariate regression comparing the effects of all child, parent, spouse and spouse's parent characteristics on three aspects of daughter's marriage costs (Prediction 4).

Dependent Variable	Independent Variable [a]	Working Class	Professional Class	Business Class	Entire Sample
		Beta [b, c]	Beta	Beta	Beta
Cost of Gold	Parents' Education	0.043	0.079	-0.123	-0.048
	Father's Occupational Rank	0.022	0.015	0.289	0.136
	Son's Education	0.233*	0.072	-0.004	0.117
	Son's Income	0.101	-0.012	0.020	0.025
	Bride's Education	-0.076	-0.002	-0.150	-0.151
	Bride's Income	0.040	0.097	0.112	0.071
	Bride's Parents' Education	0.055	0.154	0.632	0.319***
	Bride's Father's Occupational Rank	-0.040	-0.026	0.132	0.008
Total Marriage Costs	Parents' Education	0.184	0.083	-0.012	0.048
	Father's Occupational Rank	0.101	-0.021	0.075	0.122
	Son's Education	-0.028	0.023	-0.305	-0.037
	Son's Income	0.127	0.106	0.303	0.138*
	Bride's Education	-0.096	-0.049	0.178	-0.060
	Bride's Income	0.003	0.010	-0.049	-0.044
	Bride's Parents' Education	-0.072	0.147	0.118	0.082
	Bride's Father's Occupational Rank	0.245*	-0.058	0.248	0.141
Function Costs	Parents' Education	0.054	0.090	-0.261	-0.026
	Father's Occupational Rank	-0.033	-0.003	0.011	0.076
	Son's Education	-0.142	-0.023	-0.120	-0.110
	Son's Income	-0.004	0.173*	0.273	0.149*
	Bride's Education	0.180	-0.015	0.140	0.036
	Bride's Income	-0.136	-0.013	-0.004	-0.044
	Bride's Parents' Education	-0.109	0.059	0.325	0.059
	Bride's Father's Occupational Rank	0.212	0.044	0.135	0.165*

[a] All regressions in this table have been controlled for **number of children**, **proportion of daughters**, and **year of marriage**
[b] Significance level is indicated as follows: * at the .05 level, ** at the .01 level, and *** at the .001 level.
[c] Standardized betas are used in this table to ease comparison between variables.

Table 14. Daughter's Marriage Costs—Full model.
Results of OLS multivariate regression comparing the effects of all child, parent, spouse and spouse's parent characteristics on three aspects of daughter's marriage costs (Prediction 4).

Dependent Variable	Independent Variable [a]	Working Class	Professional Class	Business Class	Entire Sample
		Beta [b, c]	Beta	Beta	Beta
Cost of Gold	Parents' Education	0.536	-0.009	0.138	0.111
	Father's Occupational Rank	0.355	0.105	-0.365	0.091
	Daughter's Education	-0.043	0.061	-0.466	-0.064
	Daughter's Income	0.360	-0.145	0.024	-0.062
	Groom's Education	0.244	-0.105	0.268	-0.036
	Groom's Income	-0.468	0.278**	0.279	0.207*
	Groom's Parents' Education	-0.562	-0.025	0.746	0.146
	Groom's Father's Occupational Rank	0.398	0.280	-0.473	0.142
Total Marriage Costs	Parents' Education	0.662	-0.105	0.381	0.046
	Father's Occupational Rank	0.164	0.085	0.098	0.156
	Daughter's Education	-0.665	0.098	-0.061	-0.037
	Daughter's Income	-0.283	0.135	0.415	0.125
	Groom's Education	-0.424*	0.024	-0.075	-0.042
	Groom's Income	0.851***	0.258**	0.277	0.418***
	Groom's Parents' Education	0.080	0.067	-0.084	-0.030
	Groom's Father's Occupational Rank	0.309	0.172	0.412	0.156
Function Costs	Parents' Education	0.225	-0.062	0.379	0.054
	Father's Occupational Rank	0.140	-0.072	0.270	0.090
	Daughter's Education	-0.589	0.147	-0.207	-0.036
	Daughter's Income	-0.426**	0.188	0.369	0.106
	Groom's Education	-0.426*	0.048	-0.110	0.011
	Groom's Income	0.985***	0.063	0.179	0.312***
	Groom's Parents' Education	0.231	-0.034	-0.122	-0.110
	Groom's Father's Occupational Rank	0.087	0.198	0.460	0.225*

[a] All regressions in this table have been controlled for **number of children**, **proportion of daughters**, and **year of marriage**
[b] Significance level is indicated as follows: * at the .05 level, ** at the .01 level, and *** at the .001 level.
[c] Standardized betas are used in this table to ease comparison between variables.

Table 15. Results of OLS multivariate regression of year of marriage on three aspects of marriage costs with various sets of control variables (Prediction 5).

		Working Class	Professional Class	Business Class	Entire Sample
Sons' Marriage Costs					
Dependent Variable	**Independent Variable(s)**	**Beta** [a,b]	**Beta**	**Beta**	**Beta**
Cost of Gold	Year of Marriage [c]	0.265***	0.227***	0.384**	0.218***
	Year of Marriage [d]	0.284***	0.210***	0.345*	0.214***
	Year of Marriage [e]	0.155	0.174*	0.101	0.156**
Total Marriage Costs	Year of Marriage [c]	-0.225**	-0.096	-0.171	-0.136***
	Year of Marriage [d]	-0.253**	-0.094	-0.184	-0.128**
	Year of Marriage [e]	-0.251**	-0.136*	-0.291	-0.164***
Function Costs	Year of Marriage [c]	-0.121	0.010	-0.111	-0.064
	Year of Marriage [d]	-0.121	-0.006	-0.081	-0.059
	Year of Marriage [e]	-0.103	-0.024	-0.189	-0.084
Proportion Cost Gold	Year of Marriage [c]	0.373***	0.208***	0.568***	0.280***
	Year of Marriage [d]	0.367***	0.207**	0.580***	0.280***
	Year of Marriage [e]	0.421***	0.180*	0.516***	0.307***
Proportion Function Costs	Year of Marriage [c]	-0.013	0.114	0.043	0.019
	Year of Marriage [d]	-0.013	0.115	0.048	0.018
	Year of Marriage [e]	0.003	0.073	-0.075	0.007
Daughters' Marriage Costs					
Dependent Variable	**Independent Variable(s)**	**Beta**	**Beta**	**Beta**	**Beta**
Cost of Gold	Year of Marriage [c]	0.342***	0.152*	0.440**	0.214***
	Year of Marriage [d]	0.337***	0.135*	0.437**	0.206***
	Year of Marriage [e]	0.258**	0.051	0.363*	0.099*
Total Marriage Costs	Year of Marriage [c]	-0.221**	0.036	0.193	-0.019
	Year of Marriage [d]	-0.228**	0.040	0.225	-0.011
	Year of Marriage [e]	-0.301***	-0.076	-0.119	-0.109*
Function Costs	Year of Marriage [c]	-0.185*	0.003	0.120	-0.022
	Year of Marriage [d]	-0.187*	0.007	0.134	-0.020
	Year of Marriage [e]	-0.240**	-0.123*	-0.120	-0.120*
Proportion Cost Gold	Year of Marriage [c]	0.467***	0.059	0.359*	0.216***
	Year of Marriage [d]	0.466***	0.041	0.368*	0.213***
	Year of Marriage [e]	0.526***	0.020	0.543**	0.241***
Proportion Function Costs	Year of Marriage [c]	-0.042	0.030	0.063	0.044
	Year of Marriage [d]	-0.027	0.043	0.081	0.050
	Year of Marriage [e]	-0.062	-0.019	0.150	-0.012

[a] Significance level is indicated as follows: * at the .05 level, ** at the .01 level, and *** at the .001 level.
[b] Standardized betas are used in this table to ease comparison between variables.
[c] This regression has been controlled for **father's occupational rank**.
[d] This regression has been controlled for **father's occupational rank** and **number of children**.
[e] This regression has been controlled for **father's occupational rank**, **parents' education** and **child's education**.

Table 16. Summary of results.

Prediction	Results
1. Increased integration into a wage-labor economy, as evidenced by higher levels of education and wealth, will be associated with an increased likelihood that the custom of dowry marriage will be practiced.	**SUPPORTED** • "dowry marriages" more likely to occur in the professional and business classes than in the working class • dowry marriages occurred on average among wealthier, better-educated families and later in time
2(a). Higher levels of market-related parental and child characteristics, such as education and wealth, will be associated with higher dowries and marriage costs. 2(b). Education will be a better predictor than wealth for types of marriage costs which are most closely linked to embodied capital investment.	**SUPPORTED** • in univariate regressions, education and wealth are each positively and significantly correlated with all types of marriage costs • in multivariate regressions, both education and wealth variables are usually positive and frequently significant **SUPPORTED** • for sons, both parents' education and wealth are good predictors of cost of gold while parents' and/or child's wealth variables are better predictors of total marriage costs and function costs • for daughters, parent's education is a much stronger predictor of cost of gold while both parents' education and wealth variables are significant predictors of total marriage costs and function costs; parent's characteristics are more important than child's in determining marriage costs
3. Greater importance placed on a spouse's education will be associated with higher levels of transfer types of marriage costs, while greater importance placed on a spouse's wealth will be associated with higher levels of display types of marriage costs.	**SUPPORTED** • the importance of a spouse's education is significantly correlated with gold transfers for both sons and daughters • the importance of income and family wealth are significantly predictive of total marriage costs for daughters, while the importance of education and family wealth are predictive of total marriage costs for sons • the importance of family wealth is a significant predictor of function costs for both sons and daughters
4(a). Higher levels of market-related spouse or spouse's family characteristics, such as education and wealth, will be associated with higher dowries and marriage costs. 4(b). Spouse's and spouse's parents' education will be better predictors than wealth for types of marriage costs which are most closely linked to embodied capital investment.	**SUPPORTED** • in univariate regressions, education and wealth variables of both spouses and spouse's parents are positively and significantly correlated with all types of marriage costs • in multivariate regressions, education and wealth variables are usually positive though only a few variables are significant in any one analysis **SUPPORTED for sons, PARTIAL SUPPORT for daughters** • for sons, bride's parents' education is the best predictor of gold transfers, while son's income and/or bride's parents' wealth are the best predictors of total marriage costs and function costs • for daughters, groom's income is the strongest predictor across marriage cost types, however education variables are more strongly predictive of gold transfers than of total marriage costs or function costs
5(a). Increases in embodied capital-linked types of marriage costs, such as gold transfers, will occur faster than income inflation while increases in display-linked types of marriage costs will not. 5(b). Gold transfers or other embodied capital-linked forms of marriage costs will increase as a proportion of marriage costs over time while display-linked types of marriage costs will not.	**SUPPORTED** • cost of gold shows inflation for both sons and daughters • total marriage costs shows deflation over time; the effects are significant for sons but not for daughters • function costs show decrease over time, but the results are non-significant • controlling for fertility does not change these relationships, but controlling for education causes them to decrease (become less positive or more negative), implying a potential causal link **SUPPORTED** • cost of gold as a proportion of total marriage costs increases over time for both sons and daughters • function costs as a proportion of total marriage costs shows no significant change over time for either sons or daughters • controlling for fertility does not change these results but controlling for education improves the relationship slightly for cost of gold but reduces it for function costs

Table 17. Multiple logistic regression results for various predictors regressed on the dependent variable amount of gold.

	Working Class	Professional Class	Business Class	Entire Sample
	Sons' Marriages			
Independent Variable(s)	Beta [a, b]	Beta	Beta	Beta (p)
Year of Marriage	0.042	0.058	0.370**	0.108**
Year of Marriage	0.031	0.047	0.384**	0.090*
Father's Occupational Rank	0.110	0.248***	-0.028	0.278***
Year of Marriage	0.030	0.034	0.339*	0.089*
Father's Occupational Rank	0.119	0.251***	0.016	0.276***
Number of Children	0.167	-0.092	-0.235*	-0.121**
Year of Marriage	-0.066	0.013	0.165	0.034 (.449)
Father's Occupational Rank	-0.009	0.180*	-0.023	0.147**
Parents' Education	0.204	0.095	0.365*	0.142*
Child's Education	0.200*	0.047	0.061	0.092
	Daughters' Marriages			
Independent Variable(s)	Beta	Beta	Beta	Beta (p)
Year of Marriage	0.088	0.027	0.326*	0.131**
Year of Marriage	0.033	0.029	0.331*	0.070 (.096)
Father's Occupational Rank	0.221*	0.222***	-0.010	0.279***
Year of Marriage	0.025	0.019	0.330*	0.064 (.138)
Father's Occupational Rank	0.222*	0.227***	-0.016	0.275***
Number of Children	0.041	-0.050	-0.183	-0.073
Year of Marriage	-0.023	-0.071	0.270	-0.046 (.333)
Father's Occupational Rank	0.066	0.043	-0.045	0.059
Parents' Education	0.286*	0.222*	0.168	0.313***
Child's Education	0.005	0.092	-0.006	0.053

[a] Significance level is indicated as follows: * at the .05 level, ** at the .01 level, and *** at the .001 level.
[b] Standardized betas are used in this table to ease comparison between variables.

Figure 1. Theoretical Relationships between parental investment and offspring lifetime income as a function of economic development.

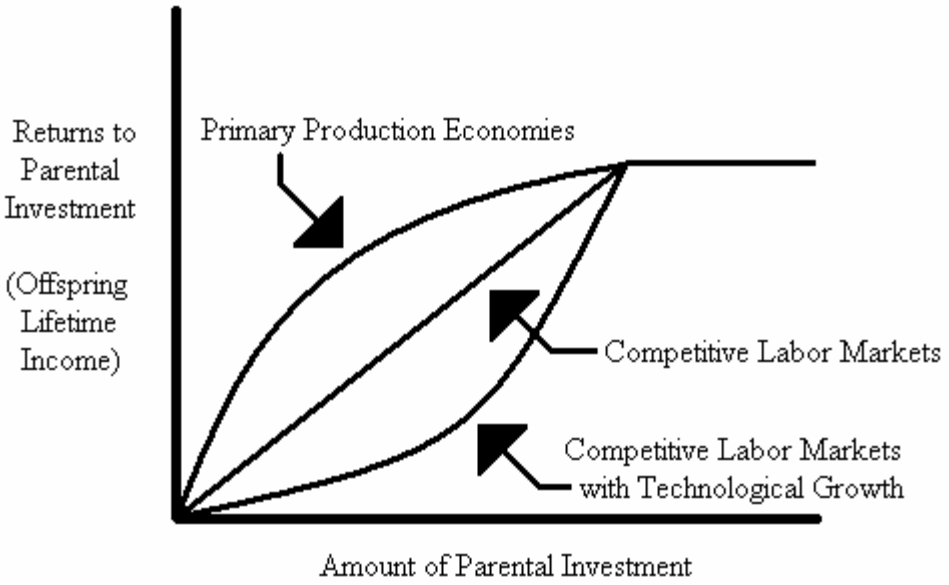


Figure 2. Impact of Embodied Capital of parents on the value of their time inputs in producing Embodied Capital in their children.

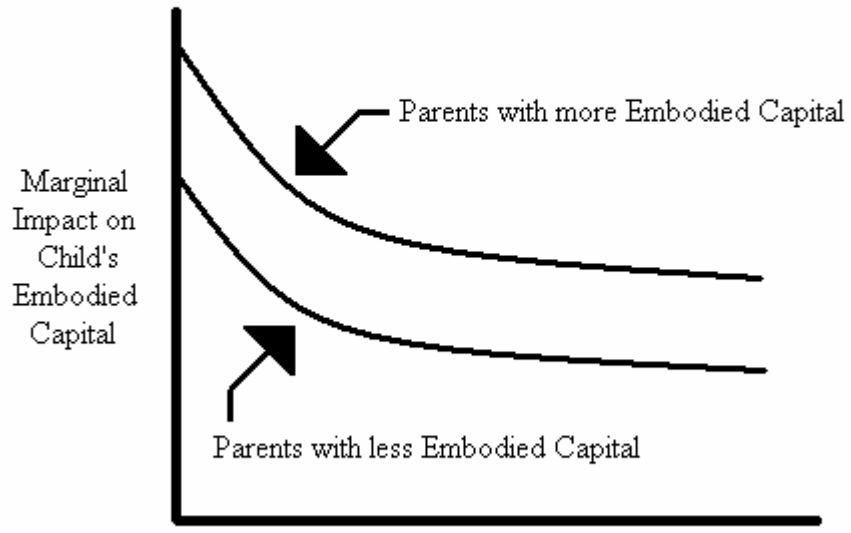
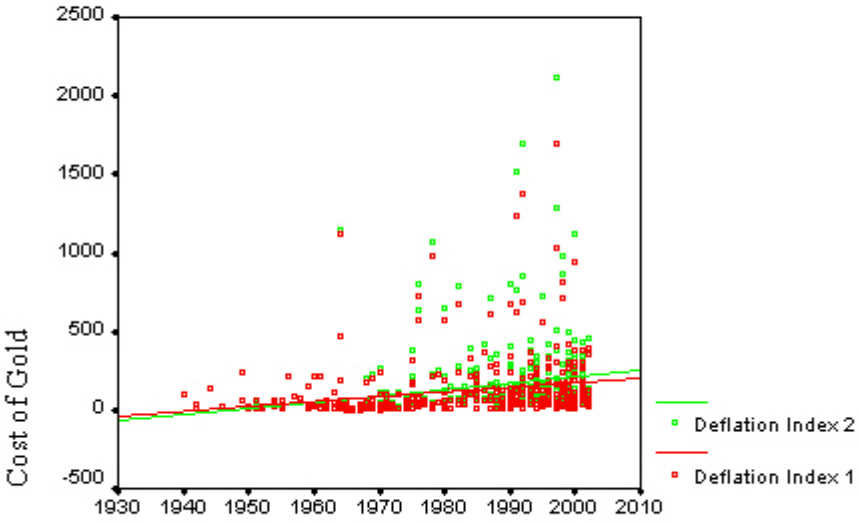


Figure 3. Son's Cost of Gold by Year of Marriage:

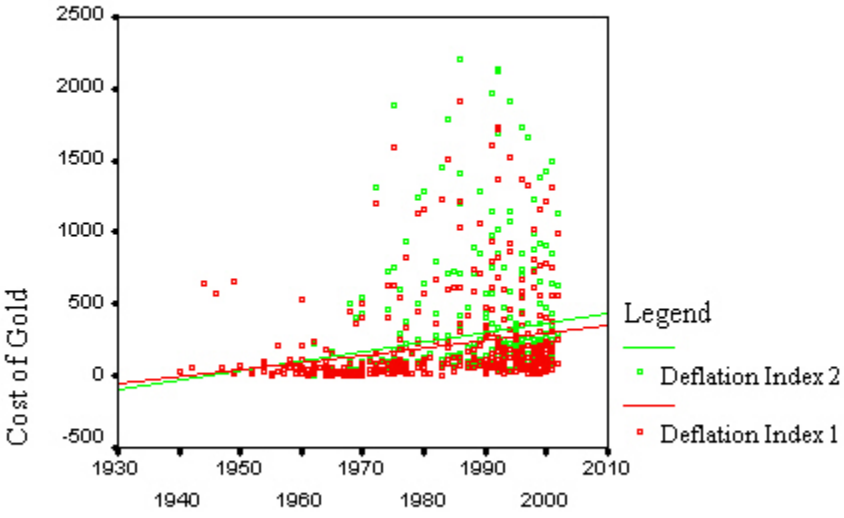
A comparison of values adjusted with two deflation indices.



Year of Marriage

Figure 4. Daughter's Cost of Gold by Year of Marriage:

A comparison of values adjusted by two deflation indices.



Year of Marriage

Figure 5a. Son's Cost of Gold by Parents' Education

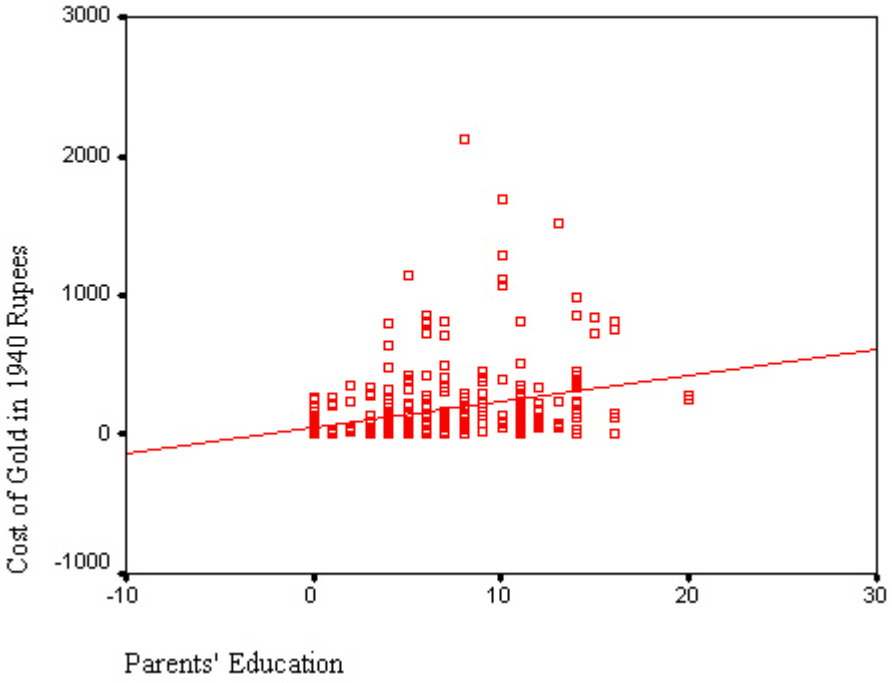


Figure 5b. Daughter's Cost of Gold by Parents' Education

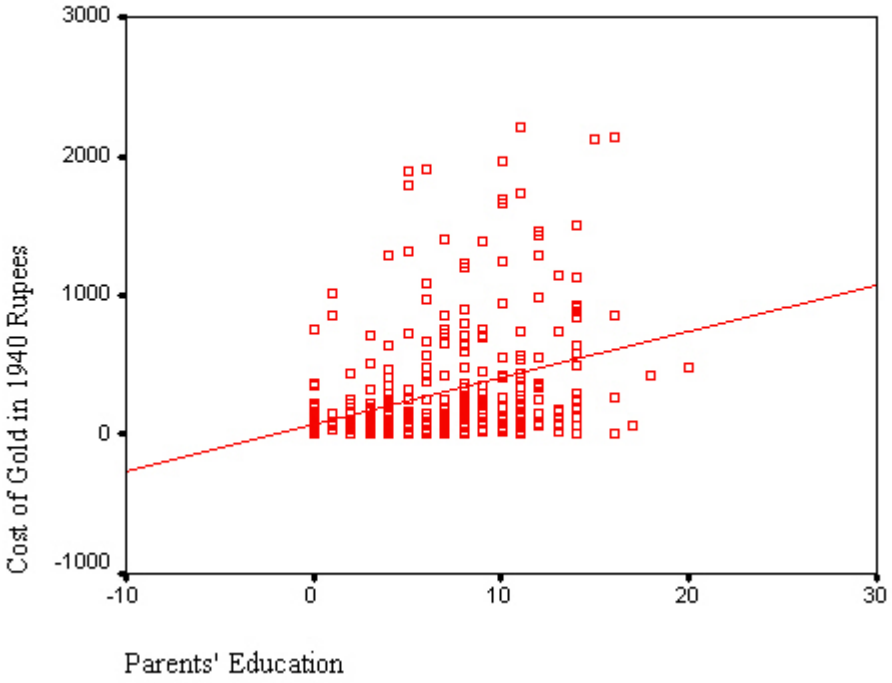


Figure 6a. Son's Total Marriage Costs by Parents' Education

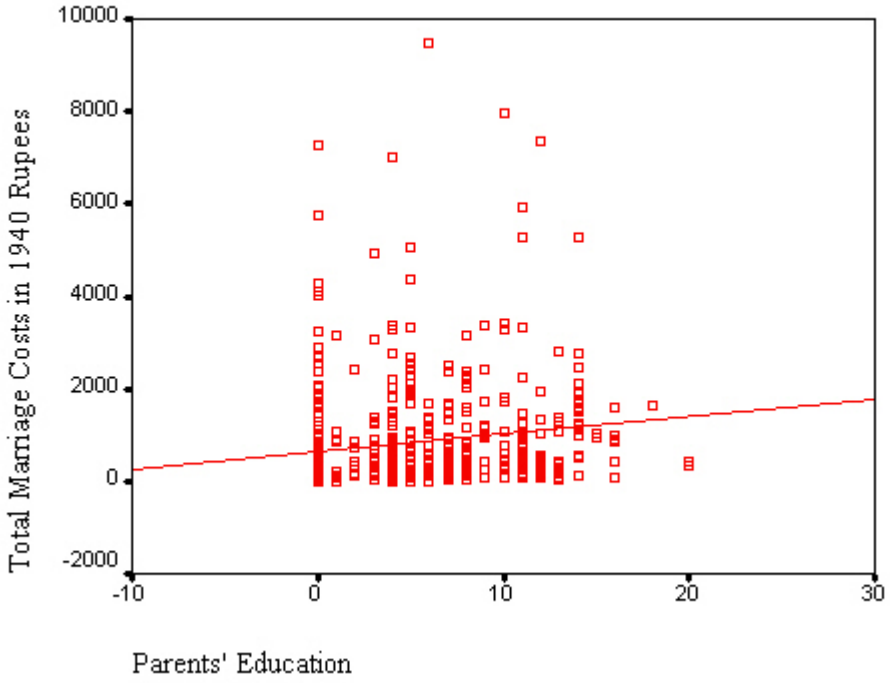


Figure 6b. Daughter's Total Marriage Costs by Parents' Education

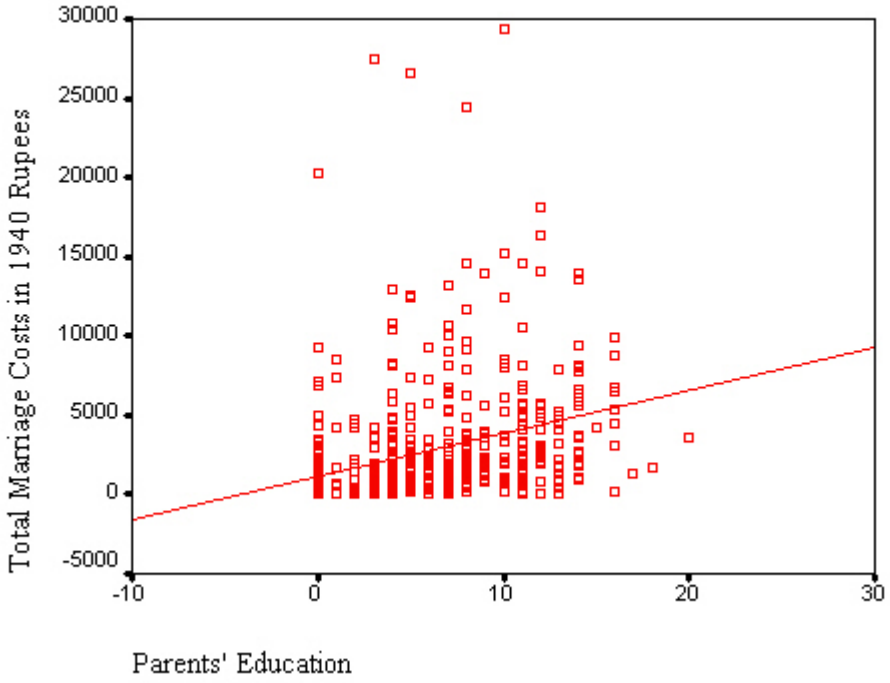


Figure 7a. Son's Function Costs by Parents' Education

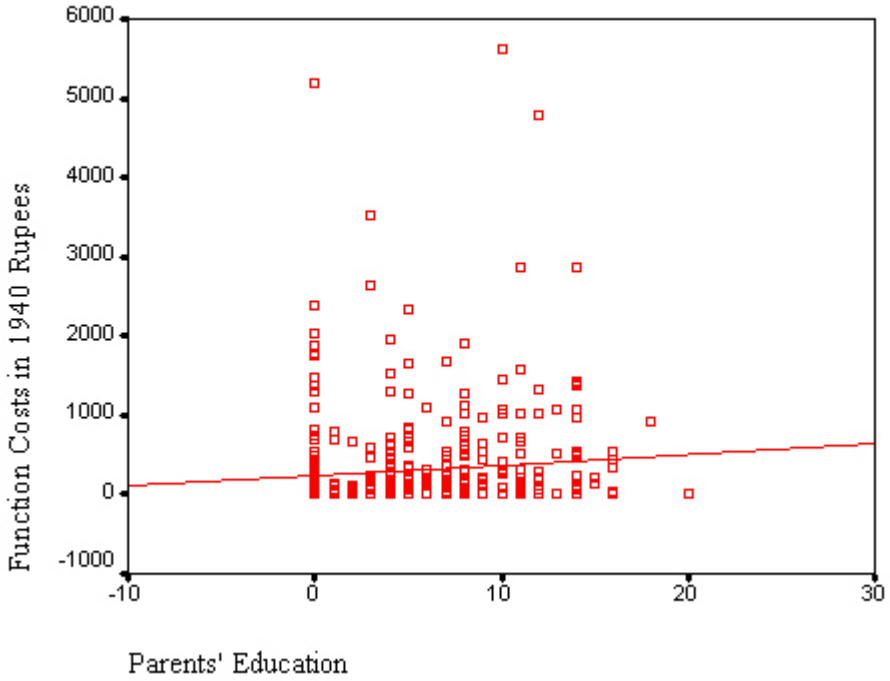


Figure 7b. Daughter's Function Costs by Parents' Education

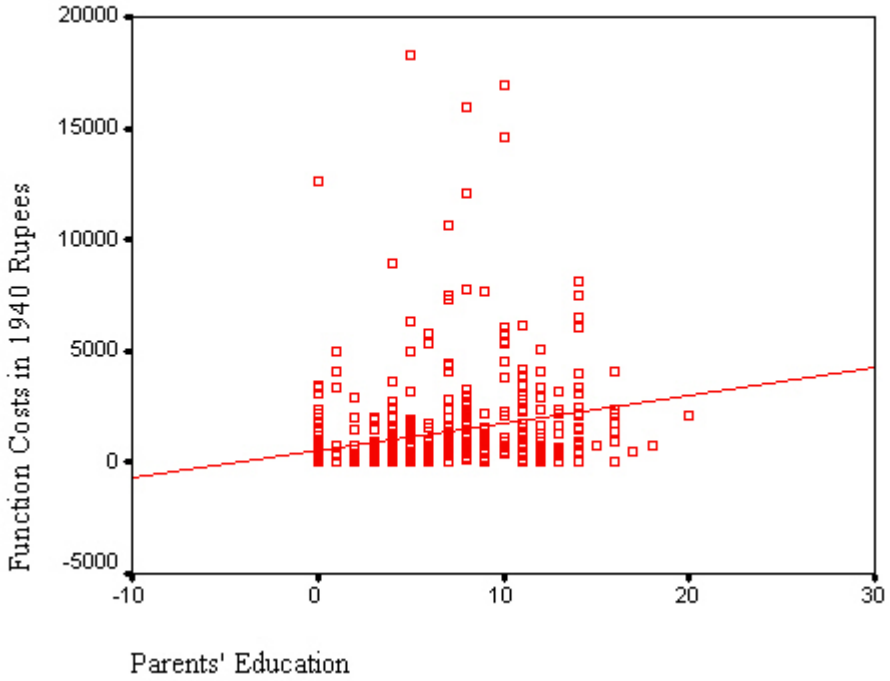


Figure 8a. Son's Cost of Gold by Father's Occ. Rank

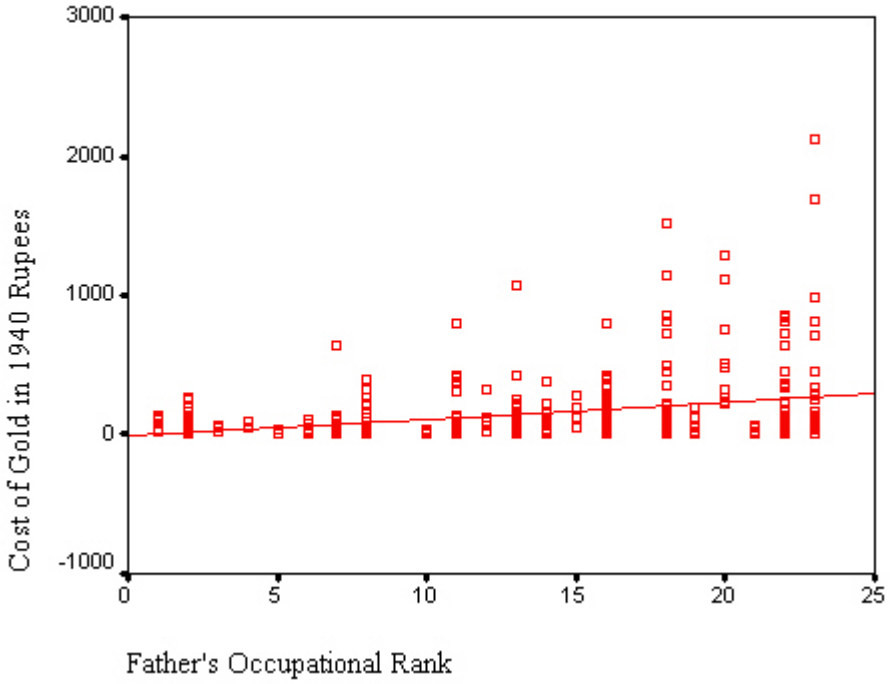


Figure 8b. Daughter's Cost of Gold by Father'sOcc. Rank

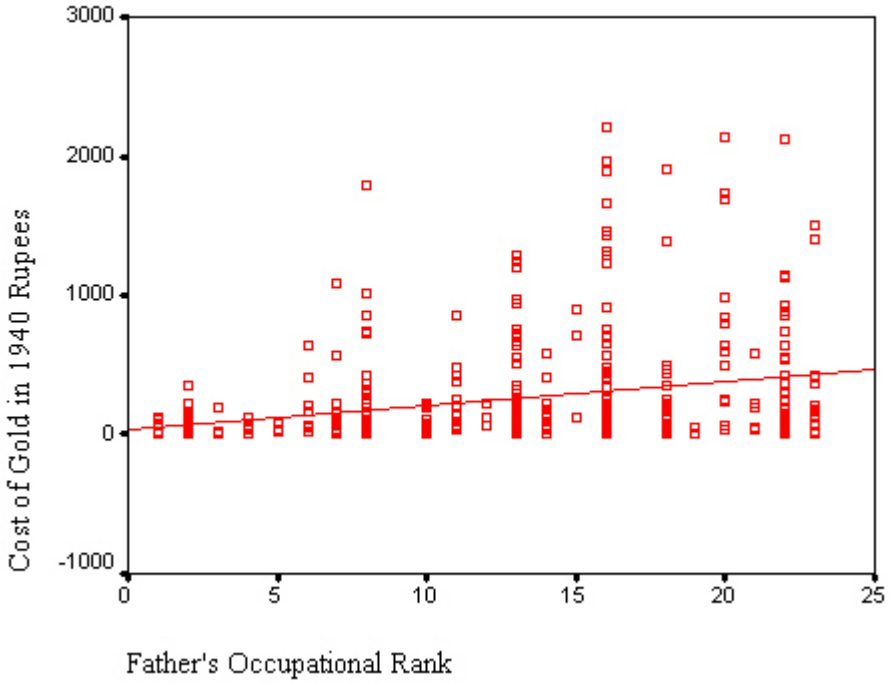


Figure 9a. Son's Total Marriage Costs by Father's Occ. Rank

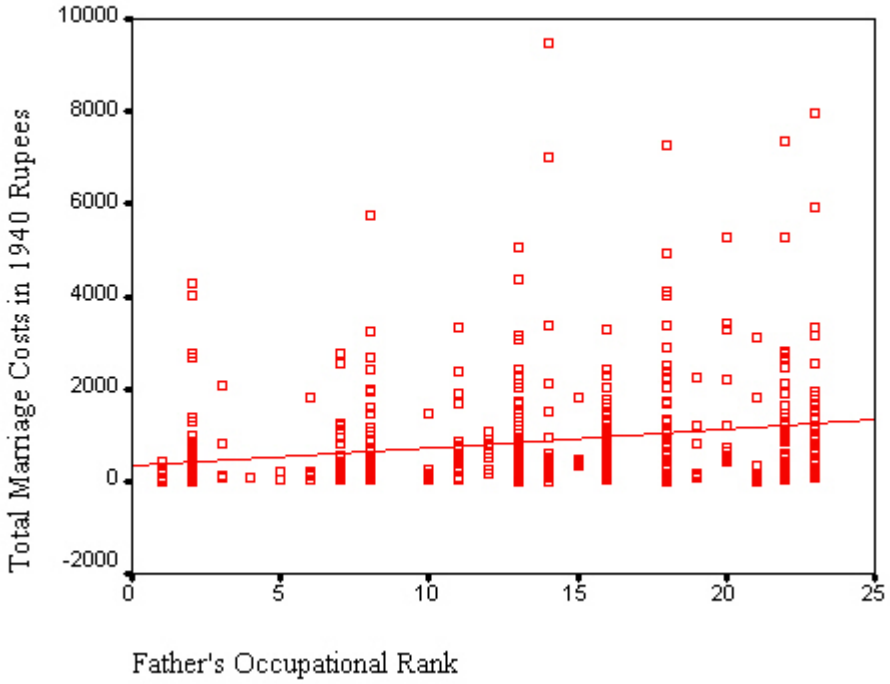


Figure 9b. Daughter's Total Marriage Costs by Father's Occ. Rank

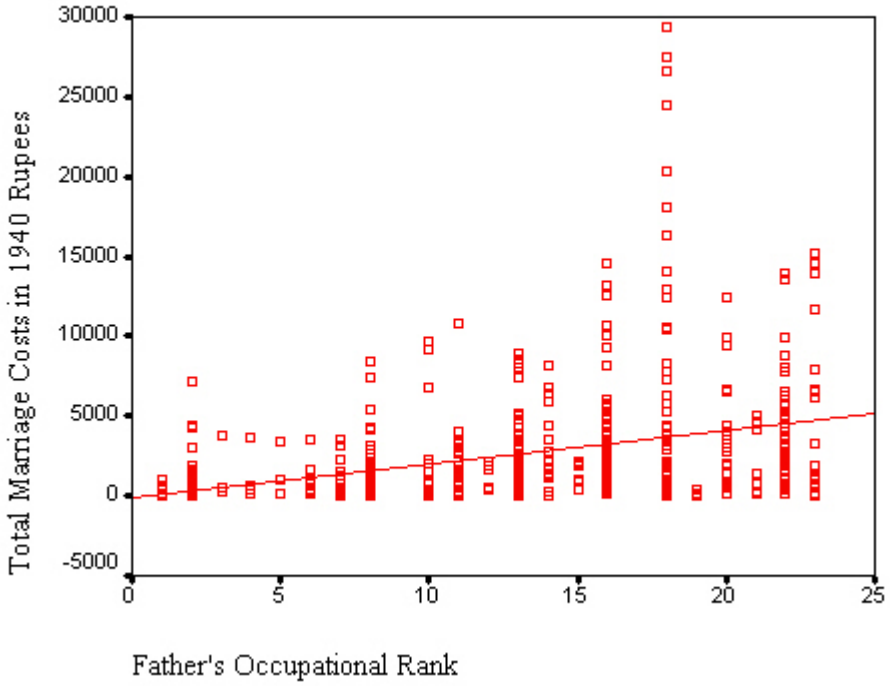


Figure 10a. Son's Function Costs by Occ. Rank

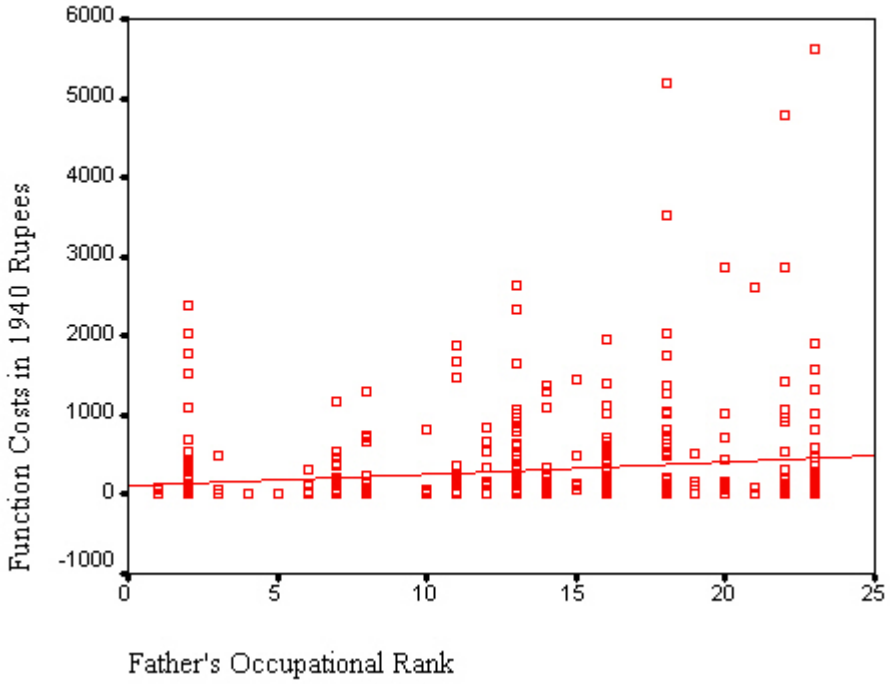


Figure 10b. Daughter's Function Costs by Father's Occ. Rank

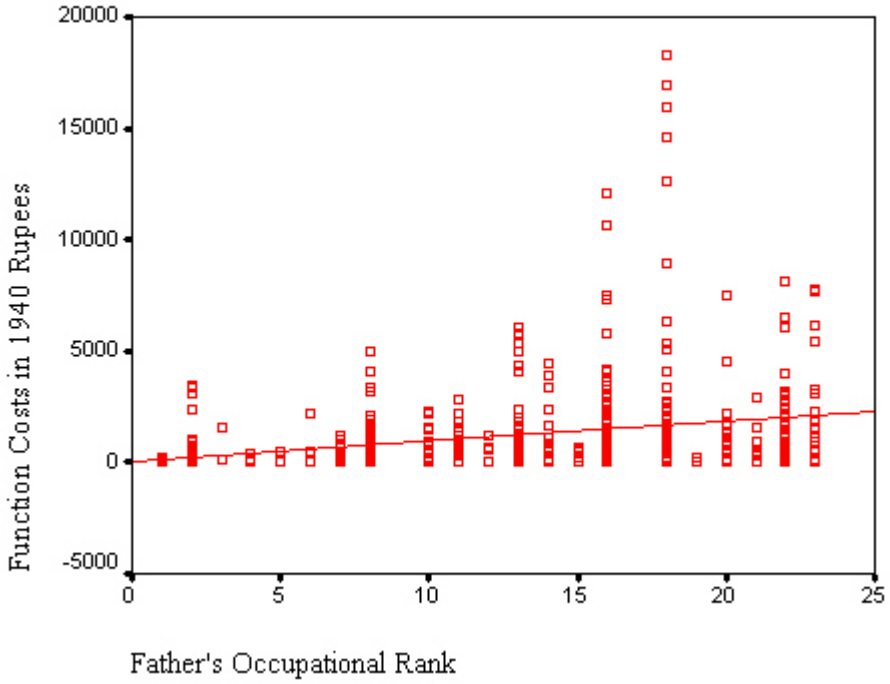


Figure 11a. Son's Cost of Gold by Year of Marriage

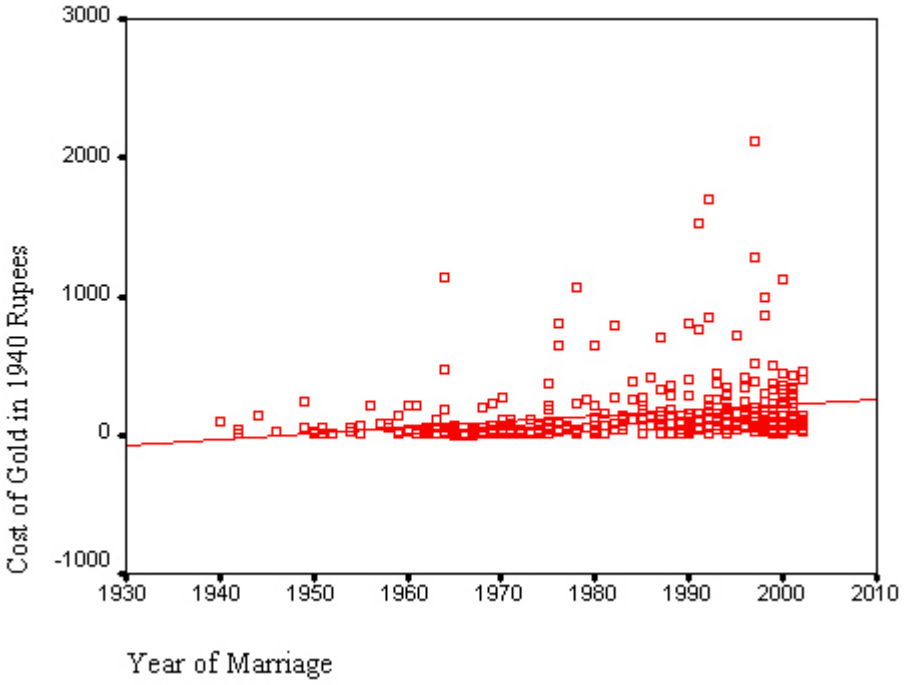


Figure 11b. Daughter's Cost of Gold by Year of Marriage

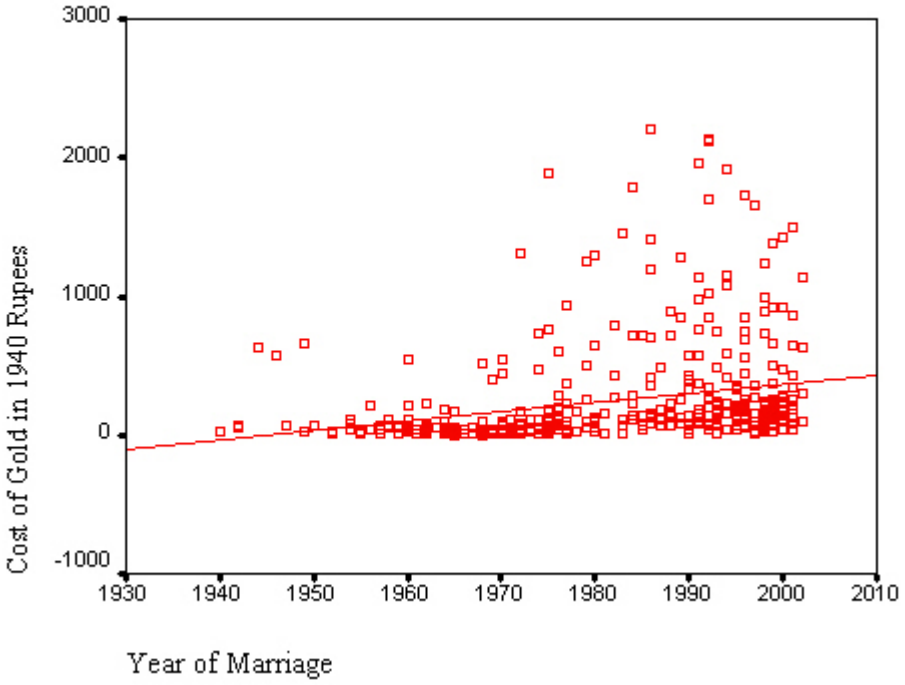


Figure 12a. Son's Total Marriage Costs by Year of Marriage

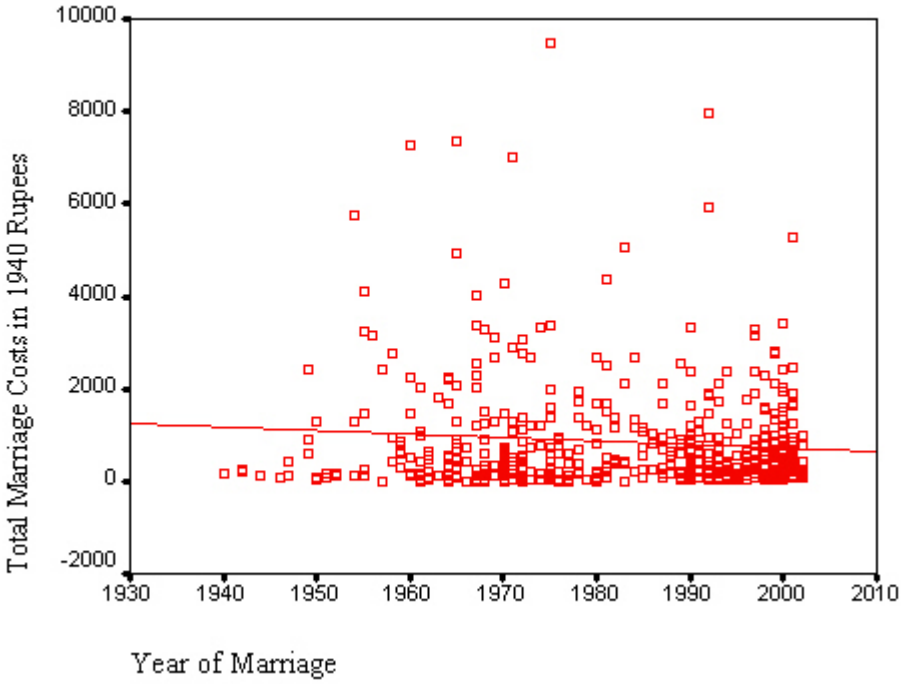


Figure 12b. Daughter's Total Marriage Costs by Year of Marriage

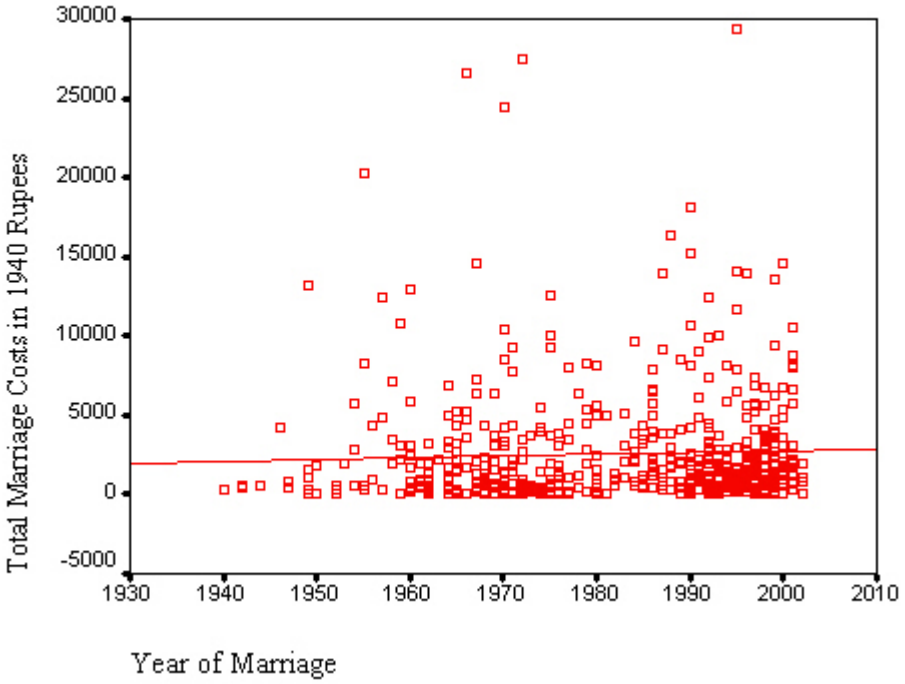


Figure 13a. Son's Function Costs by Year of Marriage

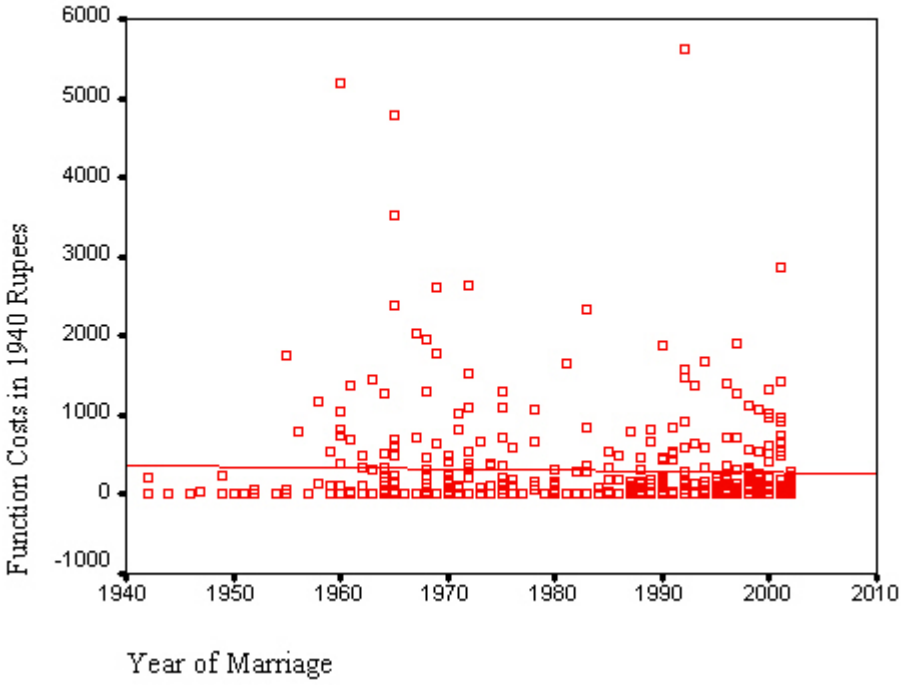


Figure 13b. Daughter's Function Costs by Year of Marriage

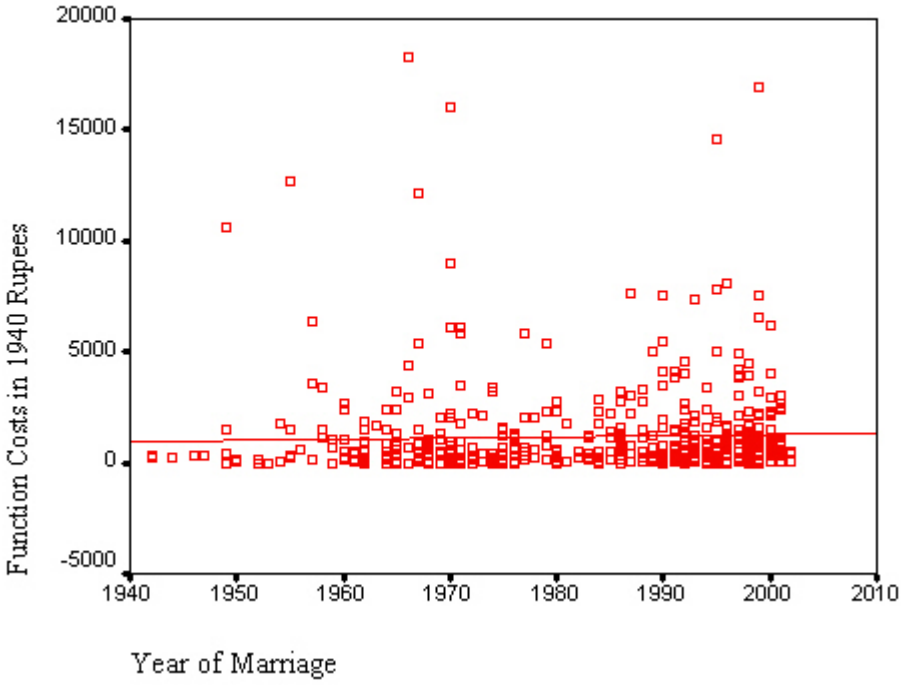


Figure 14a. Amount of Gold by Parents' Education for Sons

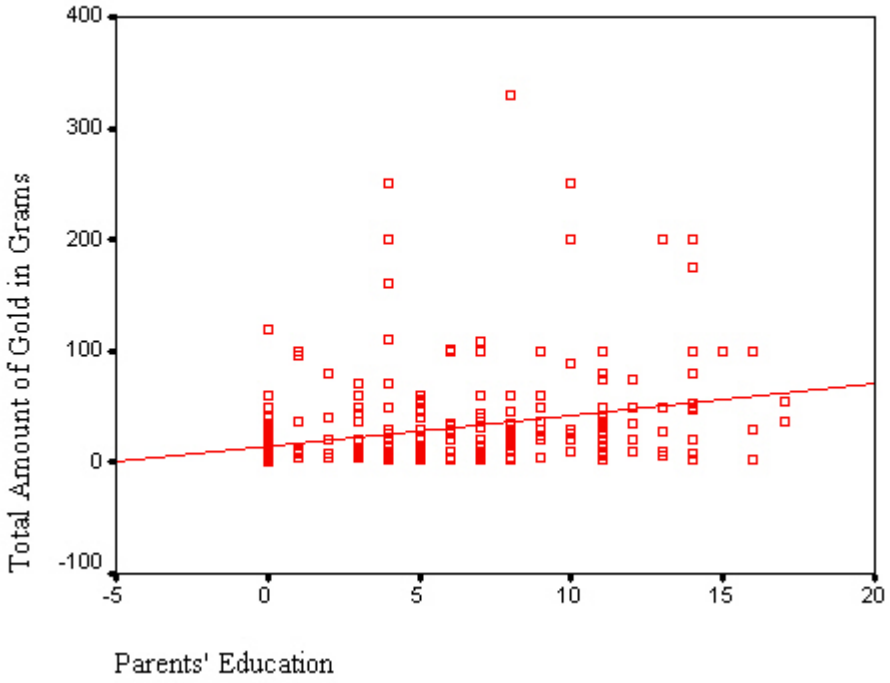


Figure 14b. Amount of Gold by Parents' Education for Daughters

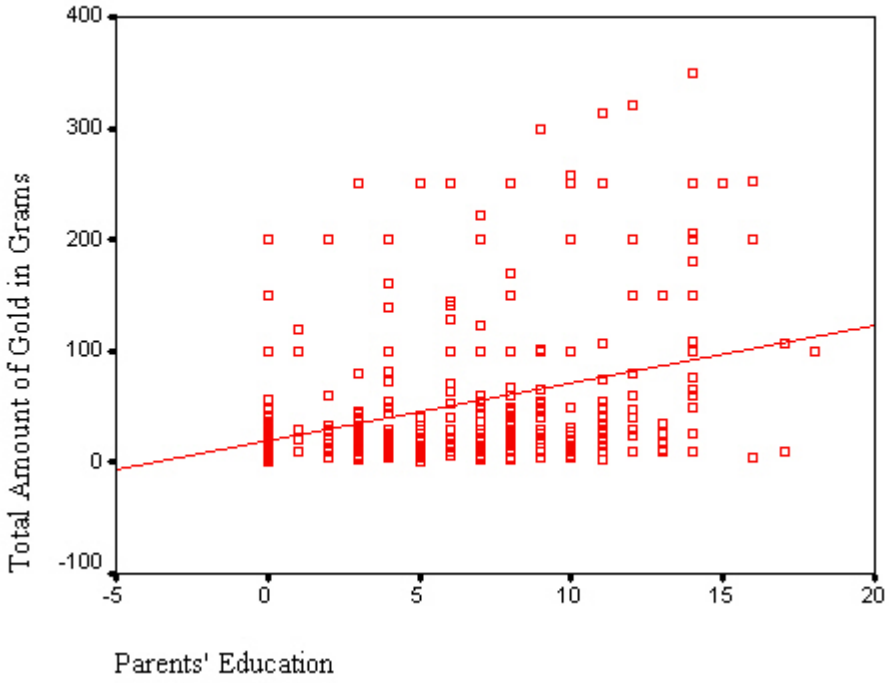


Figure 15a. Amount of Gold by Father's Occ. Rank for Sons

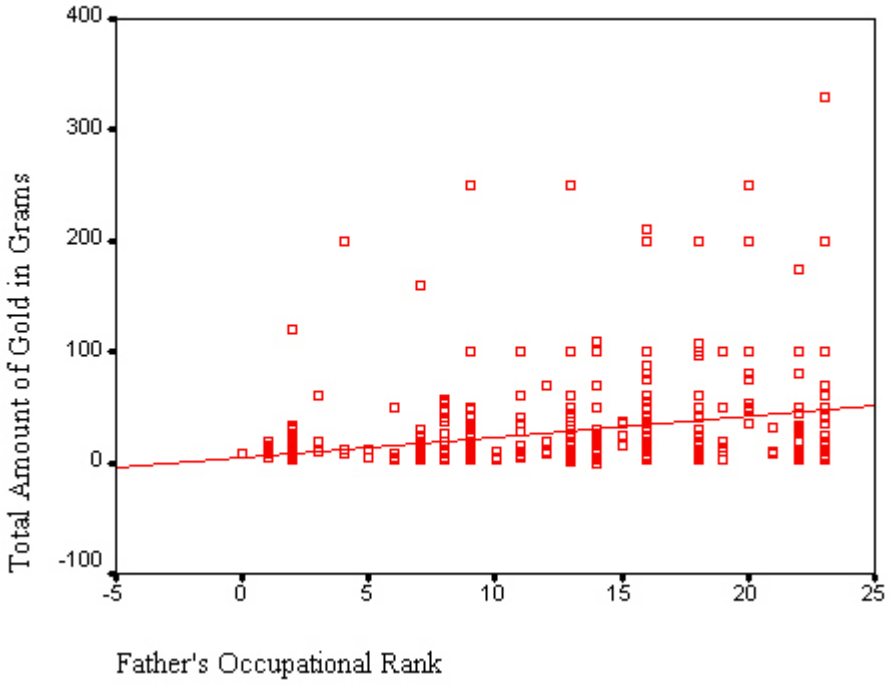


Figure 15b. Amount of Gold by Father's Occ. Rank for Daughters

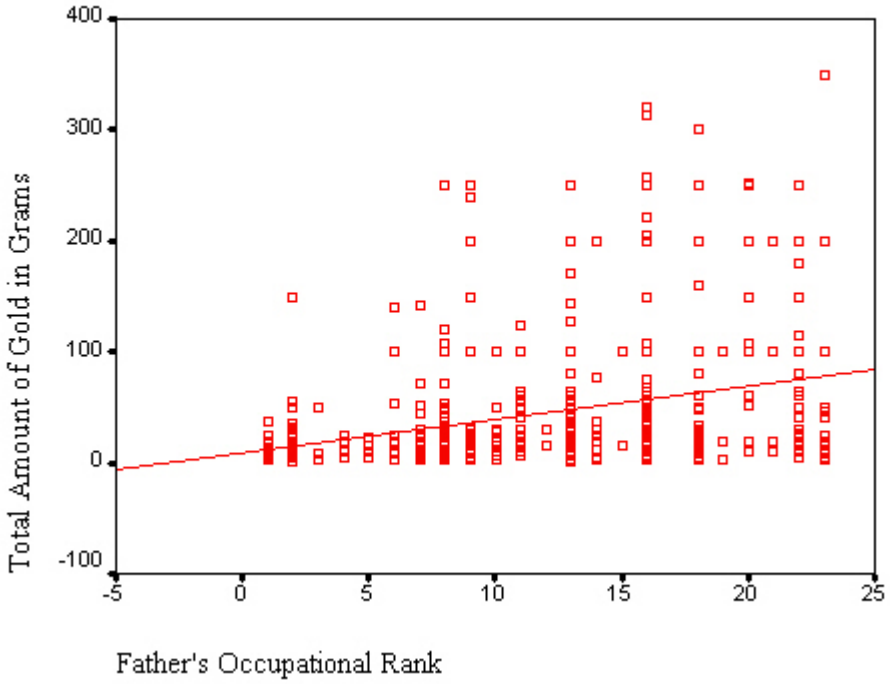


Figure 16a. Amount of Gold by Year of Marriage for Sons

Figure 16b. Amount of Gold by Year of Marriage for Daughters