Modeling Eldercare by Children and Children-in-law:

The Role of Marriage Institutions [1]

by Shoshana Grossbard
San Diego State University and IZA

January 2017

Abstract

Informal eldercare is often supplied by family members, more so in Asia than in the West. Children and their parents as well as members of adjacent generations linked by marriage (in-laws) are modeled as self-interested agents offering or responding to material incentives. A first implication from the model is that studies of the impact of eldercare on the health and happiness of in-family caregivers could be enriched by taking account of material in-marriage transfers that the children of needy elderly can possibly give to their spouses. A second implication discussed here is that provision of care to older in-laws could be related to the presence of brideprice or dowry transfers (or their in-kind equivalents) and that within a society with a given set of premarital traditions the amount of such transfer will vary with the expected amount of care for elderly in-laws. Suggestive evidence was provided based on simple comparisons between some Asian and Western countries and between two Indian regions. Daughters-in-law in the rural North of India provide more eldercare than their counterparts in the South. Their families are also likely to pay lower dowries at the time of marriage, which is consistent with the model presented here. Conclusions include a list of more implications of policy-relevance, especially to Asian economies.

Forthcoming as a Working Paper of the Asian Development Bank Institute (ADBI)

Introduction

Population ageing implies greater demand for health services, including informal eldercare. In all countries, even the richest ones, some informal eldercare is supplied by relatives. For instance, substantial proportions of older households in Japan, the U.S. and Europe have been receiving informal care from their children (Alessie et al. 2014, Kokumin Seikatsu Kiso Chosa 2013). Japan stands out from the U.S. in its proportion of informal eldercare provided by daughters-in-law. In Japan in 2013 cohabiting biological children supplied 21.8% of informal eldercare whereas children-in-law provided 11.2% (Kokumin Seikatsu Kiso Chosa 2013). Close to 70% of all informal caregivers were women, and the percentage female among children-in-law providing care to the elderly is likely to be even higher in light of the very large gender differentials in household production observed in Japan. For instance, if we compare the time that men and women spent on cooking and food-related activities Japanese and Korean women ages 18 to 64 spent 13.4 times more weekly minutes on such activities than men the same age, whereas U.S. women in the same age group spent only 2.8 times more minutes on this activity than men. The same multiples stood at 3.8 and 3.6 for France and Canada (Fisher and Robinson 2011).

A comparison of informal eldercare by children and daughters-in-law in Japan and the U.S. indicates a lesser involvement of daughters-in-law in the U.S. Almost half (47%) of caregivers of someone age 50+ in the U.S. cared for a parent, but only 8% for a parent-in-law (National Alliance for Caregiving 2015).[2] The likelihood that daughters-in-law acted as eldercare providers was even lower given the higher tendency for U.S. men to produce in the household and the lower frequency of patrilocality, i.e. the custom whereby a young couple moves to live with the husband's parents. In turn, patrilocality may be related to primogeniture, whereby eldest children (usually sons) inherit most or all of their parents' estate. The higher prevalence of primogeniture in Japan than in the U.S. has helped explain why Japanese parents were considerably more likely to leave bequests conditional on child eldercare than their American counterparts (12.8 % versus .5% of responses to question 7 in section 4.3, Horioka 2014). What then is the connection between eldercare provided by relatives and institutions regulating in-family transfers of wealth such as patrilocality? Furthermore, is there a connection between eldercare supplied by daughters-in-law and institutions channeling premarital monetary transfers such as brideprice and dowry?

To the extent that parents and children are at least partially motivated by self-interest it follows that the degree to which children's spouses provide eldercare for their in-laws could be related to the prevalence or levels of brideprice and dowry. Children's motivation to care for their elder parents or parents-in-law is either altruistic or based on self-interest (Cox and Rank 1992, Grossbard 2014, Averett et al. 2015). Empirical studies of eldercare supplied by children and transfers by older parents to their children suggest some degree of self-interest (Lopez Anuarbe 2013, Nivakoski 2015). Self-interest may lead parents to state that their future bequests are conditional on the nursing care their children will provide (Horioka 2014) or encourage children or children-in-law to incur the time costs, emotional costs and health costs associated with supplying eldercare. Differences in adherence to primogeniture, patrilocality, and informal brideprice between the two countries may help account for Japan's higher proportions of informal eldercare supplied by daughters-in-law even if we assume that the Americans and the Japanese are equally self-interested. It is difficult for governments to change institutions such as primogeniture or brideprice, but policy makers stand to gain from a better understanding of how the cultural and institutional context possibly influences informal eldercare.

---

[2] Data on older Americans receiving help from children in the form of either time or money can be found in Averett et al. (2015).

The conceptual framework outlined in this paper is based on Van Houtven and Norton's (2004, henceforth VHN) model of informal eldercare summarized in Section 2. Like VHN it assumes that spouses are at least partially motivated by self-interest when deciding whether to take care of their older in-laws or not. However, VHN did not take marriage-related variables into account. This section also outlines the Work-in-Household (WIHO) framework first introduced in Grossbard-Shechtman (1984). Section 3 expands the VHN model to incorporate WIHO related to eldercare and thus links informal eldercare to marriage institutions. This leads to many interesting implications, including those discussed in Sections 4 and 5. In Section 4 I suggest how studies estimating the impact of eldercare by relatives on their health and happiness could be enriched by taking account of possible incentives that children-in-law may obtain from spouses via intra-marriage monetary transfers. In Section 5 I argue that provision of care to older in-laws may be related to the presence of brideprice or dowry systems and that within a society with a particular system of premarital payments the amount paid may vary with the expected amount of care for elderly in-laws. Consequently, regional differences in average and median levels of dowries in India help explain differential patterns in daughter-in-laws' involvement in eldercare. Conclusions are found in Section 6.

1. Existing Conceptual Frameworks

The conceptual framework presented in the next section builds mostly on two existing frameworks: the VHN model of informal care and my WIHO model.

2.1 The VHN model. Most existing conceptual frameworks analyzing in-family eldercare and parental transfers are models of individual optimization by either a household composed of at least one child and one parent or by two separate agents: a child and a parent. Models in the first category assume common preferences within a single extended household (e.g. Cox and Rank 1992); models of the second type consider parent and child as separate decision-makers and often incorporate forms of family bargaining (e.g. VHN, Pezzin and Schone 1999).

VHN assumed that the child had the following utility function:

$$U\left(X, L, A, h^p\right),$$

where X is vector of child's consumption goods, L is child's leisure, A is informal care provided by the child and h^p is the parent's health status. If the child is altruistic she will derive a positive utility when the parent's health status improves. In turn, following Grossman (1972) VHN assumed that the parent's health status is a function of the informal care by all her children, formal medical care M and stock of human capital. VHN also assumed that the child's budget constraint is

$$w(24 - L - A) + C = p^M M + X,$$

where p^M is the price of medical care and the price of the goods consumed by the child is assumed to equal 1. The child then maximizes her utility subject to the budget constraint. Separately, they model the parent's decision-making as a utility maximization subject to a budget constraint. The main focus of the VHN model is to derive a prediction regarding the relationship between informal care supplied by the child (A) and formal care M.

The VHN household production model follows Mincer (1963), Becker (1965), and Grossman (1972) in assuming that the caregiving child is a member of an already established household. The child is either single or if he is married it is assumed that he is not influenced by other decision-makers in his nuclear household. The child does not have the option to marry and then either become the supplier of eldercare to her spouse's family or to benefit from eldercare provided by her spouse to her own parents.

As a result, even models recognizing more than one decision-maker (parent and child) such as VHN do not take into account how marriage decisions and conditions in marriage markets may affect demand or supply of eldercare. Their choice of assumptions makes sense in the context of contemporary Europe and the US, where marriages rarely entail future obligations to care for elderly in-laws. In contrast, in many parts of Asia future caregiving by daughters-in-law is often expected and thus it seems appropriate to incorporate decision-making by spouses and potential spouses into models of intergenerational eldercare.

2.2 The WIHO model. The model presented below is based on earlier models that I developed to explain how marriage markets possibly affect behaviors other than eldercare. The central concept in these models is that of Work-In-HOusehold (WIHO) defined as an informal activity that has an opportunity cost and from which another adult member of the household may benefit (Grossbard-Shechtman 1984; Grossbard 2015).[3] Therefore the other adult may be willing to compensate the worker/producer for their service. I have assumed that the other adult having a demand for WIHO is the spouse, implying that WIHO is spousal WIHO. However, there could also be a demand for WIHO on the part of the parent or the adult child and WIHO could be intergenerational. In previous research I have applied the concept of spousal WIHO to analyses of labor supply of married women (Grossbard-Shechtman and Granger 1998), individual savings of men and women, before and during marriage (Grossbard and Pereira 2010), and choice of number of (co-)wives in a polygynous society (Grossbard 1976).

The WIHO model is an exchange model, which implies that even if altruism motivates household production benefiting a spouse, it is supplemented by material incentives such as monetary transfers within the household. Such intra-marriage transfers can be considered as compensations for the work being supplied. For instance, in a household following traditional gender roles the woman may be producing more household production than the man, and in exchange the man may be transferring more income to her than she transfers to him. Intra-marriage transfers are frequent even though they are often implicit, as in the case where spouses completely pool their unequal incomes.[4]

Given that many individuals could potentially provide spousal WIHO to each other, markets for WIHO involving multiple participants help determine who marries whom and who eventually takes care of whom. Prices for WIHO are established where demand and supply intersect in each interrelated market. Markets for WIHO are particular kinds of labor markets. There are multiple markets for different kinds of labor. Likewise, there are many types of men and women and there are multiple interrelated WIHO markets, each with its equilibrium price, as in hedonic labor or housing markets (see Grossbard-Shechtman 1984, Grossbard 2015). These prices are then given from the perspective of individual agents participating in WIHO markets. Matching of individuals willing to supply WIHO with those willing to pay for it will be facilitated by the prices for WIHO.

Many factors influence markets for WIHO, including sex ratios (the ratio of men to women), the presence and effectiveness of marriage institutions such as state requirements of official marriage, availability of marriage brokers, existence of divorce laws (see Grossbard-Shechtman 2003; Grossbard 2016a), and gender norms. Given that most people are heterosexual sex ratios are important and since they are easily measurable there are many studies documenting their influence on household decisions. For example, fluctuations in sex ratios have been linked to variation in savings rates in Asia (e.g. Du and Wei 2013; Horioka and Terada-Hagiwara 2016). The price of marriage may take the form of pre-marital payments. The more men and their parents are expected

---

[3] Publications prior to Grossbard (2015) use different terms to express the concept of WIHO.
[4] Such pooling is common in Denmark (Amuedo-Dorantes et al. 2011).

to pay prior to marriage (possibly in the form of providing housing for the new couple) the more high sex ratios are likely to translate into high savings by young men and their parents. Labor supply is also likely to vary with sex ratios: the higher the ratio of men to women the higher the (unmeasured) price of women's WIHO and the less married women are likely to participate in the labor force (Grossbard 2015). How particular factors affecting marriage market conditions, such as the demand for a spouse's eldercare, influence individual behaviors or well-being depends on the gender roles prevailing in the country of observation.

The more traditional a country in the sense that it has norms placing a disproportionately large burden of WIHO on women, the more a variety of outcomes will differ by gender. For example, it was found that in Korea marriage made men happier than women and that this gender gap was more pronounced in older couples (Rudolf and Kang 2015, Bethmann and Rudolf 2016). As mentioned in the introduction Korea also happens to be a country where a vast majority of household production is performed by women. To the extent that supplying WIHO is a burden and lowers happiness, then even if men and women enjoy the fruits of WIHO equally marriage will make men happier than women. However, marital happiness also depends on how much of the couple's income benefits each member. Assume that women are rewarded for their WIHO in the form of intra-marriage transfers allowing them to consume more than they would if they were single, and that the extra consumption boosts women's happiness. The Korean gender gap in happiness suggests that even if husbands transfer some of their income to their wives to compensate them for their WIHO and to allow them to consume more than what they can afford based on their income from work, that compensation is not large enough and does not fully make up for women's larger WIHO burden. The fact that in Korea the gender gap in happiness is higher at older ages than at younger ages could indicate that either younger men do relatively more WIHO than their older counterparts, or that the compensation that men give women for the WIHO they supply has grown over time. Both of these changes may have occurred over time as by-products of women's rising labor force participation.

2. A WIHO model including spousal eldercare

When a spouse takes care of older parents-in-law it is spousal WIHO to the extent that the spouse whose parent is being cared for benefits from the service and may be willing to compensate the individual supplying such WIHO. One spouse's willingness to supply WIHO to a parent-in-law is likely to be matched with the spouse's willingness to pay for it. In contrast, providing eldercare to an own parent may not be spousal WIHO unless the spouse appreciates that care to the point where he or she is willing to 'pay' for it. It can be assumed that married individuals value their spouse's caregiving more if it benefits their own parent than if it benefits an in-law.

VHN's child's utility function becomes:

$$U^i(X, L, H_i, S, H_j, A, h^p),$$

where i is the adult child and j is the spouse. As in VHN X stands for consumption goods consumed by the individual, A is own assistance to the individual's parent, and h^p is the parent's health status. Whereas in VHN there were only two time uses that provided utility to the individual (leisure L and assistance to a parent A), I assume four time uses by which the individual can obtain (dis)utility: leisure S, labor in the workforce L, time doing WIHO for a spouse H_i and assisting a parent A. I also augment the parental health production function, adding another way to contribute to parental health via assistance from the child's spouse, part of the spouse's WIHO H_j. Now parent's health status can be produced as follows:

$$h^p = h(A \text{ by all children}, M, H_j)$$

The child's time constraint is now $T = L + H_i + S + A$, where T is total time available (let us say 24 hours a day).

In comparison to VHN my model is more complex. What helps handle the further complexity is the assumption that there are markets for WIHO establishing 'prices' for WIHO. Let us assume that an hourly 'WIHO wage' y has been established in markets for WIHO.[5]

The budget constraint then is

$wL + yH_i + C = p^M M + X + yH_j$. If the individual is married her income includes own work income, non-work income C, and income from supplying WIHO to a spouse: yH_i. Her expenditures could also include yH_j, payments to her spouse for assisting with care for her parent.

Conceptually, the problem becomes similar to that of an employer who can either perform a task herself or hire a worker to do it. Both the worker and the employer will decide on whether to enter into a 'match' depending on whether the wage being offered is acceptable. In turn, this wage is affected by equilibrium wages in the relevant labor market. Likewise, I assume that all individuals willing to supply eldercare to a spouse's parent or who may have a demand for a spouse's care for their own parent participate in the WIHO markets that establish equilibrium prices y.

As in VHN part of the identification originates from the parental decision-making and the production of parental health function. A solution can be found for this system from which we can derive both a supply of WIHO by individual i and a demand for j's WIHO. Even though the new problem has more variables than the VHN model it also has additional constraints that help identify the system. A parallel model analyzes spouse j's decisions regarding amount of WIHO she demands from i and the amount of WIHO supplied by j. All WIHO demanded or supplied are priced in WIHO markets and individuals see the price for such WIHO as given at level y. At the given market price y individual couples get together and stay together when the quantity of spouse's WIHO demanded equals the quantity supplied by the spouse (see Grossbard 2015).

The inclusion of y, the price of WIHO, in the maximization problem implies that any factor that influences y will also influence the amount of time devoted to eldercare in the form of A (assistance to own parent), WIHO supplied to a spouse H_i, and/or WIHO demanded from spouse H_j. As is usually the case, the higher the price of WIHO the smaller the quantity demanded and the larger the quantity supplied. The net predicted effect of a change in price may not always be obvious. Factors likely to influence the price of WIHO and therefore the amount of informal care by children's spouses include individual characteristics of men and women such as their birth order and their number of siblings, sex ratios, and laws regulating marriage markets. Factors influencing informal care are also likely to have an effect on formal care since informal and formal care are either substitutes or complements.

The following two sections illustrate how this modeling framework can be useful.

3. Application 1: Health and wellbeing effects of eldercare by family members

How realistic is it to assume that eldercare of in-laws is a form of WIHO and that daughters-in-law or sons-in-law possibly get compensated for it in a material form? Two Japanese studies suggest that daughters-in-law incur a cost when caring for elderly in-laws: Oshio (2014) found that caring for a mother-in-law entailed a lower mental health score and Wakabayashi and Kureishi (2016) report that compared to married women not providing care to elderly parents-in-law women who do provide such care had lower subjective health status and life satisfaction. However, this was not the

---

[5] Here it was assumed that both types of WIHO have the same price, but that does not need to be the case (see Grossbard-Shechtman 1984).

case when comparing married women caring for their own parents to women not providing such care. Niimi (2016) found no adverse effect of informal parental care on subjective well-being (SWB) of Japanese married caregivers (male and female), regardless of whether they were caring for their parents or their parents-in-law. This finding for men and women does not necessarily contradict those of the other studies based on samples of female married caregivers. Furthermore, it is possible that those caring for a parent-in-law have lower SWB than those caring for their own parent but that the amount of compensation they obtain from their spouse in return for the caregiving WIHO cancels the adverse effect that caring for their parent-in-law has on their SWB. In a society such as Japan, where men's household production is very limited, women are more likely to perform WIHO than men and they are also more likely to be compensated for that materially.

Thinking of caring for an elderly in-law in terms of WIHO can also add an additional interpretation to the findings of Bethmann and Rudolf (2016) mentioned above, namely that in (South) Korea married men are happier than married women and that this gender gap is more pronounced as couples age. Even though Korea is a relatively rich country it is still frequently the case that daughters-in-law take care of their husband's older parents (Das Gupta et al. 2003), especially if their husband is the older son. The WIHO involved in such eldercare may become more difficult on daughters-in-law as the parents age, and if their compensation for WIHO does not increase accordingly married women's utility from marriage may decrease over time.

Studies indicating that caring for older in-laws contains an element of work are not limited to the Far East. A survey completed in India and Belgium suggested that altruism is less likely to motivate the eldercare supplied by daughters-in-law than that supplied by daughters (Datta et al. 2003). There may be less direct utility from performing the caregiving, using the terms of Zhu et al. (2003). In terms of the model presented above, the disutility of H_i may exceed that of A. The lower the direct utility derived from an activity, the more the person supplying that service may need to be compensated.

Further work on how in-marriage compensation schemes may possibly influence the health, mental health, and SBW of providers of caregiving to their in-laws could possibly be of great interest.

Section 3 leads to a few new predictions linking factors likely to influence amount of informal eldercare provided by children and children-in-law.

4. **Application 2: How are brideprice and dowry related eldercare by children and children-in-law?**

It follows from the analysis in Section 3 that the prevalence or amount of dowry or brideprice are possibly tied to amount of nursing care provided by adult children and children-in-law. Brideprice is a premarital payment paid by the groom (or his family) to the bride (or her family); dowry is a premarital payment that goes from the bride (or her family) to the groom or the couple. Both types of premarital payments are related to the price of WIHO. Other possible components of that price include the intra-marriage transfers mentioned above and access to a future inheritance. In his economic theory of marriage Becker (1973, 1981) discussed how different elements of price of 'marriage' are substitutes in the sense that a premarital payment to the bride may come instead of a stream of payments from husband to wife during the marriage.[6] This implies that the more women are prevented from capturing the value of their WIHO during marriage—for instance due to limited legal protection against domestic violence--the more it is likely that a brideprice will be paid prior to marriage (Grossbard-Shechtman 1993).

---

[6] Marriage is defined as either marriage or non-marital cohabitation.

Any factor that raises the equilibrium price of women's WIHO, due to an increased demand for WIHO by men or a decreased supply of WIHO by women, is more likely to be associated with brideprice than with dowry. For example, if men are allowed to have multiple wives, i.e. polygyny is legal, but women are not allowed to have multiple husbands, the aggregate demand for women's WIHO will be higher than if all participants in marriage markets are limited to one spouse. Higher demand typically leads to higher prices. If women are prevented from benefiting from those higher prices during marriage, this may result in brideprice payments prior to marriage. Consequently it is not surprising that cross-country comparisons indicate that the presence of polygyny is frequently associated with brideprice payments and rarely associated with dowries (Grossbard-Shechtman 1993). Polygyny also typically goes together with male domination of social and political channels, preventing women from seizing the value of their WIHO (Grossbard 2016b).

Applying a similar analysis to the case of eldercare it follows that if men's aggregate demand for women's eldercare WIHO rises, the price of women's WIHO is likely to rise. In turn, a higher price for women's WIHo is likely to entail a higher probability that the prevailing premarital payment is brideprice, not dowry, especially if women don't capture the value of their WIHO during marriage. A comprehensive empirical investigation of the association between type of premarital transfer and prevalence of eldercare WIHO is difficult due to limited data on both premarital payments and the amount of eldercare provided by children and children-in-law in countries where premarital payments are common. The following is suggestive evidence of a cross-cultural association between elderly care supplied by daughters-in-law on the one hand and the prevalence of a brideprice system versus a dowry system and level of dowry on the other hand.

Consider the following three countries in the Far East: Japan, China, and South Korea. Even though these countries rarely have monetary brideprice--especially in China where it was officially banned under communist rule as part of the 1950 Marriage Law (Chu and Yu 2010)--the institution of brideprice lives on informally. Facts consistent with the idea that men pay the equivalent of a brideprice in Japan or China are that (1) relative to women and their families, men and their families are more likely to provide housing at the time of marriage (e.g. they pay for new housing or provide the family farm); and (2) single women save proportionately less than single men (Kureishi and Wakabayashi 2013, Wei and Zhang 2011). In-kind premarital brideprice seems to be paid more commonly in these countries than in Europe or the U.S.

Japan, China and Korea also have relatively high levels of informal caregiving to the elderly supplied by daughters-in-law. Even though Korea and Japan are relatively rich and have many more social programs than China the expectations that daughters-in-law take care of their husband's older parents (a form of WIHO) are quite prevalent in all three countries, certainly more so than expectations that sons-in-law take care of their wife's older parents (Das Gupta et al. 2003). In all three countries patrilocality is relatively common, meaning that after marriage a couple often goes to live close to the husband's family, sometimes under the same roof. Traditionally, patrilineality has also been common in these countries, meaning that generally sons inherited but daughters did not (Das Gupta et al. 2003). As a result, later in their life cycle women have often been living with their in-laws and have taken care of them more than they have cared for their own parents.

Evidence of high levels of eldercare provided by daughters-in-law in Japan was mentioned in the introduction. For China, data from the 2013 Health and Retirement Longitudinal Study (CHARLS) indicate that among families with sons, 13.7% of older respondents (ages 45 or more) with an IADL limit received help from daughters-in-laws, where IADL stands for Instrumental Activities of Daily Living such as shopping, using a telephone, or doing laundry. In contrast, among families with daughters only 2% of such respondents with an IADL limit received help from sons-

in-laws.[7] A broad generalization is that when comparing Japan, China and Korea to Europe and the U.S. the countries where informal brideprice is more common are also the countries where daughters-in-law tend to be more actively involved in eldercare.

How does India fit into these broad generalizations? Like Japan, China and Korea Northwest India also has strong traditions of patrilocality and patrilineality (Das Gupta et al. 2003). Overall in India it is also the case that daughters-in-law are considerably more likely to take care of their elderly in-laws than sons-in-law. According to Ugargol et al. (2015) of those providing informal help with IADL (instrument activities of daily living) close to 40% were sons and daughters-in-law and only about 15% were daughters (including unmarried daughters). Sons-in-law were not mentioned as a category. Their study was based on the 2011 Building Knowledge Base on Population Ageing in India survey (BKPAI) that included thousands of respondents over age 60 in seven Indian states, including states from the Northwest. India and China are comparable in the sense that they are poor countries with limited offerings of formal care of the elderly. In both countries sons and daughters-in-law are the main relatives taking care of the dependent elderly.

It is puzzling that in contrast to China and Japan in Northwest India the same traditions of patrilocality, patrilineality, and a relatively high prevalence of eldercare by daughters-in-law are associated mostly with a dowry system. Throughout India dowries and brideprices tend to coexist, which inspired the first economic publication on marriage: Bronfenbrenner (1971). Bronfenbrenner and, more recently Anderson (2007), have pointed out that dowries tend to be paid more frequently and consist of higher amounts among the highest social classes than among the lower classes.[8] Bronfenbrenner explained that class differential as follows: women in the lower castes work harder in the labor market and upper caste families have to pay dowry so their daughters can afford a lifestyle free of the hard work to which their lower caste counterparts are doomed. Is it possible that relative to their upper-caste counterparts poor Indian women provide not only more labor in labor markets but also more WIHO to older in-laws when families can't afford paid help? Where dowry was paid are the older parents-in-law more likely to be cared for by servants? The dowries of upper class women may allow them to access a more leisurely lifestyle after marriage, involving less hard work in both the labor market and WIHO.

The model presented here leads to the prediction that in regions where dowries are more prevalent or dowry levels are higher there will be relatively less eldercare WIHO supplied by daughters-in-law to their elderly in-laws than where dowries are less prevalent or less generous. Suggestive evidence supporting this prediction consists of a simple comparison of the prevalence of eldercare by daughters-in-law in rural areas in the North and the South of India. As summarized in Table 1, in rural Northern India dowries tend to be substantially lower than in the rural South. This is true for both the mean and the median dowry, based on 1998 data (Chowdhury 2010). Using the 2010 LASI pilot survey I calculated the percent of daughters- or sons-in-law who provided informal care of needy elderly in the North and South of India. In the North, where dowries are relatively low, daughters-in-law are considerably more likely to provide eldercare WIHO than in the South where dowries tend to be high. The contrast was huge: 25% versus 4% of eldercare provided by children's spouses (in most cases daughters-in-law). Given the low dowry levels, it is possible that in Northern India the total premarital transfer is mostly a transfer from men and their families to the new couple, for patrilocality can be interpreted as a form of brideprice: it implies that the groom and

---

[7] I thank Christine Ho for providing me with these statistics. The survey is based on a sample of thousands of respondents. The percentage of sons providing help to their parents was 19.8%, and that of daughters 10.9%.

[8] This was also the case in 17th Century France.

his family are providing housing and food to the new wife. There may thus not be much of a difference between Northern India on the one hand and Japan, China and Korea on the other hand, with regard to the association between brideprice and eldercare supplied by daughters-in-law.

5. Conclusions and Suggestions for Further Research

This paper presented a model according to which children and potential children-in-law make individual decisions regarding the provision of eldercare. They respond to incentives: the more they can get paid for taking care of a father-in-law in need of assistance the more they are likely to assist. Two implications from the model were emphasized. First, studies of the impact of eldercare on the health and happiness of the relatives who do the caregiving could be enriched by taking account of the incentives possibly received by children-in-law. Accordingly, it may be possible to approximate intra-marriage transfers from the spouse whose parent is the object of caregiving to the spouse performing the caregiving work and to estimate how these transfers affect results.

A second implication of the model is that provision of care to older in-laws will be related to the presence of brideprice or dowry transfers (in the form of money or in-kind) and that within a society with a given set of premarital traditions the amount of such transfer will vary with the expected amount of care for elderly in-laws. Suggestive evidence was provided based on a simple comparison of two Indian regions. It appears that daughters-in-law in the rural North of India provide more eldercare than their counterparts in the South. Their families are also likely to pay lower dowries at the time of marriage, which is consistent with the model presented here: it is not as likely that women's families are "buying" their daughters out of caregiving obligations. It is hoped that future research can provide rigorous empirical analysis testing for an association between eldercare by in-laws and brideprice, dowry or similar pre-marital transfers. Such research will need good data and will have to recognize that causality between the type of premarital payment and amount of eldercare could run both ways. It is also possible that a third causal factor such as poverty level affects both premarital transfers and eldercare by in-laws.

The ideas presented here can lead to many more directions for further research. Sex ratios' relation to amount of eldercare provided by various family members could be investigated. The higher the sex ratio, the higher the aggregate demand for women's WIHO and the higher the price of women's WIHO is likely to be. Men's WIHO will have a lower price. It has been shown that higher sex ratios and presumably lower prices for women's WIHO have been associated with lower rates of participation of married women in the labor force (Grossbard-Shechtman 1984; Grossbard and Amuedo-Dorantes 2007). Are they also associated with a lower eldercare supplied to in-laws by married women? Will men's lower WIHO prices lead them to supply more spousal eldercare?

Future research should also take divorce into account. Divorce does not matter when the model is applied to countries with very low divorce rates, as has traditionally been the case in the Far East. However, if divorce rates are substantial (and they are rising in Asia) the connection between premarital payments and eldercare by children-in-law is likely to be weaker. For example, men's families may be reluctant to pay their sons' wives (or their families) prior to marriage for WIHO to be performed when they reach an age of high dependency.

Another important demographic variable that needs to be incorporated in the modeling is life expectancy. Life expectancy will affect aggregate demand for eldercare WIHO supplied by children-in-law: the longer the in-laws are expected to live, the more in-family arrangements for their future care become valuable. It is also possible that the supply of eldercare by in-laws contributes to a higher life expectancy. Japan has the world's highest life expectancy. Is it partially the result of more eldercare supplied by children or children-in-law? And if so, did traditions regarding pre-marriage payments and patrilocality contribute to longevity?

Policy implications are numerous. For example, to the extent that government programs aimed at the elderly are underfunded it may become more of a policy priority to encourage informal eldercare, including that provided by daughters- and sons-in-law, as it is typically cheaper than alternative ways of providing eldercare. Long-term care of dependent elderly may be even cheaper to taxpayers if in-marriage transfers between spouses provide the right incentives.

References

Alessie, R., Angelini, V., and Pasini, G. (2014). Is it true love? Altruism versus exchange in time and money transfers. *De Economist* 162(2):193–213.

Amuedo-Dorantes, C., Bonke, J. and Grossbard, S. (2011). Income Pooling and Household Division of Labor: Evidence from Danish Couples. IZA Discussion Paper No. 5418, January.

Anderson, S. (2007) The Economics of Dowry and Brideprice. *Journal of Economic Perspectives,* 21: 151-174,

P. Arokiasamy, D. Bloom, J. Lee, K. Feeney, and M. Ozolins (2011). Longitudinal Aging Study in India: Vision, Design, Implementation, and Some Early Results,. PGDA Working Paper No. 82 http://www.hsph.harvard.edu/pgda/working.htm, November.

Averett, S.L., Sikor, A. and Argys, L.M. (2015). Intergenerational transfers and caregiving within families. in Redmount, Esther ed. *The Economics of the Family*, Vol. 2. Santa Barbara: Praeger.

Becker, G.S. (1965). A Theory of the Allocation of Time. *Economic Journal* 75: 493-515.

_____. (1973), "A Theory of Marriage: Part I." *Journal of Political Economy* 81:813-846.

_____. (1981), *A Treatise on the Family*. Cambridge: Harvard University Press.

Bethmann, D. and Rudolf, R. (2016). Happily ever after? Intrahousehold bargaining and the distribution of utility within marriage. *Review of Economics of the Household*, online first.

Bronfenbrenner, M. (1971). A Note on the Economics of the Marriage Market. *Journal of Political Economy* 79:1424-25.

Chowdhuri, A. R. (2010). "Money and Marriage: the practice of dowry and brideprice in rural India." Paper presented at the annual meetings of the Population Association of America. Downloaded from paa2010.princeton.edu/papers/100225 on January 12, 2017.

Chu, C. Y. and Yu, R.-R. (2010), *Understanding Chinese Families: A Comparative Study of Taiwan and Southeast China*. Oxford: Oxford University Press.

Cox, D. and Rank, M. R. (1992). Inter-vivos transfers and intergenerational exchange. *Review of Economics and Statistics* 74(2):305–314.

Das Gupta, M., Zhenghua, J., Bohua, L., Zhenming, X., Chung, W. and Hwa-Ok, B. (2003). Why is Son Preference so Persistent in East and South Asia? A Cross-Country Study of China, India, and the Republic of Korea, Policy Research WP Series, World Bank, January http://dx.doi.org/10.1596/1813-9450-2942

Datta, P., Poortinga, Y.H. and Marcoen, A. (2003). Parent care by Indian and Belgian caregivers in their roles of daughter/daughter-in-Law. *Journal of Cross-Cultural Psychology 34(6):736-749*.

Du, Q. and Wei, S.-J. (2013). A theory of competitive saving motive. *Journal of International Economics* 91: 275-289.

Fisher, K. and Robinson, J. (2011). Daily life in 23 countries. *Social Indicators Research* 101: 295-304.

Grossbard, A. (1976). An economic analysis of polygamy: the case of Maiduguri. *Current Anthropology* 17:701-7.

Grossbard, S. (2014). A note on altruism and caregiving in the family: do prices matter? *Review of Economics of the Household* 12(3):487-492.

Grossbard, S. (2015). *The Marriage Motive: A Price Theory of Marriage. How Marriage Markets Affect Employment, Consumption and Savings.* New York: Springer.

Grossbard, S. (2016a). "Marriage and Marriage Markets" IZA Discussion Paper No. 10312, October.

Grossbard, S. (2016b). "Polygamy and the Regulation of Marriage Markets" in *The Polygamy Question,* edited by Janet Bennion and Lisa Fishbayn Joffe, Utah State University Press.

Grossbard, S. and Amuedo-Dorantes, C. (2007). Marriage Markets and Women's Labor Force Participation. *Review of Economics of the Household* 5:249-278.

Grossbard, S. and Pereira, A. M. (2010). "Will Women Save more than Men? A Theoretical Model of Savings and Marriage" CESifo Working Paper No. 3146.

Grossbard-Shechtman, A. (1984). A Theory of Allocation of Time in Markets for Labor and Marriage. *Economic Journal* 94(4): 863-882.

Grossbard-Shechtman, S. A. and C. W. Granger. (1998). "Women's Jobs and Marriage, Baby-Boom versus Baby-Bust," *Population* 53: 731-52, (in French: Travail des Femmes et Mariage du baby-boom au baby-bust").

Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political Economy* 80(2):223-255.

Horioka, C.Y. (2014). Are Americans and Indians more altruistic than the Japanese and Chinese? Evidence from a new international survey of bequest plans. *Review of Economics of the Household* 12(3):411–437.

Horioka, C.Y. and Terada-Hagiwara, A. (2016). The Impact of Sex Ratios before Marriage on Household Saving in Two Asian Countries: The Competitive Saving Motive Revisited. *Review of Economics of the Household, onlinefirst.*

Kokumin Seikatsu Kiso Chosa (2013). A Comprehensive Survey of Living Conditions, Japan (in Japanese).

Kureishi, W. and Wakabayashi, M. (2013). What motivates single women to save? The case of Japan," *Review of Economics of the Household* 11: 681–704.

Lopez Anuarbe, M. (2013). Intergenerational Transfers in Long Term Care. *Review of Economics of the Household* 11(2):235-258.

Mincer, J. (1963). Market Prices, Opportunity Costs, and Income Effects. in C. Christ (ed.) *Measurement in Economics.* Stanford, CA: Stanford University Press.

National Alliance for Caregiving (2015). CAREGIVING IN THE U.S. 2015 – FOCUSED LOOK AT CAREGIVERS OF ADULTS AGE 50+, RESEARCH REPORT: JUNE. Accessed at http://www.caregiving.org/wp-content/uploads/2015/05/2015_CaregivingintheUS_Care-Recipients-Over-50_WEB.pdf

Niimi, Y. (2016). The "Costs" of informal care: an analysis of the impact of elderly care on caregivers' subjective well-being in Japan. *Review of Economics of the Household* 14:779-810.

Nivakoski, S. (2015). The exchange motive in intergenerational transfers. UCD Geary Institute, WP 2015/10, May.

Oshio, T. (2014). Mental health among middle-aged and older adults: evidence from a nationwide panel survey in Japan. *The Economic Review* 65(4): 332-344.

Pezzin, L.E. and Schone, B.S. (1999). Intergenerational household formation, female labor supply and informal caregiving: A bargaining approach- *Journal of Human Resources* 34: 475-503.

Rudolf, R. and Kang, S.-J. (2015). Lags and leads in life satisfaction in Korea: when gender matters. *Feminist Economics* 21:136-163.

Ugargol, A.P., Hutter, I., James, K.S., and Bailey, A. (2015). Caregiving patterns to older adults in India. Extended Abstract, PAA meetings, San Diego.

Van Houtven, C.H. and Norton, E.S. (2004). Informal care and health care use of older adults. *Journal of Health Economics* 23:1159-1180.

Wakabayashi, M. and Kureishi, W. (2016). Impacts of informal caregiving on caregivers' health and life satisfaction. Paper presented at the ADBI-AGI workshop on aging in Asia, Kitakyushu, November.

Wei, Shan-Jin and Xiaobo Zhang (2011), The Competitive Savings Motive: Evidence from Rising Sex Ratios and Savings Rates in China. *Journal of Political Economy* 119 (3): 511-564.

Zhu, C., Moore M., and Clipp, E. (2003). Dementia problem behavior and the production of informal caregiving services. *Review of Economics of the Household* 1/2: 77-110.

Table 1. Prevalence of dowry and informal care by son or daughter-in-law, rural India, by region

Region	Mean dowry (rupees)	Median dowry (rupees)	% informal care by son or daughter in law
North	19,010	6,343	25
South	57,365	30,229	4

<u>Sources:</u>
- for dowry information: Chowdhury, Afra Rahman (2010), based on data from India's 1998 Rural Economic and Demographic Survey.
- for informal care: author computations based on a subsample of rural respondents included in the 2010 LASI (the Longitudinal Aging Study in India) pilot survey. Respondents were asked who helps you in activities of daily life (ADL), which include using a toilet, bathing, dressing, eating, walking across a room, and getting out of bed. For more information on that survey see Arokiasamy et al (2011). Respondents were asked whether they received caregiving from household members. Those who answered positively reported on five categories of household helpers: biological son or daughter, son or daughter in law, grandchild, spouse/partner, or other. We computed the ratio of the number of cases of help by daughter or son in law over the total number of those reporting caregiving by a household member. The data were downloaded from the website of The Program on Global Aging, Health, and Policy, The Center for Economic and Social Research (CESR) at the University of Southern California. https://g2aging.org/?section=page&pageid=26