

# One's Own Parents or One's Spousal Parents: A Question of Strategic Bequest Motives\*

Wataru KUREISHI<sup>†</sup>  
kureishi@ec.ritsumeikan.ac.jp

Midori WAKABAYASHI<sup>‡</sup>  
mwaka@eco.osakafu-u.ac.jp

August 14, 2009

## Abstract

As is evident from feuds between wives and mothers-in-law and custody battles over grandchildren, the relation with spousal parents is an essential in part of Japanese families. However, this relationship has rarely been researched from the perspective of family economics. Therefore, in this paper, by considering a couple, the husband's parents, and wife's parents, we analyze the intergenerational transfer of bequest and co-residence among them. We examine which model is consistent with Japanese data the altruistic model or the exchange model. We use data on married women who were respondents of the "Japanese Panel Survey of Consumers," which was conducted by the Institute for Research on Household Economics. Our estimation indicates that if a respondent and her husband expect to receive a larger bequest from parents, then the couple is more likely to live with the parents, while it is less likely to do so if they expect to receive a larger bequest from the other parents. These results are consistent with the exchange model.

---

\*We are greatly indebted to Charles Yuji Horioka for his kind advice, comments, and discussions throughout the process of writing this paper. We would also like to thank Yukiko Abe, Misuzu Azuma, Shigeki Kano, Ayako Kondo, and Colin Mckenzie for their helpful comments and discussions. We thank the Institute for Research on Household Economics for permitting us to use data from the "the Japanese Panel Survey of Consumers (JPSC)." We are indebted to the Ministry of Education, Culture, Sports, Science and Technology of the Japanese government for the Grant-in-Aid for Scientific Research (#18330068 and #19330062) in support of this research.

<sup>†</sup>Corresponding author: BKC Research Organization of Social Science, Ritsumeikan University, 1-1-1 Noji-Higashi, Kusatsu, Shiga 525-8577, Japan, Tel./Fax +81-77-561-4987

<sup>‡</sup>College of Economics, Osaka Prefecture University, 1-1 Gakuencho, Nakaku, Sakai, Osaka 599-8531, Japan, Tel & Fax: +81-(0)72-254-9972

# 1 Introduction

In Japan, although a public nursing care insurance system, outlined as the provision of formal nursing-care services in a situation where nursing care is required, has been implemented since 2000, informal care is still a central part of nursing care for the aged. In many cases, the family members who co-reside with the aged shoulder the responsibility of providing the informal care. In fact, according to the 2007 National Livelihood Survey, conducted by the Ministry of Health, Labour and Welfare, the main caregivers for those who require nursing care are co-resident families (60.0%), while non-co-resident families and nursing care businesses comprise only 10.7% and 12.0% of the care givers respectively. In addition, there is a deep-rooted attitude that the aged should be cared for by co-resident family members. The National Surveys on Family in Japan, conducted by the National Institute of Population and Social Security Research since 1993, report that 65.6%–74.7% of married women agreed that the family should undertake the responsibility of caring for aged parents, while 49.4%–61.5% of them agreed the opinion that aged parents should live with their married children or married son.

An issue in elderly care in Japan is that it is regarded as quite natural that women, especially wives and daughter-in-laws, take care of aged people. In the 2007 National Livelihood Survey, 71.6% of the family caregivers were female. This means that women often have to deal with more than one aged person: their husbands, their own parents, and the parents of their husband. In fact, the 3rd National Survey on Family in Japan reports that the co-residence ratios of married women with husband's parents are 14.5%–35.1%, which are fairly larger than the ratios of those with wife's parents (4.3%–10.6%). Although the survey does not mention it, these women will provide nursing care to their husband's parents. With regard to intergenerational care, women have to consider a trade-

off between whom they co-reside with and provide care for, and between own parents and husband's parents. However, thus far, few studies have been conducted on this trade-off from the perspective of economics.

In contrast, a large number of studies have examined the trade-off between providing care for parents and working in the labor force and its relation with co-residence, which many women must consider. These studies can be classified into two models. One model, which we call the *altruistic model*, assumes that children derive utility from their caregiving since informal caregivers are usually not paid, as presented in Norton [11] (Section 3.4). Pezzin and Schone [12] positioned parental well-being as an intra-household public good and assumed that children can improve parental well-being through long-term care and income transfer, and then analyzed the bargaining between parents and children. In contrast, the other model assumes that caregiving for parents is burdensome for children. Instead, caregiving is the outcome of an implicit or explicit exchange of bequest or inter vivos transfer with parents. Hence, we call this the *exchange model*. Bernheim, Shleifer and Summers [1] argued that children provide attention to elderly parents through visits or telephone calls if the parents can credibly threaten to disinherit them. For empirical researches confirming the exchange model, see Cox and Rank [3] and Horioka [5].

In Japan, as is evident from feuds between wives and mothers-in-law and custody battles over grandchildren, it is widely recognized that the relation with spousal parents is essential especially for women. However, little research has analyzed the interaction among a couple, the husband's parents, and wife's parents. Instead, some of the above mentioned researches is the interaction between parents and children on family giving have focused on. While child may prefer to admit parents to a nursing home, the parent may want to live independently or with the child. Other researchers have focused on interactions among children. In models where parental well-being is a public good,

children may have incentives to enjoy the benefit of a public good without bearing the burden of care costs. Konrad et al. [6] argue that first-born children exploit their first mover advantage by moving away from their parents, leaving later-born children to bear a disproportionate share of long-term care responsibility. In the exchange model, siblings compete against each other for a bequest and an *intervivos* transfer, which induces the children to contact parents more frequently. In fact, the exchange model requires at least two potential beneficiaries (see Bernheim, Shleifer and Summers [1]).

In this paper, we emphasize the role of bequests in caregiving and co-residence. Its importance is apparent in the exchange model since aged parents use bequests in order to elicit attention and informal caregiving from their children. In addition, bequests are an important determining factor of the behavior of children. For example, Weil [16] argued that received or expected bequests lower the savings of the young. The magnitude of bequests has been documented in many papers. In Japan, Horioka [4] estimates their proportion to household assets at about 20–30%; Barthold and Ito [2], at about 30–40%, and Shimono and Ishikawa, [14] at about 40–60%, even though these figures are lower than the estimation by Kotlikoff and Summers [7] (about 80%). In addition, a bequest is the source of asset inequality (Saito and Ohtake [13]). Especially in Japan, Saito and Ohtake [13] point out that consumption inequalities are carried on from the older generations to the younger generations through bequests and *intervivos* gifts.

In this paper, we analyze a parent-child co-residence and the intergenerational transfer of a bequest by considering a couple, the husband's parents, and wife's parents. Our central interest is in examining which model is consistent with Japanese data —the altruistic model or the exchange model. We distinguish one's own parents from one's spousal parents, which enables us to examine how the bequest from own parents and the bequest from spousal parents have different effects on co-residence. The most important point is that,

as we shall see, theoretically, the bequest from spousal parents has a different effect in the altruistic model and the exchange model. The altruistic model predicts that co-residence with parents will increase by larger bequests, regardless of whether the bequest is from own parents or the other parents. In addition, a bequest from husband’s parents and that from wife’s parents have the same impact on the co-residence. On the other hand, the exchange model predicts that parents have to leave a larger bequest to co-reside with the couple, and that parents are less likely to co-reside with the couple if the other parents leave a larger bequest. Our estimation indicates that, first, if parents are expected to leave a larger bequest, then they are more likely to live with the couple, and second, and importantly, the couple is less likely to do so if the other parents are expected to leave a larger bequest. These findings are consistent with the exchange model.

This paper is organized as follows: in Section 2, we develop the theoretical model, and in Section 3, we present the data we use in our analysis. Further, section 4 presents our empirical model, and section 5 presents our variable definitions. Section 6 contains the descriptive statistics, and Section 7 presents our result. Finally, Section 8 concludes the paper.

## 2 Theoretical Model

### 2.1 The Setup

First, we present a setup common to the theoretical models. We consider a married unitary couple  $C$  consisting of a wife and a husband. We consider the parents of the wife as  $P_w$  and the parents of the husband as  $P_h$ .

When parents  $P_w$  and  $P_h$  retire and require nursing care, couple  $C$  decides whether to co-reside with the parents of the wife or the parents of the husband, in order to provide the parents informal family care. The living arrangement with the wife’s parents is denoted

by  $a_{P_w}$ , and the living arrangement with the husband's parents is denoted by  $a_{P_h}$ . Both  $a_{P_h}$  and  $a_{P_w}$  dichotomously indicate co-residence by 1 while living separate by 0. The couple incurs a cost for co-residence: pecuniarily, the cost includes a moving expense and a loss of job opportunity, and psychologically, it includes disturbance of privacy. The cost is denoted by the following function:

$$\kappa(a_{P_w}, a_{P_h}) = \begin{cases} \infty & \text{if } a_{P_w} = a_{P_h} = 1, \\ K > 0 & \text{if } [a_{P_w} = 1, a_{P_h} = 0] \text{ or } [a_{P_w} = 0, a_{P_h} = 1], \\ 0 & \text{otherwise,} \end{cases} \quad (1)$$

where co-residence with both the wife's parents and the husband's parents entails a prohibitively high cost.

Several years later, parents  $P_w$  and  $P_h$  die and leave bequests to the couple. The bequest from the wife's parents is denoted by  $b_{P_w}$ , while the bequest from the husband's parents is denoted by  $b_{P_h}$ .

The other variables are as follows: the consumptions of the couple, wife's parents and husband's parents are denoted by  $x_C, x_{P_w}$ , and  $x_{P_h}$ , respectively. The total earnings of the couple, the wife's parents, and the husband's parents, which are exogenously given, are denoted by  $y_C, y_{P_w}$ , and  $y_{P_h}$ , respectively.

Next, in order to explain how the couple co-resides with the parents and how the parents leave bequests to the couple, we consider two models: one is the altruistic model and the other is the exchange model.

## 2.2 The Altruistic Model

This model assumes the couple's altruism toward the parents: the married couple care about their private consumption  $x_C$  as well as their co-residential conditions  $a_{P_w}$  and  $a_{P_h}$  with utility function  $U_C(x_C, a_{P_w}, a_{P_h})$ . From the couple's altruism, we assume  $U_C(\cdot, 1, \cdot) > U_C(\cdot, 0, \cdot)$  and  $U_C(\cdot, \cdot, 1) > U_C(\cdot, \cdot, 0)$ . We also assume that  $\frac{\partial U_C}{\partial x_C} > 0$  and  $\frac{\partial^2 U_C}{\partial x_C^2} < 0$ .

In this model, we treat the bequests from the wife's parents,  $b_{P_w}$ , and those from the

husband's parents,  $b_{P_h}$ , as exogenous variables. Hence, the couple's decision to co-reside with parents is voluntary and does not depend on the parental bequeathing behaviors.

Then, the couple maximizes its utility function as follows:

$$\max_{x_C, a_{P_w}, a_{P_h}} U_C(x_C, a_{P_w}, a_{P_h}) \text{ s.t. } x_C = y_C + b_{P_w} + b_{P_h} - \kappa(a_{P_w}, a_{P_h}). \quad (2)$$

For  $i = P_w, P_h$ , let  $a_i^a = a_i^a(y_C + b_{P_w} + b_{P_h}, K)$  be the utility maximizing decision of co-residence with parents  $i$  in this altruistic model. We should note  $a_i^a$ 's dependence on the sum of the couple's total earnings and bequests from the wife's parents and the husband's parents, and not on the couple's total earnings, the bequest from the husband's parents, and the bequest from the wife's parents separately.

Therefore, we obtain the following derivatives:

$$\frac{\partial a_i^a}{\partial b_i} = \frac{\partial a_i^a}{\partial b_j} = \frac{\partial a_i^a}{\partial y_C} \geq 0 \text{ for all } i, j = P_w, P_h, \text{ with } i \neq j. \quad (3)$$

In other words, the likelihood of the couple's co-residing with parents  $i$  is affected equally by the bequest from the parents  $i$  and the bequest from the other parents  $j$ . In addition, the total earnings of the couple also have the same impact on co-residence. The positive sign of the derivatives is due to  $\frac{\partial^2 U_C}{\partial x_C^2} < 0$ . Moreover, we have a negative effect of co-residence cost  $K$ , that is,  $\frac{\partial a_i^a}{\partial K} \leq 0$ .

## 2.3 The Exchange Model

The exchange model is based on the strategic bequest motive of Bernheim et al. [1]. In this model, the couple is not altruistic, that is, it cares only about its own consumption  $x_C$ . Owing to the selfishness of the couple, parents cannot expect the couple's voluntary co-residence, and thus, each set of parents has to "purchase" co-residence with the couple in exchange for a bequest to the couple.

In purchasing co-residence, the parents compete with the other parents because of the structure of co-residential cost, such that living together with both the husband's parents

and the wife's parents is prohibitively costly for the couple,  $\kappa(1, 1) = \infty$ . In this situation, parents can acquire the co-residence with the couple by offering a bequest that is larger than that of the other parents, that is,

$$(a_{P_w}, a_{P_h}) = \begin{cases} (1, 0) & \text{if } b_{P_w} > b_{P_h} \text{ and } b_{P_w} \geq K, \\ (0, 1) & \text{if } b_{P_h} > b_{P_w} \text{ and } b_{P_h} \geq K, \\ (0, 0) & \text{if } K > b_{P_w}, b_{P_h}. \end{cases} \quad (4)$$

The last line means that, even if the parents offer a higher bequest than the other parents, the offer will be refused by the couple if the offered bequest is lower than the cost of co-residence  $K$ .

Then, parents  $i \in \{P_w, P_h\}$  solve the following noncooperative game, given the offer of the other parents  $b_j$ ,

$$\max_{x_i, b_i} U_i(x_i, a_i(b_i, b_j)) \text{ s.t. } x_i = y_i - b_i, \quad (5)$$

with the assumption that co-residence is a good for the parents,  $U_i(\cdot, 1) > U_i(\cdot, 0)$ , and that their utility is increasing and convex in their consumption  $x_i$ ,  $\frac{\partial U_i}{\partial x_i} > 0$ , and  $\frac{\partial^2 U_i}{\partial x_i^2} < 0$ .

For  $i = P_w, P_h$ , let  $b_i^e$  be the reaction of parents  $i$  given the bequest offered by the other parents  $b_j$ , and  $a_i^e$  be their corresponding living arrangement with the couple. Let  $\bar{b}_i$  be their willingness to pay for co-residence defined as  $U_i(y_i - \bar{b}_i, 1) = U_i(y_i, 0)$ . Then, we obtain parents  $i$ 's reaction  $b_i^e$  and living arrangement  $a_i^e$  as functions of the bequest offered by the other parents  $b_j$ :

$$(b_i^e, a_i^e) = \begin{cases} (0, 0) & \text{if } b_j > \bar{b}_i, \\ (b_j + \epsilon, 1) & \text{if } \bar{b}_i \geq b_j \geq K, \\ (K, 1) & \text{if } K > b_j, \end{cases} \quad (6)$$

where  $\epsilon$  is positive and small. The above relation (6) suggests that parents leave no bequest and give up co-residing with the couple if their willingness to pay is exceeded by the other parents' bequest offer. Otherwise, the parents leave a bequest that is a little larger than the other parents' offer or as much as the co-residence cost  $K$  in order to co-reside with the couple.



What should be emphasized in this exchange model is that, contrary to the altruistic model, the effect of bequests on co-residence with parents is not equal between the parents and the other parents. That is, parents' likelihood of co-residing with the couple is higher if the parents offer a larger bequest, while the likelihood is lower if the other parents offer a larger bequest. In short, we have

$$\frac{\partial a_i^e}{\partial b_i} \geq 0 \text{ and } \frac{\partial a_i^e}{\partial b_j} \leq 0 \text{ for all } i, j = P_h, P_w, \text{ with } i \neq j. \quad (7)$$

### 3 Data

We use micro data from the “Japanese Panel Survey of Consumers,” which has been conducted annually by the Institute for Research on Household Economics since October 1993. In the survey, a stratified two-stage random sample from across Japan was surveyed using the drop-off, pick-up method. The 1993 wave started with 1,500 women between 24 and 34 years of age as of October 1993. Additionally, 500 women between 24 and 27 years of age as of October 1997 have been surveyed since the 1997 wave, and 836 women between 24 and 29 years of age as of October 2003 have been surveyed since the 2003 wave.

During every wave, this survey investigated the co-residential condition of respondents. On the other hand, the anticipation of a bequest transfer from own parents and spousal parents was examined irregularly. Owing to the irregularity, we use the 2002 wave and 2004 wave because year 2004 is the most recent year when the respondents were asked whether or not they expect to inherit from own parents and spousal parents. Further, the year 2002 is the most recent year when they were asked about the amount of expected bequest and inter vivos in the form of financial assets and real assets from own parents and spousal parents.

With respect to attrition, the initial 1,500 respondents and the 500 respondents who

added in the 1997 wave decreased to 1,376 at the time of the 2002 wave. These 1,376 respondents decreased further to 1,253 at the time of the 2004 wave. On the other hand, the 836 respondents who were added in the 2003 wave decreased to 720 at the time of the 2004 wave. Thus, the 2004 wave comprised a total of 1,973 respondents.

The sample we use is as follows: respondents (i) who were married and (ii) with at least one of their own parents and at least one of their husband's parents living. In addition, we exclude all respondents for whom all the other necessary information was not provided. Of the 1,376 respondents in the 2002 wave and the 1,973 respondents in the 2004 wave, 1,067 and 1,305 women were married, while 309 and 668 were singles, respectively. Restricting the sample to respondents with at least one of their own parents and at least one of their spouse's parents living reduces the number of respondents from 1,067 and 1,305 to 1,060 and 1,300, respectively. Further, restricting the sample to respondents for whom all of the other necessary information was available finally reduces the number to 696 and 811, respectively.

## 4 Estimation Model and Estimation Method

In this section, we describe the estimation model for co-residence by considering a respondent couple, the husband's parents and the wife's parents.

We examine how respondent's co-residence with her own parents is affected by the bequest from her own parents as well as the bequest from her husband's parents. Hence, we consider the following estimation equation,

$$\begin{aligned}
 co-residence^* &= \alpha_0 + \alpha_1 bequest\_p + \alpha_2 bequest\_s + \alpha_c X_c + \alpha_p X_p + \alpha_s X_s + \epsilon, \\
 co-residence &= \begin{cases} 1 & \text{if } co-residence^* > 0, \\ 0 & \text{otherwise.} \end{cases} \tag{8}
 \end{aligned}$$

The dependent variable *co-residence* represents whether or not a respondent co-resides

with her own parents. In every wave, there are two questionnaire entries related to the co-residential condition of the respondents. The first one (a) asked which category applies to respondent's own parents or her husband's parents who live the closest to her. The choices are (1) the respondent lives in the same house as parents and earns a livelihood with them, (2) the respondent lives in the same house as parents and earn a livelihood separately from them, (3) the respondent lives in a separate house on the same proportion as parents, (4) the respondent lives in the same town or in less than 1 kilometer to the residence of the parents, (5) (if the respondent lives in 13 designated cities) the respondent lives in the same ward, (6) (if the respondent lives in the city other than 13 designated cities) the respondent lives in the same municipality, (7) the respondent lives in the same prefecture, (8) parents do not live in aforementioned (1)–(7) distances. The second one (b) asked which parents live closer to the respondent. The choices are (1) wife's parents, (2) husband's parents, (3) both wife's and husband's parents. Note that there is no respondent who answers (1)–(3) in question (a) and (3) in question (b). That is, there is no respondent who live with both own parents and spouse's parents. Then, we define the variable *co-residence* as a dummy that equals one if the respondent answers (1)–(3) in question (a) and (1) in question (b) and zero otherwise.<sup>1</sup>

We also conduct an estimation of respondent's co-residence with her husband's parents, in which we define the variable *co-residence* as a dummy that equals one if the respondent answers (1)–(3) in question (a) and (2) in question (b) and zero otherwise.

Alternatively, we use a dependent variable *care*, which represents whether or not a respondent provides or intends to provide nursing care to her own parents and the parents of her husband, respectively. The questionnaire entry on the care is different between 2002

---

<sup>1</sup>From these questions, we know respondent's distance to the closer parents but to the farther parents. That is why the co-residential condition is defined as a dummy variable rather than an ordered or continuous one.

wave and 2004 wave, as following. In 2002 wave, a respondent is requested to answer yes or no to a question that (a) whether or not she and her husband provide nursing care at present to her own and the parents of her husband, respectively if the parents are aged 65 or over, and to a question that (b) whether or not she and her husband intend to provide nursing care in the future to her own and the parents of her husband, respectively if the parents are aged 64 or under. Then, we define the variable *care* for own parents and spousal parents, respectively as a dummy that equals one if the respondent answers yes and zero if she answers no. In 2004 wave, a respondent is asked whether or not she and her husband intend to provide nursing care in the future to her own parents and the parents of her husband, respectively. The choices are (1) We provide it at present, (2) We will provide it in the future, (3) We do not provide it at present, and are not going to do it in the future, and (4) The parents are both dead. Then, we define the variable *care* for own parents and spousal parents, respectively as a dummy that equals one if the respondent answers (1) or (2) and zero if she answers (3). Note that there is no respondents who answered (4) due to sample selection.<sup>2</sup>

Independent variable *bequest\_p* represents the amount of bequests a respondent expects to receive from her own parents. In wave 2002 a respondent is asked to answer how much yen she expects to receive from her own parents as bequest and inter vivos transfer, respectively and in the form of financial assets and real assets, respectively. Then, we define the variable *bequest\_p* as the sum of the above amounts. Also independent variable *bequest\_s* is defined as the sum regarding the parents of her spouse.

Alternatively, 2004 wave asked a respondent whether or not she and her husband expect to inherit from her own parents. Then, we use the variable *dm\_bequest\_p* defined

---

<sup>2</sup>For providing nursing care to parents, it may be sufficient for children to live in parent's close neighborhood instead of co-residence. Then, a dependent variable *neighborhood* is defined as a dummy for those who answers (1)–(4) rather than (1)–(3) in question (a). However, the estimations with this dependent variable give us results almost as same as those with *co-residence*.

as a dummy variable that equals one if the respondent answered yes to the question, and zero otherwise, and the variable *dm\_bequest\_s* defined as a dummy variable that equals one if the respondent answers yes to the question regarding the parents of her husband.

The altruistic model and the exchange model give us predictions on the coefficients on *bequest\_p* and *bequest\_s*, that is,  $\alpha_1$  and  $\alpha_2$ . Especially the prediction on the effect of bequest from the parents of respondent's husband  $\alpha_2$  differs between the altruistic model and the exchange model. The altruistic model predict that the co-residence with parents is affected positively and equally by the bequest from the parents and by the bequest from the other, husband's parents. Then, we expect that  $\alpha_1$  and  $\alpha_2$  are positive and same magnitude. On the other hand, the exchange model predicts that the co-residence with parents is affected positively by the bequest from the parents, while it is affected negatively by the bequest from the other parents. Then, we expect that  $\alpha_1$  is positive and  $\alpha_2$  is negative.

The other explanatory variables are summarized as  $X_c$ ,  $X_p$  and  $X_s$ , which represent the attributes of respondents and their husbands, respondents' own parents, and the parents of the husbands, respectively.  $X_c$  includes the following variables: *c\_kids* is a dummy variable for respondents who have at least one child whose age is under thirteen years old. *w\_fulltime* and *w\_parttime* are dummy variables for respondents who are full-time workers and part-time workers, respectively. The base category of these variables is respondents who are full-time housewives. These variables must be included since a respondent who has her own children or works may live with their parents in order to receive childcare and household chore support from parents rather than parents receive support from the respondent.<sup>3</sup> Such parental support of children may be strong when children are young,

---

<sup>3</sup>The relation between the working of women and parental co-residence in Japan is examined by Nishimoto and Shichijo [10].

low education, and low income.<sup>4</sup> Hence, we include  $c\_age$ , which is the average age of a respondent and her husband,  $c\_educ$ , which is the average educational attainment of a respondent and her husband (in years),  $c\_income$ , which is the total annual income of a respondent and her husband.<sup>5</sup> We also include  $h\_eldest\_son$ , which is a dummy variable for husbands who are the eldest son,  $w\_only\_child$ ,  $h\_only\_child$ ,  $w\_three\_siblings$ ,  $h\_three\_siblings$ , which are dummy variables for sibling composition of a respondent and her husband,  $c\_urban$  and  $c\_city$ , which are dummy variables for a respondent and her husband who live in a designated city and a city, respectively. The base category of these variables is respondents who live in rural area.  $X_p$  include  $p\_age$ , which is the average ages of respondent’s own parents,  $p\_educ$ , which is the educational attainments of own father (in years), and  $p\_single$ , which is dummy variable for the respondents whose own parents are divorced or widowed.  $X_s$  includes  $s\_age$ ,  $s\_educ$  and  $s\_single$ , which correspond to those of the spousal parents of respondents.

When we estimate respondent’s co-residence with the parents of her husband, we interchange  $bequest\_p$  and  $X_p$  with  $bequest\_s$  and  $X_s$ , respectively. Also  $dm\_bequest\_p$  is interchanged with  $dm\_bequest\_s$ . We assume that  $\epsilon$  is normally distributed. And thus, we use a probit model with robust standard errors.

---

<sup>4</sup>Laitner and Ohlsson [9] see the effect of child’s earnings for parental altruism.

<sup>5</sup>Even after we control respondents’ having children, income, education, and age, there is a possibility that the motive behind parent-child co-residence is parent’s support to children rather than child’s support to parents still. Hence, we conduct estimations for robustness check using wave 1994, which asked the reason why the respondents live with their parents, in spite of a weak point that respondents are eight years younger than wave 2002. The choices are “parents need nursery care”, “to take care of parents”, “to cut back on housing expense”, “to extract childcare from their parents”, and “others.” However, we still have similar estimation results even if we dropped the respondents who answered “to extract childcare from their parents.” Actually, only 6.5% of our respondents co-reside with their parents to extract childcare from their parents. Note that about 88% of our respondents co-reside with their parents since parents need nursery care and to take care of parents.

## 5 Descriptive Statistics

Table 1 provides the numbers of observation and the percentages for discrete variables and the means and the standard deviations for continuous variables.

With respect to the dependent variable *co-residence*, we should point out that the percentage of respondents who live with their own parents is much lower than those who live with their husbands' parents (9.34% and 28.74% in 2002 wave and 9.86% and 24.66% in 2004 wave). This characteristic that co-residence with husband's parents is higher than that with wife's parents is not specific to this survey but rather general in Japan as we cited in the Introduction the figures from the 3rd National Survey on Family in Japan. See also Kureishi and Wakabayashi [8] and Wakabayashi and Horioka [15].

With respect to bequest, the following two points should be noted. First, with respect to amount variables *bequest\_p* and *bequest\_s* from wave 2002, the average amount from their own parents is much lower than that from the parents of their husband (0.84 million yen and 1.72 million yen, respectively). Since about ninety percent of respondents answer zero, if we exclude those who answer zero, these amounts become higher (more than 17 millions yen and 21 millions yen, respectively). Second, with respect to dummy variables *dm\_bequest\_p* and *dm\_bequest\_s* from wave 2004, respondents also expect that they are less likely to inherit from their own parents than the parents of her husband (28.61% and 46.36%, respectively). These percentages seem to be inconsistent with our above mention that about ninety percent of respondents answer zero. But this is due that yes-no questions are used to define these dummies.

Next, we see the relationship between bequest from wife's parents and bequest from husband's parents. The coefficient of correlation between *bequest\_p* and *bequest\_s* is 0.46 and it is 0.63 for respondents with both *bequest\_p* and *bequest\_s* strictly above zero though

there are only 17 respondents. Following the exchange model, parents who do not co-reside with their child will leave no bequest to their child. Then, these strong positive correlations might be inconsistent with the exchange model.

## 6 Estimation Results

Table 2 shows our estimation results on *co-residence*.

In the first column, where the dependent variable is co-residence with wife's parents and the main independent variables are expected amounts of bequests and inter vivos transefer, we have a positive and significant coefficient of *bequest\_p* and a negative and significant coefficient of *bequest\_s*. These coefficients indicate that if the respondent expects to receive 10 thousand yen more bequest from her own parents, then it is 0.5% points more likely that she lives with her own parents, while it is rather 0.6% points less likely that she lives with her own parents if she expects to receive 10 thousand yen more bequest from the parents of her husband. We do a  $\chi^2$  test which checks whether or not a statistical hypothesis  $bequest_p = bequest_s$  holds, and then the hypothesis is rejected with significant level of 0.004%. Hence, we can say that this result is consistent with the prediction of the exchange model.

In the second column, where we change the dependent variable to co-residence with husband's parents, we also have a result which is consistent with the exchange model: if a respondent expects to receive more bequest from her husband's parents, then she is more likely to live with husband's parents, while she is less likely to live with husband's parents if she expects to receive more bequest from the parents of her own parents. The statistical hypothesis  $bequest_p = bequest_s$  is also rejected.

Furthermore, we should take care of that the magnitude of the coefficient of *bequest\_p* in the first column is much smaller than that in the second column (0.005 vs 0.009), which



means that it is less likely for wife's parents than for husband's parents to increase the probability of co-residing with their child using an additional amount of bequest. This may be because wife's parents need to make their children to expect to receive larger bequest than husband's parents in order to win the co-residence with the children (see equation (4)). In fact, as we saw in the Descriptive Statistics section, bequest from wife's parents is much lower than that from husband's parents on average. If so, this reinforces our backing for the exchange model.

The third and fourth columns shows the results of estimations where the main independent variables are dummy variables rather than amount variables. In both columns, we also have positive and significant coefficients of  $dm\_bequest\_p$  and negative and significant coefficients of  $dm\_bequest\_s$ . That is, if a respondent expects to receive bequest from some parents, then it is 16.6% and 28.6% points more likely that she lives with the parents, compared to that she does not expect to do so. On the other hand, it is rather 10.3% and 10.5% points less likely that she lives with the parents if she expects to receive bequest from the other parents, compared to that she does not expect to do so.

Next, we see the effect of control variables. With respect to  $X_p$  and  $X_s$ , the variable  $p\_single$  has positive and significant coefficients in all of four columns, which means that a respondent and her husband are more likely to live with a parent if the parent is divorced or bereaved. In addition, a negative coefficient of variable  $s\_single$  in the second column may mean that singleness of own parents abstain the respondent from co-reside with husband parents. Variable  $p\_age$  in the third and the fourth columns has positive and significant coefficients, which means that the older parents get, the more likely the respondent and her husband co-reside with the parents.

Of course, the factors related to respondent and her husband  $X_c$  also have an influence: first, variable  $w\_fulltime$  has positive and significant coefficients in three of four columns,

and the variable *w\_parttime* has positive and significant coefficients in two of four columns. If a wife works as a full-time worker or part-time worker, then she is more likely to live with her own or her husband's parents, compared to a full-time housewife. The variable *h\_oldest\_son* has negative and significant coefficients when the dependent variable is co-residence with wife's parents (first and third columns), while it has positive and significant ones when the dependent variable is co-residence with husband's parents (second and fourth columns). This means that when a husband is the eldest son, the couple are more likely to live with the parents of the husband rather than the parents of the wife. This may reflect that in Japan the eldest sons occupies important position such as the successor of family, compared to the other sons and daughters (See Wakabayashi and Horioka [15]).

Table 3 shows our estimation results on nursing care. We have a negative and significant coefficient of amount variable *bequest\_s* in the first column, and positive and significant coefficients of dummy variable *dm\_bequest\_p* in the third and fourth columns. These indicate that if the respondent expects to receive more bequest from her husband's parents, then it is less likely that she intends to provide nursing care to her own parents. In addition, if she expects to receive bequest from some parents, then it is more likely that she intends to provide nursing care to the parents, compared with that she does not expect to do so. Hence, these results are consistent with the exchange model the same as the case of co-residence. Note that we cannot reject the hypothesis  $bequest_p = bequest_s$  in the case of care for the parents of husband in the second column. However, we cannot say that the altruistic model holds since we do not have positive coefficients of *bequest\_p* and *bequest\_s* in the case. On the whole, we have less significant coefficients in the estimations using the dependent variable *care* than in those using *co-residence*. This may be because the questionnaire phrase on care includes intension and plan in the future rather than present state of care. This uncertainty on care in the future may make it

difficult for respondents to answer the question correctly. On the other hand, dependent variable *co-residence* is defined based on the present state of co-residence. In addition, as we showed in Section 4, the questionnaire phrase used to define *care* is different between 2002 wave and 2004 wave. Let us look at the effect of the control variables. We have that if parents are single or older, then they are more likely to be cared. This is similar as in the estimations of *co-residence* in Table 2. In addition, we have a result that if husbands are the eldest sons, then the wife are more likely to care for parents-in-laws rather than own parents.

Endogeneity of the variables on bequest should be considered if the co-residence is explained by unobservable family and background characteristics and the unobservable characteristics are correlated with observed independent variables on bequest. In fact, Bernheim et al [1] pointed out that those that do may hold more bequeathable wealth simply because they like their children, while the children in turn may be attentive simply because they like their parents. If so, our probit model analysis that pools across respondent couple gives biased estimators of the effect of bequest on co-residence and care.

Let  $a_f$  be the unobserved family and background variable, which is fixed over time and changes only across respondent woman. It is unobservable family and background effect or family and background fixed effect. Then, our model is changed to;

$$co-residence^* = \beta_0 + \beta_1 bequest\_p + \beta_2 bequest\_s + \beta_c X_c + \beta_p X_p + \beta_s X_s + a_f + \epsilon, \quad (9)$$

$$co-residence = \begin{cases} 1 & \text{if } co-residence^* > 0, \\ 0 & \text{otherwise.} \end{cases}$$

By differentiating (9) across respondent, we get

$$\Delta co-residence^* = \delta_0 + \delta_1 \Delta bequest\_p + \delta_2 \Delta bequest\_s + \delta_c \Delta X_c + \delta_p \Delta X_p + \delta_s \Delta X_s + \Delta a_f \quad (10)$$

$$co-residence = \begin{cases} 1 & \text{if } co-residence^* > 0, \\ 0 & \text{otherwise,} \end{cases}$$

which removes the family effect,  $a_f$ .

In this analysis, this differentiation is done between 1998 wave with respect to both bequest amount  $bequest_p$  and  $bequest_s$  taken from 2004 wave and dummies  $dm\_bequest_p$  and  $dm\_bequest_s$  taken from 2002 wave. Year 1998 is the sixth year of this survey, when the initial 1,500 respondents were reduced to 1,196 and 500 respondents who added at the point of wave 1997 were reduced to 442. Hence, totally there remain 1,638 respondents. Then, our sample selection reduces them to 781. See the descriptive statistics in Table 4. At 1998 wave the survey did not ask the question on care but on co-residence. Hence, we analyze only using the dependent variable *co-residence*. The questions on bequest are same as that of wave 2002.

The estimation results are in Table 5 which shows the consistency with the exchange model. That is, the change in bequest from some parents has positive influence on the change in co-residence with the parents, while the change in co-residence with the parents is affected negatively by the change in bequest from the other parents. The significant levels are higher for the estimations with dummy variables than those with amount variables.

## 7 Conclusion

We analyze the intergenerational transfer of bequest and co-residence with considering a couple, husband's parents, and wife's parents. We examine which model is consistent with Japanese data, the altruistic model or the exchange model. We use respondents of married women of the "Japanese Panel Survey of Consumers," conducted by the Institute for Research on Household Economics. A series of our estimations indicate that if parents are expected to leave more bequests, then it is more likely for children couple to live with the parents, while it is less likely to do so if the other parents are expected to leave more

bequest. These are consistent with the exchange model.

Our exchange model has a characteristic that there is a scramble for co-residence with children between husband's parents and wife's parents. This kind of scramble might not subsist in the past when the supporting function of family is backed by larger household size and high proportion of farming households and self-employed households, where you could pick out easily a person in charge of nursing care in their own family. The scramble may originate in the shrink of household size and the increase in the female workforce in recent years. If the supporting function of family changes in a way that it becomes difficult for co-resident family to provide nursing care, we have to rely more on institutionalized nursing care such as the public nursing system in Japan though there may be no close substitutes for personal services provided by co-resident family members in formal markets or public institutions.

## References

- [1] Bernheim, B. D., A. Shleifer, and L. H Summers (1985), The Strategic Bequest Motive, *Journal of Political Economy*, 93(6): 1045–1076.
- [2] Barthold, Thomas A. and Ito, Takatoshi, (1991), Bequest Taxes and Accumulation of Household Wealth: US-Japan Comparison, NBER Working Paper
- [3] Cox, Donald, and Mark R. Rank (1992), Inter-vivos Transfers and Intergenerational Exchange, *Review of Economics and Statistics*, vol. 74, issue 2, pages 305-14
- [4] Horioka, C. Y., K. Yamashita, M. Nishikawa, and S. Iwamoto (2001), On The Importance, Nature, and Impact of Bequest Motives in Japan, Institute of Social and Economic Research, Osaka University, mimeo.
- [5] Horioka, C. Y. (2002), Are Japanese Selfish, Altruistic or Dynastic? *Japanese Economic Review*, 53(1): 26–54.
- [6] Kai A. Konrad, Harald Kunemund, Kjell Erik Lommerud, and Julio R. Robledo, (2002), Geography of the Family, *The American Economic Review*, Vol. 92, No. 4, pp. 981–998.
- [7] LJ Kotlikoff, LH Summers, (1981), The Role of Intergenerational Transfers in Aggregate Capital Accumulation, *The Journal of Political Economy*, Vol. 89, No. 4, pp. 706–732
- [8] Wataru KUREISHI, Midori WAKABAYASHI (2007) Why do First-born Children Live with Parents? Discussion Paper New Series (Osaka Prefecture University). 1-27

- [9] John Laitner and Henry Ohlsson (2001) Bequest Motives: A Comparison of Sweden and the United States, *Journal of Public Economics*, Volume 79, Issue 1, January 2001, Pages 205-236
- [10] Nisimoto, M. and Shichijo, T. (2004), *Oya tono doukyo to kaigo ga kikon jyosei no syuugyou ni oyobosu eikyou*, (The Effect of Parental Co-residence and Nursing Care on the Employment of Married Women), *Japanese Journal of Research on Household Economics*, 61, pp.62–72
- [11] Norton, E.C. (2000), Long-term Care. In *Handbook of Health Economics*, Volume IB, A.J. Culyer and J.P. Newhouse, eds, pp. 956–994. New York, NY: Elsevier Science B.V.
- [12] Pezzin, Liliana E., and Barbara Steinberg Schone (1999), Intergenerational Household Formation, Female Labor Supply and Informal Caregiving: A Bargaining Approach, *Journal of Human Resources*, Vol. 34, No. 3, pp. 475–503
- [13] F Ohtake, M Saito, (1998), Population Aging and Consumption Inequality in Japan, *Review of Income and Wealth*, vol. 44, issue 3, pages 361–81
- [14] Shimono, Keiko, and Ishikawa, Miho (1999), Estimating the Size of Bequests in Japan, Institute of Economic Research, Nagoya City University, Nagoya, Japan. mimeo.
- [15] Midori Wakabayashi and Charles Y. Horioka, (2006). Is the Eldest Son Different? The Residential Choice of Siblings in Japan, NBER Working Papers 12655
- [16] David N. Weil, (1994), The Saving of the Elderly in Micro and Macro Data *The Quarterly Journal of Economics*, Vol. 109, No. 1 (Feb., 1994), pp. 55-81