Intergenerational Transfers and Asset Inequality in Japan: Empirical Evidence from New Survey Data[†]

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Abstract

This paper tries to quantitatively examine the impact of intergenerational transfers on asset inequality among Japanese households. For that purpose, we estimate an intergenerational asset transfer function with various control variables, using a unique micro dataset taken from the "Household Survey on Family Relationships, Employment, Retirement Payments, and Intergenerational Transfers of Assets and Education," conducted by the Economic and Social Research Institute, Cabinet Office, Government of Japan. Employing three different models – a Tobit model, an interval regression model, and an ordered probit model – to ensure that our results are independent of the specific econometric approach used, we examine whether asset transfers received are correlated with households' financial strength. We find that higher income households are likely to receive larger asset transfers. However, the contribution of intergenerational transfers to asset inequality appears to be quantitatively limited when measuring financial strength in terms of households' life cycle wealth.

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1. Introduction

Growing economic inequality is a major concern in advanced economies around the world. Japan is no exception, as illustrated by the term *kakusa shakai*, or "social gap society," which has gained wide currency in recent years. Of course, economic inequality has many causes, but the intergenerational transfer of assets is likely one of them. Especially in a country like Japan, characterized by low economic growth and declining fertility, inherited assets are bound to make up an increasing share of household assets overall. This means that if the amount of asset transfers is positively correlated with the financial strength of heirs, intergenerational asset transfers are likely to perpetuate or even increase asset inequality across households and hence the economic gap between wealthier and less well off households.

Whether asset transfers indeed contribute to asset inequality in Japan has been the subject of a number of studies, which, however, have failed to produce conclusive results. Instead, it appears that the findings of studies using aggregate or macro data substantially depend on the choice of methodology to estimate the amount of wealth transferred. Studies based on the life cycle saving approach, which was first applied by Kotlikoff and Summers (1981), have tended to result in relatively small estimates of the ratio of wealth transferred to total household assets in Japan (e.g., Hayashi, 1986; Dekle, 1989; and Campbell, 1997), while studies employing more direct measures of inherited assets often arrive at large estimates (e.g., Barthold and Itoh, 1992; Asoh, 1998; and Shimono and Ishikawa, 2002). Studies using household-level or other micro data have similarly produced only mixed results. While a considerable number of such studies indicate that asset (as well as educational) transfers have led to an increase in asset inequality (e.g., Noguchi et al., 1989; Noguchi, 1990; Kito et al. 1993; Takayama et al., 1996; Matsuura, 2006), more recent studies by Horioka (2008; 2009) suggest otherwise.

Although there are likely to be several reasons for the conflicting results, the most obvious

explanation is that these studies only provide descriptive – rather than econometric – analyses and therefore do not incorporate potentially important factors such as the level of educational investment and the financial strength of family members of the preceding generation in examining the dynamics of inequality through intergenerational asset transfers.

The purpose of this paper is to address these shortcomings and empirically investigate the impact of intergenerational transfers on asset inequality. We do so by estimating the determinants of the amount of transfers – consisting of gifts and inheritances – using various control variables, based on a unique set of microdata taken from the "Household Survey on Family Relationships, Employment, Retirement Payments, and Intergenerational Transfers of Assets and Education," conducted in January 2010. Because our data of intergenerational asset transfers is censored from below at 0 yen and from above at 50 million yen, we first apply a Tobit model to our data to obtain an intergenerational asset transfer function. We also apply an interval regression and an ordered probit models to ensure that our results are independent of the choice of econometric model.

Regardless of which econometric model we employ, we were able to obtain reasonable estimates for the intergenerational asset transfer function with similar parameter values. Our results regarding basic household attributes can be summarized as follows. First, most intergenerational transfers appear to occur at the time of death of the heir's parents. Second, the amount of intergenerational transfers is positively correlated to heirs' age. Third, a household will receive a larger amount of asset transfers when its head is/was self-employed or a family employee.

Based on the estimated intergenerational asset transfer functions, we then examine the relationship between asset inequality and intergenerational transfers. The regressions show that households with higher educational attainment are likely to receive larger asset transfers. This

suggests that intergenerational transfers in the form of educational investment and *post mortem* asset transfers seem not to be substitutes for each other. In addition, we find that the amount of asset transfers received is significantly correlated with heirs' labor earnings, but not with households' life cycle wealth. Therefore, higher income households are likely to receive larger intergenerational transfers. On the other hand, judging from the small increase in asset transfers associated with greater life cycle wealth, the role of intergenerational transfers in widening asset inequality across Japanese households appears to be quantitatively limited.

The remainder of this paper is organized as follows. Section 2 explains our data source and provides descriptive statistics of our sample. Section 3 presents our empirical model, while Section 4 reports our estimation results and discusses their implications. Next, Section 5 shows how the probability of receiving intergenerational transfers and the amount of such transfers are correlated with household characteristics. Finally, Section 6 summarizes our findings and concludes the paper.

2. Data description

2.1 Data source

The microdata used in this paper are taken from the "Household Survey on Family Relationships, Employment, Retirement Payments, and Intergenerational Transfers of Assets and Education," conducted from January 12 to 31, 2010 by the Economic and Social Research Institute (ESRI), Cabinet Office, Government of Japan (see Hamaaki et al., 2011, for details of the survey).[1] This survey collects information not only on the basic characteristics of each family member (i.e., the household head, his/her spouse, and their children), but also on other characteristics that are not covered in existing government statistics. The former includes

[1] Although Hamaaki et al. (2011) is written in Japanese, The questionnaire and English summary of the survey are available from the following link: http://www.esri.go.jp/en/archive/e_dis/abstract/e_dis254.pdf.

information on respondents' age, sex, employment status (both past and present), and educational attainment. The latter includes, among other things, information on gifts and inheritances received from parents and on other assets holdings such as financial assets and real estate. Information on gifts and inheritances covers both financial and real assets and it should be noted that instead of asking for the current value of these assets, the survey inquires about their value on the day that respondents received them.

The survey is based on two-stage stratified random sampling: 4,000 households were randomly extracted from 200 municipal cities that were selected from 28 stratified groups (7 areas×4 city sizes). The survey covers households throughout Japan whose household heads are aged between 20 and 75 years. Households were visited by an enumerator to hand over the questionnaire, and the enumerator returned a few days later to collect it. Respondents received a 500 yen book voucher as remuneration for participating in the survey.

Out of the 4,000 extracted households, 2,302 households responded to the survey (valid response rate: 57.6%). The response rate in urban areas, such as Kanto and Kansai regions, and large cities is relatively low and, moreover, is lower for younger households than for older ones. It should also be noted that the sample is slightly biased toward households whose heads are male and those with more than two members compared with the population as a whole.[2]

2.2 Descriptive statistics

This section reports the descriptive statistics of the variables used in our empirical analysis. Variables include the following: (1) the value of intergenerational transfers – consisting of gifts and inheritances – received by respondents by the survey date (see below); (2) the age of the

[2] According to the *Population Census*, 78.0 percent of household heads in Japan are male and 70.5 percent of households have more than two family members. In contrast, in the survey, 93.1 percent of household heads are male and 86.3 percent of households have more than two family members.

household head and that of his/her spouse; (3) the occupational status of the household head; (4) the educational attainment of the household head and his/her spouse; (5) the number of siblings of the household head and his/her spouse; (6) whether the household head and his/her spouse are the first-born son or daughter in their respective families; (7) whether the household head's and his/her spouse's parents are alive or not; (8) the educational attainment of the household head's and his/her spouse's parents; (9) the household's financial strength; and (10) regional dummy variables. We use (2) to (10) as our independent variable.

The first variable, i.e., the amount of intergenerational transfers received by a household, is used as the dependent variable in our regression. The variable is based on the response to the following question: "Over your lifetime, what is the value of gifts and inheritances bequeathed to your household from your parents and other relatives?" Respondents could choose among the following answers: (i) haven't received any, (ii) less than 2 million yen, (iii) 2 million to 5 million yen, (iv) 5 million to 10 million yen, (v) 10 million to 20 million yen, (vi) 20 million to 30 million yen, (vii) 30 million to 50 million yen, (viii) more than 50 million yen, and (ix) don't know. For our regression analysis we drop the last category ("don't know") and use (i) to (viii) for our dependent variable.

Table 1 shows the distribution of intergenerational transfers for the following four groups of observation households: (1) all households for which the amount of intergenerational asset transfers is available, and (2) to (4): households for which all explanatory variables for our regression analyses, i.e., specifications (A) to (C) in the following sections, are available. The table indicates that more than 60 percent of households had not received intergenerational transfers by the survey date, regardless of which group of observations is used. This result is in line with previous studies using similar surveys (Noguchi et al., 1989; Kito et al., 1993; Takayama et al., 1996; and Horioka, 2008). The average amount received by households that

did receive gifts and inheritances was about 10 million yen.[3] Given that the average net worth of those households[4] was 32-35 million yen, the transferred assets thus accounted for roughly 30 percent of their outstanding assets.

Next, Table 2 presents the descriptive statistics of the remaining variables. Regarding the household head's occupation, we use a dummy variable that takes a value of one if the household head is/was self-employed or a family employee. As can be seen, for 16 percent of household heads this was the case. Next, looking at educational attainment, which is represented by dummy variables for junior high school graduates and university graduates, meaning that senior high school/junior college/technical college graduates make up the references group, we find that 42 percent of household heads were university graduates, while only 17 percent of spouses were university graduates. This gap probably reflects gender-based differences in the average level of education. Turning to our next set of variables, the number of siblings (including the household head or spouse) is slightly above three both for the household head and for the spouse. Further, we include a dummy variable indicating whether the household head or his/her spouse was the first-born son in their family and the first-born daughter. We find that in more than 60 percent of cases, one of the two was the first-born son and in almost 60 percent of case one was the first-born daughter. Next, turning to the dummies indicating whether the parents were still alive, we find that two-thirds of household heads and 60 percent of spouses had already lost at least one of their parents. Finally, we include one of the following two variables in different equations to represent households' financial strength. The first one is the

[3] We calculate the mean value of intergenerational transfers by averaging the median value of each interval for asset transfers (except for the highest and lowest categories). Regarding the highest (more than 50 million yen) and lowest (less than 2 million yen) categories, we convert the interval value of those two categories into 62.5 million yen (1.25 × 50 million yen) and 1.6 million yen (0.8 × 2 million yen), respectively, following the example of Horioka (2008, 2009), who applied this method to data similar to ours.

[4] The reason that we are using gross rather than net financial assets to calculate net worth is that information on household debt other than mortgages is not available. In addition, it should be noted that necessary information to calculate net worth is available only for 63-71 percent of households that have received intergenerational transfers. Therefore, the average net worth reported here is only for this subset of households.

labor earnings of the household head; the average of this variable is 5.80 million yen. The second one is households' life cycle wealth, which is defined as their net worth after subtracting gifts and inheritances received. The average of this variable is about 20 million yen.

3. Empirical analysis

3.1 Econometric approach

This section describes the econometric approach used to estimate the parameters of our intergenerational asset transfer function. We employ three different econometric models: (1) a Tobit model; (2) an interval regression model; and (3) an ordered probit model.

The Tobit model, the standard regression model for dealing with the kind of censored data that we have here, is our first choice, because our data of intergenerational asset transfers is censored from below at 0 yen and from above at 50 million yen. However, our dataset is not only censored but also coded in intervals. Therefore, we use the median value of each interval (except for the highest and lowest intervals) when applying the Tobit model.

As our second choice, we try the interval regression model, i.e., an ordered probit model with known boundaries, which takes the interval-coded structure of our dataset explicitly into account. By regarding transfer receipts as a qualitative choice problem where household *i* falls into one of the *j* ordered categories, we can apply the interval regression model for our dataset. Let y_i denote the number of an ordered category of transfers taking a value from 1 to 8. Assume that a latent variable y_i^* corresponding to different categories is determined by the following equation:

$$y_i^* = x_i\beta + u_i,$$

$$u_i \mid x_i \sim N(0,\sigma),$$

where x_i is a vector of explanatory variables and u_i is a normal error term. Let $\kappa_0 < \kappa_1 < \cdots < \kappa_8$ be known cut off points. The relationship between y_i and y_i^* can be defined as follows:

$$y_i = \begin{cases} 1 & if \quad \kappa_0 < y_i^* \le \kappa_1 \\ \vdots & \\ 8 & if \quad \kappa_7 < y_i^* \le \kappa_8, \end{cases}$$

where κ_0 and κ_8 are assumed to be $-\infty$ and ∞, respectively. Then, the probability that household *i* (*i*=1,⋯, *n*) receives intergenerational transfers of an amount falling into the *j*th (*j*=1, ⋯, 8) category is given as follows:

$$\pi_{ij} = \Pr\left(\kappa_{j-1} < y_i^* < \kappa_j\right) = \Phi\left(\frac{\kappa_j - x_i\beta}{\sigma}\right) - \Phi\left(\frac{\kappa_{j-1} - x_i\beta}{\sigma}\right), \qquad (1)$$

where $\Phi(\bullet)$ is the cumulative distribution function of the normal distribution. Moreover, the log-likelihood function of (β, σ) for each household *i* is calculated as follows:

$$\ln L(\beta, \kappa, \sigma; y, x) = \sum_{i=1}^{N}\sum_{j=1}^{8} 1\cdot\left[y_i = j\right]\cdot\ln\left(\Phi\left(\frac{\kappa_j - x_i\beta}{\sigma}\right) - \Phi\left(\frac{\kappa_{j-1} - x_i\beta}{\sigma}\right)\right). \qquad (2)$$

Maximum likelihood estimation of this function yields consistent parameters.

To check that our results are independent of which specific empirical methodology we employ, we estimate a third model, namely the ordered probit model (without known

boundaries). While the interval regression estimates both the standard deviation (σ) of the error term and β by taking the boundary values (κ) as given, the ordered probit model assumes standard normality in the error term ($\sigma = 1$) to identify κ and β. Analogous to equations (1) and (2), the log-likelihood function of the ordered probit model can be written as follows:

$$\ln L(\beta, \kappa, \sigma; y, x) = \sum_{i=1}^{N} \sum_{j=1}^{8} 1 \cdot [y_i = j] \cdot \ln\left(\Phi\left(\kappa_j - x_i\beta\right) - \Phi\left(\kappa_{j-1} - x_i\beta\right)\right). \qquad (3)$$

In Section 4, we compare the regression results of the above-mentioned three models to confirm the robustness and plausibility of our empirical findings.

3.2 Specification of the models

We use the nine independent variables described in Section 2.2 in our regression analysis.[5] They can be classified into six categories: (i) basic attributes of the household head and his/her spouse (i.e., variables (2) to (4)), (ii) their sibling status (i.e., variables (5) and (6)), (iii) whether their parents are alive or not (i.e., variable (7)), (iv) the educational attainment of their parents (i.e., variable (8)), which we use as a proxy for the financial strength of the parents,[6] (v) annual labor earnings of the household head and household life cycle wealth (i.e., variable (9)), two alternative proxies for the financial strength of respondents, and (vi) region-specific effects (i.e., variable (10)), which may reflect local traditions, customs and culture.

[5] Although the probability that a household head and his/her spouse will receive intergenerational transfers is higher if they co-reside with their parents or parents-in-law, we do not include variables related to co-residence in our analysis because such variables vary depending on the stage of the life cycle that a household head is in. More specifically, even if household heads and their spouses did not co-reside with their parents at the survey date, they may have co-resided with them before (not only living with their parents as children, but also taking them in in old age) or may do so in the future. Therefore, any effect of co-residing on the size of asset transfers that we might measure would likely be spurious. Consequently, we only use time-invariant (or pre-determined) explanatory variables in our analysis.

[6] As information on parental income and wealth are not available in our dataset, we use parental educational attainment as a proxy for these variables. Due to the nature of the Japanese labor market, where earnings and employment stability are closely correlated with educational attainment, parents' educational attainment should at least partially reflect their financial strength.

We expect the following relationships between the explanatory variables and the amount of intergenerational transfers. First, we expect that the age of the household head will have a positive effect on the amount of intergenerational transfers received, as people are more likely to have received bequests the older they get. Next, we consider the dummy for the occupational status, which takes one for those who are self-employed or working in a family business. The reason for including this variable is that those working in a family business may inherit that business, in addition to the personal assets of their parents (or other relatives), so that we would expect the coefficient on this dummy to be positive. It should be noted, however, that since separate information for family employees is not available, the dummy also includes those who are self-employed (e.g., doctors, lawyers, writers, and artists), so that the results for this variable need to be interpreted with caution. The relationship between intergenerational transfers and the educational attainment of the household head and his/her spouse, which we use as a proxy for human capital investment by their parents, could be either positive or negative. If parents treat intergenerational transfers in the form of human capital investment and transfers in the form of bequests as substitutes, then the relationship would be negative. On the other hand, if wealthy parents tend to make intergenerational transfers in both forms, then the relationship would be positive. With regard to the sibling status, bequests are likely to be smaller the greater the number of siblings, if the total amount of intergenerational asset transfers is independent of the number of children in a household and bequests are divided equally among heirs in accordance with inheritance law. On the other hand, based on traditions, a specific child with certain attributes, such as the oldest son, may receive a disproportionate amount of assets, either because parents stipulated this in their will or by agreement among siblings. With regard to the death of parents, we use two dummies for the household head and his/her spouse, respectively, indicating (1) whether one parent had deceased, or (2) whether both parents had deceased.

Moreover, in order to take into account the hike in asset prices during Japan's bubble period (1986-1991), which may have inflated the amount of intergenerational transfers, we add interaction terms of the dummies just mentioned and a dummy for the years around the bubble period (we use 1986 to 1995) to reflect whether one or more parents died during this period. As for households' financial strength (as represented by the labor earnings of the household head and the household's life cycle wealth), this could also have either a positive or a negative effect on the amount of asset transfers, depending, for example, on parents' attitudes toward asset inequality among their children, or on children's consumption/saving behavior. Therefore, the sign of the coefficient cannot be predicted. Finally, we expect that the amount of asset transfers will be positively related to parents' educational attainment, since more educated parents are likely to have had higher lifetime earnings and therefore have more assets to transfer to their children.

4. Results

In this section, we present the regression results of our intergenerational asset transfer function. In order to identify the determinants of the amount of intergenerational asset transfers with as large a sample as possible, we start by estimating our models without the variables related to households' financial strength (Section 4.1). The reason is that the information necessary to construct this variable is missing for many households, resulting in a substantial reduction in the size of the sample. We then re-estimate the models to examine the link between the amount of intergenerational asset transfers and household financial strength in order to examine whether those transfers contribute to a widening in inequality between the rich and the poor (Section 4.2).

4.1 Determinants of the amount of intergenerational asset transfers

We start by examining the determinants of the amount of intergenerational asset transfers. The results are shown in Table 3, which reports the coefficients for three different specifications: (A) including all explanatory variables (except for households' financial strength); (B) excluding variables for the spouse; and (C) further excluding the educational attainment of the household head's and his/her spouse's parents. The reason for trying specification (B) is that in about 70 percent of the households that participated in the survey, it was the household head who filled in the questionnaire, and we wanted to allow for the possibility that household heads may have reported only asset transfers they themselves received rather than the household as a whole. Finally, the reason for trying specification (C) was to use as large a sample as possible, since information on parental educational attainment was missing for a considerable number of households, constraining the sample size for specifications (A) and (B).

We estimate the three different specifications using the three different empirical models outlined in Section 3.1, i.e., the Tobit, the interval regression, and the ordered probit model. While the interval and ordered probit regressions treat the amount of asset transfers as categorical data, the Tobit model treats it as a continuous variable that is censored at 0 yen and 50 million yen. The coefficients of the ordered probit model are not comparable with those of the other two models, because the standard deviation of the error term (σ in eq. (2)) is normalized to be 1. In order to make the coefficients comparable, we multiply the coefficients of the ordered probit model by the standard deviations of the error term obtained from the other two models. The two rightmost columns under (A) to (C) in the table report the resulting coefficients.

Table 3 shows that the type of occupation of the household head, the educational attainment of household head, and that of his/her parents have a significant impact on the

amount of asset transfers received. Specifically, if the household head is self-employed or a family employee, the household is likely to receive larger intergenerational asset transfers than other households. This is probably because some of the household heads who are/were a family employee received not only personal assets but also inherited the family business. As for educational attainment, the negative coefficient on the junior high school dummy and the positive coefficient on the university dummy mean that better educated households are more likely they are to receive larger bequests. In addition, the positive coefficient on the university dummy implies that intergenerational asset transfers and educational investment by parents are not used as substitutes for each other. Finally, household heads whose parents are highly educated and therefore earn more tend to receive larger bequests.

Turning to the results for specifications (B) and (C), we find that excluding the variables for the spouse and parents' educational attainment makes the coefficients on the key variables above more significant, probably due to the larger sample size. In addition, the positive coefficient on the age of the household head also becomes significant, meaning that the total amount of asset transfers households receive increases as they get older. The pattern of the coefficients on the dummies for the number of siblings also looks more reasonable, especially in the case of specification (C), since it implies that the amount of asset transfers received gets smaller as the number of siblings increases.[7]

Table 3 also shows that intergenerational transfers are strongly associated with the death of parents. That is, compared with couples whose parents are all alive, couples whose four parents have all died tend to have received significantly larger intergenerational transfers,

[7] While further research is required, a possible explanation for the insignificant coefficients on the number of siblings dummies is that gifts and inheritances are not bequeathed in the same way. Models by Lundholm and Ohlsson (2000) suggest that while parents may divide their "observable" inheritance equally among their children because of their *post mortem* reputation, they may use *inter vivos* gifts, the amount of which is private information, to compensate less well off children. As a result, asset transfers may not be divided evenly among siblings (even when inheritances are), yielding the insignificant coefficients observed here.

clearly indicating that inheritances are far more important than *inter vivos* gifts in intergenerational transfers. As for the interaction terms indicating whether one or more parents had died during the bubble period, which may have inflated transfers, we find that most coefficients are positive but insignificant (not shown in Table 3 to conserve space).[8]

4.2 The relationship between asset transfers and household financial strength

In order to examine the impact of intergenerational asset transfers on asset inequality, we next include proxy variables for households' financial strength – their labor income and their life cycle wealth – in our estimation. If the amount of intergenerational asset transfers is positively correlated with households' financial strength, asset inequality across households will be perpetuated or may even increase. However, at least hypothetically, there are a number of reasons why the correlation may in fact be *negative*. For example, if parents tend to bequeath more to less well off children to reduce inequality among their children, this would result in a negative correlation between households' financial strength and the intergenerational transfers they receive. In addition, at least with regard to households' life cycle wealth, we may not find a positive correlation, since – according to the life cycle/permanent income hypothesis (LC/PIH) – we would expect households receiving larger asset transfers to consume more of their existing assets.

Before we present our results, a few comments on our proxy variables for households' financial strength are in order. The first is that while labor earnings are a relatively straightforward proxy for financial strength, households' life cycle wealth, which we define as households' net wealth after subtracting gifts and inheritances received, is not necessarily a

[8] There are a number of possible explanations why the interaction terms are insignificant. One is that asset transfers in this paper consist not only of inheritances but also *inter vivos* gifts, making the identification of the timing of intergenerational transfers difficult. A second possible explanation is that we top-coded our asset transfer data, which may have narrowed the difference in the amount of asset transfers during the bubble period and other times by classifying any large amount into the same category (more than 50 million yen).

direct measure of households' financial strength, since present wealth depends not only on past earnings but also on past consumption. The second comment is that the earnings and wealth of households in Japan tend to increase with age due to factors such as seniority-based wages and saving for retirement. Therefore, to examine the effects of financial strength on the size of intergenerational asset transfers, we need to identify individuals' *real* financial strength, that is, controlling for any age-related increase in labor earnings or asset holdings, since failing to do so would yield biased results. We gauge households' real financial strength controlling for age-related effects by regressing labor earnings or life cycle wealth on household heads' age and its square and then use the residuals from this regression.[9] The residuals for the labor earnings of the household head range from -6.15 million to 13.13 million yen, and those for households' life cycle wealth from -62.10 million to 103.79 million yen.

Table 4 shows the results when regressing intergenerational transfers on age-adjusted labor earnings and life cycle wealth using specification (B) in Table 3.[10] Panel I shows that the estimated coefficients on labor earnings are positive and significant regardless of which regression approach is used. The positive coefficients suggest that better off households tend to receive larger intergenerational asset transfers. Turning to Panel II, the coefficients on life cycle wealth are positive but not statistically significant. A possible interpretation is that when households receive intergenerational asset transfers, they try to at least partly offset the asset increase by consuming more of their past income (or life cycle wealth), as suggested by the LC/PIH.

5. The quantitative importance of intergenerational transfers

[9] When estimating the earnings equation, we only include individuals under the mandatory retirement age (60 years) in order to obtain a stable age-earnings profile.

[10] Since specification (B) allows us to use more observations than specification (A), we adopt this model in order to maintain a sufficient number of observations even though there are a considerable number of households for whom information for the calculation of labor earnings and life cycle wealth are missing.

The positive coefficient on the income variable suggest that, contrary to the finding by Horioka (2008, 2009), households that are already economically advantaged are also likely to receive larger intergenerational asset transfers. However, so far, we have not yet examined the quantitative importance of such transfers in widening asset inequality among households in Japan. Therefore, we next calculate the amount of intergenerational transfers for households with different attributes, using the ordered probit estimates from the previous section.[11]

5.1 Household characteristics and the probability of receiving intergenerational transfers

We start our analysis by examining the probability of receiving intergenerational transfers by focusing on a hypothetical household consisting of individuals toward the end of their lives. For this purpose, we calculate the probability that a household consisting of a 70-year-old household head with a 67-year-old spouse has received intergenerational asset transfers. Further, we assume that the household head was a salaried worker, that both he/she and his/her spouse are the first-born child, that they each have one sibling and that their parents are high school graduates.[12] Focusing on this household, we calculate the probability of receiving asset transfers varying the following characteristics: (1) the educational attainment of the household head and his/her spouse, and (2) whether all parents are alive or dead.

Table 5 reports our estimates for the expected probability, based on the regression results for the specification presented under (A) in Table 3. The results indicate, first, that the probability of having received intergenerational transfers is higher if all parents are dead. For

[11] The reasons for using the ordered probit estimates are that the Tobit model cannot be used to predict the probability that a household will receive intergenerational asset transfers and that, after carefully comparing the performance of the other two models, we came to the conclusion that the probit model better replicates the distribution of intergenerational asset transfers than the interval regression model.

[12] We also calculated the probabilities for households whose head was self-employed or a family employee; however, these did not differ greatly from the patterns for salaried workers, so we focus on the results for the latter only.

example, for a couple where both the household head and the spouse are junior high school graduates, the probability that they had received intergenerational transfers was twice as high when all four parents were dead as when all parents were alive. Second, the probability appears to be considerably higher the higher the educational attainment of the couple. For instance, the probability for a couple where both were university graduates was about two to three times as high as that for a couple where both were junior high school graduates.

5.2 Household characteristics and the amount of asset transfers

Next, let us consider how much the expected amount of intergenerational asset transfers depends on a variety of household characteristics. Since the estimated ordered probit model provides us with the probability of each observation falling into a certain interval of asset transfers, we can calculate the expected value of intergenerational transfers by summing up the product of the probability and the median amount of a particular interval. We calculate the expected amount for the same age and number of siblings as for the hypothetical household considered in the previous subsection, varying the following two household characteristics: (1) the educational attainment of the household head and his/her spouse, and (2) the former occupation of the household head. We conduct this calculation of the expected amount for all households (i.e., E[asset transfers]), and only for households that report having received intergenerational asset transfers (i.e., E[asset transfers | asset transfers>0]).

Table 6 presents the results obtained using the specification shown under (A) in Table 3. They indicate that the expected amount of asset transfers varies substantially with household characteristics. First, the expected amount appears to be correlated with the educational attainment of the couple receiving transfers. While the difference between senior high school graduates and university graduates is relatively modest (e.g., 5.69 million yen vs. 8.56 million

yen for former salaried workers), that between junior high school graduates and senior high school graduates appears to be sizable (e.g., 1.68 million yen vs. 5.69 million yen). Second, the expected amount is larger when the household head was self-employed or worked in a family business.

Next, in the lower panel of Table 6, we look at the expected amounts for those that reported actually receiving any bequests. Unsurprisingly, the figures are considerably larger than for all households in the upper panel. For instance, the conditional expectation for households where both the household head and the spouse only graduated from junior high school and the household head worked as a salaried worker was 6.67 million yen compared with an unconditional expectation of only 1.68 million yen. Thus, to a considerable extent, the lower figures for junior high school graduates in the upper panel simply reflect the fact that, as seen in Table 5, junior high school graduates are less likely to receive intergenerational transfers. However, what the results of the lower panel indicate is that even when taking this into account, there is still a considerable difference in the amount bequeathed: university graduates tend to have received about twice as much as junior high school graduates.

5.3 The impact of intergenerational transfers on asset inequality

Finally, we examine how the expected amount is correlated to households' financial strength, i.e., the level of labor earnings and accumulated life cycle wealth. The expected amounts are calculated based on the regression results reported under (C) in Table 4. Table 7 shows the results, focusing on households where the head was employed as a salaried worker, his/her parents (though not necessarily those of the spouse) have already died, and he/she is the first-born child and has one sibling. In contrast with the previous two sections, we do not assume any specific characteristics for the spouse here, since specification (C) in Table 4 does

not include any variables for the spouse. Panel I reports the amount of intergenerational asset transfers by level of age-adjusted labor earnings of the household head, ranging from -5 million to 5 million yen.[13] Asset transfers considerably increase with labor earnings; that is, a 10 million yen increase in labor earnings is associated with a 3.2-4.3 million yen increase in transfers received. The increase with labor earnings is particularly pronounced in the case of couples where both are university graduates. Panel II reports the amount of the intergenerational asset transfers by the level of age-adjusted households' life cycle wealth, ranging from -25 million to 75 million yen. The panel confirms the pattern observed for age-adjusted labor income; that is, intergenerational transfers tend to be larger the greater households' life cycle wealth. However, quantitatively, the direct effect of transfers on asset inequality appears to be limited. For example, even if life cycle wealth increases by 100 million yen, intergenerational transfers increase only by 3.1-3.5 million yen at most (as shown in the bottom two rows of Panel II).

In sum, examining how the expected amount of asset transfers is correlated with households' financial strength, we find that asset transfers tend to be larger the higher a household's income and life cycle wealth. However, the size of the increase in transfers associated with greater life cycle wealth is not substantial. These results can be interpreted as follows. First, parents who make greater investments in their children's education, a form of intergenerational transfer, which in turn tends to raise children's earning capacity, also tend to leave more assets behind. Second, the fact that the increase in asset transfers with increasing life cycle wealth is relatively minor hints at a pattern of consumption behavior following the LC/PIH, with households that can expect larger bequests from their parents tending to offset such wealth transfers by consuming more of their existing assets in order to smooth their

[13] Age-adjusted labor earnings and life cycle wealth here can be either positive or negative since they are the residuals of the earnings and wealth functions, as explained in Section 4.2.

consumption over the life cycle.

6. Conclusion

The purpose of this paper was to examine the impact of intergenerational transfers on asset inequality in Japan. Using micro data from the "Household Survey on Family Relationships, Employment, Retirement Payments, and Intergenerational Transfers of Assets and Education," we estimated intergenerational asset transfer functions with various control variables and using three different econometric models to ensure that our results do not depend on a specific econometric approach. Regardless of which econometric model we employ, we find that most intergenerational transfers occur at the time of the heirs' parents' death and that transfers vary considerably with heirs' occupational status.

Next, based on the estimated intergenerational asset transfer functions, we examined how intergenerational transfers contribute to asset inequality. Our analysis shows that households with higher educational attainment are likely to receive larger asset transfers. In addition, we find a positive correlation between the amount of asset transfers received with households' financial strength measured by labor earnings. This finding suggests that households with a higher level of educational attainment, which means that they are likely to earn more, also receive considerably larger intergenerational asset transfers. Therefore, overall, it appears that intergenerational transfers (including education) tend to perpetuate asset inequality across households and that greater investment in offspring's human capital and intergenerational asset transfers go hand in hand. However, the observed correlation between bequests received and life cycle wealth is relatively minor, probably because households that can expect larger bequests from their parents tend to offset such wealth transfers by consuming more of their existing assets.

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Table 1. Distribution of intergenerational asset transfers

	Frequency			
	All observations	Observations used for the regression analysis		
		Spec. (A)	Spec. (B)	Spec. (C)
Haven't received any	1,314	437	669	964
	(69.27)	(62.07)	(64.2)	(67.41)
Less than 2 million yen	183	74	112	147
	(9.65)	(10.51)	(10.75)	(10.28)
2 million to 5 million yen	162	76	103	128
	(8.54)	(10.8)	(9.88)	(8.95)
5 million to 10 million yen	104	55	64	86
	(5.48)	(7.81)	(6.14)	(6.01)
10 million to 20 million yen	51	25	40	43
	(2.69)	(3.55)	(3.84)	(3.01)
20 million to 30 million yen	28	14	19	21
	(1.48)	(1.99)	(1.82)	(1.47)
30 million to 50 million yen	18	8	12	12
	(0.95)	(1.14)	(1.15)	(0.84)
More than 50 million yen	37	15	23	29
	(1.95)	(2.13)	(2.21)	(2.03)
Total	1,897	704	1,042	1,430
	(100.00)	(100.00)	(100.00)	(100.00)
Average amount of asset transfers (million yen)	10.53	10.41	10.76	10.28

Note: Parentheses show the percentage of each category. "All observations" refers to the group of observations for which the amount of intergenerational asset transfers is available from the survey data. Spec. (A), (B), and (C) refer to the three following specifications of the intergenerational asset transfers function: (A) including all explanatory variables; (B) excluding variables for the spouse; and (C) further excluding the educational attainment of the household head's and his/her spouse's parents. The average amount of asset transfers is for households that reported that they had received asset transfers.

Table 2. Descriptive statistics

	Mean	Std. Dev.	Min	Max
Age of household head	54.01	12.45	22	80
Age of spouse	51.69	11.89	20	78
Dummy for occupational status of household head (=1 if head is/was self-employed or a family worker, 0 otherwise.)	0.159	-	0	1
Educational attainment of household head				
Junior high school graduate	0.094	-	0	1
Senior high school/Junior college/Technical college graduate	0.490	-	0	1
University graduate	0.416	-	0	1
Educational attainment of spouse				
Junior high school graduate	0.085	-	0	1
Senior high school/Junior college/Technical college graduate	0.749	-	0	1
University graduate	0.166	-	0	1
Number of siblings, household head (including household head himself/herself)	3.45	1.89	1	12
Number of siblings, spouse (including spouse himself/herself)	3.25	1.53	1	11
First son dummy (=1 if either household head or his/her spouse is the first son, 0 otherwise.)	0.631	-	0	1
First daughter dummy (=1 if either household head or his/her spouse is the first daugter, 0 otherwise.)	0.588	-	0	1
Dummy for one household head parent deceased (=1 if one parent of household head has deceased, 0 otherwise.)	0.267	-	0	1
Dummy for both household head parents deceased (=1 if both parents of household head have deceased, 0 otherwise.)	0.402	-	0	1
Dummy for one spouse parent deceased (=1 if one parent of spouse has deceased, 0 otherwise.)	0.294	-	0	1
Dummy for both spouse parents deceased (=1 if both parents of spouse have deceased, 0 otherwise.)	0.304	-	0	1
Educational attainment of household head's parents				
Both parents are university graduates	0.067	-	0	1
One of the parents is a university graduate	0.141	-	0	1
Educational attainment of spouse's parents				
Both parents are university graduates	0.080	-	0	1
One of the parents is a university graduate	0.143	-	0	1
Labor earnings of household head (Unit: million yen)	5.80	3.51	0	18.75
Life cycle wealth (Unit: million yen)	19.26	23.40	-40	121.5
Observations		704		

Notes: The descriptive statistics for labor earnings of the household head and life cycle wealth are based on 616 and 658 observations, respectively, because observations with missing values were dropped. As for the labor earnings of the household head, only observations for those aged under 60 are used.

Table 3. Estimation results of the intergenerational asset transfer function

Specification	(A)					(B)					(C)				
Dependent variable=Amount of intergenerational asset transfers	Tobit	Interval regression	Ordered probit			Tobit	Interval regression	Ordered probit			Tobit	Interval regression	Ordered probit		
	Coef.	Coef.	Coef.	Coef.× σ of Tobit	Coef.× σ of Int. reg.	Coef.	Coef.	Coef.	Coef.× σ of Tobit	Coef.× σ of Int. reg.	Coef.	Coef.	Coef.	Coef.× σ of Tobit	Coef.× σ of Int. reg.
Age of household head	1.62	1.59	0.107	1.85	1.81	1.41 **	1.39 **	0.096 ***	1.77	1.73	1.21 ***	1.20 ***	0.082 ***	1.54	1.51
	(1.39)	(1.37)	(0.08)			(0.54)	(0.54)	(0.029)			(0.44)	(0.43)	(0.023)		
Age of household head squared×10^{-2}	-0.02	-0.02	-0.001	-0.018	-0.018	-0.01 *	-0.01 *	-0.001 ***	-0.013	-0.013	-0.01 **	-0.01 **	-0.001 ***	-0.012	-0.012
	(0.01)	(0.01)	(0.001)			(0.01)	(0.01)	(0.0003)			(0.004)	(0.004)	(0.0002)		
Age of spouse	0.08	0.08	0.009	0.162	0.159	–	–	–	–	–	–	–	–	–	–
	(1.41)	(1.39)	(0.081)			(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
Age of spouse squared×10^{-2}	0.003	0.003	0.0001	0.002	0.002	–	–	–	–	–	–	–	–	–	–
	(0.01)	(0.01)	(0.001)			(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
Dummy for occupational status of household head	7.52 ***	7.41 ***	0.319 **	5.49	5.38	4.50 **	4.46 **	0.169	3.12	3.06	3.38 **	3.34 **	0.105	1.96	1.92
	(2.18)	(2.15)	(0.127)			(1.91)	(1.88)	(0.103)			(1.66)	(1.63)	(0.089)		
Educational attainment of household head and his/her spouse															
Household head: junior high school graduate	-8.53 **	-8.33 **	-0.497 **	-8.55	-8.38	-12.23 ***	-11.97 ***	-0.649 ***	-11.99	-11.76	-9.04 ***	-8.85 ***	-0.470 ***	-8.76	-8.60
	(3.93)	(3.86)	(0.225)			(3.07)	(3.02)	(0.163)			(2.38)	(2.34)	(0.125)		
Household head: university graduate	3.47 *	3.36 *	0.240 **	4.12	4.04	4.96 ***	4.84 ***	0.300 ***	5.54	5.44	7.91 ***	7.75 ***	0.442 ***	8.23	8.08
	(1.96)	(1.93)	(0.113)			(1.62)	(1.60)	(0.087)			(1.38)	(1.36)	(0.073)		
Spouse: junior high school graduate	-4.39	-4.23	-0.215	-3.69	-3.62	–	–	–	–	–	–	–	–	–	–
	(3.91)	(3.84)	(0.224)			(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
Spouse: university graduate	1.34	1.23	0.042	0.72	0.70	–	–	–	–	–	–	–	–	–	–
	(2.51)	(2.47)	(0.145)			(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
Number of siblings, household head (including household head)															
Two siblings	1.44	1.55	0.083	1.42	1.39	1.06	1.17	0.029	0.54	0.53	0.91	1.00	-0.004	-0.08	-0.08
	(3.83)	(3.78)	(0.22)			(3.44)	(3.39)	(0.184)			(3.12)	(3.07)	(0.165)		
Three siblings	-0.59	-0.37	0.014	0.24	0.24	-1.82	-1.66	-0.081	-1.49	-1.47	-1.68	-1.55	-0.099	-1.85	-1.81
	(3.92)	(3.87)	(0.225)			(3.50)	(3.45)	(0.188)			(3.15)	(3.11)	(0.167)		
Four or more siblings	0.72	0.92	-0.012	-0.21	-0.20	-3.78	-3.57	-0.240	-4.44	-4.36	-3.89	-3.70	-0.264	-4.91	-4.82
	(4.07)	(4.01)	(0.234)			(3.66)	(3.61)	(0.196)			(3.28)	(3.23)	(0.174)		
Number of siblings, spouse (including spouse)															
Two siblings	1.45	1.35	0.040	0.69	0.68	–	–	–	–	–	–	–	–	–	–
	(4.64)	(4.56)	(0.265)			(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
Three siblings	3.40	3.33	0.147	2.53	2.48	–	–	–	–	–	–	–	–	–	–
	(4.67)	(4.59)	(0.267)			(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
Four or more siblings	0.04	0.0002	-0.056	-0.96	-0.94	–	–	–	–	–	–	–	–	–	–
	(4.96)	(4.88)	(0.284)			(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
First son/daughter dummy															
Being first son	0.48	0.53	0.007	0.12	0.12	-0.92	-0.85	-0.058	-1.07	-1.05	0.79	0.82	0.045	0.85	0.83
	(1.9)	(1.87)	(0.11)			(1.70)	(1.67)	(0.091)			(1.47)	(1.45)	(0.078)		
Being first daughter	-0.48	-0.43	0.001	0.01	0.01	0.25	0.36	-0.043	-0.80	-0.79	0.50	0.60	-0.022	-0.41	-0.40
	(1.84)	(1.81)	(0.106)			(3.73)	(3.67)	(0.201)			(3.39)	(3.33)	(0.181)		
Parents deceased															
Dummy for one household head parent deceased	5.54 **	5.54 **	0.314 **	5.41	5.30	5.27 ***	5.22 ***	0.286 **	5.29	5.19	6.35 ***	6.28 ***	0.331 ***	6.16	6.04
	(2.54)	(2.5)	(0.146)			(2.12)	(2.09)	(0.113)			(1.92)	(1.89)	(0.102)		
Dummy for both household head parents deceased	5.34 *	5.24 *	0.309 *	5.32	5.22	7.00 ***	6.84 ***	0.363 ***	6.70	6.58	7.60 ***	7.46 ***	0.380 ***	7.07	6.94
	(3.07)	(3.02)	(0.177)			(2.60)	(2.56)	(0.139)			(2.28)	(2.25)	(0.121)		
Dummy for one spouse parent deceased	2.01	1.93	0.152	2.62	2.57	–	–	–	–	–	–	–	–	–	–
	(2.45)	(2.41)	(0.141)			(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
Dummy for both spouse parents deceased	2.28	2.20	0.143	2.46	2.41	–	–	–	–	–	–	–	–	–	–
	(2.94)	(2.89)	(0.169)			(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
Educational attainment of parents															
Both parents of the household head are university graduates	9.05 ***	8.75 ***	0.372 *	6.40	6.27	8.32 ***	8.10 ***	0.397 ***	7.33	7.19	–	–	–	–	–
	(3.59)	(3.54)	(0.209)			(2.83)	(2.79)	(0.153)			(–)	(–)	(–)	(–)	(–)
One of the parents of the household head is a university graduate	2.22	2.20	0.124	2.14	2.09	1.55	1.51	0.080	1.48	1.45	–	–	–	–	–
	(2.51)	(2.47)	(0.145)			(2.16)	(2.13)	(0.116)			(–)	(–)	(–)	(–)	(–)
Both parents of the spouse are university graduates	2.50	2.55	0.224	3.86	3.78	–	–	–	–	–	–	–	–	–	–
	(3.46)	(3.41)	(0.201)			(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
One of the parents of the spouse is a university graduate	-0.12	-0.04	-0.016	-0.28	-0.27	–	–	–	–	–	–	–	–	–	–
	(2.58)	(2.53)	(0.149)			(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
Observations			704					1042					1430		
Pseudo R^2 (Tobit and Ordered probit)/McFadden's R^2 (Interval regression)	0.022	0.054	0.060			0.019	0.046	0.053			0.017	0.040	0.047		
Standard deviation of error term (σ)	17.20	16.86	–			18.47	18.12	–			18.62	18.28	–		

Note: The unit of the dependent variable, i.e., the amount of intergenerational transfers, is million yen in columns (A) and (B). ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively. The interaction terms of the dummy for parent's death and the dummy indicating whether the time of parent's death corresponds to the period around the bubble economy (i.e., 1986 to 1995) are included. Regional dummies are also included.

Table 4. Estimation results of the correlation with labor earnings and life cycle wealth

Panel I. Labor earnings					
Dependent variable = Amount of intergenerational asset transfers	(A) Tobit	(B) Interval regression	(C) Ordered probit		
	Coef.	Coef.	Coef.	Coef.×σ([A])	Coef.×σ([B])
Labor earnings of head (Age-adjusted, Unit: million yen)	0.0079 ***	0.0078 ***	0.0005 ***	0.0068	0.0066
	(0.0022)	(0.0021)	(0.0002)		
Observations			616		
Pseudo R^2 (Tobit and Ordered probit)/McFadden's R^2 (Interval regression)	0.025	0.063		0.067	
Standard deviation of error term (σ)	13.58	13.09		—	
Panel II. Life cycle wealth					
Dependent variable = Amount of intergenerational asset transfers	(A) Tobit	(B) Interval regression	(C) Ordered probit		
	Coef.	Coef.	Coef.	Coef.×σ([A])	Coef.×σ([B])
Life cycle wealth (Age-adjusted, Unit: million yen)	0.00041	0.00040	0.00003	0.00052	0.00050
	(0.00037)	(0.00037)	(0.00002)		
Observations			658		
Pseudo R^2 (Tobit and Ordered probit)/McFadden's R^2 (Interval regression)	0.022	0.055		0.063	
Standard deviation of error term (σ)	17.85	17.44		—	

Note: The unit of the dependent variable, i.e., the amount of intergenerational asset transfers, is million yen in columns (A) and (B). ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Only observations for household heads aged under 60 are used in Panel I. Other explanatory variables, as listed in Table 3, are also included.

Table 5. Expected probability of receiving intergenerational transfers, by household characteristic

Educational attainment		(A)	(B)
Household head	Spouse	All parents alive	All parents deceased
Junior high school graduate	Junior high school graduate	**13.1%**	**25.1%**
Senior high school graduate	Senior high school graduate	**34.1%**	**51.7%**
University graduate	University graduate	**44.9%**	**62.7%**

Notes: The probabilities are calculated for a household consisting of a 70-year-old household head with a 67-year-old spouse. Further, the calculation assumes that the household head was a salaried worker, both he/she and his/her spouse are the first-born child, they each have one sibling, and their parents are a high school graduate.

Table 6. Expected amount of intergenerational transfers, by household characteristic (Unit: million yen)

E(intergenerational transfers)

		All parents deceased	
Educational attainment		(A)	(B)
Household head	Spouse	Salaried worker	Self-employed
Junior high school graduate	Junior high school graduate	**1.68**	**3.00**
Senior high school graduate	Senior high school graduate	**5.69**	**9.02**
University graduate	University graduate	**8.56**	**12.94**

E(intergenerational transfers| intergenerational transfers>0)

		All parents deceased	
Educational attainment		(C)	(D)
Household head	Spouse	Salaried worker	Self-employed
Junior high school graduate	Junior high school graduate	**6.67**	**8.26**
Senior high school graduate	Senior high school graduate	**11.01**	**14.07**
University graduate	University graduate	**13.66**	**17.49**

Notes: The probabilities are calculated for a household consisting of a 70-year-old household head with a 67-year-old spouse. Further, the calculation assumes that the household head was a salaried worker, both he/she and his/her spouse are the first-born child, they each have one sibling, and their parents are a high school graduate.

Table 7. Expected amount of intergenerational transfers, by households' financial strength

Panel I. Labor earnings (Unit: million yen)

Labor earnings of household head (Age-adjusted, Unit: million yen)		(A) -5	(B) -2.5	(C) 0	(D) 2.5	(E) 5
Educational attainment of household head						
Junior high school graduate	E(intergenerational transfers)	**2.72**	**3.35**	**4.08**	**4.95**	**5.95**
	E(intergenerational transfers| intergenerational transfers>0)	**7.07**	**7.71**	**8.44**	**9.27**	**10.19**
Senior high school graduate	E(intergenerational transfers)	**2.93**	**3.59**	**4.37**	**5.28**	**6.33**
	E(intergenerational transfers| intergenerational transfers>0)	**7.28**	**7.96**	**8.72**	**9.58**	**10.54**
University graduate	E(intergenerational transfers)	**4.04**	**4.89**	**5.88**	**7.02**	**8.32**
	E(intergenerational transfers| intergenerational transfers>0)	**8.40**	**9.22**	**10.14**	**11.17**	**12.32**

Panel II. Life cycle wealth (Unit: million yen)

Life cycle wealth (Age-adjusted, Unit: million yen)		(A) -25	(B) 0	(C) 25	(D) 50	(E) 75
Educational attainment of household head						
Junior high school graduate	E(intergenerational transfers)	**0.93**	**1.08**	**1.25**	**1.44**	**1.66**
	E(intergenerational transfers| intergenerational transfers>0)	**5.81**	**6.06**	**6.32**	**6.61**	**6.92**
Senior high school graduate	E(intergenerational transfers)	**4.62**	**5.18**	**5.79**	**6.46**	**7.18**
	E(intergenerational transfers| intergenerational transfers>0)	**10.27**	**10.82**	**11.41**	**12.04**	**12.71**
University graduate	E(intergenerational transfers)	**7.30**	**8.09**	**8.94**	**9.85**	**10.82**
	E(intergenerational transfers| intergenerational transfers>0)	**12.82**	**13.53**	**14.29**	**15.09**	**15.93**

Notes: The amounts are calculated for the households where the head was employed as a salaried worker, his/her parents have already died, and he/she is the first-born child and has one sibling. The calculation does not assume any specific characteristics for the spouse.

Appendix A. Determinants of the probability of receiving intergenerational transfers

Appendix Table A reports the marginal effects of the independent variables, which are necessary to interpret the effects of marginal changes in regressors on the probability of intergenerational transfers falling into a particular amount category. We find that, first, in most columns, the marginal effects of the occupation and the educational attainment of the household head are significant. Second, the probability of receiving intergenerational transfers is significantly higher if both parents of the household head are university educated. Given that educational attainment and financial strength tend to be closely correlated, this result implies that better off parents are more likely to make bequests to their children.

Further, we find that the dummy variable indicating whether one of the household head's parents had deceased is also significant in all columns (the only exception being column (H)). Moreover, as indicated by the negative coefficients on the dummies indicating whether the household head had lost one/both parents in column (A), the probability that households had *not* received intergenerational transfers was significantly lower for households where one or both parents had deceased than for households where both parents were still alive.

Appendix Table A. Marginal effects in the ordered probit model

Estimation method	Ordered probit							
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Category of the amount of intergenerational asset transfers	Haven't received any	Less than 2 million yen	2 million to 5 million yen	5 million to 10 million yen	10 million to 20 million yen	20 million to 30 million yen	30 million to 50 million yen	More than 5 million yen
	dy/dx	dy/dx	dy/dx	dy/dx	dy/dx	dy/dx	dy/dx	dy/dx
Age of household head×10^{-1}	-0.403	0.063	0.104	0.100	0.054	0.033	0.018	0.032
	(0.299)	(0.048)	(0.078)	(0.075)	(0.041)	(0.025)	(0.015)	(0.025)
Age of household head squared×10^{-2}	0.040	-0.006	-0.010	-0.010	-0.005	-0.003	-0.002	-0.003
	(0.027)	(0.004)	(0.007)	(0.007)	(0.004)	(0.002)	(0.001)	(0.002)
Age of spouse×10^{-1}	-0.035	0.006	0.009	0.009	0.005	0.003	0.002	0.003
	(0.304)	(0.047)	(0.078)	(0.075)	(0.041)	(0.025)	(0.014)	(0.024)
Age of spouse squared×10^{-2}	-0.004	0.001	0.001	0.001	0.001	0.000	0.000	0.000
	(0.029)	(0.005)	(0.007)	(0.007)	(0.004)	(0.002)	(0.001)	(0.002)
Dummy for occupational status of household head	-0.123 **	0.015 ***	0.029 **	0.031 **	0.018 **	0.011 *	0.007 *	0.012 *
	(0.05)	(0.005)	(0.011)	(0.013)	(0.008)	(0.006)	(0.004)	(0.007)
Educational attainment of household head and his/her spouse								
Household head: junior high school graduate	0.169 **	-0.035 *	-0.047 **	-0.040 **	-0.020 **	-0.011 **	-0.006 **	-0.010 **
	(0.067)	(0.018)	(0.021)	(0.016)	(0.008)	(0.005)	(0.003)	(0.004)
Household head: university graduate	-0.090 **	0.013 **	0.023 **	0.022 **	0.012 *	0.007 *	0.004 *	0.008 *
	(0.043)	(0.006)	(0.011)	(0.011)	(0.006)	(0.004)	(0.003)	(0.004)
Spouse: junior high school graduate	0.078	-0.014	-0.021	-0.019	-0.010	-0.006	-0.003	-0.005
	(0.078)	(0.016)	(0.022)	(0.019)	(0.009)	(0.005)	(0.003)	(0.005)
Spouse: university graduate	-0.016	0.002	0.004	0.004	0.002	0.001	0.001	0.001
	(0.055)	(0.008)	(0.014)	(0.014)	(0.007)	(0.005)	(0.003)	(0.005)
Number of siblings, household head (including household head)								
Two siblings	-0.031	0.005	0.008	0.008	0.004	0.003	0.001	0.003
	(0.083)	(0.012)	(0.021)	(0.021)	(0.011)	(0.007)	(0.004)	(0.007)
Three siblings	-0.005	0.001	0.001	0.001	0.001	0.000	0.000	0.000
	(0.085)	(0.013)	(0.022)	(0.021)	(0.011)	(0.007)	(0.004)	(0.007)
Four or more siblings	0.005	-0.001	-0.001	-0.001	-0.001	0.000	0.000	0.000
	(0.088)	(0.014)	(0.023)	(0.022)	(0.012)	(0.007)	(0.004)	(0.007)
Number of siblings, spouse (including spouse)								
Two siblings	-0.015	0.002	0.004	0.004	0.002	0.001	0.001	0.001
	(0.1)	(0.015)	(0.025)	(0.025)	(0.013)	(0.008)	(0.005)	(0.008)
Three siblings	-0.056	0.008	0.014	0.014	0.008	0.005	0.003	0.005
	(0.101)	(0.014)	(0.025)	(0.025)	(0.014)	(0.009)	(0.005)	(0.009)
Four or more siblings	0.021	-0.003	-0.005	-0.005	-0.003	-0.002	-0.001	-0.002
	(0.106)	(0.017)	(0.027)	(0.026)	(0.014)	(0.008)	(0.005)	(0.008)
First son/daughter dummy								
Being first son	-0.003	0.000	0.001	0.001	0.000	0.000	0.000	0.000
	(0.041)	(0.006)	(0.011)	(0.01)	(0.005)	(0.003)	(0.002)	(0.003)
Being first daughter	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.04)	(0.006)	(0.01)	(0.01)	(0.005)	(0.003)	(0.002)	(0.003)
Parents deceased								
Dummy for one household head parent deceased	-0.120 **	0.016 **	0.029 **	0.030 **	0.017 *	0.011 *	0.006	0.011 *
	(0.057)	(0.007)	(0.013)	(0.015)	(0.009)	(0.006)	(0.004)	(0.007)
Dummy for both household head parents deceased	-0.117 *	0.017 *	0.029 *	0.029 *	0.016	0.010	0.006	0.010
	(0.067)	(0.009)	(0.017)	(0.017)	(0.01)	(0.006)	(0.004)	(0.007)
Dummy for one spouse parent deceased	-0.058	0.008	0.015	0.014	0.008	0.005	0.003	0.005
	(0.054)	(0.008)	(0.013)	(0.013)	(0.008)	(0.005)	(0.003)	(0.005)
Dummy for both spouse parents deceased	-0.054	0.008	0.014	0.013	0.007	0.004	0.003	0.005
	(0.065)	(0.009)	(0.016)	(0.016)	(0.009)	(0.006)	(0.003)	(0.006)
Educational attainment of parents								
Both parents of the household head are university graduates	-0.145 *	0.016 ***	0.033 **	0.036 *	0.022	0.014	0.008	0.016
	(0.083)	(0.006)	(0.016)	(0.021)	(0.014)	(0.01)	(0.006)	(0.013)
One of the parents of the household head is a university graduate	-0.047	0.007	0.012	0.012	0.006	0.004	0.002	0.004
	(0.056)	(0.007)	(0.014)	(0.014)	(0.008)	(0.005)	(0.003)	(0.005)
Both parents of the spouse are university graduates	-0.086	0.011	0.021	0.022	0.012	0.008	0.005	0.008
	(0.079)	(0.008)	(0.018)	(0.02)	(0.012)	(0.008)	(0.005)	(0.009)
One of the parents of the spouse is a university graduate	0.006	-0.001	-0.002	-0.001	-0.001	0.000	0.000	0.000
	(0.056)	(0.009)	(0.014)	(0.014)	(0.007)	(0.004)	(0.003)	(0.004)
LR chi-squared				110.29 ***				
Pseudo R^2				0.060				
Observations				704				

Note: ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively. The marginal effects are evaluated at the means of the independent variables. The interaction terms of the dummy for parent's death and the dummy indicating whether the time of parent's death corresponds to the period around the bubble economy (i.e., 1986 to 1995) are included. Regional dummies are also included.