The Wealth Decumulation Behavior of the Retired Elderly in Japan: The Relative Importance of Precautionary Saving and Bequest Motives

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Abstract

This paper analyzes the determinants of the wealth decumulation behavior of the retired elderly in Japan using unique information from two household surveys, and by so doing, attempts to assess the relative importance of precautionary saving and bequest motives in explaining the lower than expected rates of wealth decumulation of the retired elderly. Taken together, our analyses of these two datasets show that precautionary saving plays a relatively important role in explaining the lower than expected wealth decumulation rate of the retired elderly, at least in the case of Japan, even though both precautionary saving and bequest motives are important drivers behind this puzzle. Our results also suggest the possibility that financial burden of parental care may also affect the wealth decumulation behavior of the retired elderly in Japan. Given that parental care responsibilities tend to

[i] The empirical work undertaken in this paper utilizes micro data from the Preference Parameters Study of Osaka University's 21st Century Center of Excellence (COE) Program "Behavioral Macrodynamics Based on Surveys and Experiments" and its Global COE Project "Human Behavior and Socioeconomic Dynamics." We acknowledge the program/project's contributors—Yoshiro Tsutsui, Fumio Ohtake, and Shinsuke Ikeda. We also use data from the Survey on Households and Saving for our empirical analysis. We are grateful to the Yu-cho Foundation for providing us with these data. We are also grateful to Anton Braun, Jim Been, Isaac Ehrlich, Jong-Wha Lee, Kathleen McGarry, Colin R. McKenzie, Masao Ogaki, Kwanho Shin, and other participants of the 1st Meeting of the Society of Economics of the Household; the 92nd Annual Conference of the Western Economic Association International; the Applied Economics Workshop and Special Workshop at the Institute of Economic Studies, Keio University; the Seminar at the College of Political Science and Economics, Korea University; the ADBI-AGI Workshop on "Public and Private Investment in Human Capital and Intergenerational Transfers"; the Rokko Forum at the Graduate School of Economics, Kobe University; and the Asian Growth Research Institute Staff Seminar for their valuable comments. This work was supported by JSPS (Japan Society for the Promotion of Science) KAKENHI Grant Numbers 15H01950 and 18H00870, a project grant from the Asian Growth Research Institute, and financial support from the Joint Usage/Research Center at the Institute of Social and Economic Research, Osaka University.

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arise relatively late in life, often after retirement, in the case of Japan, our results suggest that the financial burden of parental care may be a relevant issue when analyzing the wealth decumulation behavior of the elderly.

Keywords: Aged, bequests, dissaving, Japan, life-cycle model, precautionary saving, retired elderly, saving, wealth decumulation

JEL classification codes: D14, D15, D64, E21, J14

1. Introduction

Japan had one of the highest household saving rates among the member countries of the Organisation for Economic Co-operation and Development (OECD) until the mid-1980s,[1] but her household saving rate has been declining steadily since the mid-1970s and has been very low (sometimes even negative) during the last 15 years (Horioka, 2017). One of the main driving forces behind this observed trend in the household saving rate is population aging (e.g., Horioka, 1997). According to the simplest version of the life-cycle model, people accumulate wealth during their working lives and decumulate their wealth after retirement in order to smooth consumption over the life cycle. Thus, theory predicts that saving rates should decline as population aging progresses, and Japan's recent experience is fully consistent with this theoretical prediction.

However, what is puzzling is that, although the link between population aging and aggregate trends in household saving rates predicted by the life-cycle model has been verified empirically in the case of Japan (e.g., Horioka, 1997), the wealth decumulation rates (the ratios of dissaving to the stock of wealth) of the retired elderly in Japan are lower than those implied by the basic life-cycle model with no bequest motives and no longevity risk. For example, Horioka (2010) and Horioka and Niimi (2017) find that the wealth decumulation rates of the retired elderly in Japan have been only 1 to 3% per year during the last 15 years when wealth is measured as financial net worth, even though they have shown a slight upward trend over time. These low wealth decumulation rates imply that many die with significant wealth. Moreover, almost 70% of total financial wealth is held by households whose heads are aged 60 or above in Japan,[2] and more than 90% of financial net worth is held by such households. These figures show that the lion's share of financial assets in Japan is held by the elderly and underscore the importance of understanding the wealth decumulation behavior of this age group.

[1] Based on data on household saving rates from OECD, *OECD Economic Outlook* (Statistical Annex), various issues (http://www.oecd-ilibrary.org/economics/oecd-economic-outlook_16097408).

[2] Based on data on two-or-more-person households from Statistics Bureau, Ministry of Internal Affairs and Communications, *Annual Report on the Family Income and Expenditure Survey, Volume II: Savings and Liabilities*, 2017 edition (http://www.stat.go.jp/data/sav/2017np/index.html).

The wealth decumulation rates of the elderly have been found to be lower than predicted by the basic life-cycle model not only in Japan but in other countries as well, and several alternative explanations have been put forward to explain this puzzle, including precautionary saving and bequest motives. However, the empirical literature has not yet reached a consensus on the relative importance of the different explanations, and there is scope for more work to disentangle precautionary saving motives from other motives, including bequest motives (De Nardi, French, and Jones, 2016). Furthermore, previous work on the wealth decumulation behavior of the elderly has been conducted predominantly using data on the United States (US), and there are only a handful studies that look at the case of Japan.

Using micro data from two household surveys, this paper analyzes the determinants of the wealth decumulation behavior of the retired elderly in Japan with the goal of identifying possible explanations for why their rate of wealth decumulation is lower than predicted by the basic life-cycle model. In so doing, our paper attempts to fill the aforementioned gaps in the literature by making three key contributions. First, it attempts to assess the relative importance of precautionary saving and bequest motives in explaining the wealth decumulation behavior of the retired elderly. Despite growing efforts to overcome the challenge of assessing the relative importance of precautionary saving and bequest motives in recent years, more work remains to be done (De Nardi, French, and Jones, 2016). Moreover, we also examine the implications of different types of bequest motives for the wealth decumulation behavior of the retired elderly by exploiting detailed information on the nature of bequest motives that these households have.

Second, this paper looks at the case of Japan where empirical work on the reasons behind the low wealth decumulation rate of the elderly remains limited. It would be interesting to see whether previous findings obtained mostly for the US and European countries also hold in the case of Japan where the institutional setting and social norms differ from those

in these countries. Japan has a universal mandatory health insurance program[3] and also introduced a mandatory long-term care insurance (LTCI) program[4] with universal and relatively generous coverage in 2000. Another unique feature of Japan is that elderly care has traditionally taken place within the family setting. While there is some evidence that perceived filial obligations have been declining among adult children since the launch of the LTCI program (e.g., Tsutsui, Muramatsu, and Higashino, 2014), some studies find that informal care by adult children continues to be the most common source of caregiving for the elderly in Japan (Hanaoka and Norton, 2008; Long, Campbell, and Nishimura, 2009).

Third, this paper investigates the implications of the financial burden of parental care for the wealth decumulation behavior of the retired elderly. While much attention has so far been paid in the literature to the implications of their own long-term care needs for the wealth decumulation rate of the elderly, there has not been any previous research that takes into account the financial burden of parental care when analyzing the wealth decumulation behavior of the elderly. This is a particularly relevant issue in Japan where parental care needs tend to arise relatively late in people's lives because of the high life expectancy in the country. The share of cases in which both the care recipient and his/her main family caregiver are aged 65 or above is as high as about 55%, and the share of cases in which both are aged 75 or above is about 30%.[5] As far as we know, this is the first paper to analyze the implications of the financial burden of parental care for the

[3] Everyone in Japan is covered by one health insurance program or another, and the health insurance system for the elderly aged 75 or above is especially generous. Under the current health care system for this age group, which was enacted in April 2008, those in this age group can access necessary health care subject to a 10% co-payment (30% in the case of those with an income comparable to the current workforce). By contrast the co-payment rate is, in principle, 20% for those under the age of 6, 30% for those aged 6 to 69, and 20% for those aged 70 to 74 (30% in the case of those with an income comparable to the current workforce).

[4] This program has universal coverage and everyone aged 65 or above as well as those under 65 but with aging-related disabilities are entitled to receive necessary care services regardless of their income level or the availability of family caregivers as long as they are certified as requiring support or long-term care. It does not provide cash allowances to family caregivers, but it covers the cost of services purchased from the formal sector once they are certified as requiring care or support subject to a 10% co-payment (Tsutsui and Muramatsu, 2005). The amount of services for which care recipients are eligible is determined by the degree of their disability. The cost of the services that care recipients receive above this amount must be covered entirely by care recipients themselves.

[5] Based on data from Ministry of Health, Labour and Welfare, *An Overview of the 2016 Comprehensive Survey of Living Conditions* (http://www.mhlw.go.jp/toukei/saikin/hw/k-tyosa/k-tyosa16/index.html).

wealth decumulation behavior of the retired elderly.

We use two different datasets for our empirical analysis—the Survey on Households and Saving conducted by the Yu-cho Foundation and the Preference Parameters Study conducted by Osaka University. Both datasets contain unique information that will allow us to shed light on the relative importance of the alternative explanations for the lower than expected wealth decumulation rate of the retired elderly.

The rest of the paper is organized as follows. Section 2 reviews the relevant literature. Section 3 describes the two datasets used for our empirical analysis. Section 4 explains the estimation strategy as well as the empirical specification. Section 5 presents the estimation results. Section 6 summarizes the main findings and discusses some policy implications.

2. Literature Survey

The life-cycle model, first formalized by Modigliani and Brumberg (1954), still serves as the workhorse for analyzing the saving behavior of households. According to the simplest version of the life-cycle model, people accumulate wealth during their working lives and decumulate their wealth after retirement to smooth consumption over the life cycle. However, such a pattern is often not verified empirically as the elderly are found to decumulate their wealth much more slowly than implied by the basic life-cycle model.

To match the actual behavior of the elderly, a number of factors have been incorporated into the life-cycle model, including bequest motives as well as precautionary saving induced by lifespan uncertainty and/or the possibility of facing high medical expenses in the future.[6] However, the empirical literature has not yet reached a consensus on the relative importance of the different explanations. Hurd (1987, 1989), for instance, shows that the low rate of wealth decumulation by the elderly is likely to be due to mortality risk

[6] De Nardi, French, and Jones (2016) provide a useful summary of potential reasons why the elderly continue to hold onto a relatively large amount of wealth into very old age.

rather than a bequest motive. Hurd (1989) thus argues that most bequests are accidental bequests arising from lifespan uncertainty.

In a similar vein, Dynan, Skinner, and Zeldes (2002) show that saving for precautionary purposes is bequeathed (i.e., that the bequest motive becomes "operative") if no unforeseen events (e.g., low earnings, living long, or high medical expenses) take place. This may be why many households state that they plan to leave a bequest and a large share of households do receive bequests even though a bequest motive is rarely mentioned as a reason for saving (retirement and precautionary motives are mentioned much more often as motives for saving) (Dynan, Skinner, and Zeldes, 2002). According to Dynan, Skinner, and Zeldes (2002), saving therefore serves, in practice, a dual role and the importance of both motives cannot be distinguished without additional information. They note that this helps explain why adding a bequest motive on top of precautionary saving tends to have only a limited impact on wealth accumulation for nearly all households.

Lockwood (2014) attempts to solve the problem of separately identifying precautionary saving and bequest motives by analyzing saving and long-term care insurance decisions. While the low rate of long-term care insurance coverage is often cited as evidence against bequest motives, he points out that the opportunity cost of precautionary saving is higher for people without a bequest motive, who would like to consume all of their wealth, than for those with a bequest motive, who value the prospect of leaving wealth to their heirs. Hence, Lockwood (2014) argues that the low rate of long-term care insurance coverage, especially among relatively wealthy retirees and especially in combination with the slow decumulation of wealth, is likely to be the evidence in favor of a bequest motive.

By contrast, Dobrescu (2015) develops a life-cycle model that considers the effects of both health and medical spending risks on the insurance and saving decisions of retirees where health insurance can be provided either formally by the market or informally by the family. Given that wealth holdings encourage family members to provide the elderly with informal care, the model allows for a strategic bequest motive. Using data on European countries, her simulation results show that health risks and potentially high

medical spending are the main drivers of slow wealth decumulation in old age (and consequently of large bequests). The results suggest that the absence of perfect formal insurance markets coupled with borrowing constraints and health dynamics creates a strong incentive for the elderly to keep wealth for strategic reasons (i.e., to induce family members to provide care).

Ameriks *et al*. (2015), on the other hand, design survey questions that involve hypothetical trade-offs between consuming long-term care and leaving bequests to shed light on the relative importance of precautionary saving and bequest motives. Their estimation results show that precautionary saving motives associated with long-term care needs are significantly more important than bequest motives as a driver of the saving behavior of the elderly in the US. Using a similar survey instrument to resolve the identification problem, Ameriks *et al*. (2011) also find that precautionary saving in response to public care aversion plays a significant role in explaining the low rate of spending of many middle-class retirees although bequest motives are found to be more prevalent even among the middle class than previously thought.[7]

This is similar to the findings of De Nardi, French, and Jones (2010), who estimate a structural model of life-cycle saving that incorporates heterogeneity in medical expenses and lifespans along with bequest motives. Their estimation results provide limited evidence in favor of a bequest motive while longevity and medical expense risks are found to play a critical role in explaining the saving behavior of the elderly in the case of the US. They find that medical expenses are much higher and more volatile than previously estimated (e.g., Palumbo, 1999) largely because previous work understates the extent to which these expenses rise with both age and permanent income. They thus argue that an important reason why the income-rich elderly decumulate wealth slowly is the high level of medical expenses they are likely to face later in their lives. Indeed, French *et al*. (2006) show, using data for the US, that death is often preceded by a costly illness

[7] Public care aversion refers to the desire to avoid simultaneously running out of wealth and needing long-term care and hence having to rely on (low-quality) publicly provided long-term care at the end of life (Ameriks *et al*., 2011).

with a significant increase in out-of-pocket medical expenses. Their findings therefore suggest that end-of-life expenditures such as medical expenses provide an important reason for the elderly to retain their assets into very old age. Kopecky and Koreshkova (2014) extend the work of De Nardi, French, and Jones (2010) by separating nursing home expenses from other medical expenses and find for the US that out-of-pocket nursing home expenses have a disproportionately large effect on wealth decumulation late in life.

While existing work on the wealth decumulation behavior of the elderly has been undertaken predominantly for the US, previous studies for countries other than the US find some interesting contrasts. For instance, Spicer, Stavrunova, and Thorp (2016) find that, unlike in the US, the impact of health shocks on the wealth decumulation behavior of retired households is minimal in the case of Australia. While bad health can affect the liquid asset holdings of retired households, poor health and changes in health status are found to have only a limited impact on retirees' wealth levels, decumulation patterns, and portfolio choices in Australia, presumably because Australian retirees are well covered for most medical expenses (Spicer, Stavrunova, and Thorp, 2016).

Similarly, Van Ooijen, Alessie, and Kalwij (2015) find, using data on the Netherlands, that health shocks even result in higher household saving in old age because health care expenditures are almost completely insured (and probably because deteriorating health constrains non-health-care consumption), which makes precautionary saving less necessary in the Netherlands. This is consistent with the findings obtained for Germany by Börsch-Supan (1992). Rather than wondering why the elderly save so much, Börsch-Supan (1992) investigates why the elderly consume so little to explain the U-shaped profile of the wealth accumulation behavior of the elderly—a decline in wealth until about age 70 followed by a strong increase past that age—in Germany. He explains that because of the generous pension system and the almost complete coverage of health expenses by the mandatory health insurance system in Germany, the declining consumption in very old age arises because the elderly cannot consume all of their annuity income, as a result of which wealth is accumulated.

Unfortunately, the literature on the wealth decumulation behavior of the elderly in Japan remains relatively limited. Previous studies find, as predicted by the life-cycle model, that the elderly decumulate wealth once they retire/stop working (e.g., Horioka, 2010; Horioka *et al*., 1996; Usuki, Kitamura, and Nakajima, 2016). However, the few studies that look at the wealth decumulation rate of the elderly show that, as in many other countries, the elderly decumulate wealth more slowly than predicted by the basic life-cycle model (e.g., Horioka, 2010; Horioka and Niimi, 2017; Murata, 2018).

Nevertheless, the reasons for the slow decumulation of wealth by the elderly have been rarely examined with few exceptions. Horioka *et al*. (1996) and Horioka *et al*. (2002) find that households with a bequest motive show a lower rate of wealth decumulation (a higher rate of wealth accumulation) than those without such a motive, indicating the importance of bequest motives in explaining the wealth decumulation behavior of the elderly in Japan. Similarly, Murata (2018) finds that having a bequest motive is an important explanation for why the dissaving rate of the elderly is lower than predicted by the simple life-cycle model. By contrast, she finds that precautionary saving does not play a key role in explaining the dissaving behavior of the elderly except for those without a bequest motive. On the other hand, Horioka and Niimi (2017) find both precautionary saving and bequest motives to be key determinants of the wealth decumulation behavior of the elderly, but their analysis shows that precautionary saving plays a bigger role in explaining the relatively slow decumulation of wealth by the elderly. The limited empirical studies on Japan therefore obtain mixed results regarding the relative importance of precautionary saving and bequest motives in explaining the wealth decumulation behavior of the elderly in Japan, as in other countries.

The main purpose of this paper is to fill these gaps in the literature by making three key contributions. First, it aims to assess the relative importance of precautionary saving and bequest motives in explaining the wealth decumulation behavior of the retired elderly. Second, it looks at the case of Japan, where empirical work on the reasons for the slow decumulation of wealth by the elderly remains limited. Third, it investigates the

implications of the financial burden of parental care for the wealth decumulation behavior of the retired elderly, which has not been examined previously.

3. Data

We conduct two separate regression analyses using two different datasets to shed light on the relative importance of precautionary saving and bequest motives in explaining the wealth decumulation behavior of the retired elderly in Japan. These two datasets complement each other well: the first dataset allows us to examine the determinants of the *probability* of decumulating wealth while the second dataset allows us to examine the determinants of the *rate* of wealth decumulation. Both datasets contain unique information on precautionary saving and bequest motives, which helps us to assess their relative importance for the wealth decumulation behavior of the retired elderly, as explained in detail in Section 4.

3.1 Survey on Households and Saving

The first dataset we use for our analysis is the Survey on Households and Saving (Kakei to Chochiku nikansuru Chousa), which has been conducted biennially since 2013 in Japan by the Yu-cho Foundation. In this survey, a sample of households with two or more persons and with a household head who is 20 years old or above was drawn to be nationally representative using a two-stage stratified random sampling procedure. We use data from the 2013 and 2015 waves of this survey. In 2013 and 2015, 1,734 and 1,691 households completed the questionnaire, respectively. Since the data from this survey are unfortunately not a panel, we pool the data collected in 2013 and 2015 and conduct a cross-sectional analysis using these data.

The Survey on Households and Saving is conducted with the aim of better understanding households' livelihood and saving behavior. It collects detailed information on, among other things, saving, housing, wealth, labor supply, consumption, pensions, and bequests. One of the key questions that the survey asks households is whether they are currently (i)

accumulating their financial wealth, (ii) keeping the level of their financial wealth more or less constant, or (iii) decumulating their financial wealth. Using the answers to this question, it is possible to examine the determinants of the probability of decumulating financial wealth. The survey also asks households about the share of saving for different motives, including precautionary motives and bequest motives, in total saving. Another unique piece of information we use for our analysis is the amount of the financial burden of parental care that is borne by households. By exploiting such information, it is possible to shed light on the relevance of competing hypotheses regarding the wealth decumulation behavior of the retired elderly.

Since we would like to analyze the wealth decumulation behavior of the elderly who are retired, we restrict our estimation sample to those households whose household heads and their spouses are both aged 60 or above and are both retired (i.e., neither working nor looking for work). Given that the data on wealth are collected at the household level and that this survey is conducted only for households with two or more persons, we restrict our estimation sample to couple households only in order to eliminate any possible effects of having other household members on the wealth decumulation pattern of the household.

Applying the above sample restriction rules reduces the number of observations to 364, and excluding households with missing information on key variables reduces the number of observations further to 210. To verify the representativeness of our sample, we compare this estimation sample to the sample of retired couple households from the Family Income and Expenditure Survey, which is conducted annually by the Statistics Bureau, Ministry of Internal Affairs and Communications in Japan. The comparison (shown in the Appendix) confirms that our estimation sample from the Survey on Households and Saving is broadly comparable to the corresponding sample from the Family Income and Expenditure Survey in terms of the homeownership rate and the level of financial liabilities although the level of financial assets (and therefore that of financial net worth) from the Survey on Households and Saving seems somewhat lower than those from the Family Income and Expenditure Survey. Hence, we need to be cautious about making generalizations based on data from the Survey on Households and Saving.

3.2 Preference Parameters Study

The second dataset we use is the Preference Parameters Study (Kurashi no Konomi to Manzokudo nitsuiteno Anketo) of Osaka University. This survey was conducted annually in Japan during the 2003-13 period by the 21st Century Center of Excellence (COE) Program "Behavioral Macrodynamics Based on Surveys and Experiments" and the Global COE Project "Human Behavior and Socioeconomic Dynamics" of Osaka University. A sample of individuals aged 20-69 was drawn to be nationally representative using a two-stage stratified random sampling procedure. The sample has a panel component although fresh observations were added in 2004, 2006, and 2009 to overcome the problem of attrition. The survey was also conducted using the same survey instrument in China, India, and the US though for shorter periods.

Given that not all questions were asked in every year, we have decided to use data from the 2012 and 2013 waves in order to ensure that we can construct the relevant variables for our empirical analysis. In the case of the 2012 and 2013 waves, 4,588 and 4,321 respondents completed the questionnaire, respectively. In addition to basic information on respondents and their households such as household composition, consumption, income, wealth, and other socioeconomic characteristics, this survey collected information on pensions that respondents receive, the type of bequest motives they have, and their preference for leaving a bequest to their children as opposed to receiving high-quality long-term care based on responses to hypothetical questions *à la* Ameriks *et al*. (2011).

Unlike in the case of the Survey on Households and Saving, the sample for the Preference Parameters Study includes single-person households. We therefore restrict our estimation sample to single-person or couple households in which the respondent and, if married, his/her spouse are aged 60 or above and are retired (i.e., neither working nor looking for work). We also restrict our estimation sample to those respondents who were surveyed in both years. Applying the above restrictions reduces the number of observations to 227,

and excluding respondents with missing information on key variables reduces the number of observations further to 137. We also compare this estimation sample to the corresponding sample from the Family Income and Expenditure Survey, and this comparison shows that our estimation sample is comparable to the sample from the Family Income and Expenditure Survey in terms of the key wealth-related variables, as shown in the Appendix.

4. Estimation Strategy and Empirical Specification

4.1 Empirical Analysis Using Data from the Survey on Households and Saving

In the first analysis, we examine the determinants of the probability of decumulating wealth for the retired elderly. The Survey on Households and Saving asks households whether they are currently (i) accumulating their financial wealth, (ii) keeping the level of their financial wealth more or less constant, or (iii) decumulating their financial wealth, as noted earlier.[8] Based on respondents' responses to this question, we create a binary variable that equals one if the household is currently decumulating its financial wealth and zero otherwise and estimate a probit model for the determinants of the probability of decumulating financial wealth among the retired elderly.[9]

The Survey on Households and Saving also includes a question on the relative shares of saving for different motives. Our main variables of interest are those that indicate the shares of saving for bequests, precautionary purposes, and long-term care in total saving. Note that the share of precautionary saving refers to saving for illness, disasters, and other unexpected events. Other saving motives include children's education expenses, marriage

[8] We should note that the question uses the word "saving" (stock of saving), which some respondents may interpret narrowly as including only bank and postal deposits. Thus, there may be some respondents who reply that they are decumulating their financial wealth because they are decumulating their bank and postal deposits even though their total financial net worth is constant or even increasing.

[9] The behavior of households that are accumulating their financial wealth and that of households that are keeping the level of their financial wealth more or less constant are different in nature, and thus estimating an ordered probit model might be a more suitable estimation strategy. However, since the share of households that are accumulating their wealth is negligible (only 8 out of 210 households) in our estimation sample, we have decided to estimate a probit model instead.

expenses (either the respondent's own marriage or his/her children's marriage), purchase of land/housing (including housing renovations), purchase of durable goods, leisure, retirement, and no reason in particular but for peace in mind. We would expect the shares of saving for bequests, precautionary purposes, and long-term care in total saving to be negatively associated with the probability of decumulating wealth.

Another key explanatory variable is the monthly financial cost of parental care borne by the household. This variable is constructed by aggregating the long-term care expenses that the household pays for the household head's mother, father, mother-in-law, and father-in-law. We would expect this variable to be positively associated with the probability of decumulating wealth since the need to bear the financial burden of parental care will increase the need to decumulate wealth.

Other explanatory variables include the age and educational attainment of the household head,[10] the self-rated health assessment of the household head and his spouse, a dummy variable for having a child (children), a homeownership dummy, and the level of financial net worth. Financial wealth is defined as the total amount of wealth in the form of bank and postal deposits, foreign currency-denominated financial products, life insurance, individual pensions, bonds, stocks, investment trusts, payroll saving schemes, and others. Financial net worth is obtained by subtracting the total amount of debt from financial wealth. Unfortunately, because of the absence of data on the value of real assets, we could not construct a variable for net worth, but we partially compensate for this by including a homeownership dummy.

Finally, we include a variable that indicates the share of living expenses that public pensions cover. It is not clear *a priori* whether receiving relatively generous public pensions will increase or decrease the probability of decumulating wealth. On the one hand, the receipt of generous pensions will reduce the need for precautionary saving

[10] In the case of the Survey on Households and Saving, the respondent himself/herself specifies who is the head of his/her household. The majority of household heads are found to be male (only 3 households in our estimation sample had a female household head).

associated with lifespan uncertainty, which in turn may induce the elderly to decumulate their wealth faster. On the other hand, receiving large pensions relative to their living expenses will reduce the need for the elderly to rely on their own wealth to finance their living expenses, which in turn may induce them to decumulate their wealth more slowly. The effect of public pensions on the wealth decumulation behavior of the retired elderly is therefore an empirical question.

Given that we pool data from the 2013 and 2015 waves, as noted earlier, the values of financial net worth and the financial burden of parental care borne by the household are converted to 2013 prices.

4.2 Empirical Analysis Using Data from the Preference Parameters Study

In the second analysis, we analyze the determinants of changes in the level of wealth by taking advantage of the panel structure of the Preference Parameters Study. Following Spicer, Stavrunova, and Thorp (2016), our dependent variable is the percentage change in financial net worth between 2012 and 2013 expressed as the difference in the logarithm of financial net worth, $100\log(w_{i2013}/w_{i2012})$, for household i. We regress this variable on the values of the explanatory variables at the beginning of the wealth accumulation or decumulation period, i.e., the year 2012, using ordinary least squares (OLS). We use the percentage change in financial net worth rather than that in net worth because the Japanese tend to live in their own homes until they die and because "reverse mortgages" are not very popular in Japan.[11] We would therefore expect changes in wealth holdings to occur more with respect to financial assets than to non-financial assets in the case of retired households. That is indeed what we find for our estimation sample: the level of financial net worth increased, on average, by 5.1% while that of net worth increased by only 0.4% between 2012 and 2013.

[11] Nevertheless, we also tried using the percentage change in the level of net worth as our dependent variable and our key findings remain the same. The regression results are available from the authors upon request.

One of our main explanatory variables of interest is a variable that indicates the nature of the bequest motive that each respondent has. The Preference Parameters Study asks respondents about their plans for bequests. Based on responses to this question, we divide our sample into four groups: (i) those who plan to leave bequests no matter what; (ii) those who plan to leave bequests under certain conditions (e.g., if their children provide elderly care, provide financial support, and/or take over the family business); (iii) those who plan to leave bequests only if there is any wealth left over upon their death; and (iv) those who have no plans to leave a bequest. In other words, this variable indicates whether the respondent has a (altruistic) strong bequest motive, a strategic bequest motive, a passive or weak bequest motive (bequests are accidental or unintended in this case), or no bequest motive. The inclusion of this variable allows us to investigate the implications of different types of bequest motives for the wealth decumulation behavior of the retired elderly.

Another key explanatory variable is a variable that indicates the strength of one's bequest motive relative to one's precautionary saving motive. Unfortunately, unlike the Survey of Households and Saving, the Preference Parameters Study did not collect information on saving for different motives, which constitutes a direct measure of respondents' preference for saving for bequests as opposed to precautionary saving. Instead, it included hypothetical questions that sought to capture respondents' preference for leaving a bequest to their children as opposed to receiving high-quality long-term care at the end of their lives. More specifically, the Preference Parameters Study asked respondents the following question:[12]

> Please answer the following question concerning how you want to spend the final year of your life. Please assume that you are currently 85 years old, have one year left to live, and have total wealth of 20 million yen. Up to how much will you be willing to pay out-of-pocket to live in a private room in a nursing home during your last year of life? Please circle the response that applies to you. Please assume that the rest of the 20 million yen will be left to your children as an inheritance.

[12] Given that this question was included only in the 2011 wave, we used information from the 2011 wave on the assumption that such preferences did not change significantly between 2011 and 2012.

(1) I would like to live in a private room if I did not have to pay anything out of my own pocket (i.e., I want to leave all of my wealth (20 million yen) to my children as an inheritance).
(2) I would be willing to pay up to 2.5 million yen out of my own pocket to live in a private room.
(3) I would be willing to pay up to 5 million yen out of my own pocket to live in a private room.
(4) I would be willing to pay up to 10 million yen out of my own pocket to live in a private room.
(5) I would be willing to pay up to 12.5 million yen out of my own pocket to live in a private room.
(6) I would be willing to pay up to 15 million yen out of my own pocket to live in a private room.
(7) I would be willing to pay up to 17.5 million yen out of my own pocket to live in a private room.
(8) I would be willing to pay up to 20 million yen out of my own pocket to live in a private room.

This question is similar to the questions designed by Ameriks *et al*. (2011), who used responses to the questions to distinguish between precautionary saving and bequest motives. Responses to this particular question essentially indicate how much respondents care about their own wellbeing at the end of their lives relative to leaving bequests to their children. Moreover, we would expect those who care more about their own wellbeing to allocate more toward precautionary saving than toward saving for bequests. We therefore believe that responses to the question indicate, at least indirectly, how much respondents value the prospect of leaving bequests to their children relative to saving for precautionary purposes for their own wellbeing.

Accordingly, we construct a variable that measures respondents' preference for bequests versus precautionary saving using their responses to this hypothetical question and then examine whether this variable affects their wealth decumulation behavior. We express this variable as the share of end-of-life wealth (i.e., 20 million yen) that the respondent is willing to allocate to bequests. For example, if respondents choose (1), we assume that they are willing to allocate 100% of their wealth (20 million out of 20 million yen) to bequests. If they choose (2), we assume that they are willing to allocate 87.5% of their wealth (17.5 million out of 20 million yen) to bequests, and so on. Hence, we construct this variable by assigning the values 1, 0.875, 0.75, 0.5, 0.375, 0.25, 0.125 and 0 to

responses (1) through (8) above, respectively.

Other explanatory variables include the age, gender, educational attainment, marital status and self-rated health assessment of the respondent, a dummy variable for having a child (children), a homeownership dummy variable, the level of net worth, the share of living expenses covered by public pensions, and a dummy variable that equals one if the respondent expects to receive bequests and/or *inter vivos* transfers from his/her parents and/or (if married) from his/her parents-in-law. We also include a variable that indicates whether the household has a saving plan for the next one year.

As in the case of the Survey on Households and Saving, we express the value of net worth in 2013 prices. Furthermore, in addition to the above explanatory variables, regional dummies as well as a dummy variable for residing in a major (ordinance-designated) city are included to control for geographical variations.

5. Empirical Results

5.1 Regression Results based on Data from the Survey on Households and Saving

We start by discussing the findings from our empirical analysis based on data from the Survey on Households and Saving. We first report some basic statistics on household wealth holdings. Table 1 summarizes the average level of financial net worth as well as the average homeownership rate by the age, educational attainment, and self-rated health status of household heads.[13] The table shows that the average level of financial net worth declines as the household head gets older, suggesting that retired households are decumulating their financial wealth over time. This suggests that the life-cycle model holds in the case of Japan, at least if we measure wealth holdings in terms of financial net

[13] Note that the number of observations for the 60-69 age group is smaller than that for the 70-79 age group because we include only retired couple-households in the sample and because the employment rate for the 60-69 age group is generally higher than that for the 70-79 age group. For example, according to the 2015 Labor Force Survey (available at http://www.stat.go.jp/data/roudou/rireki/nen/ft/pdf/2015.pdf), the employment rates for those aged 60-64, 65-69, 70-74, and 75 or above are 62.2%, 41.5%, 24.9%, and 8.3%, respectively.

worth. However, note that we are not taking cohort effects into account here and a more detailed analysis using panel data is needed to reach a definitive conclusion. As expected, households whose heads are university graduates have a significantly larger amount of financial net worth than those whose heads do not have a university degree. In addition, households whose heads are in good health seem to hold a greater amount of financial net worth than those whose heads are in poor health. Table 1 also shows that the majority of households own a house or a condominium in Japan.

Table 1: Wealth Levels of Retired Households (in million yen)

	No. of observations	Financial net worth		Homeownership (%)
		Mean	Standard deviation	
Household heads' characteristics				
Age groups				
60-69	41	34.17	32.45	0.98
70-79	119	16.59	18.95	0.93
80+	50	14.16	19.33	0.84
Education				
University	66	27.43	27.73	0.92
No university	144	15.79	20.13	0.92
Health				
Good, relatively good	141	21.16	25.38	0.96
Not very good, not good	69	15.93	18.25	0.84
Total	210	19.45	23.36	0.92

Source: Calculations based on data from the 2013 and 2015 waves of the Survey on Households and Saving.

We estimate a probit model in order to investigate the determinants of the probability of decumulating financial wealth among the retired elderly, as explained in Section 4.1. Table 2 reports the summary statistics of the dependent and explanatory variables for all households as well as separately for households that are decumulating financial wealth and those who are not. This table shows that only about 53% of households in our sample are decumulating their financial wealth, which implies that nearly half of the retired elderly in Japan are continuing to accumulate financial wealth or keeping the level of their financial wealth constant, in violation of the prediction of the basic life-cycle model with no bequest motives or longevity risk.

Table 2: Summary Statistics

	All households		Households decumulating financial wealth		Households not decumulating financial wealth	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Decumulating financial wealth	0.53					
Household head's age	75.20	6.23	74.86	6.56	75.59	5.83
Household head's age^2/100	56.94	9.46	56.46	9.91	57.47	8.94
Child	0.88		0.87		0.88	
University degree (household head)	0.31		0.24**		0.39	
Good health (household head)	0.67		0.57***		0.79	
Good health (spouse)	0.70		0.58***		0.83	
Homeownership	0.92		0.92		0.92	
Financial net worth (million yen)	19.45	23.36	14.30***	17.94	25.22	27.19
Pensions (share of living expenses)	0.92	0.29	0.88**	0.24	0.98	0.33
Share of saving for bequests	0.02	0.08	0.01**	0.04	0.03	0.10
Share of saving for precautionary purposes	0.23	0.23	0.21	0.22	0.25	0.23
Share of saving for long-term care needs	0.15	0.22	0.16	0.21	0.15	0.23
Monthly financial cost of long-term care for parents/parents-in-law (thousand yen)	4.67	23.43	5.57	23.43	3.65	23.52
2015 year dummy	0.47		0.47		0.47	
No. of observations	210		111		99	

Note: *** and ** indicate that the mean value of the variable is statistically different between households that are decumulating financial wealth and those that are not at the 1% and 5% significance levels.
Source: Calculations based on data from the 2013 and 2015 waves of the Survey on Households and Saving.

Turning to the explanatory variables, Table 2 shows that the average age of the household head is about 75 years old. The majority of households own a house or a condominium (about 92%) and have a child (children) (about 88%). We do not find a significant difference in these characteristics between households that are decumulating financial wealth and those that are not. By contrast, we find that households whose heads are not university graduates or whose members are in poor health are more likely to be decumulating financial wealth than those whose heads are better educated or whose

members are in good health. We also find that the level of financial net worth is significantly lower for households that are decumulating financial wealth than for those that are not. While the table shows that public pensions generally cover a relatively large share of living expenses, this share is found to be smaller for households that are decumulating financial wealth than for those that are not.

Table 2 also shows that the share of saving for bequests in total saving (about 2%) is extremely small. The average share of saving for bequests is only about 6% of total saving even among the wealthiest quintile (based on financial net worth). In fact, the majority (about 94%) have no saving for bequests. This indicates that relatively few households are saving specifically for bequests. This may not be surprising given that the bequest motive is found to be relatively weak among the Japanese than among, for example, Americans (Horioka, 2014). Nevertheless, the share of saving for bequests in total saving is found to be smaller for households that are decumulating financial wealth than for those that are not. By contrast, the shares of saving for precautionary purposes and long-term care needs in total saving are much larger than that for bequests. Nearly one-quarter of saving is for precautionary purposes while about 15% is for long-term care needs. However, we find no statistically significant difference in these shares between households that are decumulating financial wealth and those that are not.

Finally, while we do not find a statistically significant difference in the monthly financial cost of parental care, it is found to be greater for households that are decumulating financial wealth than for those that are not. Note that the average monthly financial cost of parental care reported in Table 2 does not seem so high, but the mean figure for non-zero observations is about 75,000 Japanese yen (about US$680).[14] This is a non-trivial amount even though Japan introduced a mandatory LTCI program in Japan,[15] and it

[14] At the exchange rate of US$1 = 110 Japanese yen.

[15] According to the survey on the cost of at-home care conducted by the Institute for Research on Household Economics in 2016, households, on average, spend about 16,000 Japanese yen (about $145) per month for formal care services (the out-of-pocket portion) and about 34,000 Japanese yen (about $310) per month for caregiving-related expenses (such as the cost of diapers, medical expenses, etc.) other than formal care services (Tanaka, 2017). These figures are costs per care recipient (per elderly parent) that households bear monthly. The results from this survey also suggest that the cost of long-term care is relatively significant despite the existence of the LTCI program in Japan. Note that these figures are just averages and

would be interesting to see how the financial burden of parental care affects the wealth decumulation behavior of retired elderly households.

Table 3: Regression Results for Probit Model

	Average marginal effect	Standard error
Household head's age	-0.243***	0.093
Household head's age^2/100	0.154**	0.061
Child	-0.061	0.099
University degree (household head)	-0.143**	0.069
Good health (household head)	-0.195***	0.073
Good health (spouse)	-0.163**	0.076
Homeownership	0.085	0.114
Financial net worth (million yen)	-0.005***	0.002
Pensions (share of living expenses)	-0.232**	0.110
Share of saving for bequests	-0.680	0.526
Share of saving for precautionary purposes	-0.287**	0.141
Share of saving for long-term care needs	0.002	0.143
Monthly financial cost of long-term care for parents/parents-in-law (thousand yen)	0.002*	0.014
2015 year dummy	0.032	0.063
No. of observations	210	
Pseudo R^2	0.187	

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.
Source: Estimation based on data from the 2013 and 2015 waves of the Survey on Households and Saving.

Table 3 reports the regression results for the probit model for the probability of decumulating financial wealth in terms of average marginal effects. Given that we conduct a cross-sectional analysis, we acknowledge that we can only determine associations between various factors and the probability of decumulating financial wealth and that we will not be able to ascertain their causal effects.

One of the main objectives of this paper is to examine the relative importance of precautionary saving and bequest motives as explanations for the relatively slow decumulation of wealth by the elderly. We find that the marginal effect of the share of

that the cost is likely to increase as the level of disability increases. In addition, the cost of institutional care is likely to be much greater than these figures for the cost of at-home care.

saving for precautionary purposes is negative and significant, as expected. More specifically, the results show that a one percentage point increase in the share of saving for precautionary purposes is associated with a 0.3 percentage point decline in the probability of decumulating financial wealth. However, we find that the marginal effect of the share of saving for bequest is negative but insignificant. Hence, the results indicate that precautionary saving seems to play a larger role in explaining the wealth decumulation behavior of the retired elderly than bequest motives, at least in the case of Japan.

We also included the share of saving for long-term care needs, but its marginal effect is not statistically significant either. This may reflect the fact that Japan introduced a mandatory LTCI program in 2000, which is relatively generous in terms of coverage. Table 2 shows that households allocate a relatively large share (about 15%) of their total saving to future long-term care needs, which suggests that the financial burden of long-term care borne by households can be significant despite the introduction of this system.[16] However, the share of saving for long-term care needs may not have a significant effect on the wealth decumulation behavior of the elderly because some parents expect their children to provide care themselves or to provide financial support to pay for professional care when they become in need of care. In the case of Japan, elderly care has traditionally taken place within the family setting. While such traditional norms have been changing in Japan with perceived filial obligation norms declining since the launch of the LTCI program (e.g., Tsutsui, Muramatsu, and Higashino, 2014), some studies find that informal care by adult children continues to be the most common source of caregiving for elderly parents in Japan (Hanaoka and Norton, 2008; Long, Campbell and Nishimura, 2009). As a result, saving for long-term care needs may be less urgent than, say, saving for precautionary purposes.

Indeed, Table 3 shows that the financial burden of parental care has a positive and

[16] Because of the wording of the question, we assume that the saving for long-term care needs here is mainly to cover the long-term care costs of household members, i.e., of either the household head or his spouse in our sample of couple households.

significant effect on the probability of decumulating financial wealth, suggesting that adult children provide a safety net for their elderly parents in case they require financial support to pay for the cost of long-term care. The regression results indicate that a 1,000-yen (about US$9)[17] increase in the monthly financial cost of parental care is associated with an increase in the probability of decumulating financial wealth of about 0.2 percentage points. This finding suggests that the financial burden that retired households bear for their elderly parents' long-term care might be a relevant issue when analyzing their wealth decumulation behavior, at least in the case of Japan where adult children's obligation to take care of their elderly parents remains relatively strong in comparison to the US and Europe.

As for the other regression results, we find a U-shaped relationship between the age of the household head and the probability of decumulating financial wealth, with a decline in the probability of decumulating financial wealth until the age of about 79, followed by an increase past that age. A possible explanation for this pattern is that, although retired individuals may enjoy travelling and other leisure activities when they first retire, they may become less able to engage in such activities as they age, as a result of which their consumption (and their need to decumulate financial wealth) may decline with age. However, the probability of decumulating wealth might start rising after the age of 79 because medical and long-term care needs are likely to increase prior to death.

Table 3 also shows that households whose heads are better educated or those whose members are in relatively good health are less likely to decumulate financial wealth. The latter result may be because people in good health incur less medical expenses and are thus better able to accumulate wealth or because the life expectancy of people in good health is likely to be longer, meaning that they have a greater need to accumulate wealth.

The level of financial net worth is also negatively associated with the probability of decumulating financial wealth, but its marginal effect is relatively small in magnitude—a

[17] At the exchange rate of US$1 = 110 Japanese yen.

one million yen (about US$9,100)[18] increase in financial net worth is associated with only a 0.5 percentage point decline in the probability of decumulating financial wealth. As for the effect of public pensions, a one percentage point increase in the share of living expenses covered by public pensions is associated with a 0.2 percentage point decline in the probability of decumulating financial wealth. This suggests that receiving relatively generous public pensions alleviates the need to decumulate wealth to finance one's living expenses.

5.2 Regression Results based on Data from the Preference Parameters Study

We now turn to our discussion of the regression results based on data from the Preference Parameters Study. As we have done for the Survey of Households and Saving, we summarize in Table 4 the average level of financial net worth as well as the average homeownership rate by the age, educational attainment, and self-rated health status of respondents using data from the Preference Parameters Study.[19] As shown in Table 1, the older, the better educated, and the more healthy the respondent is, the higher is the level of his/her household financial net worth, while the majority of elderly households are found to own a house or a condominium.[20]

In the analysis using data from the Preference Parameters Study, we examine the

[18] At the exchange rate of US$1 = 110 Japanese yen.

[19] Note that in the case of the Preference Parameters Study, we do not have any observations older than 78 in the 2012 wave of the survey because all respondents were 69 or younger when they were surveyed initially although they became older with each wave of the survey. This is the same reason why the share of respondents in the 60-69 age group is higher in the Preference Parameters Study than in the Survey of Households and Saving (compare Tables 1 and 4).

[20] This survey collected information only on the respondent's own health status. Note that the shares of household heads and their spouses who are in good health were found to be higher in the Survey on Households and Saving than in the Preference Parameters Study. This is due mainly to the fact that the way in which the relevant question was phrased and the reply options were different between the two surveys. In the case of the Survey on Households and Saving, respondents were asked how the household head's health was and how his spouse's health was, and they were asked to choose from among the following options: good, relatively good, not very good, and not good. We constructed a good health variable for the household head (or his spouse) that equals one if the household head's (or his spouse's) health was reported to be good or relatively good and zero otherwise. By contrast, in the case of the Preference Parameters Study, respondents were asked how true the statement "I'm concerned about my health" was for them and they were asked to answer on a scale of 1 to 5 where "1" means "it is particularly true" and "5" means "it is not true at all." We constructed a good health variable that equals one if respondents chose 4 or 5 and zero otherwise.

determinants of the wealth accumulation or decumulation rate (the percentage change in financial net worth) of the retired elderly, as explained in Section 4.2. Table 5 reports the summary statistics for the dependent and explanatory variables. According to this table, households in Japan increased their financial net worth slightly (by about 5%), on average, between 2012 and 2013. The fact that even retired households in Japan are continuing to accumulate wealth, on average, indicates that the same puzzle that is observed in other countries (viz., the failure to observe a tendency for the retired elderly to decumulate their wealth) is observed in Japan as well.

Table 4: Wealth Levels of Retired Households (in million yen)

	No. of observations	Financial net worth		Homeownership (%)
		Mean	Standard deviation	
Respondents' characteristics				
Age groups				
60-69	69	26.34	31.04	0.91
70-79	68	21.59	22.39	0.94
Education				
University	29	37.97	40.28	0.93
No university	108	20.23	21.02	0.93
Health				
Good, relatively good	35	29.77	34.08	0.94
Average, not very good, not good	102	22.00	24.14	0.92
Total	137	23.99	27.10	0.93

Source: Calculations based on data from the 2012 wave of the Preference Parameters Study.

The average age of respondents is about 69 years old and about 48% of respondents are female. Just over one-fifth of respondents have a university degree. The majority of respondents are married (about 84%), have a child (children) (about 88%), and own a house or a condominium (about 93%). About one quarter of respondents say that they are not concerned about their health. Only about 4% of respondents expect to receive bequests and/or *inter vivos* transfers from their parents and/or parents-in-law. This figure seems somewhat low, but this is presumably because many households in this age group are likely to have already received intergenerational transfers from their own parents and/or parents-in-law. It is interesting to find that about 28% of households have a saving

plan for the next year.

Table 5 also shows that respondents would allocate, on average, about 62% of their end-of-life wealth to a bequest and the remaining (about 38%) to cover long-term care costs (the cost of a private room in a nursing home). To take a closer look at this, Figure 1 shows the distribution of this share. We find that a relatively large share of respondents would prefer allocating more to bequests rather than to covering long-term care costs. To see whether this preference varies by the nature of the respondent's bequest motive, Table 6 reports the average share of end-of-life wealth allocated to a bequest as well as the average levels of financial net worth and net worth by type of bequest motive.

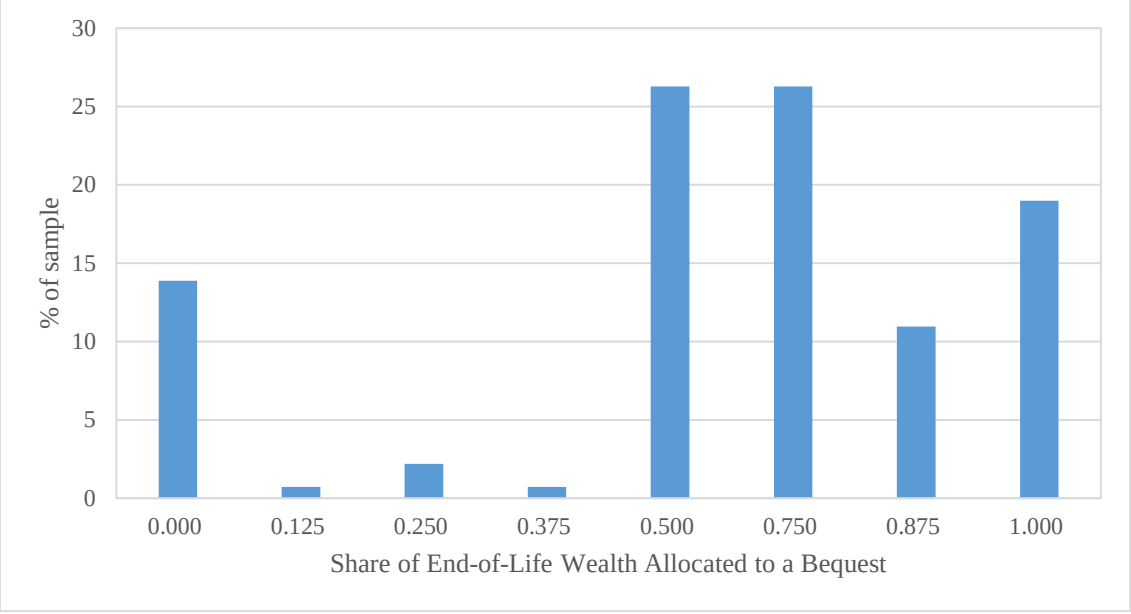
Table 5: Summary Statistics

	Mean	Standard deviation
Percentage change in financial net worth (100 log(financial net worth for 2013/financial net worth for 2012))	5.09	48.95
Respondent's characteristics		
Age	69.23	4.16
$Age^2/100$	48.10	5.76
Female	0.48	
Married	0.84	
Good health	0.26	
University degree	0.21	
Child	0.88	
Homeownership	0.93	
Net worth (million yen)	45.88	40.29
Expect to receive bequests and/or *inter vivos* transfers	0.04	
Pensions (share of living expenses)	0.74	0.22
Have a saving plan for the next one year	0.28	
Preference for leaving a bequest (share of end-of-life wealth allocated to bequests)	0.62	0.32
Bequest motives		
No bequest motive	0.15	
Strong (altruistic) bequest motive	0.18	
Strategic bequest motive	0.04	
Weak bequest motive	0.62	
Residing in a major city	0.21	
No. of observations	137	

Source: Calculations based on data from the 2012 and 2013 waves of the Preference Parameters Study.

First of all, Table 5 shows that the majority of respondents (about 62%) have only a weak bequest motive—i.e., they plan to leave a bequest only if they have some wealth left over at death. In other words, bequests are likely to be more accidental or unintended in nature in the case of Japan. This is consistent with the findings of a previous international comparison analysis of bequest motives (Horioka, 2014), which finds that the bequest motive of the Japanese tends to be much weaker than that of Americans. Table 6 then shows that, as expected, the share of end-of-life wealth that respondents allocate to a bequest is highest for those who have a strong (altruistic) or strategic bequest motive, while it is relatively low for those who have a weak or no bequest motive. The same table also shows that relatively well-off households are more likely to have a strong or strategic bequest motive than those who are less well-off. Similar findings are obtained, for instance, by Alessie, Lusardi, and Kapteyn (1999), who find, using data on the Netherlands, that bequest motives are mostly concentrated among rich households and that saving for one's children increases almost monotonically with wealth.

Figure 1: Trade-off between Bequests and Long-term Care at the End of Life



Source: Calculations based on data from the 2011 wave of the Preference Parameters Study.

Table 6: Trade-off between Bequests and Long-term Care and Wealth Levels by Type of Bequest Motive

	Share of end-of-life wealth allocated to a bequest	Financial net worth (million yen)	Net worth (million yen)
Strong (altruistic) bequest motive	0.69	34.95	61.28
Strategic bequest motive	0.69	43.31	72.19
Weak bequest motive	0.62	22.82	45.01
No bequest motive	0.56	10.14	23.57
Total	0.62	23.99	45.88

Source: Calculations based on data from the 2011and 2012 waves of the Preference Parameters Study.

Table 7: OLS Regression Results

	Coefficient	Standard error
Respondents' characteristics		
Age	9.979	29.914
$Age^2/100$	-7.517	21.663
Female	-19.935*	11.805
Married	-8.811	10.707
Good health	16.561	11.952
University degree	-12.935	12.476
Child	10.317	14.477
Homeownership	6.381	18.285
Net worth (million yen)	-0.186	0.131
Expect to receive bequests and/or *inter vivos* transfers	-20.674	23.712
Pensions (share of living expenses)	3.260	20.792
Have a saving plan	-4.709	11.441
Preference for bequests (share of end-of-life wealth allocated to a bequest)	-46.679***	17.535
Bequest motives		
(No bequest motive)		
Strong (altruistic) bequest motive	26.352*	15.419
Strategic bequest motive	46.294**	18.568
Weak bequest motive	24.607*	12.952
Residing in a major city	1.245	9.494
Constant	-316.390	1029.451
R^2	0.209	
No. of observations	137	

Note: ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. Robust standard errors are reported. Regional dummies are included in all regressions.
Source: Estimation based on data from the 2012 and 2013 waves of the Preference Parameters Study.

We now turn to the regression results reported in Table 7. We find that having a stronger preference for leaving a bequest to one's children versus receiving more luxurious/comfortable long-term care is negatively associated with the financial wealth

accumulation rate. More specifically, if the share of end-of-life wealth allocated to a bequest increases by one percentage point, the wealth accumulation (decumulation) rate is expected to decrease (increase) by about 0.5 percentage points. This can be interpreted as saying that having a strong precautionary saving motive relative to a bequest motive leads to a lower wealth decumulation rate. This is consistent with the conclusion we have reached earlier based on data from the Survey on Households and Saving that precautionary saving plays a more important role in explaining the slow decumulation of wealth by the retired elderly in Japan.

As far as the nature of bequest motives is concerned, we find that every type of bequest motive is significantly and positively associated with the wealth accumulation rate. This suggests that bequest motives also play some role in explaining the wealth decumulation behavior of the retired elderly in Japan. The magnitude of the effect is largest for the strategic bequest motive. In other words, we find that households with a strategic bequest motive accumulate wealth faster (decumulate wealth more slowly) than not only households with no bequest motive but also households with any other type of bequest motive. Given that a strategic bequest motive comes at least partly from the household's desire to induce family members to provide necessary long-term care in old age, this result also suggests that the observed lower than expected wealth decumulation rate of the elderly is driven more by precautionary saving than by (altruistic) bequest motives, at least in the case of Japan.

6. Conclusions

This paper analyzed the determinants of the wealth decumulation behavior of the retired elderly in Japan using unique information from two household surveys (namely, the Survey on Households and Saving and the Preference Parameters Study), and by so doing, attempted to assess the relative importance of precautionary saving and bequest motives in explaining the lower than expected rates of wealth decumulation of the retired elderly in Japan. Taken together, our analyses of these two datasets showed that both precautionary saving and bequest motives are important drivers behind the lower than expected wealth decumulation rates of the retired elderly in Japan.

As for which of the two aforementioned factors is more important as an explanation for the lower than expected wealth decumulation rate of the retired elderly in Japan, both the fact that the elderly who are saving relatively more for precautionary purposes are less likely to decumulate financial wealth than other elderly and the fact that having a preference for leaving a bequest to one's children as opposed to being more concerned about one's own wellbeing at the end of one's life leads to a significant decrease (increase) in the wealth accumulation (decumulation) rate suggest that saving for precautionary purposes is more important as an explanation of the lower than expected wealth decumulation rate of the elderly than saving for bequests, at least in the case of Japan. This may partly reflect the relatively weak bequest motive of the Japanese in comparison with, for example, that of Americans.

Another key finding of our analysis is that, despite the relatively generous coverage of the Japanese LTCI program, the financial burden of parental care that the elderly bear can be significant enough to affect their wealth decumulation behavior. Given that parental care responsibilities tend to arise relatively late in life, often after retirement, in the case of Japan, our results suggest that the financial burden of parental care may be a relevant issue when analyzing the wealth decumulation behavior of the elderly.

An important direction for future work is to extend our analysis using panel data. Panel data analysis will allow us to examine, among other things, the effect of health shocks as well as family status transitions (e.g., widowhood and divorce) on the wealth accumulation/decumulation of the elderly, which the current analysis could not do due to data constraints even though they have been found to be important determinants of the wealth decumulation behavior of the elderly (e.g., Poterba, Venti, and Wise, 2011; Van Ooijen, Alessie, and Kalwij, 2015). Working with a data set with a larger sample size is also on the agenda. Another area that requires more work is to examine why precautionary saving remains so important for the elderly in Japan even though they face, at least objectively, relatively little uncertainty given the comprehensive coverage of the public pension, health insurance, and LTCI programs. The answer to this question is key to

understanding why the wealth decumulation rate of the elderly in Japan is so low and what can be done to induce them to decumulate their wealth at a faster rate. Furthermore, given that we could examine the implication of the financial burden of parental care for the wealth decumulation behavior of the retired elderly using data only from the Survey of Households and Saving due to the absence of relevant data in the Preference Parameters Study, more work certainly needs to be done to determine the importance of the financial burden of parental care for the elderly's wealth decumulation patterns.

Despite these limitations, the findings of this paper have some important policy implications. Reducing gift taxes on *inter vivos* transfers is sometimes considered as a way to encourage the elderly to transfer their wealth to younger generations. Indeed, the Japanese government recently revised the gift tax structure by reducing the tax rate in cases where donees are the children or grandchildren of the donor, as part of the 2013 Tax Reform, which became effective on January 1, 2015. In addition, there are currently various tax exemptions for gifts from parents and grandparents that are used for housing acquisition, education, marriage, and childcare. Our finding that bequest motives are one of the explanations for the slow decumulation of wealth by the retired elderly suggests that such measures might help induce the elderly to decumulate their wealth faster. Nevertheless, we also find that a relatively small percentage of households have a strong (altruistic) bequest motive and that the vast majority do not have saving specifically for bequests in the case of Japan. These findings seem to cast some doubt on how effective such measures would be.

We now turn our attention to the finding that precautionary saving plays a relatively important role in explaining the wealth decumulation behavior of the retired elderly in Japan. This suggests that alleviating the uncertainties that the retired elderly in Japan face would be the most effective way of raising their wealth decumulation rates. The previous literature has shown that the main sources of uncertainty that the retired elderly are likely to face are lifespan uncertainty and the possibility of facing high medical expenses and long-term care expenses in the future. The coverage of Japan's public pension, health insurance, and LTCI programs is relatively comprehensive, but it is possible that there are

some lacunae in the current structure of these programs. Identifying the defects of the systems that lead the elderly to retain their wealth into very old age is beyond the scope of this paper, but this is certainly an important agenda for future research.

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Appendix: Comparison of Estimation Samples with Data from the Family Income and Expenditure Survey (in million yen at 2013 prices)

	2013 Family Income and Expenditure Survey Retired couple households (husband aged 65 or above and wife aged 60 or above)	2013 and 2015 Survey on Households and Saving Retired couple households (husband and wife aged 60 or above)	2012 Preference Parameters Study Retired couple or single-person households (husband and wife (or the single person) aged 60 or above)
Homeownership (%)	92.6	91.9	92.7
Financial assets	23.64	19.81	24.38
Liabilities	0.33	0.37	0.39
Financial net worth	23.31	19.44	23.99
Number of observations	1,119	210	137

Source: Data from the 2013 and 2015 Survey on Households and Saving; data from the 2012 Preference Parameters Study; and the Statistics Bureau, Ministry of Internal Affairs and Communications, *Annual Report on the Family Income and Expenditure Survey 2013, Volume II: Savings and Liabilities*, 2013 edition (http://www.stat.go.jp/data/sav/2013np/index.htm).