

**THE DISSAVING OF THE AGED REVISITED:  
THE CASE OF JAPAN**

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Abstract

In this paper, I survey the previous literature on the saving behavior of the aged in Japan and then present some survey data on the saving behavior of the aged in Japan that became available recently. To summarize the main findings of this paper, all previous studies as well as the newly available data I analyze find that the retired aged dissave and that even the working aged dissave at very advanced ages. These findings are consistent with the life cycle model and suggest that this model is highly applicable in the case of Japan.

Keywords: Saving, dissaving, consumption, aged, elderly, households, life cycle model, life cycle hypothesis, Japan

*Journal of Economic Literature* classification numbers: D12, D91, E21

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## **1. Introduction**

In this paper, I survey the previous literature on the saving behavior of the aged in Japan and then present some survey data on the saving behavior of the aged in Japan that became available recently. This is an important topic because the life cycle model posits that people work and save when they are young and retire and dissave when they are old, meaning that analyzing the saving behavior of the aged can shed light on whether the life cycle model is applicable in the real world.

To summarize the main findings of this paper, all previous studies as well as the newly available data I analyze find that the retired aged dissave and that even the working aged dissave at very advanced ages. These findings are consistent with the life cycle model and suggest that this model is highly applicable in the case of Japan.

This paper is organized as follows: in Section 2, I conduct a selective survey of the previous literature on the saving behavior of the aged in Japan; in Section 3, I present some survey data on the saving behavior of the aged in Japan that became available recently; in Section 4, I present other evidence on the applicability of the life cycle model in the case of Japan; and Section 5 concludes.

## **2. A Survey of the Previous Literature on the Saving Behavior of the Aged in Japan**

Although it is easy to speak about the saving of the aged in theoretical terms, it is notoriously difficult to measure it in actual practice, and as a result, no consensus has been reached about whether or not the aged dissave. Just to enumerate some of the problems that arise when one wants to measure the saving of the aged, one problem is that the unit of observation of the data that are available is almost always the household, and hence it is not possible to obtain direct data on the saving of the aged individuals who live in multi-generation households. This problem is especially severe in Japan, where there are so many extended families (households in which parents and their grown children live together). According to the Population Census of the Japanese Government, the proportion of the aged who live with their children was a full 73 percent in 1980, and although this proportion has declined steadily since then, it was still 53 percent in 2000.

Second, households are usually classified by the age of the household head and since aged household members are not necessarily the household head (in fact, they usually are not because the head is defined as the household member with the highest income), it is difficult to identify households that have aged members.

Because of these data limitations, previous researchers were forced to look at data on the saving of households whose head is aged and to make inferences about the saving of all aged individuals based on these data. However, the two aforementioned problems apply in the case of such data. First, such data pertain to the household as a whole and include the saving of not only the aged head but also of his/her spouse, cohabiting children, cohabiting grandchildren, and so on. Second, such an analysis totally ignores the saving of aged individuals who are *not* household heads (primarily aged individuals who live with their children, hereafter referred to as 'dependent aged') and implicitly assumes that their behavior is identical to that of aged heads. This is a risky assumption because the majority of the aged in Japan live with their children and are *not* classified as the household head and because these dependent aged are very different from the independent aged (for example, they are presumably considerably poorer, on average).

Thus, even if one finds that households headed by an aged individual in Japan do not dissave, one cannot conclude that all aged in Japan do not dissave. For one thing, the failure of the independent aged to dissave could merely reflect the positive saving of cohabiting children and other cohabiting family members, and for another, aged heads are, on average, more affluent than dependent aged and hence are more likely to be able to save.

The seminal paper by Hayashi, Ando, and Ferris (1988) is an important addition to the literature on the saving behavior of the aged because it is the first attempt to estimate the saving behavior of aged persons living in extended families. The ingenious method they use to indirectly infer the stock (flow) of saving of such aged is to assume that the stock (flow) of saving of younger generations living in extended families is identical to that of similarly aged nuclear families and to compute the stock (flow) of saving of older generations living in extended families as the total stock (flow) of saving of extended families minus the stock (flow) of saving of the younger generation.<sup>1</sup> They apply this method to micro data from the 1984 National Survey of Family Income and Expenditure, which is conducted every five years by the Statistics Bureau of the Ministry of Internal Affairs and Communications of the Government of Japan.

Hayashi, Ando, and Ferris (1988) present the results for both the stock and flow of saving,

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<sup>1</sup> Hayashi et al. (1988) also use another method in which they examine how the stock (flow) of saving of extended families in which the younger generation is of a certain age changes as the age of the older generation increases, but the results based on this method are not discussed here due to space limitations.

but in my opinion, the results for the flow of saving are more reliable because (1) they do not need to be adjusted for the so-called cohort effect, (2) they do not include intergenerational transfers, and (3) they do not include capital gains and losses, allowing us to focus on out-of-pocket saving. Therefore, I focus on the results for the flow of saving in what follows.

Hayashi, Ando, and Ferris's (1988) results show that the flow of saving of the aged living in extended families is positive for all but the oldest aged (i.e., those aged 87). Moreover, their results for the aged living in nuclear families show that their flow of saving is also positive except for those aged 80 or older. They do find, however, that the single aged of all ages (who are relatively poor) dissave. Thus, Hayashi, Ando, and Ferris's (1988) results provide some (but not overwhelming) support for the life-cycle model, with the majority of the aged in Japan continuing to save and only the oldest aged (i.e., those aged 80 or older) and the single aged dissaving.

However, the fact that the single aged of all ages dissave and the fact that most aged dissave eventually (i.e., when they reach their eighties) provide some support for the life-cycle model. Moreover, one of the few defects of Hayashi, Ando, and Ferris's (1988) analysis is that it fails to control for the employment status of the aged. The life-cycle model predicts not that *all* aged will dissave but rather that the *retired* aged will dissave, and it is highly likely that Hayashi, Ando, and Ferris (1988) would have found more widespread evidence of dissaving if they had focused on the retired aged. Put differently, I believe that the fact that they find any evidence at all of dissaving, even though they include the working aged in their sample, constitutes strong evidence in favor of the life-cycle model.

One analysis that is closely related to that of Hayashi, Ando, and Ferris (1988) and that takes account of the employment status of the aged to some extent is that of Ishikawa (1988), who uses data from the Family Saving Survey, conducted by the Statistics Bureau of the Ministry of Internal Affairs and Communications of the Government of Japan, to analyze the saving behavior of the dependent and independent aged in Japan. Ishikawa (1988) finds that the presence of cohabiting aged parents has virtually no impact on the saving rate of young households, which suggests that aged parents cohabiting with their children are neither saving nor dissaving, but he has no information on whether the cohabiting parents are working or retired. However, he *can* break down the sample of independent aged into those who are working and those who are retired and finds that the average total saving rates of salaried workers (including corporate managers), self-employed and retired independent aged households are 15.8 percent, 11.5 percent, and 1.5 percent, respectively, and that their average financial saving rates are 8.5 percent, 4.7 percent, and -6.9 percent, respectively. Thus, he

finds, as expected, that the saving rates of working and retired aged are very different, with the former being positive and much higher than the latter, and the latter being roughly zero in the case of the total saving rate and negative and large in absolute value in the case of the financial saving rate. Thus, the clearest evidence of dissaving by the aged can be found in Ishikawa's (1988) analysis of the independent retired aged, which is the only analysis discussed so far that takes account of the individual's employment status.

Finally, data from the Household Survey of Financial Asset Choice, conducted by the Institute of Posts and Telecommunications Policy of Japan Postal, show that the retired aged dissave, on average, in Japan and that even the working aged dissave, on average, after the age of 70 (see Horioka et al., 1996). This constitutes even stronger support for the applicability of the life-cycle model of saving in Japan.

### **3. Newly Available Data on the Saving Behavior of the Aged in Japan**

In this section, I survey newly available survey data on the saving behavior of the aged in Japan. Unfortunately, no direct data on the saving behavior of the retired aged were available in Japan until recently. The Family Income and Expenditure Survey, conducted by the Statistics Bureau of the Ministry of Internal Affairs and Communications of the Government of Japan, collects information on saving rates ('ratios of surplus') by age group of the household head, but the problem is that, until recently, data on saving rates were collected only for salaried-worker households (households in which the household head is a salaried worker). Thus, even the data for aged households pertained only to aged households *whose head was still working as a salaried worker*, and no information was available on the saving rates of the *retired* aged even though it is their saving rate that is of most interest.

Table 1 shows data on saving rates by age group of the household head for salaried-worker households for the 1990-2004 period, and as can be seen from this table, the saving rates of aged households (households with a head who is 60 years or above) is lower than that of younger households but is positive and large in absolute magnitude nonetheless, ranging from 9.4 to 22.6 percent. Looking at trends over time, the saving rates of aged households declined more or less steadily during the 1995-2004 period, from 22.6 percent in 1995 to 9.4 percent in 2004, but was positive and large in absolute magnitude even in 2004. However, these figures are not necessarily contrary to the life-cycle model because they pertain to salaried-worker households, *not* to retired households. What is needed is information on the saving rates of *retired* aged households.

Fortunately, the Family Income and Expenditure Survey started collecting saving rate data

and other data on various categories of aged households, including retired aged households, in 1995. Thus, it became possible for the first time to know the saving rate of the retired aged. Table 2 shows data on the saving rates of various categories of retired aged households for the 1995-2004 period, and as can be seen from this table, the saving rate of all three categories of retired aged households is negative and large in absolute magnitude. For example, the saving rate of households with a retired head aged 60 or older ranged from -9.9 to -29.2 percent, that of retired households all of whose members are aged ranged from -5.2 to -22.0 percent, and that of retired aged couples ranged from -4.0 to -21.4 percent.

Trends over time differ from one category of retired aged households to another: The dissaving rate of households with a retired head aged 60 or older declined slightly from 1995 until 1997 and increased sharply thereafter (in absolute magnitude), while the dissaving rate of retired households all of whose members are aged and that of retired aged couples fell steadily from 1995 until 2000 and increased sharply thereafter (in absolute magnitude). Thus, the dissaving rates of all categories of retired aged households show a downward trend, followed by an upward trend. The year in which the dissaving rate bottoms out differs by category, but all categories of retired aged households have shown a trend toward increased dissaving since at least 2000.

A close analysis of the data reveals that the increase in the rate of dissaving is due largely to the decline in public pension benefits and, to a lesser extent, to an increase in consumption. For example, the rate of dissaving of retired aged couples increased (in absolute magnitude) from -4.0 percent in 2000 to -21.4 percent in 2004, and an analysis of the data reveals that 54.1 percent of this decline was due to a 10.1 percent decline in public pension benefits and that 34.1 percent of the decline was due to a 4.9 percent increase in consumption. Public pension benefits were reduced in a number of ways as part of the 2000 reforms (for example, the earnings-related component was reduced by 5 percent for new retirees, the wage indexation of benefits was temporarily suspended, an earnings test was imposed on those aged 65-69, and it was decided to gradually raise the pensionable age from 60 to 65 starting in 2001 (see Horioka (2001) for more details)), and thus it is not surprising that public pension benefits fell so sharply after 2000.

Note, finally, that there are a number of conceptual defects in the saving rate concept used in the Family Income and Expenditure Survey. First, gross concepts of saving and disposable income (gross of depreciation) are used even though net concepts are preferable. Second, the imputed rent on owner-occupied housing is not included in consumption or in disposable income, even though it should be. Thus, the saving rate concept used in the Family Income

and Expenditure Survey is as follows:

$$SYG = SG/YDG,$$

where SYG = gross household saving rate

SG = gross saving

YDG = gross disposable income

Converting saving and disposable income to net terms and adding the imputed rent on owner-occupied housing to disposable income yields the following saving rate:

$$SYN = (SG - D)/(YDG - D + IR),$$

where SYN = net household saving rate

D = depreciation on owner-occupied housing

IR = imputed rent on owner-occupied housing

If we assume that depreciation can be calculated as

$$D = d*H,$$

where d = depreciation rate

H = market value of owner-occupied housing

and that imputed rent on owner-occupied housing can be calculated as

$$IR = (r + d)*H,$$

where r = interest rate

then the “correct” household saving rate can be rewritten as follows:

$$SYN = (SG - d*H)/(YDG - d*H + (r + d)*H)$$

which reduces to

$$SYN = (SG - d*H)/(YDG + r*H)$$

Thus, the saving concept used in the Family Income and Expenditure Survey is upward biased for two reasons: because the numerator is upward biased by the inclusion of depreciation and because the denominator is downward biased by the exclusion of the foregone interest income from holding one’s wealth in the form of owner-occupied housing. Correcting these biases would cause the dissaving rates of the retired aged in Japan to be even larger in absolute value than the unadjusted figures suggest.

We look finally at the rate of financial decumulation of retired households, which is defined as the ratio of net financial saving (net purchases of financial assets minus the net increase in liabilities) to beginning-of-period financial net worth (holdings of financial assets minus liabilities outstanding). I do not look at the rate of total decumulation because no data are available on the stock of real assets (land/housing) and because most Japanese households do not draw down their stock of real assets (land/housing) during retirement. Table 3 shows the

rate of financial decumulation of households with a retired head aged 65 or older for the 1995-2004 period, and as this table shows, the rate of financial decumulation of such households ranged from 0.84 to 2.26 percent, which implies a time horizon of 44 to 118 years if we assume that households will decumulate at a constant rate from now until they pass away. Thus, retired households in Japan decumulate their financial saving, as predicted by the life-cycle model. Their rates of financial decumulation seem low at first glance but they are in the right ballpark if we take account of the defect in the saving data noted earlier (the upward bias caused by the inclusion of depreciation), lifespan uncertainty, and/or the presence of a bequest motive.

As for trends over time in the rate of financial decumulation of retired households, it declines until 1998, shows no clear trend between 1998 and 2001, then shows an upward trend thereafter (all in absolute magnitude); thus, trends over time in the rate of financial decumulation of retired households are broadly consistent with trends over time in the saving rates of such households.

Thus, it appears that the tendency of the retired aged in Japan to dissave has always been observed (at least since 1995) and that this tendency has become even more pronounced in recent years. This suggests that the life-cycle model of saving is highly applicable in Japan and that it has become even more applicable in recent years.

#### **4. Other Evidence on the Applicability of the Life Cycle Model in Japan**

Note, moreover, that various other types of data and evidence also provide strong support for the applicability of the life-cycle model of saving in Japan (see, for example, Hayashi, 1986, 1997; Horioka, 1984, 1993, 2002; and Horioka et al., 2000). For example, Horioka and Watanabe (1997) decompose total household saving in Japan into saving for individual motives and find that saving for retirement is by far the largest component, accounting for a full 62.5 percent of total household saving.

As another example, econometric analyses based on time series data as well as cross-country data (see, for example, Horioka, 1989, 1997) provide strong evidence that the age structure of the population has a significant impact on household, private, and national saving rates, as predicted by the life-cycle model of saving.

As yet another example, Horioka (2002) and Horioka et al. (2000) find that the vast majority of bequests in Japan are either unintended or accidental, arising from lifespan uncertainty or are selfishly motivated bequests that are left in exchange for care, attention, and/or financial assistance provided by one's children during old age, both of which are consistent with the life-cycle model of saving.

As a final example, Movshuk (2006) finds evidence of a double-humped age-saving profile in Japan as well as in the other countries he studies, and although his results do not yield information on the absolute level of the saving rate at each age, the sharp decline he finds at older ages strongly suggests that the saving rate becomes negative.

## **5. Conclusion**

In this paper, I surveyed the previous literature on the saving behavior of the aged in Japan and then presented some survey data on the saving behavior of the aged in Japan that became available recently. To summarize the main findings of this paper, all previous studies as well as the newly available data I analyze have found that the retired aged dissave and that even the working aged dissave at very advanced ages. These findings are consistent with the life cycle model and suggest that this model is highly applicable in the case of Japan.

I turn next to directions for further research. Few studies have examined the saving behavior of the dependent aged (the aged who live with their children) in Japan (the only ones of which I am aware are Hayashi, Ando, and Ferris (1988) and Ishikawa (1988)), and moreover, none of these studies have looked at the saving behavior of the *retired* dependent aged. Since the proportion of the aged who live with their children is still high (about one-half) in Japan and since a crucial implication of the life cycle model is that the retired aged dissave, it is important to analyze the saving behavior of the retired dependent aged and to examine whether they dissave, as predicted by the life cycle model.

I turn finally to the policy implications of my findings. Japan's population is aging at the fastest rate in human history and Japan will soon have the most aged population in the world. My finding that the (retired) aged dissave in Japan implies that this rapid population aging will cause a sharp decline in Japan's household saving rate. Since Japan's household saving rate had already fallen to 2.6 percent by 2004, according to national accounts data, a further decline implies that Japan's household saving rate, which was formerly one of the highest in the world, will soon become negative.

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**Table 1: Saving Rate by the Age Group of the Household Head, 1990-2002**

| Calendar Year | All ages | 29 years or younger | 30-39 years | 40-49 years | 50-59 years | 60 or older |
|---------------|----------|---------------------|-------------|-------------|-------------|-------------|
| 1990          | 24.7     | 24.0                | 27.1        | 24.0        | 25.1        | 19.0        |
| 1991          | 25.5     | 25.8                | 27.2        | 25.1        | 25.9        | 21.0        |
| 1992          | 25.5     | 26.0                | 28.3        | 25.2        | 24.7        | 20.7        |
| 1993          | 25.7     | 25.3                | 29.0        | 24.9        | 24.9        | 22.6        |
| 1994          | 26.6     | 27.6                | 28.5        | 25.2        | 28.2        | 20.5        |
| 1995          | 27.5     | 28.0                | 31.3        | 25.4        | 28.3        | 22.6        |
| 1996          | 28.0     | 28.1                | 31.4        | 27.1        | 28.4        | 21.8        |
| 1997          | 28.0     | 30.4                | 31.3        | 26.9        | 28.3        | 22.4        |
| 1998          | 28.7     | 29.5                | 32.8        | 28.0        | 28.7        | 22.5        |
| 1999          | 28.5     | 28.8                | 32.7        | 28.5        | 27.3        | 21.0        |
| 2000          | 27.9     | 25.9                | 32.3        | 29.1        | 26.8        | 17.9        |
| 2001          | 27.9     | 24.0                | 33.8        | 27.5        | 27.0        | 18.4        |
| 2002          | 26.9     | 26.1                | 33.3        | 27.8        | 25.5        | 13.7        |
| 2003          | 26.0     | 28.4                | 32.3        | 27.0        | 24.1        | 12.1        |
| 2004          | 25.6     | 24.6                | 31.4        | 27.9        | 23.5        | 9.4         |

Notes: The figures show the saving rates ("ratios of surplus") of salaried worker households.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications, Government of Japan, ed., *Annual Report on the Family Income and Expenditure Survey* (Tokyo: Japan Statistical Association), various editions.

**Table 2: The Saving Rate of the Retired Aged in Japan**

| Calendar year | Retired aged households (1) | Retired aged households (2) | Retired aged couples |
|---------------|-----------------------------|-----------------------------|----------------------|
| 1995          | -11.5                       | -9.2                        | -9.3                 |
| 1996          | -10.8                       | -6.0                        | -5.8                 |
| 1997          | -9.9                        | -6.3                        | -5.1                 |
| 1998          | -11.3                       | -6.1                        | -5.4                 |
| 1999          | -14.6                       | -7.4                        | -6.0                 |
| 2000          | -16.2                       | -5.2                        | -4.0                 |
| 2001          | -20.4                       | -14.5                       | -14.3                |
| 2002          | -26.0                       | -19.6                       | -18.3                |
| 2003          | -24.6                       | -16.4                       | -15.7                |
| 2004          | -29.2                       | -22.0                       | -21.4                |

Notes: The figures show saving rates ("ratios of surplus"). "Retired aged households (1)" denote households in which there is at least one member who is 60 years or older. "Retired aged households (2)" denote households in which all males are 65 years or older, all females are 60 years or older, and there is at least one member who is 65 years or older. "Retired aged couples" denote retired couples in which the husband is 65 years or older and the wife is 60 years or older.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications, Government of Japan, ed., *Annual Report on the Family Income and Expenditure Survey* (Tokyo: Japan Statistical Association), various editions.

**Table 3: Rates of Financial Decumulation of Households with a Retired Head Aged 65 or Older**

| Calendar Year | Financial Saving<br>(1000 yen) | Financial Net<br>Worth (1,000 yen) | Rate of Financial<br>Decumulation<br>(percent) | Implied Time Horizon<br>(years) |
|---------------|--------------------------------|------------------------------------|--|---------------------------------|
| 1995          | -376.74                        | 22,574                             | 1.67   | 59.92                           |
| 1996          | -406.54                        | 22,078                             | 1.84   | 54.31                           |
| 1997          | -332.66                        | 22,371                             | 1.49   | 67.25                           |
| 1998          | -176.93                        | 20,958                             | 0.84   | 118.45                          |
| 1999          | -299.10                        | 20,758                             | 1.44   | 69.40                           |
| 2000          | -349.74                        | 24,050                             | 1.45   | 68.77                           |
| 2001          | -228.71                        | 25,113                             | 0.91   | 109.80                          |
| 2002          | -313.62                        | 23,702                             | 1.32   | 75.58                           |
| 2003          | -280.31                        | 22,290                             | 1.26   | 79.52                           |
| 2004          | -514.32                        | 22,735                             | 2.26   | 44.20                           |

Notes: Financial saving is defined as net purchases of financial assets minus the net increase in liabilities, financial net worth as holdings of financial assets minus liabilities outstanding, and the rate of financial decumulation as the negative of the ratio of financial saving to beginning-of-year financial net worth, and the implied time horizon as the reciprocal of the rate of financial decumulation..

Since 2002, holdings of financial assets and liabilities outstanding are available for the year as a whole only. I estimated beginning-of-year financial worth for 2002 by taking the average of the beginning-of-year figures for 2001 and 2003. I estimated beginning-of-year financial net worth for 2003 and 2004 by taking the average of the previous year's figure for the year as whole and the current year's figure for the year as a whole.

Sources: Statistics Bureau, Ministry of Internal Affairs and Communications, *Annual Report on the Family Income and Expenditure Survey (Income and Expenditure (Two-or-More-Person Households) and Savings and Liabilities)*, various issues, and Statistics Bureau, Ministry of Public Management, Home Affairs, Posts and Telecommunications, *Family Saving Survey*, various issues. Both are published by Tokyo: Japan Statistical Association.