Household Savings in Japan Revisited

Yukinobu Kitamura, Noriyuki Takayama and Fumiko Arita*

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Abstract

This paper investigates the household saving and wealth holding behavior in Japan, especially after the burst of the bubble economy in the 1990s. While the saving behavior we found in our previous study (Takayama and Kitamura (1994)) remains in general, the cohort analysis sheds new light on the saving behavior in Japan. With a careful construction of the cohort data, life-cycle (age) effect, time series effect, and cohort effect can be distinguished clearly. It provides valuable information to policy makers.

Keywords: savings, life-cycle, pension, cohorts, and wealth.
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1. Introduction

It has past six years since our publication on household savings in Japan, using a large micro data, the National Survey of Family Income and Expenditure (NSFIE), over the period of 1979-1989 (see Takayama and Kitamura (1994)).

Now the micro data from the 1994 NSFIE becoming available among academic users, we would like to add new information to our previous work and find out new facts emerged after the burst of the infamous bubble economy.

There are several interesting questions to ask. First, how do disposable income, consumption expenditure and savings change over different cohorts? Are there any qualitative differences among different cohorts? At first glance, the basic pattern seems the same across cohorts, but with a closer look, we find some differences from 1989 to 1994, over the period of the bubble economy and its aftermath.

Second, it is said that Japan experiences an unprecedented rapid aging, then what are the main implications of aging in Japan? What is the main source of increases in inequality, the age variation, the cross section income variation or within the cohort variation? As Weizsäcker (1996) argues, distributive implication of aging process is important and aging process definitively increases in inequality. Nevertheless, in Japan, the saving behavior varies mainly according to the income variation. We need

to identify why and what policy implications we can draw from this observation.

This leads to the third question. What is an appropriate social security system in a aging society? Takayama participates the public pension debate recently and shows his proposal in Takayama (1992,1996,1998). Takayama, Kitamura and Yoshida (1999) and Takayama and Kitamura (1999) conduct generational accounting calculation for Japan and show a significant magnitude of fiscal imbalance in Japan.

To answer above questions, we need to distinguish between life cycle (age) effect, time series effect and cohort effect. All these effects interact each other and are difficult to separate out. With aid of four data points of NSFIEs, we can overcome these difficulties to some extent and identify the main driving force of household saving behavior in Japan.

2. The Data

The NSFIE has been conducted every five years since 1959 to reveal levels of income, consumption and household assets, and their structure and distribution, as well as their differences among regions, through the investigation of family income and expenditure and assets and liabilities in Japanese households. This survey is designed to sample over 50,000 households (to be more precise, 53,000 in 1979, 54,000 in 1984, 59,100 in 1989

and 56,000 in 1994). Survey items include (1) family income and expenditure, (2) annual income, financial assets and liabilities, (3) major durable goods, and (4) attributes of households and their members, including housing conditions.

With a large sample size and wide coverage in items, the NSFIE is indeed a mine of information. It enables to make detailed analyses according to various household characteristics.

The data we use here are taken from the 1979,1984,1989 and 1994 NSFIE. In the previous study (Takayama and Kitamura (1994)), monthly consumption data are converted into yearly data after taking seasonal fluctuations into account. As yearly income is originally given in the NSFIE, savings are calculated as yearly income minus taxes and social security contributions, minus yearly consumption.

Advantage of this approach is to obtain internationally comparable yearly savings, given most households smooth out their consumption-saving patterns over a year[1].

Disadvantage of this approach is to estimate some crucial variables such as yearly consumption and yearly taxes and social security contributions. The NSFIE contains information only for the three months, September through November, we have to use

[1] Of course, we cannot eliminate possibilities of purchasing large consumer durables and houses, that are rare events in all households. In such cases, yearly consumption can easily exceed yearly disposable income.

external information from the Family Income and Expenditure Survey (FIES) for other month's consumption and to calculate taxes and social security contributions using information on household characteristics and yearly income in the NSFIE.

These processes can be sources of errors in variables. For example, conversion from three monthly to yearly consumption is done simply through multiplying common (average) annual conversion factors for 10 major expenditure items by three monthly respective consumption.

Needless to say, each household can have different expenditure patterns over a year. It may not be appropriate to apply common (average) annual conversion factors for households with different characteristics (e.g. different demographic compositions and different income groups). To calculate annual taxes and social security contributions is very difficult, given numerous exemptions, deductions and allowances. We have to admit that this calculation is very gross estimate of actual taxes and social security contributions[2].

If we use the original three monthly data, we can avoid above mentioned problems. Disadvantage of this data is to cover only a part of consumption-saving patterns over a

[2] In order to construct reasonable cohort data, we have to make fairly accurate and comparable estimations of taxes and social security contributions over time. At the moment, we are not quite sure that the calculated data from the 1994 NSFIE is comparable with those from the other NSFIEs.

year. Fig 1 illustrates the case in point.

*** Fig. 1 about here ***

The time series of household saving rates from the FIES remains stable at around 25% while those from the NSFIE stay less than 10%[3]. It would be quite misleading to attribute movements in the three monthly NSFIE data to the representative yearly Japanese household saving behavior. In addition, we cannot directly apply a constrained optimization approach of consumer behavior because of a strong heterogeneity among the samples.

Nevertheless, the times series of the FIES and the NSFIE follow a similar trend, and it is the trend, not the level that we are interested in mostly in this paper. As the first step, we will use the original NSFIE data and try not to convert these into yearly income, consumption and savings. In other words, this paper intends to use raw data without arbitrary statistical adjustments; therefore, it does not seek full comparability with the yearly saving rates. Comparable analysis using the yearly data is left to our future work.

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[3] Three monthly average saving rate from the NSFIE can be converted into a yearly saving rate with the help of the FIES every monthly data. The formula we use in Fig.1 is given $\hat{\beta} = \hat{\alpha}(\overline{Y_\alpha / Y}) + (\overline{X_Z / Y})$ where $\hat{\beta}$ = yearly saving rate, $\hat{\alpha}$ = three monthly average saving rate from the NSFIE, Y_α = sum of disposable income in September through November from the FIES, Y = yearly disposable income from the FIES, X_Z = sum of savings in January through August and December from the FIES.

3. Cohort Analysis of Income, Consumption and Saving

Disposable income and consumption by cohort are shown in Fig.2 and Fig.3 respectively. Both disposable income and consumption are increasing steadily for the younger cohorts while they start decreasing for the older cohorts. This was true even in 1994, the middle of long economic recession. As a result, the savings by cohort follow the similar trend (Fig. 4). In general, the cohort-profiles are highly consistent with the age-income and the age-consumption profiles that are hump-shaped, reaching its peaks at ages 50-54.

*** Fig. 2-4 about here ***

To put these data together, the saving rate by cohort is shown in Fig. 5. As discussed in the previous section, the saving rates are low in general in the period between September and November. Converted these into annual saving rates, the average would be around 25% (see Fig. 1). A general pattern of the saving rate remains the same as the pervious study, i.e. the saving rate increases over the age-profile.

According to our framework, the following identity is defined.

Income – (tax and social security contributions) = disposable income

= consumption and savings (1)

Social security contributions are further divided into public pension contributions, health insurance, and other social insurance. Let us define discretionary savings as savings in the RHS of eq. (1) and mandatory savings as (public pension contributions – public pension benefits + contributions to the severance pay fund + interests from social security wealth + interests from accumulated severance pay). For statistical simplicity, here we take mandatory savings simply as public pension contributions minus public pension benefits (i.e. net public pension contributions), and ignore contributions to the severance pay fund, interests from social security wealth and interests from accumulated severance pay. Then, it is obvious from construction of eq.(1) that discretionary savings are negatively correlated with mandatory savings. In addition, we calculate the crude ratio between mandatory savings and discretionary savings for different age groups. The results are given in Table 1.

*** Table 1 about here ***

It is apparent that the ratio becomes significantly negative for those aged above 60. That is, mandatory savings do matter with the elderly. Another notable feature is that

the average ratio gets substantially smaller after the 1980s. Therefore, even if the trade-off relationship may exist between mandatory and discretionary savings, its impact would be smaller in recent years, at least for the working generations aged 20-59.

Takayama (1992a,b) conducted an econometric estimation of consumption expenditure, using the present value of public pension benefits (=GSSW) as one of the explanatory variables in the 1979 and 1984 NSFIE. Estimated values of the parameter for GSSW are significantly positive. For workers' households, the figures are about 1.2% in 1979 and 2.4% in 1984, implying that the presence of social security wealth caused annual consumption expenditure to increase 1.2% and 2.4% of GSSW in 1979 and 1984 respectively.

The model can be refined by allowing the effect of human capital variables to vary by age. The presence of social security wealth is estimated to increase 1984 consumption expenditures of workers' households by about 1.5% of GSSW. This increase in consumption expenditure would be equivalent to 13.9% and 12.0% of disposable income in 1979 and 1984 respectively.

The Japanese public pension program increases working households' propensity to consume, viz., the evidence confirms the hypothesis that social security wealth

discourages personal savings in Japan.

Note, however, that the public pension system has been changed many times and will be reformed again and again in the future. Benefits and contributions will be more closely balanced; the social security wealth of each individual will also be reduced in the near future by raising the normal retirement age to 65 or more and by decreasing real levels of monthly benefits. The future prospects of these reforms might have encouraged household savings[4].

Going back to the relationship between mandatory and discretionary savings, generous public pension benefits in Japan are expected to be reduced, while the contribution rate can be frozen forever at the current level or be reduced through a partial shift of funding to a consumption-based tax. At the same time, we should encourage private initiatives including a private, personal saving account for retirement, through the use of powerful tax-incentives[5]. In addition, generational accounting results from Japan (see Takayama, Kitamura and Yoshida (1999) and Takayama and Kitamura (1999)) also indicate that we cannot afford to provide generous public pension benefits to the boomer generation and that further public pension reforms would be inevitable, if

[4] Although we have not conducted econometric analysis using the 1989 and 1994 NSFIE, high saving rates among those aged above 55, might be an evidence of precautionary savings due to uncertainty in the public pension system. See Takayama (2000a) for the latest public pension reform plan.

the public pension scheme is to be kept running.

Among many cohorts, the baby boomer cohort (generation) deserves a special attention because they consist the largest demographic cohort. As Fig. 5 shows, the baby boomer cohort reduced their saving rates by 2.6% from 1989 to 1994, while the neighboring cohorts increase their rates.

*** Fig.5 about here ***

Why this happened? As very moderate hump shapes are observed in Fig. 2-3, both the disposable income and consumption reach its peaks around the mid 50s of age, with accelerating increases in consumption expenditure in the 40s of age. The baby boomer cohort happened to be their 40s in 1994. As discussed before, consumption expenditure increases steadily from 1989 to 1994, and especially so for the baby boomer cohort. That results in a drop in saving rates. It is noteworthy that in U.S., the unprecedented economic boom in the 1990s enables the boomer generation to accumulate their wealth (see Sterling and Waite (1998)) in the forms of real estate, pension funds, and stocks, while in Japan, the unprecedented economic recession in the 1990s made very little room for the boomer generation to accumulate their wealth for

[5] A Japanese version of 401K plan is to be introduced in the near future. See Takayama (2000b).

after-retirement (see Fig. 6-8 below)[6].

4. Wealth Holding by Cohort and Social Security Wealth

Net worth (financial and housing assets minus debt), net financial assets, and net housing assets by cohort are shown in Fig.6-8. All are increasing steadily over time for all cohorts. Sharp increases in net worth, net financial assets, and net housing assets occurred between 1984 and 1989, corresponding to the period of the bubble economy. After the burst of the bubble economy in the early 1990s, values of net housing assets grow very slowly as shown in Fig.8 while those of net financial assets grow more or less at the same rate as in the period of the bubble economy as shown in Fig.7. It is surprising to find that net financial assets increase even after the collapse of the stock market in Japan. Net financial assets reach its peak at ages 60-64 because of lump-sum retirement severance payments at around age 60. As Takayama and Kitamura (1994) shows, intergenerational transfers might be made from the elderly cohorts to the younger cohorts. However, from the net worth and financial assets holding by cohorts, no strong evidence of transfers can be observed, in particular, for

[6] We have to be careful about the conceptual differences of the baby boomer generations in U.S. and in Japan. In U.S. the baby boomer includes those who were born from 1946 to 1968, while in Japan, it usually includes only those who were born from 1946 to 1949.

the baby boomer cohorts to receive.

*** Fig 6-8 about here ***

Net worth (financial and housing assets) increases over all the age-profile without a substantial decrease after age 65. Net housing assets in 1994 remains, more or less, the same as in 1989. Net financial assets are higher than those in the previous period. But, as housing assets accounted for 66% of total net worth in 1994, net worth in 1994 is higher than in 1989. It should be noted, therefore, that as far as the household worth is concerned, net worth does not drop even after the burst of the bubble in the early 1990s.

Wealth distribution became more imbalanced in the 1990s. In particular, net worth holdings became increasingly distorted between home owners and tenants. In addition, wealth is much unevenly distributed than income. To confirm this conjecture, the Gini coefficient of *income* distribution in Japan has been the range of 0.3-0.4 in 1979-1994 while the Gini coefficient of *net worth* was 0.519 in 1984 and was worsen to be 0.562 in 1994.

*** Fig.9 about here ***

Fig. 9 reveals a three dimensional picture of wealth distribution. These pictures show variance of wealth distribution within the same income decile is larger than that within the same wealth decile. This implies those who belong to a lower income

decile might have a substantially large amount of wealth while those who belong to a lower wealth decile is less likely to earn a substantially high income. In other words, it may be misleading to observe wealth distribution over income decile because income is not a good indicator of wealth holding.

Takayama (1992a) decomposes net worth distribution over home ownership, age profile, region, employment status, and income class. Home ownership explains 12.2% of wealth inequality. Age profile, region, employment status explain as little as 2-8%. Income class, here again, plays the major role in explaining the wealth inequality by 15.9%.

To construct social security wealth (SSW) as the mandatory savings, we need to use the baseline equation as follows,

$$SSW_{t+1} = (1+\rho)SSW_t + \tau_t - b_t \qquad (2)$$

where SSW = social security wealth, ρ =internal rate of return, τ_t = public pension contribution, b_t = public pension benefits.

First, the stream of public pension contributions can be calculated from age-earning profile multiplied by historical public pension contribution rates over the

period of 1960-1999. Second, the stream of public pension benefits is to be adjusted annually with inflation and is added up to the average life expectancy (from 2000 to 2022). Third, we have to set $SSW_{t+R} = 0$ such that the internal rate of return equates two streams; public pension contributions and benefits under the Pay-As-You-Go system. Result is given in Fig.10. At the age of retirement, 60, in year 2000, *SSW* in Japan is estimated to equal 34.21million yen and the nominal internal rate of return is 8.7% per year.

Given the average net financial assets (excluding *SSW*) for age 60-64 in 1994 was 20.42 million yen, the estimated *SSW* 34.21 million is very large indeed, although the actual *SSW* is expected to be even larger than 34.21 million yen.

As is obvious, the SSW includes a component of intergenerational transfers. If we assume that the market rate of return from investment was 5.5% in nominal terms per annum, and that the discount rate for the future SSW will be 4.0%, then, the estimated SSW will go up to 50.92 million yen. This figure will be rather common in the Japanese sense. Consequently, the component of intergenerational transfers in the SSW will turn out to be as much large as 29.13 million yen, in this case.

*** Fig.10 about here ***

5. Conclusion

Unlike the previous study of cross section analysis of the NSFIE in Takayama and Kitamura (1994), in this paper we observe the household saving behavior in Japan from a viewpoint of cohort profile.

The reasons for using the cohort profile are as follows. First, currently consumer behavior is theoretically modeled on the basis of intertemporal optimization. This behavior cannot be captured by cross-sectional data. It is only with panel data that one can track individual consumers or households over time.

Second, if the panel data are not available, repeated cross-sectional data can partly overcome the absence of panel data. Although the same individual is only observed once, a sample from the same cohort is observed at each date, so that one can track income, consumption and savings of a sample of individuals in the same cohort.

Third, with a careful construction of the cohort data, life-cycle (age) effect, time-series effect and cohort effect can be distinguished clearly. Our simple exercise in this paper illustrates a special cohort effect for the baby boomer generation after the burst of the bubble economy.

Needless to say, before we conduct full fledged empirical works, many statistical and empirical obstacles are to be removed. Nevertheless we are quite certain that this

new approach paves the way for future empirical works on the household saving behavior in Japan.

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Table 1. The Crude Ratio between Mandatory and Discretionary Savings (%)

		Age	
Year	Average	20-59	60+
1979	17.4	17.9	-18.0
1984	3.4	5.1	-36.8
1989	3.7	5.1	-30.5
1994	3.9	6.0	-24.6

Source: National Survey of Family Income and Expenditure, 1979,1984,1989, and 1994.

Note: The mandatory savings are defined as a difference between public pension contributions and its benefits, i.e. net public pension contributions. Those aged above 60 receive public pension benefits so that mandatory savings become negative.