Why Has Japan's Household Savings Rate Remained High even during the 1990s?[+]

-- Empirical Analysis on Risk Bias Viewed by the Characteristics of the Household Sector --

July 1999

Shinobu Nakagawa[*]
Research and Statistics Department
Bank of Japan

[Abstract]

1. Japan's household savings rate decreased during the 1980s due to the progress in upgrading the nation's social security system and the aging of Japanese society, but has turned to a gradual increase in the 1990s. Households may be increasing precautionary savings amid growing uncertainty (risk) regarding the future in the Japanese economy as a whole.

2. While the "household" is usually referred to as a single entity, it is actually comprised of diverse segments with different characteristics, and these segments may be categorized by annual income, age and occupation of the head of household, and other factors. Thus, while the household savings rate has increased as a whole, the individual savings patterns and motivations for savings may differ. This paper employs various survey data regarding households, including the *Family Income and Expenditure Survey* and the *Family Savings Survey* (Management and Coordination Agency), as well as the *Public Opinion Survey on Household Savings and Consumption* (Central Council for Savings Information), to analyze what types of risks are primarily recognized by what types of households, and what types of households are increasing their motivation to save.

3. First, looking at the average household savings rates by annual income and age of the head of household, from 1990 through to the present, the segments that have been increasing their savings rates on a relative basis are low-income households and elderly households. Additionally, to examine the factors that affect savings rates by annual income, the functions are estimated using the average savings rate by annual income as the dependent variable and ① projected income for the next half-year by annual income (expected nominal income growth), ② income risk by annual income (dispersion of the expected real income growth rate) calculated using the Carlson-Perkin Method, and ③ the real interest rate as the independent variables. The results show that in recent years, income risk is functioning as a factor to increase savings rates, especially for the low- and middle-income households. On the other hand, no significant relationship is found between the real interest rate and savings rates overall.

4. To analyze in detail the reasons why low-income households are perceiving risk, these households are categorized by the age of the head of household. The figures show that recently the savings rates of the middle-aged and elderly households are increasing the most. Considering that the unemployment rates for middle-aged and elderly workers have been increasing comparatively quickly since 1990, anxiety regarding current employment conditions may be the primary reason why middle-aged and elderly low-income households presently perceive risk.

5. Meanwhile, looking at various types of surveys about life after retirement, the percentage of responses indicating "anxiety about post-retirement livelihood" has been increasing rapidly, especially among the young households. Moreover, the perceptions of problems with pension systems by age indicate that individuals in their 20s and 30s view the situation most seriously. The reasons cited include "future reductions in pension benefits" and "raising the age from which pension benefits will be paid." This indicates that the motivation to save among the young households may be increasing due to lowered expectations about their income in the distant future, including pension benefits.

6. Next, the reasons why savings rates are increasing in the elderly households are considered. Generally, the life-cycle hypothesis dictates that the savings rates of elderly households should be lower than the average for all households, because after retirement the representative individual consumes the assets he has accumulated during his working life. Nevertheless, the average savings rate among elderly Japanese is actually higher than the average for all households, in contrast to the conditions in the United States where savings rates peak during middle age and then decline in proportion to age (Chart 8). Incidentally, also unlike the situation in the United States, in Japan the assets per household by age remain virtually unchanged between ages 60-64 and ages 65 and above, so there are no signs that the elderly are consuming their savings.

7. In speculating why the elderly refrain from blithely consuming their assets, one possibility might be the motivation to leave behind an estate. Nevertheless, various surveys show that only six percent of both individuals in their 60s and those 70 or older have a positive intention to leave behind their own assets as a bequest for their descendants. On the other

hand, only around 10 percent of those who will be inheriting the estates (individuals in their 20s, 30s, and 40s) expect to inherit assets from their parents. Thus, the inheritance issue does not have that great an influence on savings rates among all age segments, at least not before the assets are actually inherited.

8. Another possible reason why the elderly refrain from consuming their assets is that they may feel some sort of anxiety regarding their future. In fact, even though the pension system has now been substantially enhanced, approximately half of the elderly believe that they "cannot live comfortably on pension benefits alone." The reason cited for this is the belief that "the self-payment burden for medical care and nursing care for the elderly will increase." Additionally, the majority of the elderly cite "preparations for illness or emergencies" among their savings goals. Thus, along with the increase in average life expectancy, the elderly have a growing anxiety about the various burdens that increase with age, including the possibility that they may require nursing care, and this apparently leads them to increase their savings, or at least to refrain from blithely consuming their savings.

9. To summarize, Japan's household savings rate has been increasing from 1990 because the motivation to save among individual segments has been rising due to different perceptions of risk: ① the middle-aged and elderly low-income households feel anxiety regarding employment conditions, ② the young households feel anxiety regarding pension systems, and ③ the elderly households feel anxiety regarding nursing care. Considering that the aging of Japanese society will continue to progress, how to create an environment in which the elderly can consume their savings without concern is an important issue for the entire Japanese economy. In a survey of individuals in their 50s and 60s, who will eventually become the core of the elderly, when asked about their post-retirement (future) lifestyle, the highest percentage of respondents states that they "would like to continue working for as long as possible." Thus, to begin with, preparing an employment environment in which the elderly can easily work should lead to an easing of the household propensity to save. Additionally, considering that the majority of assets held by the elderly are real assets (housing, residential land, etc.), it is necessary to arrange a system to generate liquidity from real assets so the elderly can easily secure cash flow. As one specific measure, the use of reverse mortgages could be considered.

1. Introduction

Based on the System of National Accounts (SNA), Japan's household savings rate has changed over time along with the stages of the nation's economic development (Chart 1). The household savings rate consistently increased through the mid-1970s, with the realization of high economic growth and the relatively high proportion of youth in the total population. Thereafter, from the 1980s, the household savings rate consistently decreased as a result of ① the maturation of the economy after experiencing the second oil shock, ② the upgrading of the social security system, and ③ the aging of the population. Particularly in the late 1980s, the pace of decline of the savings rate accelerated, but this may be attributed to the so-called "asset effect" (the wealth effect) from the bubble economy.

From 1990 as well, initially, the effects from these factors that caused the decline in the household savings rate during the 1980s were expected to strengthen, and the downward trend of the 1980s was projected to continue. In fact, however, even though these factors did strengthen, the household savings rate actually turned to a gradual increase from the 1990s.[1] As for the background to this development, it seems that some sort of shock which had not yet emerged in the 1980s occurred to stimulate household savings propensity, in other words, households' uncertainty (risk) regarding the future increased.

From the 1990s, as a result of the increased risk regarding the future, household consumption has become stagnant overall (households' precautionary savings increased), and this development is analyzed in "Recent Personal Consumption Trends" in the June 1998 issue of the *Bank of Japan Monthly Bulletin* and other publications. However, because these analyses grasp the overall household sector based on the "representative household," they do not necessarily clarify the micro-level behavior of individual households.

---

[1] Aside from the SNA basis, there are two other ways of calculating household savings rates as defined in two surveys conducted by the Management and Coordination Agency: the *Family Income and Expenditure Survey* and the *Family Savings Survey* (refer to the notes to Chart 1 for the specific definitions under each survey). The trends under these two surveys are generally consistent with those on an SNA basis, but there are major differences regarding the performance during the late 1980s (Chart 1). During this period, the household savings rate decreased on an SNA basis, but increased on the *Family Income and Expenditure Survey* basis and the *Family Savings Survey* basis. This may be due to differences in the way the statistics are processed. Specifically, in the latter two surveys ① the number of sample households is small, ② the imputed rent for owner-occupied homes and social security expenses other than the self-payment burden for medical expenses are not included in expenditures (this factor increases the savings rate level), and ③ the proportion of consumer durables and service expenditures in total expenditures is low (this factor hinders the influence from the asset effect; refer to the bottom charts in Chart 1 (also refer to Ueda and Ono (1993), and Economic Planning Agency (1998)).

In contrast, this paper employs various survey data regarding the household sector, including the *Family Income and Expenditure Survey* and the *Family Savings Survey* (Management and Coordination Agency), as well as the *Public Opinion Survey on Household Savings and Consumption* (Central Council for Savings Information), to analyze what types of risks are primarily recognized by what types of households, and what types of households are increasing their motivation to save.

2. Savings Behavior from the 1990s by Household Characteristics

2-1. Average Savings Rates by Household Characteristics

Examining the average household savings rates by annual income based on the *Family Income and Expenditure Survey* and the *Family Savings Survey* (Chart 2-1), from 1990 through to the present, it is the low-income households categorized as class 1 and class 2 households that have been increasing their savings rates compared with that of the average for all households.[2] Using other characteristics, the households that have been increasing their savings rates on a relative basis are: employees of small enterprises by the scale of the enterprise where the head of household is employed (Chart 2-2), elderly households (especially non-wage-earner households[3]) by the age of the head of household (Charts 2-3 and 2-4), and homeowners[4] by home ownership classification (Chart 2-5), respectively. The savings rates have also been increasing on a relative basis in households headed by young wage-earners in their 20s and 30s (Chart 2-3), and this is apparently because most of these are categorized as low-income households (an analysis of the savings behavior of the young households is presented in Chapter 3). Charts 2-1 to 2-5 also show that these trends have remained essentially the same since the most recent economic peak (at the beginning of

---

[2] In the *Family Income and Expenditure Survey*, all sample households are categorized into five classes by annual income from the lowest to the highest. For the 1998 survey, for example, the classifications for wage-earner households were as follows: class 1 – less than ¥4.94 million; class 2 – from ¥4.94 million to less than ¥6.46 million; class 3 – from ¥6.46 million to less than ¥8.08 million; class 4 – from ¥8.08 million to less than ¥10.47 million; and class 5 – ¥10.47 million or more.

[3] Non-wage-earner households refer to those where the head of household is self-employed, living on a pension, etc.

[4] It is believed that the majority of homeowners are repaying housing loans. In the *Family Income and Expenditure Survey*, because the repayments of housing loans are classified as different from consumption expenditures (not included in real expenditures) under the definitions in Chart 1, the propensity to consume of owner-occupied households tends to be lower (the savings rate tends to be higher).

1997), except for the segment of households headed by young wage-earners in their 20s whose savings rate has recently declined.

As summarized in the following table, the savings rates of the low-income and elderly households (especially non-wage-earner households) have been increasing on a relative basis from the 1990s.

Average Savings Rates by Household Characteristics --Summary of Charts 2-1 to 2-5--

| Characteristics | 1991-1998 | | | | |
	← Increase (compared with the overall average) Decrease →				
1. Annual Income	Class 1	Class 2	Class 3	Class 5	Class 4
2. Scale of Enterprise	Small	Large	Medium	-	-
3. Age	30s	20s	40s	50s	60 or older
4. Age (all households)	60 or older	20s	50s	30s	40s
5. Homeownership	Owners	Non-owners	-	-	-

| Characteristics | 1997-1998 | | | | |
	← Increase (compared with the overall average) Decrease →				
1. Annual Income	Class 3	Class 2	Class 4	Class 1	Class 5
2. Scale of Enterprise	Small	Medium	Large	-	-
3. Age	30s	40s	50s	60s	20s
5. Homeownership	Owners	Non-owners	-	-	-

Notes:
1. Except as otherwise specified, all figures refer to wage-earner households.
2. "Age of the Head of Household (all households)" is based on the amount of change in savings rates from 1991 to 1997.

2-2. Household Consumption (Savings) Behavior by Household Characteristics Based on the *Public Opinion Survey on Household Savings and Consumption*

This section employs the data collected for the *Public Opinion Survey on Household Savings and Consumption* to analyze household consumption (savings) behavior by household characteristics.[5] Specifically, statistical analyses are conducted on the trends of answers given by individuals to questions regarding the actual increase or decrease in consumption over the past year and the expected increase or decrease in consumption during

---

[5] The data was processed and analyzed with the cooperation of the Central Council for Savings Information.

the coming year. For example, whether it is unlikely that an individual with a low annual income answers that he or she plans to increase his or her consumption is analyzed.

The data for the *Public Opinion Survey on Household Savings and Consumption* is used here because ① the sample population is large, which makes it possible to lessen the bias in the estimation, and ② there are various statistical problems with the *Family Income and Expenditure Survey* and the *Family Savings Survey*, as noted in Footnote 1, and there is a need to support the characteristics presented in Section 2-1, above, from a different perspective.

The ordered probit model is a representative technique for the analysis of public opinion survey data. This model is a method to estimate the influence of each of the respondents' characteristics (annual income level, age, home ownership, residence area, etc.) on the replies to a given question item in an ordered response format (e.g., "increased consumption," "did not change consumption," "decreased consumption"). Please refer to Appendix for the details of the ordered probit model.

Present (1998) household consumption (savings) behavior is analyzed using the ordered probit model. The estimation formula is set as follows.[6]

Estimation Formula (All Households)

$c^* = a_1 *$ income $+ a_2 *$ age $+ a_3 *$ home $+ a_4 *$ area

$c = 0 \ (c^* < \gamma_1)$

$c = 1 \ (\gamma_1 \leq c^* < \gamma_2)$

$c = 2 \ (\gamma_2 \leq c^*)$

c: Increase or decrease in consumption from 1997 to 1998 (0: decreased, 1: unchanged, 2: increased)

income: Respondent's annual income (from a minimum of ¥600,000 to a maximum of ¥50 million)

age: Respondent's age (20s, 30s, 40s, 50s, 60-64, 65-69, 70 or older)[7]

---

[6] The ordered probit model assumes a standard normal distribution for the distribution of the error term, and the domain of the distribution is divided into three areas in accordance with the answers to the questionnaire. In the estimation formula, the terms γ_1 and γ_2 can be considered as imaginary points on the horizontal axis that determine the extent of these areas (please refer to Appendix).

[7] The numbers, 25, 35, 45, 55, 62.5, 67.5, and 72.5, are corresponded respectively to each of the age segments.

home: Respondent's home ownership status (0: homeowner, 1: non-homeowner)

area: Respondent's residence area (1: major city, 2: city with at least 40,000 households, 3: city with at least 20,000 but less than 40,000 households, 4: city with at least 10,000 but less than 20,000 households, 5: city with less than 10,000 households, 6: town, village, or county area).

The estimation results presented in the following table show that for the increase of consumption from 1997 to 1998, annual income (parameter a_1) has a statistically significant, positive effect. Individuals with a high (low) annual income have a high (low) probability of increasing their consumption. The respondent's age (parameter a_2) has a statistically significant, negative effect whereby the probability of an increase in consumption declines with the respondent's age. No statistically significant relationship is found between changes in consumption and the respondent's home ownership status or residence area, that is to say, parameters a_3 and a_4 are not significant. To summarize, there is a low probability that low-income and elderly individuals increase their consumption from 1997 to 1998 (that is, there is a high probability that they increase their savings).[8]

Estimation Results (1) Using the Ordered Probit Model

	a_1	a_2	a_3	a_4	γ_1	γ_2	Pseudo-R^2
97 to 98	0.0003	-0.0124	0.0045	0.0065	-1.1574	0.2534	0.013
	(4.37)	(-7.58)	(0.09)	(0.61)	(-12.40)	(2.76)	
	<0.00>	<0.00>	<0.93>	<0.54>	<0.00>	<0.01>	

Notes:
1. Estimated using the maximum likelihood method. Sample number: 3,416 (excluding the data from individuals who give no response for their annual income).
2. Figures in parentheses show the z value (the asymptotic t value). Figures in brackets show the p value (the probability of each parameter being zero). The shadowed areas have a significance level of five percent.

Next, the model is used to verify if the same trends hold true for expected consumption from 1998 to 1999. The same estimation formula is used, except that the dependent variable

---

[8] While Section 2-1, above, analyzes average household savings rates, the analysis in this section (whether or not there is a significant decrease in consumption or a significant increase in savings) only addresses the partial numerator, and thus caution must be exercised in directly linking the two results. Considering that the average annual income (the partial denominator) of the 1998 survey does not show a large decrease from the previous

c is changed to "projected increase or decrease in consumption from 1998 to 1999" (0: decrease, 1: no change, 2: increase). The estimation results presented in the following table show that while the significance level itself declines, the higher (lower) the annual income, the greater (lesser) the probability of increasing consumption, and that the older the respondent, the lesser the probability of increasing consumption. Thus, through 1999 as well, there is a strong desire to limit consumption (increase savings) among low-income and elderly individuals. The respondent's residence area (parameter a_4) has a statistically significant, negative effect on expected consumption whereby the smaller the population of the residence area, the stronger the likelihood to limit consumption.[9]

Estimation Results (2) Using the Ordered Probit Model

	a_1	a_2	a_3	a_4	γ_1	γ_2	Pseudo-R^2
98 to 99	0.0001 (1.42) <0.16>	-0.0039 (-2.30) <0.02>	-0.0266 (-0.53) <0.60>	-0.0288 (-2.60) <0.01>	-0.5634 (-5.97) <0.00>	1.0731 (11.27) <0.00>	0.003

Notes:
1. Estimated using the maximum likelihood method. Sample number: 3,416 (excluding the data from individuals who give no response for their annual income).
2. Figures in parentheses show the z value (the asymptotic t value). Figures in brackets show the p value (the probability of each parameter being zero). The shadowed areas have a significance level of five percent.

The analyses in this chapter confirm that the low-income and elderly households perceive some sort of uncertainty (risk) regarding the future, and have been increasing their savings rates since 1990, and especially at present. Moreover, the analyses verify that these households continue to have a strong desire to increase their savings into the future. The following chapters narrow the focus to the low-income and elderly households, and analyze the causes of the risk perceived by these households and the contents of this risk in somewhat greater detail.

---

year (refer to the bottom tables in Chart 5), by itself the increase or decrease in consumption (savings), which is the numerator, provides general support to confirm the present developments in average savings rates.
[9] Looking at the survey data used here in greater detail, in general the smaller the populations of the residence areas where the respondents live, the more likely that they belong to the low-income or elderly segments, and this may partially explain this tendency.

3. Risk Perceived by the Low-income Households and Causes of this Risk

3-1. Risk Perceived by the Low-income Households

In this section the risk perceived by the low-income households is verified based on estimations. First, looking at the income prospects over the next half-year by annual income (Chart 3-1), at present the lower the income, the greater the perceived deterioration of the near-future income environment (the expected nominal income growth), but this relatively pessimistic outlook of the low-income households is not specific to the 1990s. Next, the income risk by annual income (dispersion of the expected real income growth rate[10]) is calculated using the Carlson-Perkin Method as introduced in "Recent Personal Consumption Trends" in the June 1998 issue of the *Bank of Japan Monthly Bulletin* (Chart 3-2). The results show that during the 1980s there was little perception of income risk among all income segments. From 1990, however, there began to be a perception of income risk in each segment, and at present the lower the income level, the greater the increase in uncertainty regarding future income.[11]

In addition to the future income environment and income risk, the real interest rate is another factor determining savings rates. The influence of the real interest rate on savings can be broadly divided into the substitution effect (the effect whereby present savings are increased because it is advantageous to restrict present consumption and increase savings when the real interest rate rises) and the income effect (the effect whereby present consumption (savings) is increased (decreased) when the real interest rate rises, because even if future salary income remains unchanged the interest income from savings increases and the total lifetime income increases). Savings behavior depends on the relative magnitude of these two effects, and thus it is said that no sweeping generalizations can be made regarding the influence of the real interest rates on savings rates.

---

[10] The following example illustrates why the dispersion of income may be used to indicate the uncertainty (risk) regarding the future. If the next year's income of a given household is defined as ¥5 million and the probability of realizing incomes of ¥4 million or ¥6 million are both 50 percent, the expected income is ¥5 million in both cases. Nevertheless, because the dispersion (uncertainty) is greater in the latter case, and assuming risk-averse household behavior, even when the expected income is the same there is an incentive to reduce present consumption (to increase savings).

[11] While the perception of income risk in high-income households is presently at a low level, there were sporadic high figures from 1993 through 1995. This may be influenced by ① the bias that occurs in subdividing the entire sample (approximately 5,000 households), and ② the sensitive reaction to the large decline in stock and land prices following the collapse of the bubble economy by high-income households, which own a relatively large amount of stocks and other market-risk assets.

Here, using time series data, the savings rate functions are estimated to measure the influence of the real interest rate, the future income environment, and the income risk on average savings rates by annual income segment (low-, middle-, and high-income households).

Estimation Formula

$s_{it} = b_{i0} + b_{i1} * r_t + b_{i2} * yf_{it} + b_{i3} * risk_{it}$

s_i: Average savings rate in the ith household (seasonally adjusted)

r: Real interest rate (short-term prime rate,[12] computed in real terms using the CPI (general, seasonally adjusted) for all households)

yf_i: Future income environment for the ith household (the figures presented in Chart 3-1, seasonally adjusted)

$risk_i$:   Income risk for the ith household (the figures presented in Chart 3-2)

i: Three categories: low-, middle-, and high-income households

The estimation results presented in the following table indicate the following characteristics. ① The overall model fitness ($adjR^2$) is generally good at 61-69 percent. ② Particularly for the low- and middle-income households, income risk (parameter b_3) functions as a factor that significantly increases savings rates. On the other hand, ③ when members of high-income households determine their own savings rates, they do not have much of a perception of the income risk.[13] Rather, ④ the influence of the income effect from the real interest rate (parameter b_1) is somewhat stronger on high-income households while there is no statistically significant relationship found for the low- and middle-income households. Additionally, ⑤ for the middle- and high-income households, the constant terms (parameter b_0) have a positive significant effect, implying that there are factors that determine savings rates independent of the three independent variables adopted here (such as frugality).

---

[12] The interest rates that households are aware of are those on bank deposits. However, due to the liberalization of bank deposit rates and other developments, it is difficult to obtain long-term time series data on bank deposit rates, so here the short-term prime rate is used as a proxy for bank deposit rates.

[13] During the estimation period (the second quarter of 1976 through the fourth quarter of 1998), the average age of the head of household was 37.7-43.5 years for the low-income households, 39.2-45.9 years for the middle-income households, and 46.4-51.4 years for the high-income households, and it appears that income risk, which is an independent variable in the above estimation formula, is determined by an entirely different factor than age.

<u>Estimation Results for the Average Savings Rate Functions by Annual Income Segment</u>

	b_0	b_1	b_2	b_3	AR1	adjR^2	S.E./B-G
Low-income	9.79	0.10	0.07	0.29	0.65	0.69	1.79
<Class 1>	(2.00)	(0.97)	(0.68)	(2.86)	(7.80)		0.447
Middle-income	17.87	-0.07	0.07	0.44	0.62	0.61	1.77
<Class 3>	(3.56)	(-0.66)	(0.66)	(4.18)	(7.12)		0.013
High-income	28.81	-0.23	-0.01	0.11	0.72	0.63	1.80
<Class 5>	(5.64)	(-2.37)	(-0.14)	(1.66)	(10.86)		0.012

Notes:
1. A first order serial correlation is assumed for the error term, and it is estimated using the maximum likelihood method.
2. The estimation period runs from the second quarter of 1976 through the fourth quarter of 1998.
3. Figures in parentheses show the t value. S.E. is the estimated standard error of the equation. The shadowed areas have a significance level of one percent.
4. B-G is the p value for the Breusch-Godfrey serial correlation test. (H_0: no serial correlation in the error terms; tested selecting one and two lags). The higher the p value, the lower the possibility of rejecting the null hypothesis. The null hypothesis could not be rejected with the significance level of one percent.

3-2. Classification of Low-income Households: Two Types of Low-income Households

In Section 3-1, it was confirmed that the low-income households in particular perceive risk and are raising their savings rates. However, the annual income classifications in the *Family Income and Expenditure Survey* and other sources used for this paper are simply based on whether or not the average annual income of a given household is low at the time a particular survey is conducted, and it is not appropriate to view all low-income households as comprising a single homogeneous group. Especially, when the content of risk is analyzed as in this paper, a slightly more detailed classification of low-income households is necessary.

Here, the content of the perceived risk is analyzed classifying the low-income households into two categories: the middle-aged and elderly low-income households and the young households.

(Risk perceived by the middle-aged and elderly low-income households)

First, the savings behavior of the middle-aged and elderly low-income households is examined. Extracting the data on the low-income households (the one segment with an

annual income of less than ¥5 million[14]) from the *National Survey of Family Income and Expenditure* (Management and Coordination Agency), which is conducted once every five years, for 1984, 1989, and 1994 and examining the average savings rates further classified by the age of the head of household (Chart 4), in the most recent 1994 survey the average savings rate of the middle-aged and elderly households where the head of household is in his or her 50s rose the most compared with the two previous surveys. To conduct a similar analysis on the present conditions, taking the aggregate data from the *Public Opinion Survey on Household Savings and Consumption* for 1998 regarding the low-income households (the one segment with an annual household income of less than ¥5 million[15]) and examining the net increase or decrease in consumption further classified by the age of the head of household,[16] in terms of both actual results over the past one year (Chart 5-1) and prospects for the coming year (Chart 5-2), the middle-aged and elderly households where the head of household is 50-65 years old restricted, or intend to restrict, consumption the most. As the average annual income of the sample households for this survey where the head of household is under 60 years old and the annual income is less than ¥5 million was essentially unchanged from the previous year, this shows that the middle-aged and elderly low-income households in particular are increasing their savings rates from last year and intend to increase their savings rates in the future as well. To summarize the above findings, from 1990 the middle-aged and elderly low-income households have perceived some sort of risk and their savings motivation has been rising.

Then, let us consider the factors causing this perception of risk among the middle-aged and elderly low-income households. First, looking at the employment environment by age (Chart 6-1),[17] the pace of increase in the unemployment rate among the middle-aged and elderly workers aged 40-65 has been faster than that among other age workers. Throughout the 1990s, the outlook for the near future employment environment also shows greater employment anxiety among the middle-aged and elderly compared with that among the young (Chart 6-2). Moreover, considering the survey results whereby a high percentage of

---

[14] This figure is chosen because the annual income of Class 1 households in the 1994 *Family Income and Expenditure Survey* is less than ¥4.87 million.
[15] This figure is chosen because the annual income of Class 1 households in the 1998 *Family Income and Expenditure Survey* is less than ¥4.94 million.
[16] The data was processed and analyzed with the cooperation of the Central Council for Savings Information.
[17] The analyses in Chart 6 are limited to the middle-aged and elderly households as a whole due to data limitations.

middle-aged and elderly workers has been dismissed at their company's convenience (i.e., for "restructuring," Chart 6-3), the risk perceived by the middle-aged and elderly (low-income) workers includes the possible bankruptcy of the firms where they are employed (primarily small enterprises) and employment anxiety over possible job loss from restructuring.

(Risk perceived by the young households)

Next, the savings behavior of the young households is examined. As noted above, the young households do not perceive much risk in terms of employment anxiety compared with the middle-aged and elderly households. Nevertheless, as indicated by Chart 2-3, the savings rate of the young households has been increasing from 1990, so it is also necessary to examine the content of the risk perceived by members of the young households, who are in their 20s and 30s.

Then, let us consider the factors causing this perception of risk among the young households. According to a questionnaire survey on post-retirement lifestyle (Chart 7-1), the percentage of individuals in the young households centered around those in their 20s who respond that they "feel some anxiety regarding their post-retirement livelihood" is increasing rapidly for both men and women. This is apparently related to the fact that the young households are the ones that view the problems with pension systems most seriously. It is over the past 3 or 4 years that leading magazines and other publications have been focusing on the problems with pension systems and that there has begun to be a widespread awareness of these problems throughout society (Chart 7-2). The perceptions of problems with pension systems by age indicate that the young households in their 20s and 30s view the situation most seriously (Chart 7-3). The main reasons cited for this are, overwhelmingly, "future reductions in pension benefits" and "raising the age from which pension benefits will be paid." Based on the above findings, it appears that the members of young households are increasing their precautionary savings because they are pessimistic about future pension benefits and believe that this will result in a decrease in their lifetime incomes.

4. Savings Behavior of the Elderly Households

In the average saving rates by age presented in Charts 2-3 and 2-4, from 1990 the households showing the highest increase in savings rates are the elderly households (especially non-wage-earner households).

Generally, the life-cycle hypothesis dictates that the savings rates of elderly households should be lower than the average for all households, because after retirement the elderly consume the assets they have accumulated during their working lives. Nevertheless, the average savings rate among elderly Japanese has actually been higher than the average for all households since the late 1980s (Chart 8-1). Also, comparing average saving rates by age between Japan and the United States (Chart 8-2), in Japan from 1990 the older the head of household, the higher the savings rate,[18] while in the United States from the late 1980s elderly households have consistently been consuming their savings.

Moreover, the financial assets per household by age remain virtually unchanged between ages 60-64 and ages 65 and above (Chart 9-1), so there are no signs that the elderly are consuming their savings. In contrast, in the United States, while there is no category of households 60 and above, those aged 65 and above do consume a substantial amount of their savings. Also, the Japanese figures for total assets including land, housing, and other real assets show that total household assets continue to accumulate along with the age of the head of household (Chart 9-2(1)), so once again the proposition that the elderly consume their assets cannot be confirmed.[19]

---

[18] Regarding the pattern whereby the savings rates are not declining even when individuals grow old, Yashiro and Maeda (1994) use the data from the *National Survey of Family Income and Expenditure* (1989) and assert that the savings rate among the elderly turns negative and the life-cycle hypothesis holds true if the savings rates by age are recalculated considering ① the behavior of other elderly living in the young and middle-aged households (the age segment data in the *Family Income and Expenditure Survey* and the *Family Savings Survey* are classified solely by the age of the head of household) and ② the imputed rent for owner-occupied homes, etc. While this analysis by Yashiro and Maeda (1994) has certain problems in that data for self-employed and other non-wage-earner households are not considered, the consideration of item ① is particularly important (Hayashi, Ando and Ferris (1988) point out the importance of item ①). Nevertheless, as the 1989 survey reflects the conditions at the peak of the bubble economy period when the savings rates of elderly households, which tend to hold more assets than other households, were not that high, there is a possibility that the savings rates of the elderly at that time turn negative after adjustments for items ① and ②, etc. In contrast, in this paper, using the data from the 1994 survey on the savings rates by age for all households including people living alone (Chart 8-2), the savings rate of the elderly households is 10-15 percentage points higher than those of other households. Thus, even after making adjustments such as for items ① and ②, etc., the savings rate of the elderly would not turn negative for 1994.

[19] The majority of the assets held by elderly Japanese are housing, residential land and other real assets (Chart 9-2(2)).

Henceforth, Japan will experience a full-fledged aging of society (Chart 10-1) and the percentage of elderly households is projected to increase (Chart 10-2). Amid these trends, if the savings rates of elderly households remain at a high level, in other words, if elderly households maintain a consistent stance against consuming their assets, as at present, there is a possibility that the household savings rate of the entire Japanese economy may increase.

5. Risk Perceived by the Elderly Households

5-1. Verification of the Life-cycle Hypothesis

Why is it that elderly Japanese continue to save?

First, let us assume that the elderly are the household sector where the head of household is 65 or older as of 1997. The relationship between life cycle and net savings balance shows that the elderly steadily increase their savings during their working lives (Chart 11-1). Further supposing that they retire at age 60, their savings increase rapidly for several years before and after retirement.[20] Thereafter, once they surpass age 65 they do begin to consume their savings, but the amount is insignificant. Additionally, looking at the gap between the amount of savings actually held by the elderly and their savings targets (Chart 11-2), at present there is an average shortfall of ¥10.73 million for households where the head of household is in his 60s and ¥7.42 million for households where the head of household is 70 or older. These data show a substantial difference versus the pure life-cycle hypothesis which dictates that individuals will consume their assets after retirement so that their assets will decline to zero at the time of death.

5-2. Motivation to Leave behind an Estate

In speculating why the elderly do not consume their assets, the first possibility might be the motivation to leave behind an estate for their descendents. In other words, it is not plausible for individuals with a strong intention to leave behind the assets they saved during their working lives as a bequest to consume their assets.

---

[20] This is most likely because at this point in life individuals often ① receive lump-sum retirement benefits and ② inherit assets from their parents, etc.

However, a survey on the savings purposes of elderly Japanese shows that only about six percent of both individuals in their 60s and those 70 or older have a positive intention to leave behind their own savings as a bequest for their descendants (Chart 12-1).[21] On the other hand, just over 10 percent of the individuals in their 20s, 30s, and 40s who will be inheriting the estates explicitly expect to inherit assets from their parents (Chart 12-2(1)).[22] Thus, the inheritance issue does not have that great an influence on savings rates among the elderly who will be bequeathing the assets or among the young and middle-aged who will be receiving the assets, at least not before the assets are actually inherited.

BOX: Expansion of the Life Cycle Hypothesis

This box introduces the discussion of expanding the pure life-cycle hypothesis (Horioka (1993), Hayashi (1998)). The expanded life-cycle hypothesis maintains that when individuals present gifts or leave an estate to their descendants, this is actually a compensation for some sort of monopolistic service from them (e.g., nursing care when this service becomes necessary, or some other tangible or intangible assistance), and that if the parents, who are generally elderly, define the inheritance of their assets after death as a lump-sum payment for such services, then the life-cycle hypothesis holds true from the parent's perspective. At present, there is apparently no research that refutes this expanded life-cycle hypothesis.[23]

The key point regarding this expanded life-cycle hypothesis is whether or not a type of "strategic contract" exists between the parent and the child whereby the parent's estate represents compensation for services rendered.[24] Specifically, does the parent "expect" nursing care service and other types of assistance from his or her descendants and intentionally hold assets for his or her estate, and does the child "expect" to inherit an estate

---

[21] This question was only regarding financial assets.

[22] This question was not specifically limited to financial assets.

[23] At the opposite end of the spectrum from the life-cycle hypothesis, which does not recognize altruism – that is, which is based on pure self-interest (the doctrine that savings are only for one's own benefit) – lies the dynasty hypothesis. The dynasty hypothesis asserts that the parents and their descendents comprise a single decision-making body based on altruism, but researchers in both Japan and the United States have rejected this hypothesis (for example, refer to Altonji, Hayashi and Kotlikoff (1992), Hayashi, Altonji and Kotlikoff (1996), and Hayashi (1995)).

from the parent as a matter of course as compensation for providing nursing care services and other types of assistance?

Based solely on the information presented in Charts 12-2(1) and 12-2(2), there is no strong evidence supporting the existence of such mutual "expectations" between parents and their children. More directly, according to a survey on the relationship between the amounts of bequests and the post-retirement care given by children (Chart 12-2(3)), only about 20 percent of individuals 60 or older clearly responded that "the amount of my bequests will change depending on whether or not I am provided with care during old age."

Thus, even if the parents have some bequest motive, it is difficult to claim that this represents a strategic bequest motive whereby the parents have positive "expectations" of receiving nursing care services and other types of assistance from their descendents.

5-3. Anxiety Regarding the Future: The Risk of Requiring Nursing Care

The second possible reason why the elderly do not consume their savings is that they may feel some sort of anxiety regarding their future livelihood. Even though the majority of elderly Japanese today are already receiving pension benefits and belong to a generation that can expect to continue to receive stable benefit payments, according to Chart 7-3, approximately half of the elderly believe that they "cannot live comfortably on pension benefits alone." The reason cited for this by many of the elderly is the belief that "the self-payment burden for medical care and nursing care for the elderly will increase." Moreover, as shown in Chart 12-1, the number one savings purpose among the elderly is "preparations for illness or emergencies."

Let us analyze the reasons for this perception of the risk of illness or the need for nursing care in somewhat greater detail. First, looking at a survey asking the elderly why they refrain from consuming their savings (Chart 13-1), half of the respondents replied that they "should not consume their savings unless they encounter some misfortune such as

---

[24] The tendency in the United States whereby the amount of contact (telephone calls, visits, etc.) from the child to the parent strategically determines the amount of the bequest has been verified by Bernheim, Shleifer and Summers (1985). In this paper, this inheritance motivation is referred to as the "strategic bequest motive."

becoming ill or requiring nursing care."[25] Next, is this anxiety regarding the possible future need for nursing care among Japanese elderly unusually high by international standards? The percentage of individuals who replied that they do not feel anxiety regarding the possible future need for nursing care (those who respond that they feel almost no anxiety plus those who respond that they feel no anxiety whatsoever) is lowest in Japan (Chart 13-2(1)). While the reason for this is not necessarily clear, in Japan ① it is difficult to receive nursing care on a flexible basis (Chart 13-2(2)), and ② the entrance fees for paid nursing homes are extremely high (an average of approximately ¥26 million for individuals entering alone; Chart 13-2(3)). Hence, there is a high probability that these problems with the social welfare system function as a strong incentive for the elderly to maintain sufficient savings to cover the high costs they will incur if they require nursing care.

Thus, along with the increase in average life expectancy, the elderly have a growing anxiety about the various burdens that increase with age, including the possibility that they may require nursing care, and this apparently leads them to increase their savings, or at least to refrain from blithely consuming their savings.[26]

6. Conclusion

The above detailed analyses of average savings rates by household characteristics confirm that from 1990, ① the middle-aged and elderly low-income households, ② the young households, and ③ the elderly households (particularly non-wage-earner households), each perceives different types of risks and this is increasing their motivation for savings. Specifically, ① the middle-aged and elderly low-income households feel anxiety regarding employment conditions (enterprise bankruptcy, restructuring, etc.); ② the young households

---

[25] In this survey as well, only about four percent of the respondents cited a positive intention to leave behind an estate for their descendants.

[26] Based on this information, let us now reconsider the inheritance issue. While the average life expectancy is increasing, this is only an average, so individuals generally include the possibility that they will live a long life beyond the average life expectancy in their life plans. Nevertheless, the majority of individuals actually die when they reach the average life expectancy, and thus the assets they saved in case they might require nursing care in the future (aside from those taken by inheritance taxes) become an accidental bequest. Such accidental bequests apparently account for a large percentage of all estates in the real world. By definition, the descendants cannot expect to receive accidental bequests beforehand, so the bequests become transitory income that is only perceived when it is actually inherited. Prior research on accidental bequests within the framework of savings theory includes that by Abel (1985).

feel anxiety regarding pension systems; and ③ the elderly households feel anxiety regarding the possible future need for nursing care.

These three types of risks represent factors that had not yet emerged or which people were not yet aware of during the 1980s. From 1990, despite the upgrading of the social security system and the aging of society, which are factors that should cause a decline in savings rate, these new types of risks appeared and their impact was greater than expected. Thus, Japan's savings rate, which was initially projected to decline from 1990, was actually pushed up into a rising trend, albeit gradual.

Considering that the aging of Japanese society will continue to progress, how to create an environment in which the elderly can consume their savings without concern is an important issue for the entire Japanese economy. Regarding this point, it will first be necessary to relieve the anxiety among the elderly regarding the possible future need for nursing care by upgrading the nursing care system.

Also, in a survey of individuals in their 50s and 60s, who will eventually become the core of the elderly, when asked about their post-retirement (future) lifestyle (Chart 14-1), the highest percentage of respondents state that they "would like to continue working for as long as possible." Considering this as well as the fact that the propensity to consume is high (the savings rate is low) among elderly workers, improving the employment environment for the elderly should stimulate consumption (the consumption of savings) by the elderly.[27]

Moreover, as shown in Chart 9-2(2), the majority of assets held by the elderly are housing, residential land, and other real assets. In Japan, because the expenses for purchasing housing are generally high, in many cases the majority of the savings by the young and middle aged are allocated for housing, residential land, and other real assets, so the accumulation of financial assets tends to occur relatively late. Given these circumstances, it will be important to arrange a system to generate liquidity from real assets so that the elderly

---

[27] As shown by the survey results presented in Chart 14-2, the elderly have a strong desire to work. Many of the respondents (individuals who have retired at least once) cited "continuous employment and other provision of employment" and "extension of the mandatory retirement age" among their demands to enterprises. Considering this situation from the labor supply aspect, that is, the strong desire to work among the elderly, some sort of revision needs to be made to the present custom whereby the mandatory retirement age is essentially set at age 60. On the other hand, in a survey asking enterprises why they do not increase their employment of elderly workers (Chart 14-3), the enterprises responded that they "do not have work that is appropriate for elderly people," and "the elderly cannot handle excessive demands because of insufficient physical strength and health."

can easily secure cash flow. As one specific measure, the use of reverse mortgages[28] could be considered. In Japan, there is presently a low level of awareness of reverse mortgages among the middle-aged and elderly (Chart 15), because ① the individuals eligible for reverse mortgages are extremely limited (for example, limited only to individuals utilizing home care services provided by public corporations in the case of public systems, or to individuals who own real estate with a minimum value of ¥100 or ¥200 million in the case of private-sector systems), and ② the reverse mortgages are not being actively promoted because the financial institutions have to deal with a high level of uncertainty regarding the time of death of the trustor. Thus, the cumulative number of such contracts to date is on the order of 300-400 contracts (Chart 16). In contrast, in the United States the cumulative number of contracts for the Department of Housing and Urban Development Home Equity Conversion Mortgage (HUD-HECM), which is the representative reverse mortgage product in that country, alone was approximately 18,000 contracts as of January 1997 (sales of the HUD-HECM were initiated from 1989). Considering that the majority of assets owned by Japanese elderly are real assets, there is clearly substantial leeway for the further utilization of the reverse mortgage system.

---

[28] Reverse mortgages are real asset conversion plans whereby the owner of housing assets (housing, residential land, etc.) – which represent the majority of the assets owned by the elderly – uses these assets as collateral for a loan, receives periodic cash payments, and the loan is paid off in a lump sum by disposing of the assets when the owner dies. The normal methods of converting real estate into cash are the sale of the real estate (in this case, the owner must pay transfer taxes and move to a different residence) or a regular loan using the real estate as collateral (in this case, the owner must make monthly loan payments). In contrast, reverse mortgage plans have clear merits in that the owner does not need to move to a different residence or to make monthly loan payments. In Japan, reverse mortgages are presently offered by 13 municipal governments such as Musashino City and Setagaya Ward (Tokyo), and by financial institutions with trust functions.

Appendix: Ordered Probit Model

The probit models is the stochastic method that is often employed for the analysis of qualitative data. Qualitative data are data that are not expressed in concrete quantitative numerals, but rather data with qualitative characteristics such as "agree" or "disagree" in the responses to questionnaire surveys. The ordered probit model is employed when there is some sort of order in the response formation for qualitative data (e.g., "increase" $\rightarrow$ "no change" $\rightarrow$ "decrease").

1. First, let Y_i be the observed value, and consider three cases for the response: 0 ("increase"), 1 ("no change"), and 2 ("decrease").

2. Next, there is a latent variable Y_i^* that determines the value of Y_i. Assume that this can be expressed by the following equation.[29]

$$Y_i^* = a_1 + a_2 X_i + \varepsilon_i \qquad \text{(Eq. 1)}$$

Here X_i is an independent variable that influences the selection of Y_i (e.g., the annual income or age of the respondent), and Equation 1 is the sum of the parts that can be systematically explained by X_i and the other parts, which are expressed by the error term ε_i. While the latent variable Y_i^* cannot be directly observed, its value is determined by the following equation.

$$Y_i = \begin{cases} 0 & \\ 1 & \text{if} \\ 2 & \end{cases} \quad \begin{cases} Y_i^* \leq \gamma_1 \\ \gamma_1 < Y_i^* \leq \gamma_2 \\ \gamma_2 < Y_i^* \end{cases} \qquad \text{(Eq. 2)}$$

The parameters γ_1 and γ_2 in Equation 2 may be considered as points on the horizontal axis that determine the domain of the probability distribution (domain 0, domain 1, and

---

[29] For simplification, only one independent variable is included. The following theory remains exactly the same when there are multiple independent variables.

domain 2). Like parameters a_1 and a_2 in Equation 1, these are unknown parameters that can be estimated from the actual data.

3. Assume that the error term ε_i in Equation 1 follows a standard normal distribution.[30] If $F(\bullet)$ is the cumulative distribution function where $-\varepsilon_i = a_1 + a_2 X_i - Y_i^*$, the conditional probabilities that $Y_i = 0$, 1, or 2, respectively, can be expressed by the following equations.

$\Pr (Y_i = 0; X_i, a, \gamma) = 1 - F(a_1 + a_2 X_i - \gamma_1)$

$\Pr (Y_i = 1; X_i, a, \gamma) = F(a_1 + a_2 X_i - \gamma_1) - F(a_1 + a_2 X_i - \gamma_2)$ (Eq. 3)

$\Pr (Y_i = 2; X_i, a, \gamma) = F(a_1 + a_2 X_i - \gamma_2)$

4. Finally, the four parameters in Equation 3 (a_1, a_2, γ_1, γ_2) are estimated using the maximum likelihood method. In this case, the log likelihood function (LLF) for Y_i becomes the expression in Equation 4.

$$LLF(a, \gamma) = \log \prod_{Y_i=0} \Pr(Y_i = 0; X_i, a, \gamma) + \log \prod_{Y_i=1} \Pr(Y_i = 1; X_i, a, \gamma)$$

$$+ \log \prod_{Y_i=2} \Pr(Y_i = 2; X_i, a, \gamma) \qquad\qquad (\text{Eq. } 4)$$

Thus, the four parameters can be partially differentiated, set at zero, and the answer when the LLF for Equation 4 is maximized is the estimated maximum likelihood value for each parameter.

---

[30] When it is assumed that the error term ε_1 follows a logistic distribution, this is called an ordered logit model.

References

[English Language]

Abel, A. B.(1985), "Precautionary Saving and Accidental Bequests," *American Economic Review, Vol.75*.

Altonji, J., Hayashi, F. and Kotlikoff, L.(1992), "Is the Extended Family Altruistically Linked? Direct Tests Using Micro Data," *American Economic Review, Vol.82*.

Altonji, J., Hayashi, F. and Kotlikoff, L.(1995), "Parental Altruism and Inter Vivos Transfers: Theory and Evidence," *NBER Working Paper 5378*.

Banks, J., Blundell, R. and Tanner, S.(1998), "Is There a Retirement-Savings Puzzle?," *American Economic Review, Vol.88*.

Barro, R. J. and Friedman, J. W.(1977), "On Uncertain Lifetimes," *Journal of Political Economy, Vol.85*.

Bernheim, B. D., Shleifer, A. and Summers, L. H.(1985), "The Strategic Bequest Motive," *Journal of Political Economy, Vol.93*.

Carlson, J. A. and Parkin, M.(1975), "Inflation Expectation," *Economica 42*.

Carroll, C. D. and Samwick, A. A.(1998), "How Important is Precautionary Saving?," *Review of Economics and Statistics, Vol.LXXX*.

Hayashi, F.(1986), "Why Is Japan's Saving Rate So Apparently High?," in S. Fischer, ed., *Macroeconomics Annual, Vol. 1, National Bureau of Economic Research*.

Hayashi, F., Ando, A. and Ferris, R.(1988), "Life Cycle and Bequest Savings," *Journal of the Japanese and International Economies, 2*.

Hayashi, F.(1995), "Is the Japanese Extended Family Altruistically Linked? A Test Based on Engel Curves," *Journal of Political Economy, Vol.103*.

Hayashi, F., Altonji, J. and Kotlikoff, L.(1996), "Risk-sharing between and within Families," *Econometrica, Vol.64*.

Hayashi, F.(1998), "Understanding Saving," *MIT Press*.

Higgins, M.(1998), "Demography, National Savings and International Capital Flows," *International Economic Review, Vol.39, No.2*.

Horioka, C. Y.(1984), "The Applicability of the Life-Cycle Hypothesis of Saving to Japan," *The Kyoto University Economic Review, 54, No.2*.

Horioka, C. Y.(1989), "Why Is Japan's Private Saving Rate So high?," *In Ryuzo Sato and Takashi Negishi (eds.), Developments in Japanese Economics. Tokyo : Academic Press / Harcourt Brace Jovanovich Japan, Inc.*.

Horioka, C. Y.(1993), "Saving in Japan," in Heertje, A., eds., *World Savings, Blackwell Publishers, UK / USA*.


[Japanese Language]

Economic Planning Agency (1998), *Fiscal Year 1998 Annual Economic Report*, July 1998.

Bank of Japan Research and Statistics Department (1998), "Recent Personal Consumption Trends," *Bank of Japan Monthly Bulletin*, June 1998.

Ueda, K. and Ono, M. (1993), "The Enigma of Household Savings Rates Movements: Regarding the Inconsistency between Household Surveys and National Accounts," *Monetary Research*, Vol. 12 No. 2; Bank of Japan Institute for Monetary and Economic Studies.

Yashiro, M. and Maeda, Y. (1994), "The Appropriateness of the Life-cycle Hypothesis in Japan," *Japan Economic Research*, No. 27.

(Chart 1)

Household Savings Rates
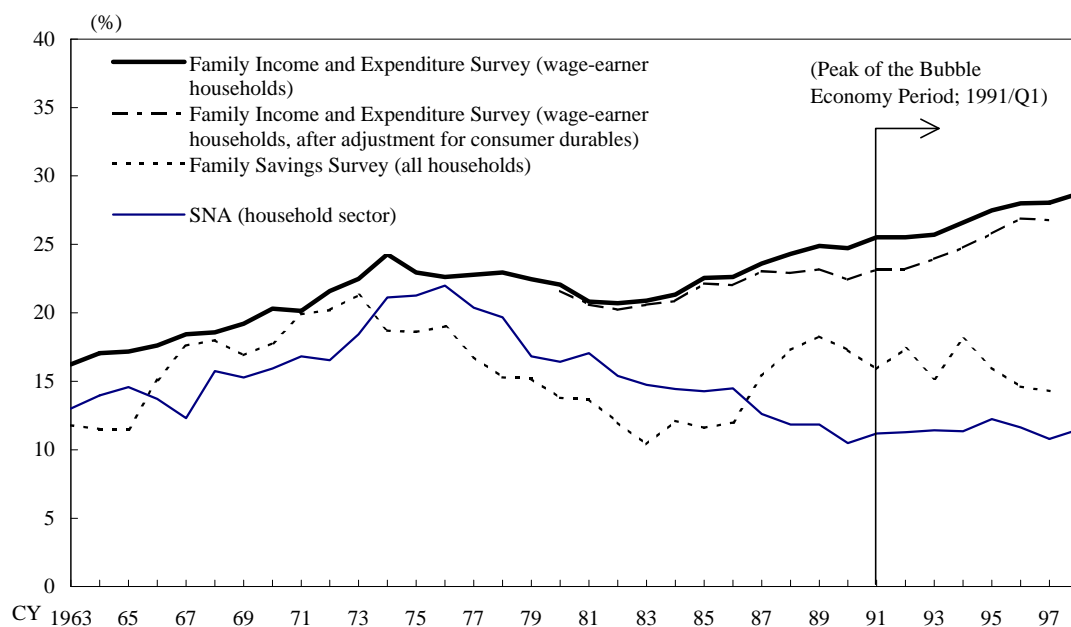
Notes:
1. The 1998 *SNA* figure is adopted for the 1st quarter 1998 *SNA* figure.
2. The savings rates are defined as follows, and this definition is used unless otherwise specified.
   For the *Family Income and Expenditure Survey* and the *SNA* : (1-expenditures / disposable income) × 100.
   For the *Family Savings Survey* : (savings amount / annual income) × 100.
3. "After adjustment for consumer durables" refers to the savings rate after expenditures are recalculated
   assuming that the percentage of consumer durables in total expenditures in the *Family Income and
   Expenditure Survey* is the same as that in the *SNA* (refer to the following reference chart).

(Reference Chart)

Percentage of Consumer Durables and Service Expenditures in Total Expenditures

(Consumer Durables)   (Service Expenditures)
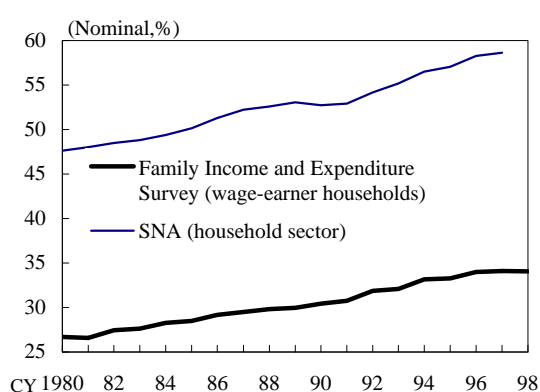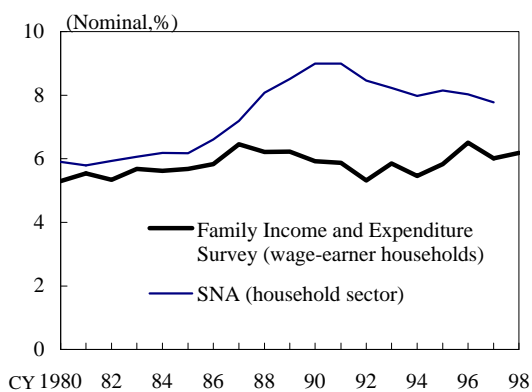
Source: Economic Planning Agency, "*System of National Accounts* ," Management and Coordination Agency,
        "*Family Income and Expenditure Survey* " and "*Family Savings Survey* ."

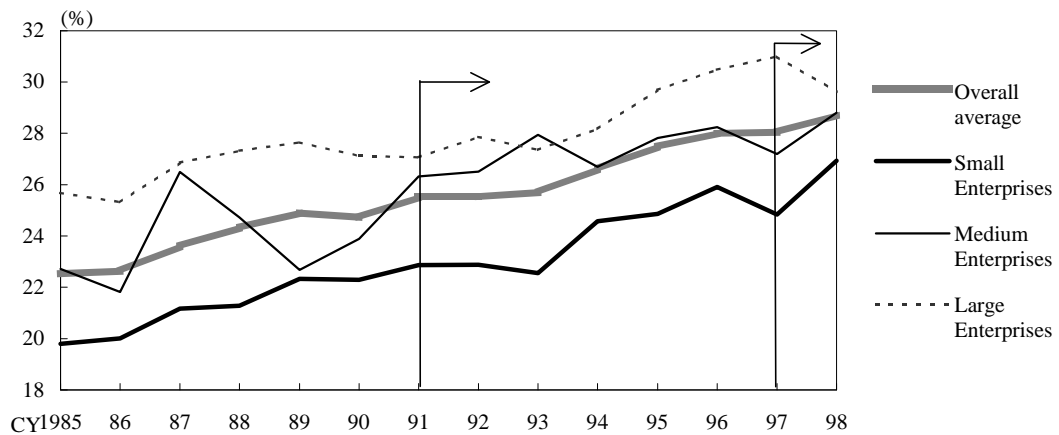(Chart 2)

Average Savings Rates by Household Characteristics

1. By Annual Income (wage-earner households)
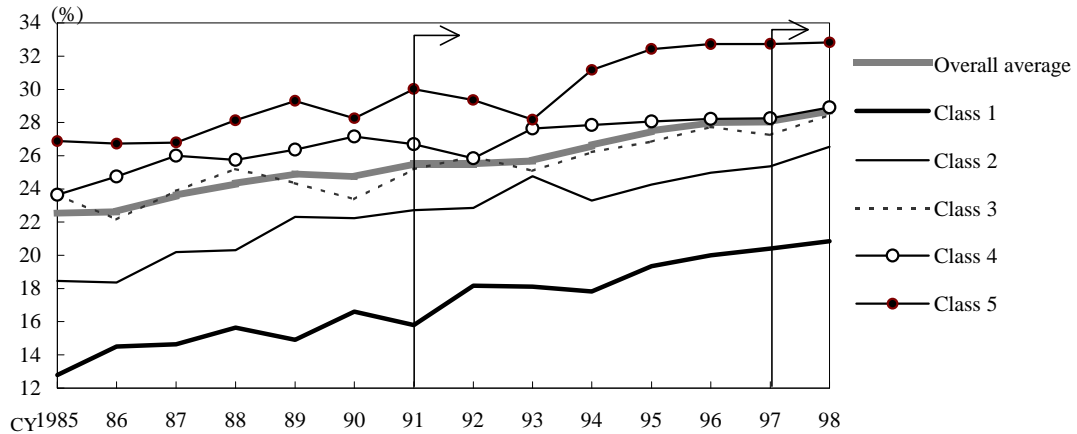
Change in the segment savings rate - change in the overall average (percentage points)

	Class 1	Class 2	Class 3	Class 4	Class 5
1991-1998	1.9	0.6	0.1	-0.9	-0.4
1997-1998	-0.2	0.5	0.6	0.0	-0.6

2. By Scale of the Enterprise Where the Head of Household is Employed
    (wage-earner households)

Change in the segment savings rate - change in the overall average (percentage points)

|	Small Enterprises	Medium Enterprises	Large Enterprises
1991-1998	0.9	-0.7	-0.6
1997-1998	1.4	1.0	-2.0

Notes:
Small Enterprises: enterprises with less than 300 employees.
Medium Enterprises: enterprises with 300 to less than 1,000 employees.
Large Enterprises: enterprises with 1,000 or more employees.
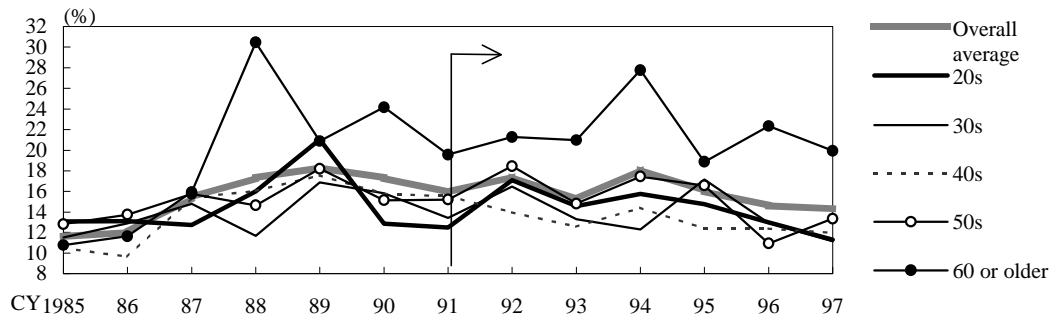
(Chart 2 continued)

3. By Age of the Head of Household (wage-earner households)
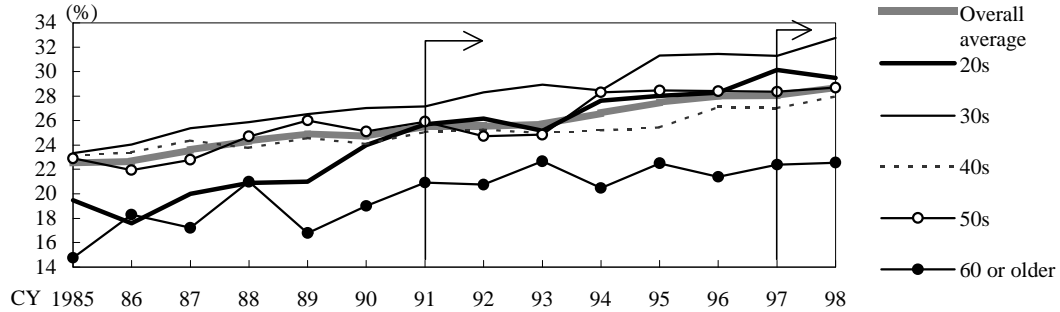
Change in the segment savings rate - change in the overall average (percentage points)

	20s	30s	40s	50s	60 or older
1991-1998	0.6	2.4	-0.3	-0.4	-1.5
1997-1998	-1.3	0.8	0.3	-0.3	-0.5

4. By Age of the Head of Household (all households)

Change in the segment savings rate - change in the overall average (percentage points)

	20s	30s	40s	50s	60 or older
1991-1997	0.4	-0.7	-2.0	-0.3	2.0

5. By Home Ownership (wage-earner households)
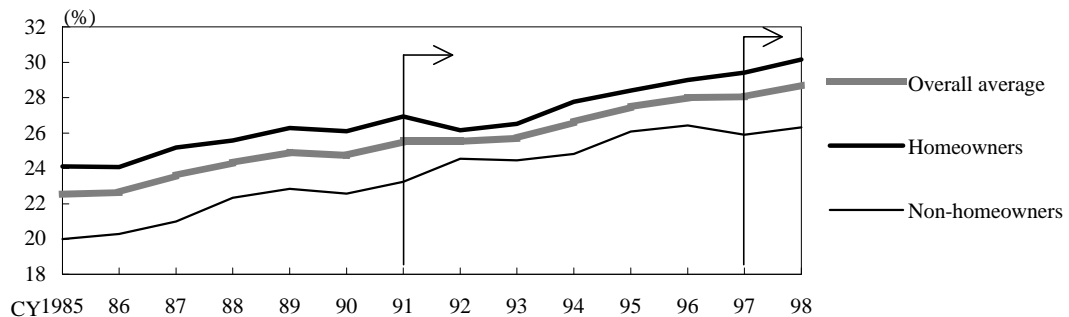
Change in the segment savings rate - change in the overall average (percentage points)

|	Homeowners	Non-homeowners
1991-1998	0.0	-0.1
1997-1998	0.1	-0.2

Notes:
 The average savings rate for non-homeowners is calculated by subtracting the average savings rate of
 homeowners from the total, based on the home ownership ratio, etc.

Source: Management and Coordination Agency, "*Family Income and Expenditure Survey*" and "*Family Savings
        Survey*."
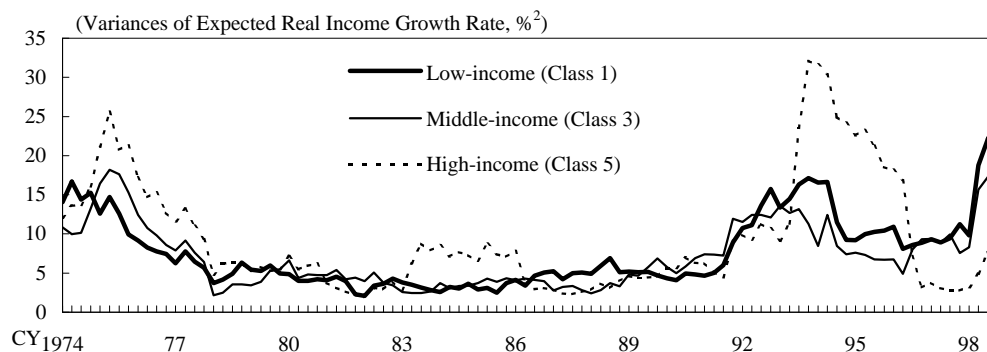
(Chart 3)

Future Income Environment by Annual Income

1. Income Prospects Over the Next Half-year
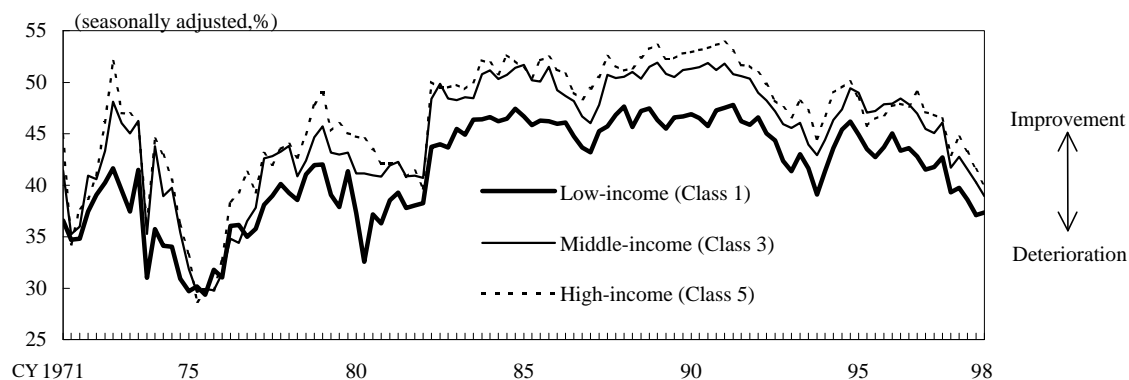
Notes:
1. There are five responses to the question asking how income growth will change over the next half-year (figures prior to the 1st quarter of 1991 are for the next full year): "improve," "improve slightly," "remain unchanged," "deteriorate slightly," and "deteriorate." The index is calculated by assigning weights of 1.0, 0.75, 0.5, 0.25, and 0 to each of these responses, respectively.
2. The sample is divided into five categories based on annual income levels from lowest to highest (class 1 through class 5). The lowest class is defined as the low-income households (annual income of less than ¥4 million (as of the 4th quarter 1998 survey)), the middle class as the middle-income households (annual income of ¥5.5 to less than ¥7.5 million), and the highest class as the high-income households (annual income of ¥9.5 million or more). From the 2nd quarter of 1994, the sample is divided into seven categories, so the lowest two classes and the highest two classes are combined into the low-income households and the high-income households, respectively, using weighted averages in line with the number of households in each class.

2. Income Risk

Notes:
1. Variances of expected real income growth rate calculated using the Carlson-Perkin Method.
2. Refer to Note 2 to the above chart for the income segment classification.

Source: Economic Planning Agency, "*Consumer's Behavior Survey*," Management and Coordination Agency, "*Family Income and Expenditure Survey*" and "*Consumer Price Index*."

(Chart 4)

# Average Savings Rates of the Low-income Households by Age of the Head of Household
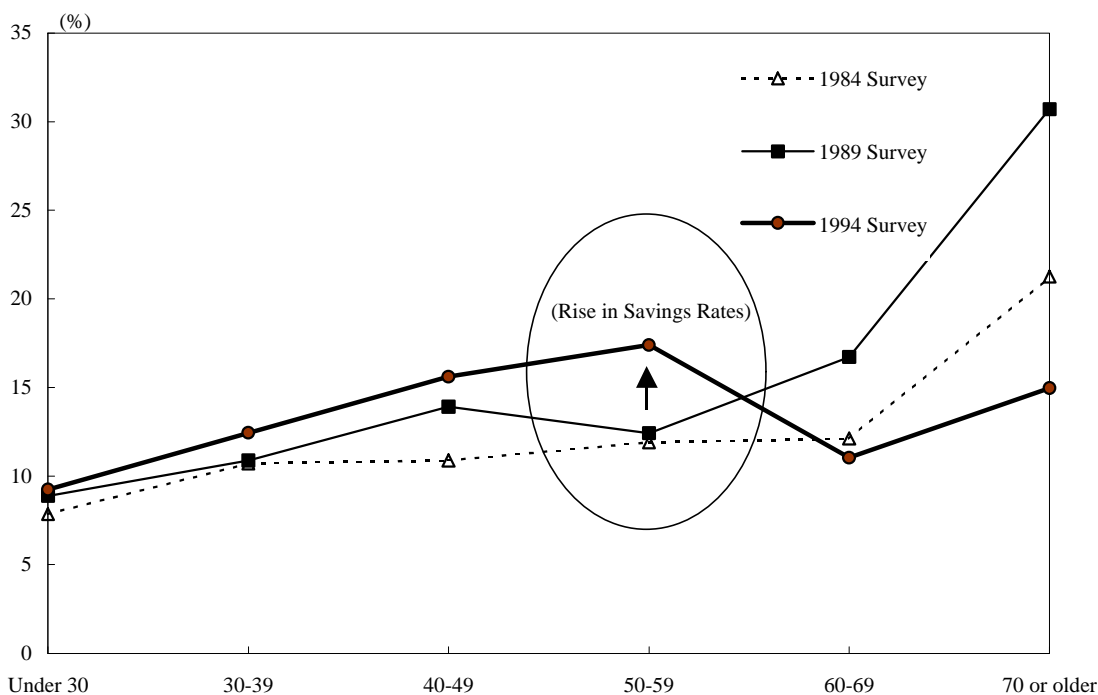
Notes:
 1. Wage-earner households with at least two people. Calculated by (100 - the average propensity to consume).
 2. Aggregated by extracting the wage-earner households with annual incomes of less than ¥5 million from all
    samples and using the weighted average for the number of such households.

Source: Management and Coordination Agency, "*National Survey of Family Income and Expenditure* ."

(Chart 5)

# Expenditure Stance of Low-income Households by Age

1. Net Increase or Decrease in Expenditures over the Past Year (1997 to 1998)
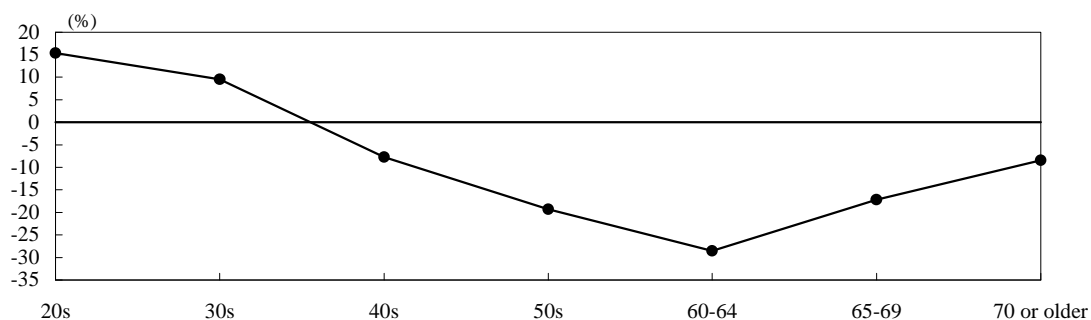
Notes:
1. (Percentage of households that increased expenditures) - (percentage of households that decreased expenditures).
2. Aggregate data for households with an annual income of less than ¥5 million.

2. Projected Net Increase or Decrease in Expenditures over the Coming Year (1998 to 1999)
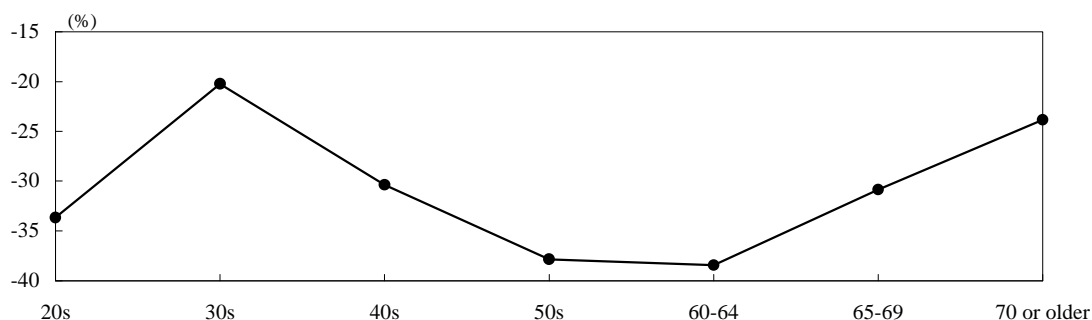
Notes:
1. (Percentage of households that plan to increase expenditures) - (percentage of households that plan to decrease expenditures).
2. Aggregate data for households with an annual income of less than ¥5 million.

(Reference Charts)

Average Annual Income Distribution by Age of the Head of Household and by Income

	Average Annual Income (¥10,000)	
	1997	1998
20s	390	395
30s	509	508
40s	634	629
50s	726	691
60s	576	516
70 or older	487	425
Total	605	576

	Average Annual Income (¥10,000)	
	1997	1998
Less than ¥2m	140	140
¥2m - ¥3m	238	240
¥3m - ¥4m	329	333
¥4m - ¥5m	427	427
¥5m - ¥7m	565	565
¥7 - ¥10m	789	791
¥10m or more	1,317	1,292
Total	605	576

Source: Central Council for Savings Information, "*Public Opinion Survey on Household Savings and Consumption*."

(Chart 6)

Employment Environment by Age

1. Unemployment Rate

(%)

|	1975	1980	1985	1990	1991	1998	Change 1991-1998 (# of times)
39 or younger	2.13	2.33	3.09	2.74	2.82	5.35	1.90
40-54	1.34	1.34	1.72	1.29	1.28	2.55	1.99
55-64	2.40	2.86	3.79	2.68	2.44	5.00	2.05
65 or older	1.36	1.43	1.53	0.93	1.03	1.97	1.92
Total	1.89	2.01	2.62	2.11	2.10	4.11	1.96

2. Future Employment Income Environment (Percentage of Households Responding that the Employment Environment Will Deteriorate over the Next Half-year)
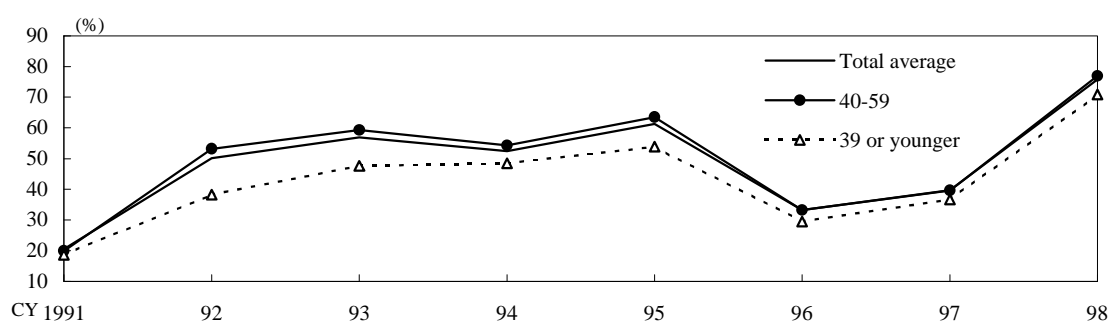
Notes:
1. The figures for individuals 39 or younger are the simple average of those for individuals under 30 and those for individuals 30-39; the figures for individuals 40-59 are the simple average of those for individuals 40-49 and those for individuals 50-59.
2. The figures for each year are those from the June survey.

3. Percentage of Workers Dismissed at their Companies' Convenience (1994-1996 average)
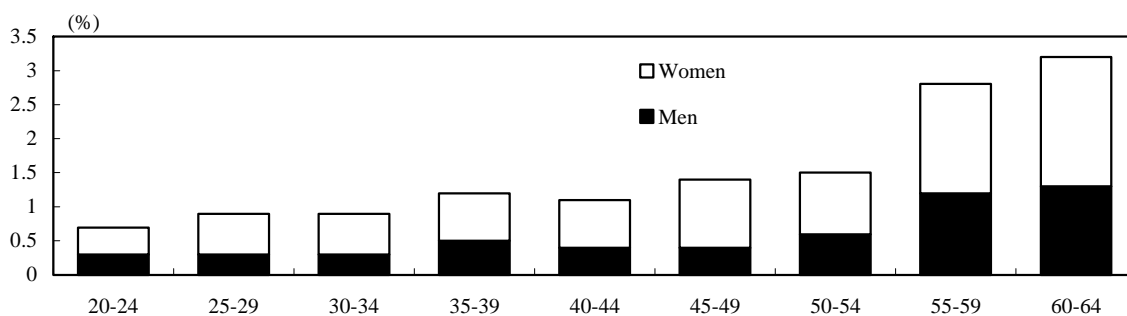

Note: Ratio of workers dismissed at their companies' convenience to the total number of regular employees (excluding workers sent to affiliated firms, etc.).

Source: Management and Coordination Agency, "*Labor Force Survey*," Economic Planning Agency, "*White Paper on the National Lifestyle* (1998)."
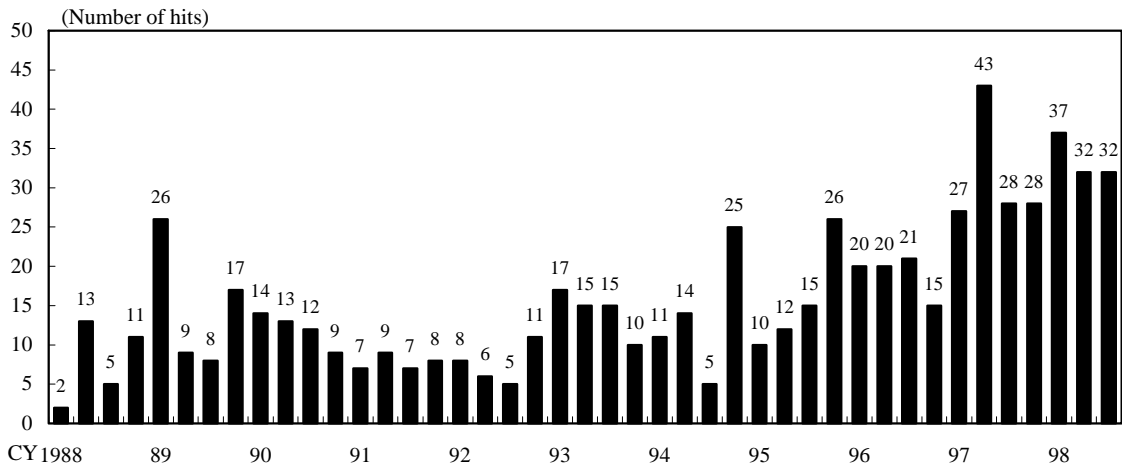
(Chart 7)

Risk Perceived by the Young (Pension Systems Problems)

1. Anxiety Regarding Post-retirement Livelihood
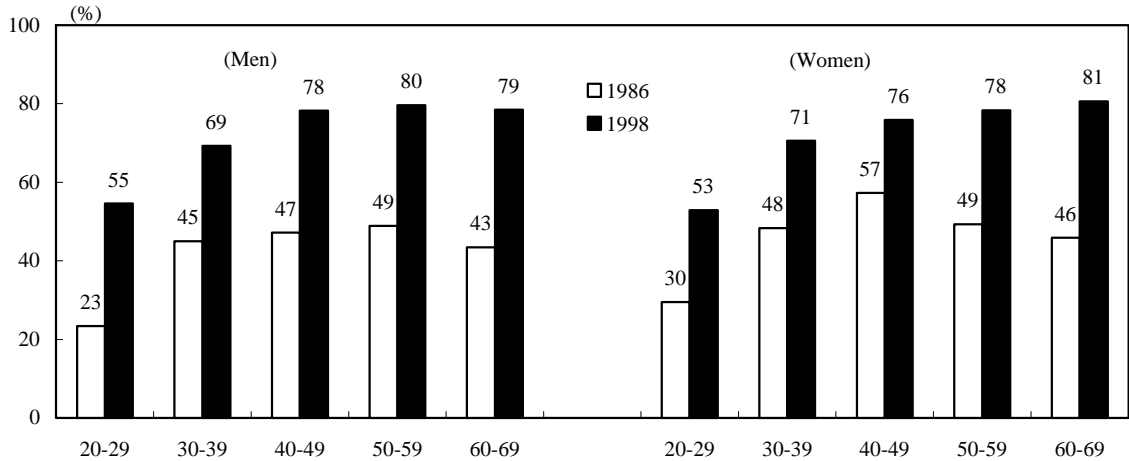
Note: Percentage of individuals who responded that "they feel some anxiety" to the question "Do you feel some anxiety regarding your post-retirement livelihood, or do you feel no such anxiety?"

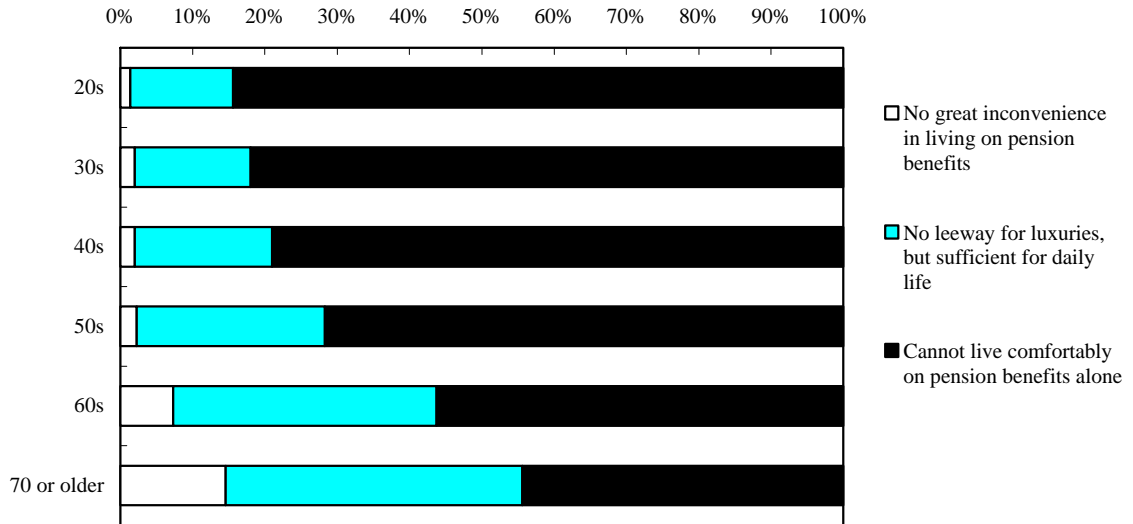## 2. Emergence of the Pension Problems Issue

Note: Number of hits from a search of articles appearing in weekly, biweekly, and monthly magazines using the keyword "pension." The magazines searched were *Shukan Asahi* , *Sunday Asahi* , *Sunday Mainichi* , *Shukan Yomiuri* , *Nikkei Business, AERA, Newsweek* , *SPA* !, *Shukan Toyo Keizai* , *Shukan Shincho* , *Shukan Bunshun* , *Shukan Diamond* , *Shukan Post* , *Shukan Hoseki* , *Shukan Gendai* , *Focus* , *Friday* , and *Flash* (weekly magazines); *Dime* and *Zaikai* (biweekly magazines); *Bungei Shunju* , *Gendai* , *Nikkei Trendy* , *President* , *Gekkan Playboy* , *Shincho 45* , *Jitsugyo no Nihon* , *Sentaku* , and *Kurashi no Techo* (monthly magazines); and *Shukan Sunday, Asahi Journal* , *NEXT* , *BOX* , *WILL* , *Nikkei Event* , and *Nikkei Antropos* (magazines that have suspended or ceased publication).

(Chart 7 continued)

3. View of Problems with Pension Systems (1998)
(1) Perception of Pension Benefits

□ No great inconvenience in living on pension benefits

■ No leeway for luxuries, but sufficient for daily life

■ Cannot live comfortably on pension benefits alone

(2) Reasons Why Respondents Replied They Cannot Live Comfortably on Pension Benefits Alone

■ Expectations that expenses will increase due to price rises, etc.

■ Expectations that the age from which pension benefits are paid will be raised

□ Expectations that the amount of pension benefits will be decreased

■ Expectations that the self-payment burden for medical care and nursing care for the elderly will increase

□ Other reasons
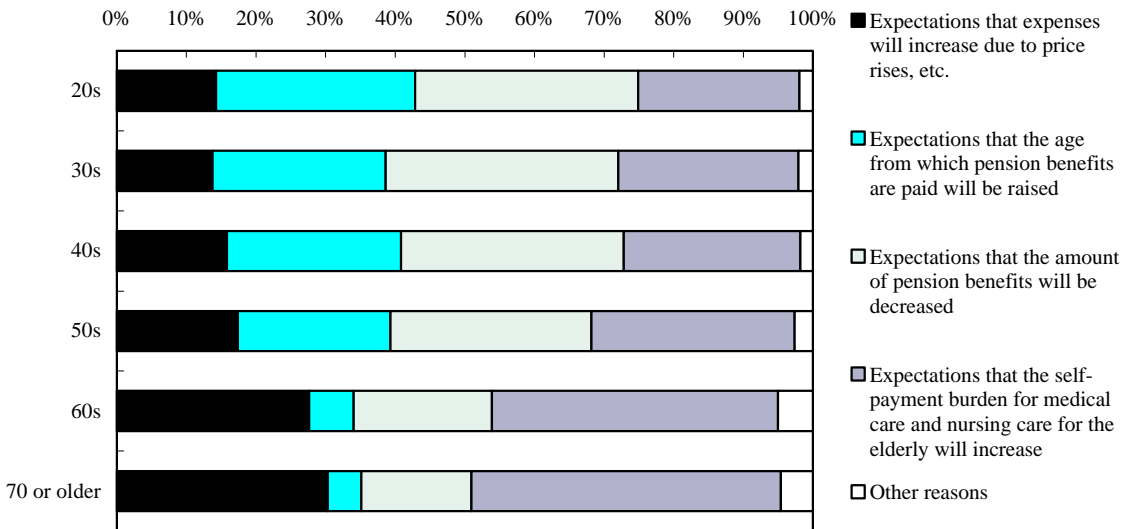
Note: Multiple responses permitted up to two responses.

(Chart 8)

Average Savings Rates of the Elderly (All Households)

1. Average Savings Rates

Note: All households with at least two people.

2. U.S. - Japan Comparison of Average Savings Rates (by age)
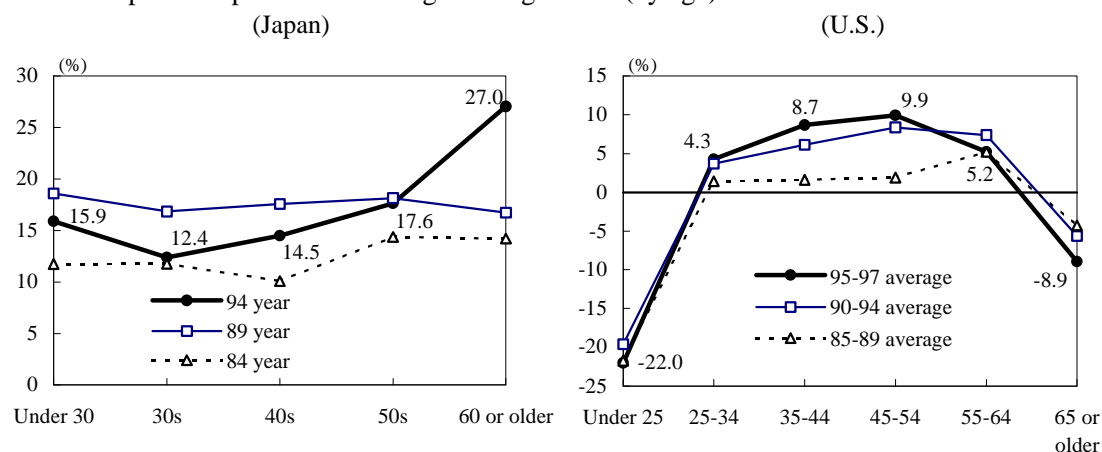
(Japan)   (U.S.)

Notes:
1. For Japan, weighted average of all households with at least two people plus wage-earner and unemployed households with only one person.
2. For Japan, the savings rates for all households with at least two people are taken from Management and Coordination Agency, "*Family Savings Survey*," and the savings rates for wage-earner and unemployed households with only one person are taken from Management and Coordination Agency, "*National Survey of Family Income and Expenditure*." The savings rates are calculated using the weighted average based on the aggregate numbers of households in each category in Management and Coordination Agency, "*National Survey of Family Income and Expenditure*."
3. For the U.S., the savings rates for all households with at least two people are calculated as: (after-tax income - household expenditures) / after-tax income ×100.

Source: Management and Coordination Agency,"*Family Savings Survey*" and "*National Survey of Family Income and Expenditure*," U.S. Department of Labor, "*Consumer Expenditure Survey*."

(Chart 9)

Outstanding Balance of Assets Held by Age

1. Financial Assets (gross basis; all households; average per household)

(1) Japan (1997)   (2) United States (1995, including households with only one person)
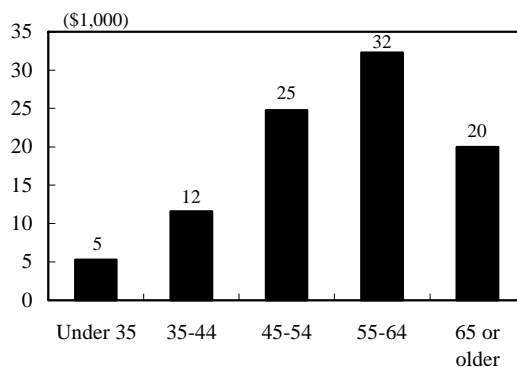
2. Total Assets (real assets + financial assets; gross basis; all households; average per household)
(1) Japan (1994)
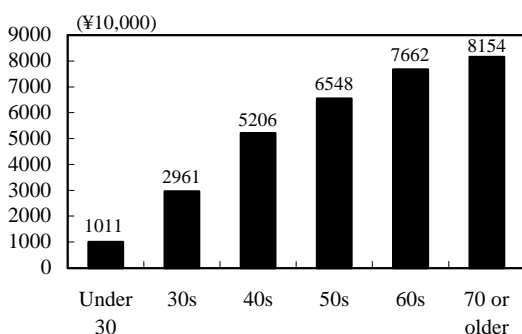
(2) Breakdown of Total Assets Owned by the Elderly (1994)
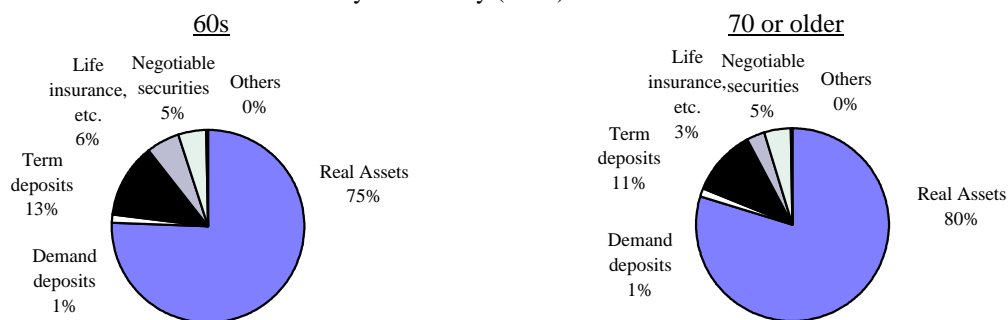
60s   70 or older
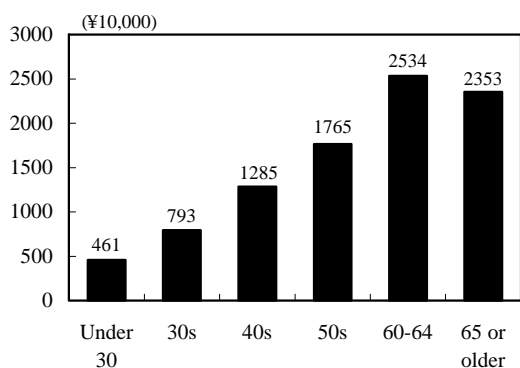

Source: Management and Coordination Agency, "*Family Savings Survey*" and "*National Survey of Family Income and Expenditure,*" U.S. Federal Reserve Board, "*The Survey of Consumer Finances*."

(Chart 10)

Advance of the Aging Society

1. Percentage of the Population 65 or Over -International Comparison-
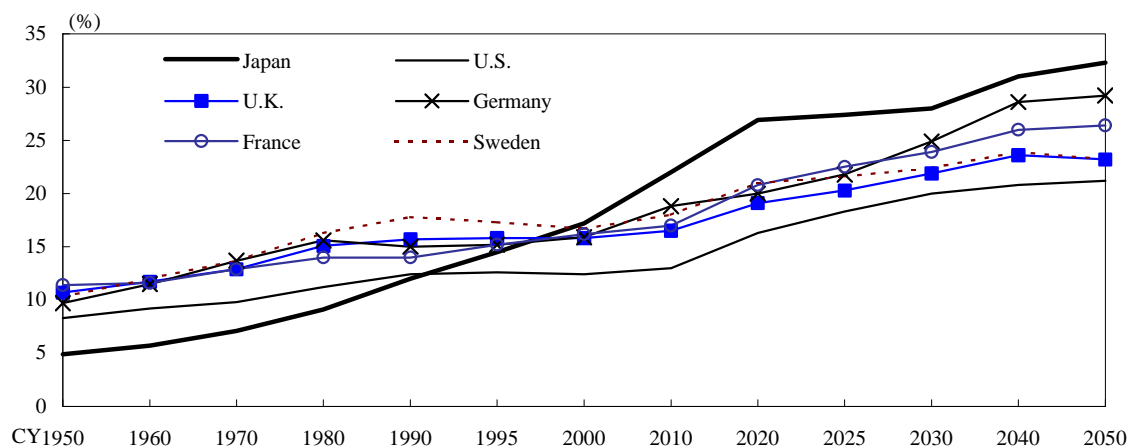
2. Percentage of Households by Household Composition
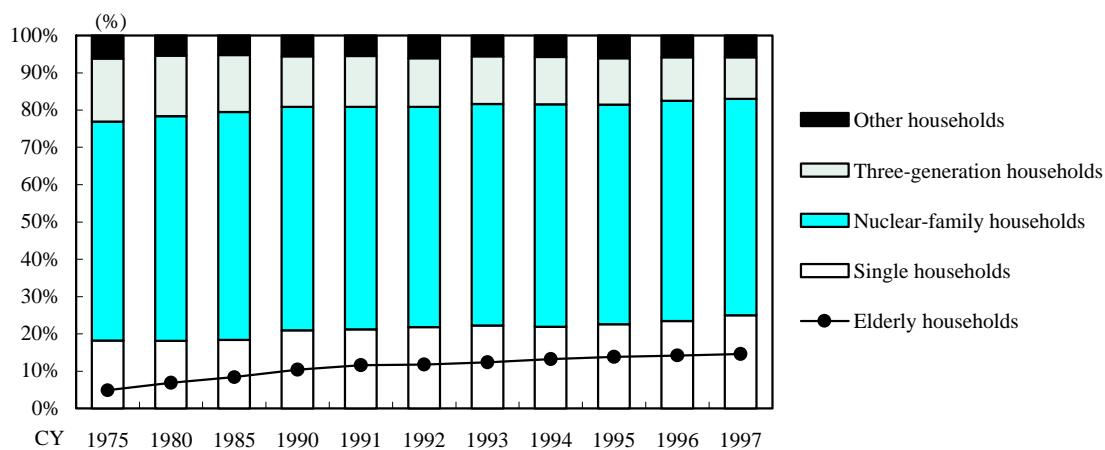
Notes:
 Single households: households with only one person.
 Nuclear-family households: households with married couples only + households with married couples and
 and unmarried children only + households with a single parent and unmarried children only.
 Three-generation households: households with three or more generations directly related to the
 head of household.
 Other households: households aside from those in the above three categories.
 Elderly households: households with a man 65 or over and / or a woman 60 or over only, or together with
 unmarried children less than 18 years old.

 Source: Ministry of Health and Welfare, "*White Paper on Health and Welfare*."

(Chart 11)

Life-cycle and Elderly Savings Behavior

1. Relationship Between Life-cycle and the Outstanding Balance of Savings

(Net outstanding savings balance per household; real basis; ¥10,000)

	35-39 (1967)	40-44 (1972)	45-49 (1977)	50-54 (1982)	55-59 (1987)	60-64 (1992)	65 or older (1997)
(CY)	165	378	446	748	1422	2206	2030

Notes:
1. This chart does not simply show the net outstanding savings balance by household age as of 1997. Rather, it depicts the relationship between the life-cycle stage and the net outstanding savings balance for ho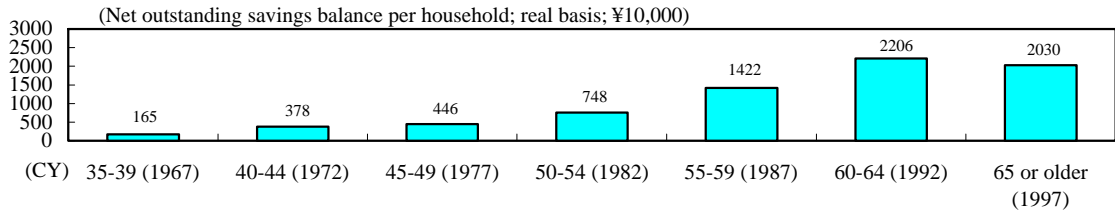useholds where the head of household is in the 65 or older age segment as of 1997. Thus, for example, the chart assumes that the heads of these households were in the 60-64 age segment in 1992, and adopts the 1992 figures for the net outstanding savings balance for the 60-64 age segment. Similarly, the chart presents the 1987 figures for the 55-59 age segment , the 1982 figures for the 50-54 age segment, the 1977 figures for the 45-49 age segment, the 1972 figures for the 40-44 age segment, and the 1967 figures for the 35-39 age segment.
2. Calculated on a real basis in 1997 yen using the private-sector final consumption expenditure deflator.

2. Outstanding Balance of Savings and Savings Targets

(Overall Average)

Outstanding savings balance (left-hand scale)

Savings target (left-hand scale)

Gap (outstanding savings balance-savings target; right-hand scale)

(60s)

Outstanding savings balance (left-hand scale)

Savings target (left-hand scale)

Gap (outstanding savings balance-savings target; right-hand scale)

(70 or older)

Outstanding savings balance (left-hand scale)

Savings target (left-hand scale)

Gap (outstanding savings balance-savings target; right-hand scale)

Source: Management and Coordination Agency, "*Family Savings Survey,*" Central Council for Savings Information, "*Public Opinion Survey on Household Savings and Consumption .*"

(Chart 12)

Savings Purposes of the Elderly (Bequest Motive)

1. Savings Purposes of the Elderly (1998)

50s	69	75	2	44
60s	76	80	6	20
70 or older	69	82	6	10

☐ Funds for post-retirement (future) livelihood
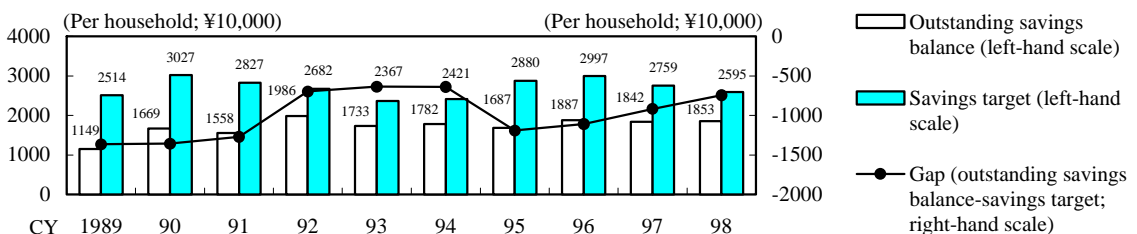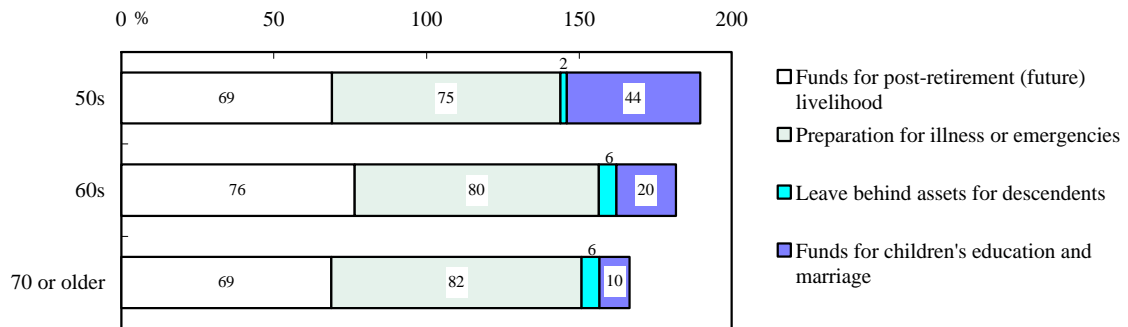
☐ Preparation for illness or emergencies

☐ Leave behind assets for descendents

☐ Funds for children's education and marriage

Note: Only the main responses are listed. Multiple responses permitted up to three responses.

2. Perceptions Regarding Inheritance

(1) Expectations of Inheriting Assets from Parents (among individuals in their 20s, 30s, and 40s)

—— 20s   —— 30s   ······ 40s
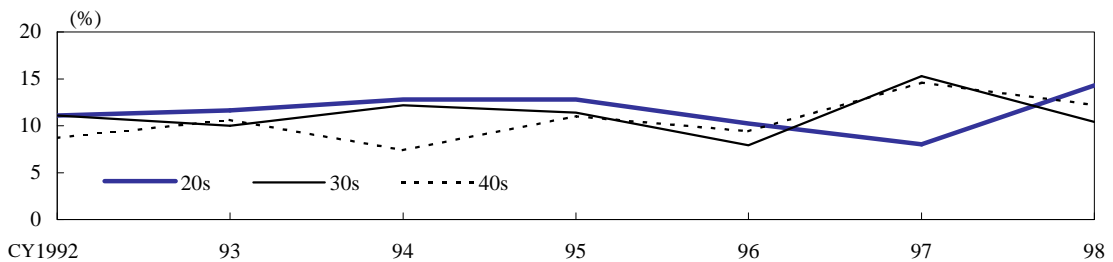
Note: Percentage of households responding that they expect to inherit assets from their parents as a reason why they are not worried about their post-retirement livelihood.

(2) Expectations of Receiving Assistance from Children (among people 60 or older)

Can expect assistance

Cannot expect assistance

60s

70 or older
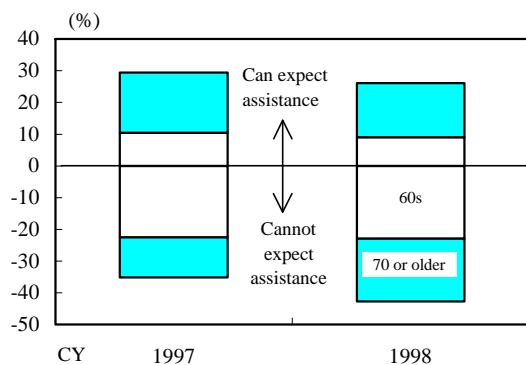
Note: Percentage of households responding that they can (or cannot) expect assistance from their children as a resource for their daily lives.

(3) Relationship Between Post-retirement Care and the Amount of Bequests

55-59	25	32	26	18
60-64	22	33	26	18
65-69	20	37	26	16

☐ Amounts of bequests do not depend on whether care is provided during old age

☐ Amounts of bequests will change depending on whether care is provided during old age

☐ Cannot say either way

☐ Do not know
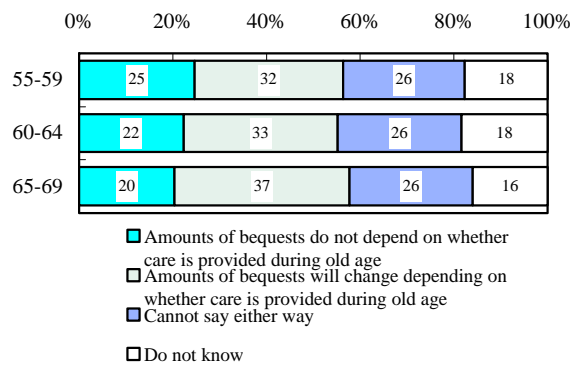
Note: Responses to the question "When you make bequests to your children, how will you consider whether or not they provide you with post-retirement assistance?"

Source: Central Council for Savings Information, "*Public Opinion Survey on Household Savings and Consumption* ," Economic Planning Agency, "*National Survey of Lifestyle Preferences* (fiscal 1998)."

(Chart 13)

Savings Purposes of the Elderly (Preparation for the Possibility of Requiring Nursing Care)

1. Reasoning Concerning the Consumption of Savings by the Elderly (1996)

Savings should be inherited by children and other family members, and should not be consumed
4%

Unclear
7%

Others
1%

Savings can continually be consumed in a planned manner for the purpose of enjoying hobbies and a more abundant lifestyle
7%

Savings should not be consumed expect when suffering misfortune such as becoming ill or requiring nursing care
50%

Savings can be consumed little by little to maintain a regular lifestyle
19%

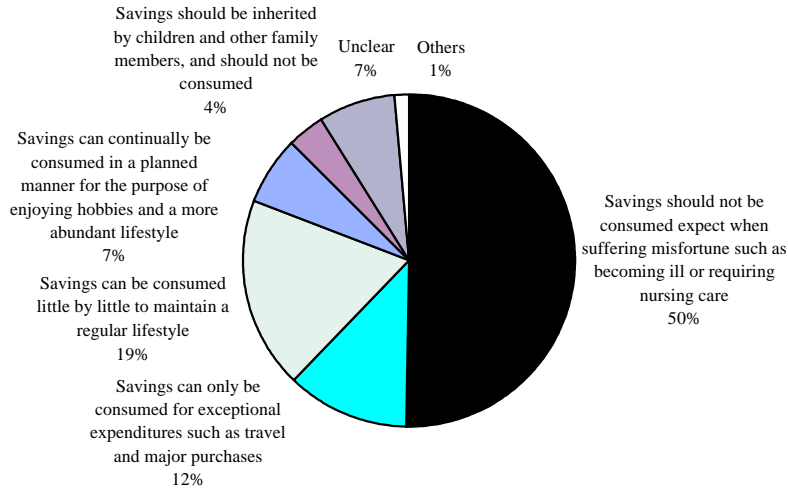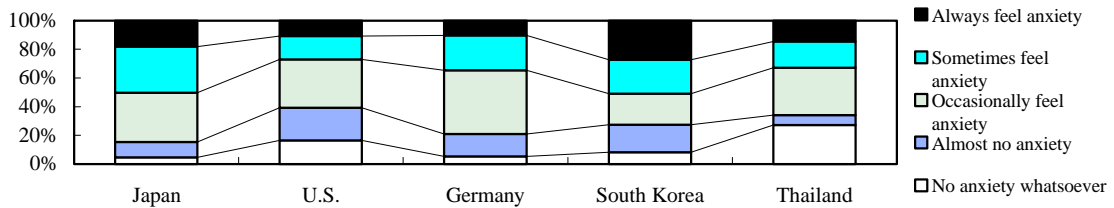Savings can only be consumed for exceptional expenditures such as travel and major purchases
12%

2. Anxiety Regarding the Possible Future Need for Nursing Care, and Its Background

(1) Anxiety Regarding the Possible Future Need for Nursing Care (International Comparison; 1996)

- Always feel anxiety
- Sometimes feel anxiety
- Occasionally feel anxiety
- Almost no anxiety
- No anxiety whatsoever

(2) Present Conditions of Nursing Care Services (International Comparison)

(Number of individuals per 100 people)

| Japan | U.S. | U.K. | Denmark | Sweden | Norway | Finland |
| 2 | 4 | 13 | 17 | 13 | 14 | 24 |
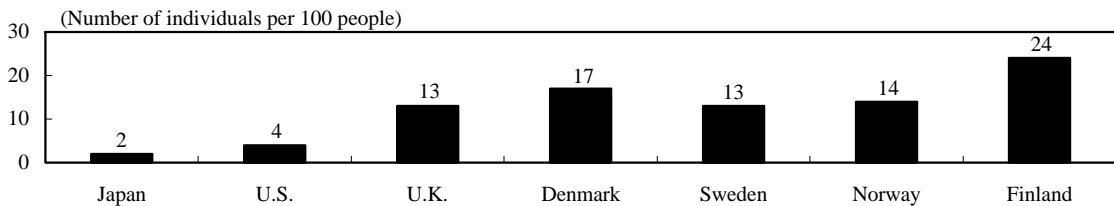
Notes:
1. Number of individuals 65 or older receiving home helper services.
2. Data for Japan are from 1993; data for the U.S., Sweden, and Finland are from1990; and data for the U.K., Norway, and Denmark are from 1991.

(3) Costs of Paid Nursing Homes (as of July 1, 1997)

	Entrance fees (average of 228 facilities)	Monthly fees (management fees + food expenses; average of 275 facilities)
For individuals	¥25.82 million	¥125,000
For couples	¥35.71 million	¥211,000

Source: Economic Planning Agency, "*National Survey of Lifestyle Preferences* (fiscal 1998)."

(Chart 14)

Employment Environment for the Elderly

1. Post-retirement (Future) Lifestyle Image (1997)

Legend:
- □ Do not know what to do
- □ Want to participate in volunteer activities and help others
- □ Want to devote myself to my hobbies
- ■ Want to continue working for as long as possible
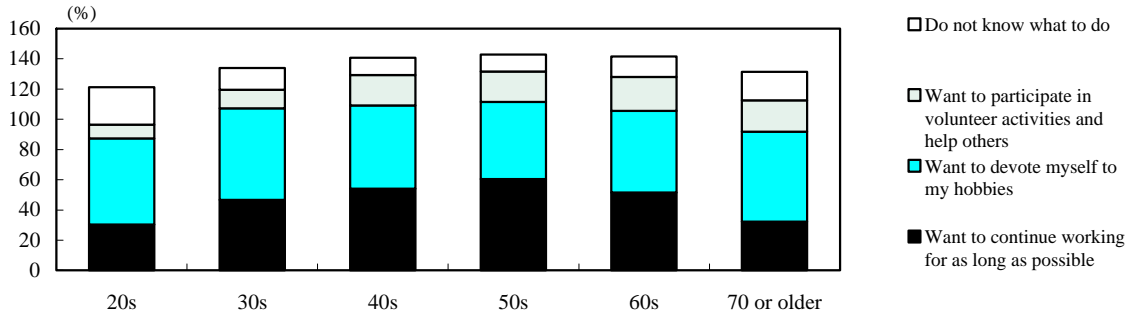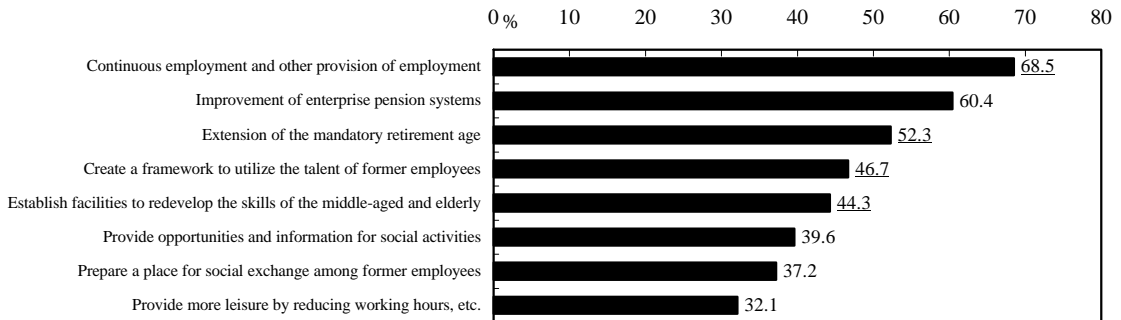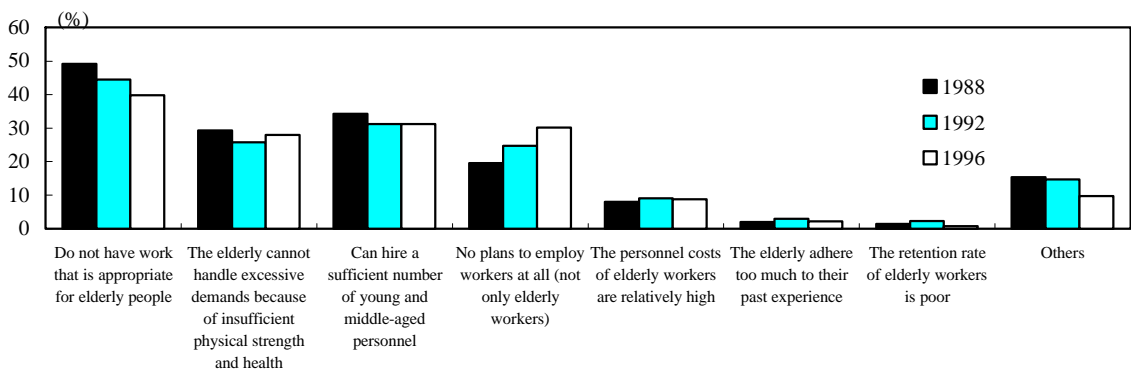
Note: Multiple responses permitted (no restrictions).

2. Elderly People's Requests to Enterprises (1998)

Request	%
Continuous employment and other provision of employment	68.5
Improvement of enterprise pension systems	60.4
Extension of the mandatory retirement age	52.3
Create a framework to utilize the talent of former employees	46.7
Establish facilities to redevelop the skills of the middle-aged and elderly	44.3
Provide opportunities and information for social activities	39.6
Prepare a place for social exchange among former employees	37.2
Provide more leisure by reducing working hours, etc.	32.1

Note: The underline figures are those concerning employment of the elderly. Multiple responses permitted (only the top eight responses are presented here).

3. Reasons for Not Increasing the Employment of Elderly Workers (from the enterprises' perspective)

Legend:
- ■ 1988
- □ 1992
- □ 1996

Categories: Do not have work that is appropriate for elderly people; The elderly cannot handle excessive demands because of insufficient physical strength and health; Can hire a sufficient number of young and middle-aged personnel; No plans to employ workers at all (not only elderly workers); The personnel costs of elderly workers are relatively high; The elderly adhere too much to their past experience; The retention rate of elderly workers is poor; Others
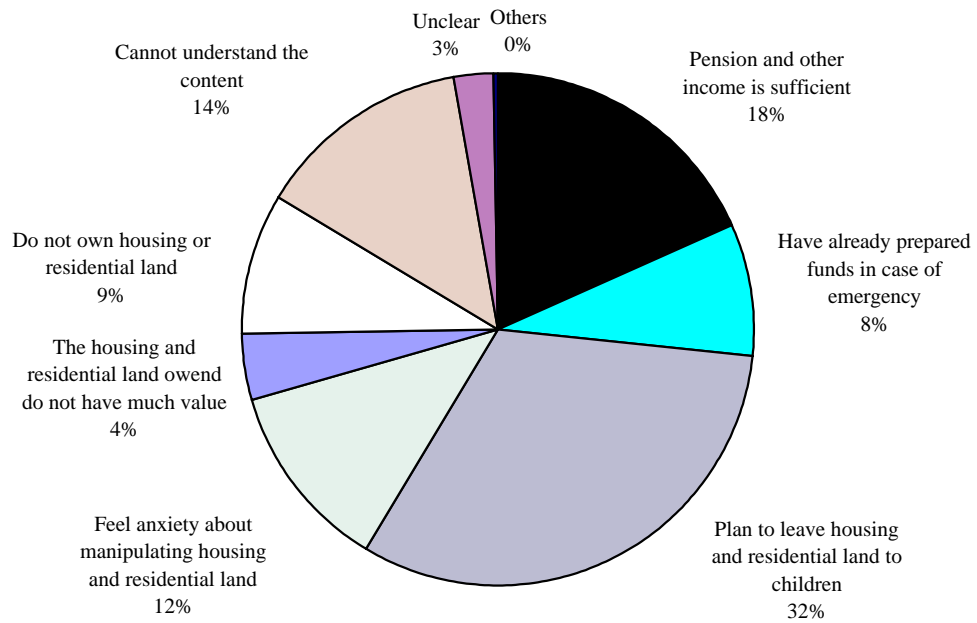
Source: Central Council for Savings Information, "*Public Opinion Survey on Household Savings and Consumption,*" Economic Planning Agency, "*National Survey of Lifestyle Preferences* (fiscal 1998)."

(Chart 15)

Problems with Reverse Mortgages

(Reasons for not using reverse mortgages; 1998)

Unclear 3%
Others 0%
Cannot understand the content 14%
Pension and other income is sufficient 18%
Do not own housing or residential land 9%
Have already prepared funds in case of emergency 8%
The housing and residential land owend do not have much value 4%
Plan to leave housing and residential land to children 32%
Feel anxiety about manipulating housing and residential land 12%

Source: Economic Planning Agency, "*National Survey of Lifestyle Prefernces* (fiscal 1998)."

(Chart 16)

Outline of Reverse Mortgages and Number of Contracts Concluded

1. Public Systems (results through the end of 1996)

Municipal Body	System Name	Starting Date	Cumulative Number of Contracts	Eligible Parties
Musashino City Welfare Public Corp.	Welfare lending regulations	Apr. 1981	28	Individuals 65 or older who have lived in the city for at least one year and are using the public corporation's services
Setagaya *Fureai* Public Corp.	Setagaya silver financing system	Apr. 1990	15	Single and married couple households 70 or older who have lived in the ward for at least one year
Shinjuku Ward Welfare Public Corp.	*Iki-iki* financing system	Oct. 1992	8	Single and married couple households 65 or older who have lived in the ward for at least one year and are enrolled in the public corporations' service membership system
Nakano Ward	Asset utilization welfare lending system	July 1991	6	Individuals 65 or older who have lived in the ward for at least one year and are using the public corporation's services
Hoya City Welfare Public Corp.	Hoya silver financing mediation project	Mar. 1994	5	Individuals 65 or older who have lived in the city for at least one year and are using the public corporation's services
Total (total of 13 municipal bodies including others not listed above)			71	

Note: The chart lists the cumulative number of contracts concluded through the end of December 1996 by public corporations and other municipal bodies that have concluded at least five contracts.

2. Private-sector Systems (results through the end of fiscal 1994)

Bank Name	Starting Date	Cumulative Number of Contracts	Eligible Parties
Mitsubishi Trust Bank	Dec. 1987	about 20	Married couples 60 or older (individuals also possible) owning at least ¥200 million of land
Sumitomo Trust Bank	Jan. 1987	195	Individuals 60 or older owning at least ¥100 million of residential land
Mitsui Trust Bank	Mar. 1984	3	Individuals at least 65 (married couples also possible) owning at least ¥100 million of real estate
Yasuda Trust Bank	Apr. 1984	Not aggregated	Individuals at least 70 (for married couples, both must be at least 70) owning at least ¥100 million of real estate
Toyo Trust Bank	Feb. 1985	Not aggregated	Individuals at least 70 owning at least ¥200 million of real estate
Chuo Trust Bank	Apr. 1985	about 20	Individuals at least 65 owning at least ¥200 million of land
Nippon Trust Bank	Feb. 1989	15	Individuals and married couples at least 65 owning land with a market value of at least ¥100 million or condominiums with a market value of at least ¥200 million (including the building value)
Daiwa Bank	Apr. 1989	11	Individuals and married couples at least 60 years old owning at least ¥100 million of land
Total		at least 264	

Source: Elderly Housing Foundation (ed.), "*Data Book on Elderly Society Housing and Welfare* (1998)."