The Effect of Pension Reform on Pension-Benefit Expectations and Savings Decisions in Japan

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Abstract

Using the Japanese Study of Aging and Retirement (JSTAR), a new Japanese panel survey of people age 50 or older, we find that many Japanese in their early 50s - compared with those in their late 50s and early 60s - expect their level of public pension benefits to decline. We find that recent pension reform, which raised the pensionable age, affected people by increasing the age when they expect to claim their benefits by almost the exact same amount for all. The reform decreases their expectations for public pension benefits, although this effect is not necessarily significant. We also find evidence that individuals' anxiety about the public pension program's future induces an increase in their private savings.

Keywords: subjective expectations; pension reform; uncertainty; savings.
JEL Classification: E21; H55.

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The authors thank Mitsuhide Hoshino, Hidehiko Ichimura, Masayuki Morikawa, Jim Smith, and the participants at the RIETI Workshop and the RIETI-RAND Workshop for their helpful comments. This research is supported by JSPS grant 22000001.

1. Introduction

In Japan's rapidly aging society, the baby boomer generation is reaching retirement age. As a result, the public pension program faces financial challenges that threaten the program's solvency and ability to provide benefits for future generations. To cope with the overall increase in benefits and the deteriorating fiscal balances, the Japanese government enacted pension reform in 1994 and 2000 that raised the pensionable age from 60 to 65 for individuals who are employed by private corporations and therefore covered by the Employee Pension Insurance (EPI) program. This pension reform may have affected these individuals' subjective expectations about their future public pension arrangements and consequently alter their savings, asset holdings, and labor supply decisions.[1]

This paper aims to investigate to what extent this recent pension reform in Japan affected individuals' subjective expectations about their pension claiming age, retirement age, and future public pension benefits. The paper then examines whether individuals' loss of confidence in the future public pension system induces them to save more for retirement.

Researchers in the United States have devoted considerable attention to collecting data on individuals' subjective expectations of future pension benefits because of the growing importance of understanding the impact of pension policies on individuals' decision making. For example, Dominitz and Manski (2006) examine the subjective probabilistic expectations of U.S. Social Security benefits and find striking uncertainty and heterogeneity of beliefs about the future structure of the Social Security system. Utilizing data on Social Security expectations, Dominitz et al. (2002) show through a simulation that changes in Social Security policy affect individuals' expectations for Social Security and thus their retirement savings. More recently, Delavande and Rohwedder (2011) estimate the relationship between individuals' uncertainty about Social Security policy and their portfolio composition of risky and safe assets. In Europe, Bottazzi et al.

[1] Because the pension benefit and contribution schemes are required by law to be reviewed at least every five years from the viewpoint of their financial balances and sustainability, non-retirees may fear that the outlook for the scheme may worsen.

(2006) estimate the effect of Italian pension reforms on individuals' expectations of retirement outcomes and pension benefits and their level of retirement savings. Additionally, Bottazzi et al. (2011) estimate the effect of Italian pension reforms on individuals' portfolio choices. However, because of an absence of data on subjective expectations of future public pension benefits in Japan, almost no empirical studies in Japan have examined the relationships between changes in public pension policy, individuals' subjective expectations of future public pension benefits, and their decisions about savings. Therefore, in this paper, we utilize the Japanese Study of Aging and Retirement (JSTAR), which is a new Japanese panel survey that collects information on the economic, social, and health conditions of people age 50 or older and that also asks the respondents about their subjective probabilistic expectations of future public pension benefits. We find that Japanese in their early 50s have substantially more uncertain and heterogeneous expectations about the future of the public pension program than those in their late 50s and early 60s.

Many studies report that middle-aged and older adults save excessively compared with the amounts estimated in the life cycle hypothesis. De Nardi et al. (2009, 2010) show that middle-aged and older adults save a large amount for the following reasons: to leave a bequest to their children, to pay for expensive medical care, and to prepare for a longer life expectancy. In addition to these motives, another important factor explaining the high saving rate in Japan is individuals' perceptions that public pensions could become more unreliable, as shown by Horioka et al. (2000) and Horioka et al. (2007). The Economic Survey of Japan (2009) has used cross-country data to find a negative relationship between the household saving rate and the proportion of individuals reporting confidence about the future of their public pensions. However, this prediction has not been tested using data with rich demographic and economic information, such as the data from the JSTAR. Furthermore, recent public pension reform, which increased the pensionable age from 60 to 65 based on birth cohorts (two or four consecutive birth cohorts

having the identical pensionable age), may have weakened individuals' confidence in the future of the public pension system and affect their savings decisions. However, this reform effect has not been explored yet. Using the JSTAR, we find that this pension reform affected individuals by increasing the age at which they expect to claim their pension benefits by almost the same exact amount as the increase in their pensionable age. We also find that the reform decreased the individuals' expectations for public pension benefits, although this effect is not necessarily significant. When exploiting the variation in pension reform to identify the effects of pension expectations on savings decisions, we find that non-retirees' anxiety about the public pension program's future induces them to save more.

In Section 2, we review recent public pension reform in Japan. Section 3 describes the JSTAR data. Section 4 presents the distribution of public pension expectations conditional on birth cohorts. Section 5 estimates the effect of personal characteristics on public pension expectations and also studies the effect of public pension reform on public pension expectations. Section 6 estimates the effects of public pension expectations on savings decisions. Section 7 concludes the paper.

2. Overview of Public Pension Reform in Japan

The public old-age pension scheme in Japan is composed of three plans: (1) National Pension Insurance (NPI, *Kokumin Nenkin*) for self-employed workers and non-employed people; (2) Employees' Pension Insurance (EPI, *Kosei Nenkin*) for those employed by private corporations; and (3) Mutual Aid Insurance (MAI, *Kyosai Nenkin*) for those employed in the public sector and private schools. In 2007, the NPI, EPI, and MAI covered 45.5, 48.0, and 6.5 percent of the population insured by public pension programs, respectively (Oshio et al.; 2010, 2011). Because the MAI has almost the same benefit scheme as the EPI, the MAI and the EPI are combined in the JSTAR questionnaire. The NPI consists only of a flat-rate benefit (the so called Old-Age Basic Pension, *Rorei Kiso Nenkin*), whereas the EPI consists of a two-tier benefit scheme:

flat-rate and wage-proportional benefits. To be eligible to receive a public pension in Japan, one must pay a monthly premium to the plan for a minimum of 25 years. Dependent spouses of the EPI and MAI beneficiaries are entitled to the flat-rate benefit without paying contributions if their income is below the minimum taxable income.[2]

The pensionable age for the NPI is 65 for both men and women. In contrast, the pensionable age for the flat-rate benefit of the EPI has been set at age 60 since 1975 for men and since 2000 for women. However, the pension reforms in 1994 and 2000 will raise the pensionable age for the EPI's flat-rate and wage-proportional benefits in stages from age 60 to 65, as presented in Table 1, Panel A. For male EPI beneficiaries, the pensionable age will increase in the following two stages. In the first stage, the pensionable age for the flat-rate benefit of the EPI will increase by one year every three years from 2001 to 2013, when the pensionable age will reach 65. In the second stage, the pensionable age for the wage-proportional benefit of the EPI will increase by one year every three years from 2013 to 2025, when the pensionable age will reach 65. For female EPI beneficiaries, the pensionable age will increase with a lag of five years relative to men. That is, the pensionable age for female EPI beneficiaries will increase from 60 to 65 in the following order: from 2006 to 2018 for the flat-rate benefit and from 2018 until 2030 for the wage-proportional benefit.

To provide stable employment for adults in their early 60s, who will no longer be eligible for the flat-rate EPI, the government passed the Employment Measures Law in 2004. This law requires companies to ensure employment up to the pensionable age and thus obligates companies to gradually raise the mandatory retirement age, to introduce a continued employment system from age 60 to age 65 (as in Table 1, Panel B), or to completely abolish mandatory retirement.

[2] Until 1986, the employees' dependent spouses either contributed voluntarily to the NPI or were simply left uninsured (except for a survivor's benefit). The 1986 reform put the dependent spouses under the public pension umbrella, although they were exempt from contributing to public pension plans.

3. Data and Descriptive Statistics

The data used in this study are from the Japanese Study of Aging and Retirement (JSTAR), which is designed and conducted jointly by the Research Institute of Economy, Trade, and Industry (RIETI), Hitotsubashi University, and the University of Tokyo. The JSTAR is Japan's first globally comparable panel data survey of the elderly. Its design is similar to the U.S. Health and Retirement Study (HRS), the Survey of Health, Ageing and Retirement in Europe (SHARE), and the English Longitudinal Study of Ageing (ELSA). The JSTAR covers a wide range of information, including the economic, social, and health conditions of middle-aged and older adults.

The individuals in the baseline sample of JSTAR were between the ages of 50 and 75 in 2007 and lived in the following five municipalities in Japan: Takikawa City in Hokkaido; Sendai City in the Tohoku area; Adachi Ward, which is a city in the Tokyo metropolis; Kanazawa City in the Hokuriku area; and Shirakawa town in the Chubu area. Naha City, located in Okinawa, was added to the sample in 2008, and Tosu City in the Kyushu area was added in 2009.[3] The response rate was close to 60 percent, and the sample included 5,800 participants. The second wave of baseline sample surveys was conducted in 2009. A more detailed description of the survey's design and sample methodology can be found in Ichimura et al. (2009).

We restricted the JSTAR data to those respondents between the ages of 50 and 65 who are not currently receiving public pension benefits. At the time of the interview, 2,355 individuals responding to the first wave of the JSTAR (5 municipalities, Naha, and Tosu) reported that they were not receiving public pension benefits, and 2,002 individuals indicated that they would be receiving public pension benefits in the future.

Table 2 provides the characteristics of our sample. Among those who plan to receive public pension benefits in the future, the average age is 56.7. Additionally, 48.6 percent are

[3] The JSTAR is not a probabilistic national sampling, but within the seven cities, the researchers selected a probabilistic sample for each site.

female, 85.2 percent are married, and 84.3 percent are working for pay. In terms of education, 15.5 percent received less than a high school degree, 45.7 percent received a high school degree, 18.0 percent attained a junior college degree, and 20.6 percent earned a university degree or greater.

4. Distributions of Public Pension Expectations

In this section, we provide our findings on the distributions of subjective expectations about the public pension claiming age, retirement age, public pension benefit level, and the drop in the future public pension benefit level, which are conditional on fiscal year birth cohorts and graphed separately based on the type of pension individuals are planning to receive.[4] We present the graphical results for only the men because the graphical results for the women are similar to those of the men. (See Okumura and Usui (2011) for the graphical results for the women.) The Appendix contains an English translation of the JSTAR questionnaire regarding public pension expectations.

4.1. Expectations about the Public Pension Claiming Age and the Retirement Age

Figure 1 displays the percentage of respondents in a given fiscal year birth cohort who expect the public pension claiming age to be a specific age from 60 to 70 years old. The sample includes five municipalities in 2007, Naha in 2008, and Tosu in 2009. For the men planning to receive the NPI in Panel A, 36.3 percent of those born after 1952 did not know when they would claim their pension, while 48.4 percent expected to begin receiving benefits at age 65. For those born before 1951, 17.2 percent did not know when they would claim their pension, while those expecting to receive benefits at age 65 increased to 67.9 percent. Therefore, in examining the older cohorts, we find that the percentage of those who do not know when they will claim their pension declines and that more individuals are planning to claim their pension at age 65. In contrast, of the men who plan to receive the EPI (and are thus likely to be affected by pension

[4] In Japan, the government's financial year runs from April to March of the following year.

reforms) in Panel B, the 1945-1946 cohorts (where age 63 is the eligible age to claim the flat-rate benefit) are the second most likely to expect to claim their pension at age 63. The 1947-1948 cohorts (where age 64 is the eligible age to claim the flat-rate benefit) are the second most likely to claim at age 64. The much younger cohorts (whose eligibility for the flat-rate benefit has increased to age 65) are a mixture of those who expect to claim their pension at age 65 and those who do not yet know what their expected claiming age will be. In this sense, this group is quite similar to the younger cohorts in the NPI sample. Because the EPI beneficiaries are more likely to delay claiming their pension based on an increase in the eligibility age, the reform appears to impact the pension claiming age of the EPI beneficiaries.

Figure 2 displays the percentages of workers in specific fiscal year birth cohorts who expect to retire at a given age.[5] For the men who plan to receive the NPI in Panel A, the individuals in the younger cohorts expect that they will never stop working, whereas the individuals in the older cohorts increasingly expect to retire after age 65. For the men who plan to receive the EPI in Panel B, the individuals in the younger cohorts are divided between those who expect that they will never stop working and those who expect to retire at age 60. In the older cohorts, the percentage of individuals who expect to retire at a later age gradually increases, although the fraction of those who expect that they will never retire remains approximately the same.

By comparing the age at which workers expect to retire with the age at which they plan to claim their pension, we find that, among the men who are currently working, only 15.0 percent expect to claim their future pension benefits at retirement. This low percentage exists partly because in Japan, 38.9 percent of workers expect to never stop working. Hence, the retirement

[5] When asked about the timing of retirement in the 2007 wave, 39.4 percent of the workers reported that they were "undecided about when to retire." In the 2009 survey, the respondents were given an additional option: "never expect to stop working." As a result, there was a significant drop in those who reported "undecided." Specifically, among those who reported "undecided" in the 2007 wave, 54.85 percent reported that they "never expect to stop working," and 22.3 percent reported that they were "undecided" in the 2009 wave. Therefore, we restrict the sample to those who responded to the revised JSTAR questionnaire for the expected retirement age.

decision appears to be made independently of an individual's pension claiming age. Proposals to reform Social Security in the U.S. (e.g., raise the full retirement age) have been found to encourage workers to delay their retirement (De Nardi et al., 2010). In contrast, raising the pensionable age in Japan may not have as large an effect on the expected retirement age because older Japanese workers already have high incentives to work.

4.2. Expectations about the Public Pension Benefit Level

We next present the expected public pension benefit level, for which we have information on the expected amount of public pension benefits and the expected ratio of the public pension benefits to pre-retirement earnings (i.e., the expected replacement rate).

The median of the expected public pension benefit for men is 720,000 yen per year for the NPI beneficiaries and 1,800,000 yen per year for the EPI beneficiaries. The interquartile range of the distribution for men is 400,000 yen per year for the NPI beneficiaries and 1,400,000 yen per year for the EPI beneficiaries. Therefore, the expected benefit level is greater and more widely distributed for the EPI beneficiaries than for the NPI beneficiaries. Figure 3 displays the quantiles of the expected amount of public pension benefits conditional on fiscal year birth cohorts. For the NPI beneficiaries in Panel A, the median of the distribution is approximately the same for the younger and older cohorts, but the interquartile range of the distribution is larger for the younger cohorts than for the older cohorts. This finding suggests a greater uncertainty in the amount of expected benefits in the younger cohorts. Through the pension reform, there is no significant difference in the expected benefit level for the EPI beneficiaries across the birth cohorts to which different pensionable ages apply (Panel B).

Because the wage-proportional part of the public pension benefits for the EPI beneficiaries is proportional to the pre-retirement earnings, the heterogeneity in the expected public pension benefits for the EPI beneficiaries presumably reflects not only the heterogeneity in the individuals' expectations about the future structure of the pension system, which is subject to

political reform, but also heterogeneity in the individuals' earnings. To extract the heterogeneity of expectations about the pension system, we utilize the question in the JSTAR that asks about the expected ratio of public pension benefits to pre-retirement earnings (i.e., the replacement rate). Figure 4 displays the probability of the expected ratio of public pension benefits to pre-retirement earnings conditional on fiscal year birth cohorts. For the EPI beneficiaries in Panel B, those who respond "don't know" decline in the older cohorts. When we focus on the EPI beneficiaries who report the actual values of the expected replacement rate in Panel B, the distribution of the probability of the expected replacement rate is approximately the same for the younger and older cohorts. Moreover, there appears to be no significant difference in the expected replacement rate for the EPI beneficiaries across the birth cohorts to which different pensionable ages apply.

4.3. Expectations about the Drop in Future Public Pension Benefits

The JSTAR has a unique question that directly asks the respondents about the subjective uncertainty of their future public pension benefit levels. Specifically, the JSTAR inquires about the subjective probability that the expected benefit level could be reduced by 10 percent or more in the future. Figure 5 displays the responses to the expected probability of a more-than-10-percent decrease in the future public pension benefit level conditional on fiscal year birth cohorts. For the NPI beneficiaries in Panel A, a significant fraction of the younger cohorts expect a more-than-10-percent chance of a more-than-10-percent reduction in their future public pension benefit level, which is measured in Panel A by the difference between a line indicating a less-than-100 percent chance and a line indicating a less-than-10-percent chance. In contrast, a significant fraction of the older cohorts expect a less-than-10-percent chance of a more-than-10-percent reduction. For the EPI beneficiaries in Panel B, the fraction of the respondents who report a 0 percent chance of a reduction in the future pension benefit level is higher in the older cohorts than in the younger cohorts. In contrast, the fraction of the respondents who report a more-than-10-percent chance of a more-than-10-percent reduction is lower in the

older cohorts than in the younger cohorts for the EPI beneficiaries. Therefore, for both the NPI and EPI beneficiaries, the older cohorts tend to be less pessimistic than the younger cohorts about the continuation of the existing structure of the public pension system. There also appear to be no significant differences in the expected probability of a decrease in the benefit level for the EPI beneficiaries across the birth cohorts to which different pensionable ages apply through the pension reform.

In conclusion, in this section, we find that beliefs about the public pension program demonstrate substantial uncertainty and heterogeneity. The younger cohorts are less confident than the older cohorts about future public pension benefits. They report greater subjective probability of decline in future public pension benefits and provide more "don't know" responses about their public pension expectations. There are also differences between the NPI and the EPI beneficiaries in their expectations about public pensions. The EPI beneficiaries who are affected by the pension reform have a more accurate picture of the future of the public pension program.

5. Public Pension Expectations and Pension Reform

In this section, we use a regression framework to estimate the effects of individuals' personal characteristics on their public pension and retirement expectations. We then assess the effect of the pension reform on the individuals' public pension and retirement expectations.

5.1. Personal Characteristics and Public Pension and Retirement Expectations

We first estimate the effect of individuals' personal characteristics on their public pension and retirement expectations. The sample includes male and female respondents in five municipalities in 2007 and 2009, Naha in 2008, and Tosu in 2009.

In Table 3, Column 1, we present the estimated effects of personal characteristics on the expected pension claiming age. Personal characteristics include the following: age, gender, marital status, education, labor market experience, work status, health status, asset, income, and

probability of survival until age 75 divided by life table probability. Controls for city and calendar years are also included in the regression models (results not reported). The individuals who are more educated (junior college or university and over) are more likely to expect to claim their public pension at an older age, whereas those who are in their late 50s (relative to those in their early 50s), female, and less healthy are more likely to expect to claim a pension at a younger age. In Table 3, Column 2, we present the estimated effects of personal characteristics on the expected retirement age. The individuals in their late 50s and early 60s (relative to those in early 50s) are more likely to expect to retire at a later age. The individuals in their late 50s plan to claim their public pension at a younger age, but they expect to stop working at a later age. This finding indicates that for this group, the public pension benefits are likely to be insufficient to maintain their living standards. Those who have less employment potential (less income and less than high school education) expect to retire at a later age. Additionally, those who have higher expectations of surviving until age 75 expect to retire at a later age.

In Table 3, Columns 3 and 4, the estimated effects of personal characteristics on the expected amount of public pension benefits and the expected replacement rate are presented, respectively. We find that women expect to receive 582,700 yen less in public pension benefits per year than men and that the individuals with less than high school education expect to receive 157,200 yen less per year than those with only high school education. The individuals in their early 60s expect to receive 69,740 yen more per year in public pension benefits than those in their early 50s, although this effect is insignificant. Additionally, the expected replacement rate is 8.79 percent higher for women than men, but it does not vary much by education and age.

In Table 3, Column 5, we present the estimated effects of personal characteristics on the expected probability of a more-than-10 percent drop in future public pension benefits. As the question is only asked of the respondents and not their spouses, the sample size drops to 1,148. The coefficient for ages 60-65 is negative, which suggests the following: (1) the individuals in

their early 60s are much more confident about the continuation of the public pension system than those in their early 50s, and (2) the individuals who are closer to claiming their public pension are able to perform more accurate pension calculations (Gustman and Steinmeier, 2004). The labor market participants (i.e., those who are currently working for pay) are more likely to expect a drop in their future public pension benefits, as they may choose to work to guard against a decline in their future public pension.

5.2. Effect of Pension Reforms on Expectations of Public Pension Benefits

We next estimate the effect of pension reforms on individuals' public pension and retirement expectations. Specifically, we examine whether there was a discrete change in public pension and retirement expectations on either side of the fixed threshold, which is April 2 of those birth years affected by the reform (see Table 1, Panel A). In a particular reform year, the pensionable age for the EPI beneficiaries whose birth dates are before April 2 is earlier by one year than those whose birth dates are on and after April 2. In contrast, in the years when there is no reform, the pensionable age will remain the same for all individuals, regardless of their birth dates. Thus, we can conduct a difference-in-difference analysis to estimate the effect of pension reform on public pension expectations by interacting a dummy for planning to receive Employee Pension Insurance (EPI_i), a dummy for the reform year ($REFORM_i$), and vector of dummies for the 2nd, 3rd, and 4th quarters of birth ($BIRTH_i$). Specifically, we estimate the following regression:

$$\begin{aligned} y_i = {} & X_i\Pi + \alpha_1 + \alpha_2 EPI_i + \alpha_3 BIRTH_i + \alpha_4 BIRTH_i \times EPI_i \\ & + \alpha_5 REFORM_i + \alpha_6 REFORM_i \times EPI_i + \alpha_7 REFORM_i \times BIRTH_i \\ & + \gamma REFORM_i \times BIRTH_i \times EPI_i + \varepsilon_i, \end{aligned} \tag{1}$$

where y_i is the measure of public pension expectations and X_i is the covariate used in Table 3. The coefficient γ reflects the reform effect on the public pension expectations.[6]

[6] This framework is similar to that of Bottazzi et al. (2006), who study how the expected retirement age and expected replacement rate have been affected by the Italian pension reform.

Table 4 presents the estimation results. In Table 4, Column 1, we find that pension reform induces people to raise their expected pension claiming age by 1.234 (0.461) years for those born in the 2nd quarter (relative to those born in the 1st quarter who are unaffected by the reform), by 1.145 (0.455) years for those born in the 3rd quarter, and by 1.092 (0.445) years for those born in the 4th quarter. Therefore, the EPI beneficiaries are fully informed about the reform, and those affected by the reform respond by expecting to delay their pension claiming age by exactly one year. In Table 4, Column 2, the effect of pension reform on the expected retirement age is reported. The pension reform raises the retirement age by 0.634 (1.759) years for those born in the 2nd quarter, -1.210 (1.513) years for those born in the 3rd quarter, and 0.203 (1.357) years for those born in the 4th quarter. Because the reform effect on retirement age is small and insignificant, the retirement decision is independent of pension reform.

According to the estimation results in Table 4, Column 3, people expect that because of the pension reform, their public pension benefit levels will drop by 283,890 yen per year for those born in the 2nd quarter, drop by 620,150 yen per year for those born in the 3rd quarter, and increase by 249,690 yen per year for those born in the 4th quarter. The reform effect on those born in the 3rd quarter is significant and especially large in magnitude, amounting to a nearly 50 percent drop in the level of expected public pension benefits (based on the median of the expected public pension benefits for the EPI beneficiaries of 1,200,000 yen per year). However, the sign for those born in the 4th quarter goes in the opposite direction. For the reform effect on the expected replacement rate, which is reported in Table 4, Column 4, we find a small, positive, and insignificant reform effect for those born in the 2nd and 3rd quarters and a somewhat large, positive, and insignificant reform effect for those born in the 4th quarter. Therefore, the reform does not significantly affect the expected replacement rate.

Lastly, as shown in Table 4, Column 5, we find a small negative and insignificant reform effect on the expected probability that future public pension benefits will drop by more than 10

percent for those born in the 2nd and 3rd quarters but a small positive and insignificant reform effect for those born in the 4th quarter. Because these effects are all small and insignificant, the reform appears not to affect the individuals' expectations about the drop in future pension benefits.

We conclude that the reform has a noticeable effect on the respondents by raising their expectations of the pension claiming age, but the decreasing effect on the expected public pension benefit levels is not as robust as the effect on the expected pension claiming age.

6. Effects of Expectations Regarding Pension Benefits on Private Savings

We examine how individuals' expectations about the future of their public pension benefits affect their savings decisions. Our empirical specification is

$$PS_i = \alpha + y_i\beta + X_i\Gamma + \varepsilon_i, \qquad (2)$$

where PS_i is the private savings amount, y_i is the measure of public pension expectations, X_i is the covariate, and ε_i is the error term. The key coefficient of interest is β, which reflects the effect of public pension expectations on private savings.

The specification above is based on the model that reflects the relationship between public pension wealth (PPW_i) and private savings amount (PS_i):

$$PS_i = \mu + \theta PPW_i + X_i\Lambda + \upsilon_i. \qquad (3)$$

We assume that θ is negative because of the substitution effect of public pension wealth (PPW_i) on private savings amount (PS_i). However, income and asset effects, bequest motives, future health risks, and a risk-averse personality may cause a positive correlation between public pension wealth (PPW_i) and private savings amount (PS_i) that negates the substitution effect. To address this issue, we use the following two approaches. First, to control for the positive correlation, the covariate X_i needs to include variables such as labor earnings, asset level, health conditions, the planned amount of bequest for heirs, and a measure of risk aversion. Therefore, as covariates in X_i in Equation (3), we include the planned bequest amount for heirs and a measure

of risk aversion to the covariates used in Table 3, which already include income, assets, and self-rated health status. However, the coefficients of these additional covariates are insignificant, and the estimation results are almost identical to those obtained when only the covariates used in Table 3 are used as X_i. Therefore, in the estimation results presented below, we report the results with the same covariates used in Table 3. Second, we take advantage of the pension reform as a source of exogenous variation of PPW_i and use an instrumental variable approach to identify the substitution effect.

We define the public pension wealth (PPW_i) in Equation (3) as follows: the present value of the expected future public pension benefits that will be received from the expected pension claiming age to the maximum length of life, where the discount factor is composed of the survival probability and real interest rate. That is,

$$PPW_i = E_i(\sigma_i) \sum_{\tau=N_i}^{T} \delta_{i,\tau} \left(\frac{1}{1+r}\right)^{\tau-N_i}, \qquad (4)$$

where σ_i is the planned public pension benefit level, N_i is the expected pension claiming age, T is the maximum length of life, $\delta_{i,\tau}$ is the survival probability at time τ, and *r* is the real interest rate. The variables σ_i, N_i, and $\delta_{i,\tau}$ can be obtained from the JSTAR, as σ_i can be considered as either the expected (planned) public pension benefit level or the expected replacement rate, N_i as the expected pension claiming age, and $\delta_{i,\tau}$ as the expected probability of survival.

The JSTAR, as described in the questionnaire in the Appendix, asked the respondents about their subjective probability p_i that the amount of public pension benefit they expect to receive σ_i could be reduced by 10 percent or more in the future. Therefore, the expected future public pension benefit level $E_i(\sigma_i)$ is within the range of $0.9\sigma_i(1-p_i)$ to $\sigma_i(1-0.1p_i)$ because

$$E_i(\sigma_i) \in [0,0.9\sigma_i]p_i + [0.9\sigma_i, \sigma_i](1-p_i) \qquad (5)$$

$$= \sigma_i[0.9(1-p_i), (1-0.1p_i)].$$

From Equations (4) and (5), it is straightforward to show the following: (*i*) p_i negatively affects the upper and lower bounds of the expected future public pension benefit level $E_i(\sigma_i)$ and thus negatively affects PPW_i; (*ii*) σ_i positively affects PPW_i; (*iii*) N_i negatively affects PPW_i; and (*iv*) $\delta_{i,\tau}$ positively affects PPW_i. Therefore, we substitute Equation (5) into Equation (4) and then linearly approximate Equation (4) as

$$PPW_i = \pi_0 + \pi_1 p_i + \pi_2 \sigma_i + \pi_3 N_i + X_i \Psi + u_i, \qquad (6)$$

where δ_i is included in X_i. We predict that $\pi_1 < 0$, $\pi_2 > 0$, and $\pi_3 < 0$. Next, we plug Equation (6) into Equation (3) and obtain

$$PS_i = \alpha + \phi_1 p_i + \phi_2 \sigma_i + \phi_3 N_i + X_i \Gamma + \varepsilon_i, \qquad (7)$$

where $\phi_1 = \theta\pi_1 > 0$, $\phi_2 = \theta\pi_2 < 0$, $\phi_3 = \theta\pi_3 > 0$, $\alpha = \mu + \theta\pi_0$, $\Gamma = \Lambda + \theta\Psi$, and $\varepsilon_i = \upsilon_i + \theta u_i$.[7] Equation (7) is equal to the private savings equation of Equation (2) when $y_i = (p_i, \sigma_i, N_i)$ and $\beta = (\phi_1, \phi_2, \phi_3)'$.

Table 5 presents the estimation results for the private savings equation in Equation (7). The dependent variable PS_i is a logarithm of the respondents' final saving goals, which can be obtained from the JSTAR.[8] The covariates X_i are the same as those in Table 3. In Table 5, Column 1, which includes p_i, N_i, and σ_i (the expected amount of public pension benefits) as the measures of public pension expectations, the probability of expecting a more-than-10-percent drop in future benefits has a significantly positive effect at the 5 percent level. Specifically, when the individuals' expected probability of a more-than-10-percent decline in pension benefits increases by 10 percent, their private savings goals increase by 11.0 percent. Therefore, the

[7] The sign of coefficient $\delta_{i,\tau}$ cannot be predicted because an increase in the expected probability of survival can induce an individual to increase PPW_i and PS_i at the same time.

[8] There are two reasons why we use the respondents' final savings goals to represent their private savings amount (PS_i) in Equation (7). First, both the final savings goal and the private pension wealth (PPW_i) match the expected values. Second, although the PPW_i is the present value at the pension claiming age, the final savings goal is usually considered to be the amount that the respondents are planning to save by their pension claiming age; thus, we can assume that the PS_i and the PPW_i are measured at approximately the same time in Equation (3).

coefficient p_i is positive and significant, and the sign is as we hypothesized in Equation (7). However, the coefficients N_i and σ_i are insignificant and close to zero, and the signs are not in the expected direction.

The public pension wealth (PPW_i) may be endogenous in Equation (3). Therefore, we use pension reform as a source of exogenous variation in the expected pension claiming age. Specifically, we use the following as instruments: the interactions between a dummy for planning to receive the Employer Pension Insurance (EPI_i), a dummy for the reform year ($REFORM_i$), and a vector of dummies for birth dates in the 2nd, 3rd, and 4th quarters ($BIRTH_i$), which are used as independent variables in Equation (1) and are mutually exclusive and collectively exhaustive.[9] Note that pension reform has a significantly positive impact in delaying the expected pension claiming age as shown in Section 5.2 and can thus be used as an instrument for the expected pension claiming age. In Column 2 of Table 5, we report the IV estimates. A 10 percent increase in the expected probability of a more-than-10-percent decline in pension benefit raises the individuals' private savings goals by 10.5 percent, which is significant at the 10 percent level. The sign of the coefficient for the pension claiming age is now the same as that predicted in Equation (7). The effect of σ_i on the final savings goal is insignificant and close to zero, and the sign is not in the expected direction. In Columns 3 and 4 of Table 5, we report the OLS and IV estimates when we use the expected replacement rate for σ_i, respectively. Both the OLS and IV estimates for the effect of the probability of expecting a more-than-10-percent drop in future benefits on private savings goals are 0.012 and significant (the OLS and IV estimates are significant at the 5 percent level and at the 10 percent level, respectively).

In conclusion, we find robust evidence that a reported drop in expectations of future public pension benefits has a positive effect on individuals' private savings goals.

[9] Bottazzi et al. (2006) estimate the substitution effect of pension wealth on private wealth by using dummies for the Italian post-pension reform period and employment groups as instruments.

7. Conclusion

Using the Japanese Study of Aging and Retirement (JSTAR), a new Japanese panel survey of people age 50 or older, we find that many Japanese in their early 50s are less confident about the future of the public pension system than those in their late 50s and early 60s. We find that recent pension reform, which raised the pensionable age, affected people by increasing the age when they expect to claim their benefits by almost the exact amount for all but did not affect their estimated retirement age. The reform also reduced the individuals' expected levels of public pension benefits, but this effect is not necessarily significant. We also find that the individuals' anxiety about the public pension program's future induces an increase in their private savings. Therefore, less confidence about the future of the public pension system causes Japanese adults to over-save.

Appendix: JSTAR Questionnaire on Public Pension Expectations

(1) In the future do you expect to receive any further public pension benefits?
1. Yes
2. No
3. Don't know
4. Refuse to answer

If the answer was 1, go to (2).

(2) What type of pension is it? Please select the most appropriate choice from the following.
1. National Pension Plan (basic old-age pension)
2. Old-age welfare annuity or retirement mutual pension (including basic pension)
3. Survivor's pension
4. Disability pension
5. Don't know
6. Refuse to answer

Regardless of the answer, go to (3).

(3) At what age do you expect to begin receiving that pension?
1. Age:_____
2. Don't know
3. Refuse to answer

Regardless of the answer, go to (4).

(4) Approximately how much do you expect to receive per year before taxes? If you don't mind, please tell me the total amount that will be deposited into your bank or postal account.
1. Approximately ____ yen
2. Don't know
3. Refuse to answer

Regardless of the answer, go to (5).

(5) Approximately what percent of your last working salary does that total amount to? If you did not work before, please say so.
1. ____%
2. Did not work
3. Don't know
4. Refuse to answer

Regardless of the answer, go to (6).

(6) Do you think it is likely that the amount you expect to receive could be reduced by 10% or more in the future? If you think it could be reduced, please provide the probability of such a reduction occurring in the future. If you don't think it could be reduced, please say so.
1. ____ %
2. No possibility (zero percent)

3. Don’t know
4. Refuse to answer

References

Bottazzi, Renata, Tullio, Jappelli, and Mario Padula. 2006. “Retirement Expectations, Pension Reforms, and Their Effect on Private Wealth Accumulation.” *Journal of Public Economics* 90(12): 2187-2212.

Bottazzi, Reneta, Tullio Jappelli, and Mario Padula. 2011. “The Portfolio Effect of Pension Reforms: Evidence from Italy.” *Journal of Pension Economics and Finance* 10(1), 75-97.

Delavande, Adeline, and Susann Rohwedder. 2011. “Individuals’ Uncertainty About Future Social Security Benefits and Portfolio Choice.” *Journal of Applied Econometrics* 26(3): 489-519.

De Nardi, Mariacristina, Eric French, and John B. Jones. 2009. “Life Expectancy and Old Age Savings.” *American Economic Review Paper and Proceedings* 99(2): 110-115.

De Nardi, Mariacristina, Eric French, and John B. Jones. 2010. “Why Do the Elderly Save? The Role of Medical Expenses.” *Journal of Political Economy* 118(1): 39-75.

Dominitz, Jeff, Charles F. Manski, and Jordan Heinz. 2002. “Social Security Expectations and Retirement Savings Decisions.” NBER Working Paper No. 8718.

Dominitz, Jeff, and Charles F. Manski. 2006. “Measuring Pension-Benefit Expectations Probabilistically.” *Labour* 20(2): 201-236.

Economic Survey of Japan. 2009. “Employment/Social Security and Household Behavior.” In *Annual Report on the Japanese Economy and Public Finance 2009 – Overcoming Financial Crisis and Vision for Sustained Recovery –*. Cabinet Office, Government of Japan: 197-274.

Gustman, Alan L. and Thomas Steinmeier. 2004. “What People Don’t Know About Their Pensions and Social Security.” In *Private Pensions and Public Policies*, eds. William G. Gale, John B. Shoven and Mark J. Warshawsky. Washington, D.C., Brookings Institution: 57-125.

Horioka, Charles Y., Hideki Fujisaki, Wako Watanabe, and Takatsugu Kouno. 2000. “Are Americans More Altruistic Than the Japanese? A U.S. – Japan Comparison of Saving and Bequest Motives.” *International Economic Journal* 14(1): 1-31.

Horioka, Carles Y., Wataru Suzuki, and Tatsuo Hatta. 2007. “Aging, Saving, and Public Pensions in Japan.” NBER Working Paper No. 13273.

Ichimura, Hidehiko, Hideki Hashimoto, and Satoshi Shimizutani. 2009. “Japanese Study of Aging and Retirement (JSTAR) First Results 2009 Report.” RIETI Discussion Paper Series 09-E-047.

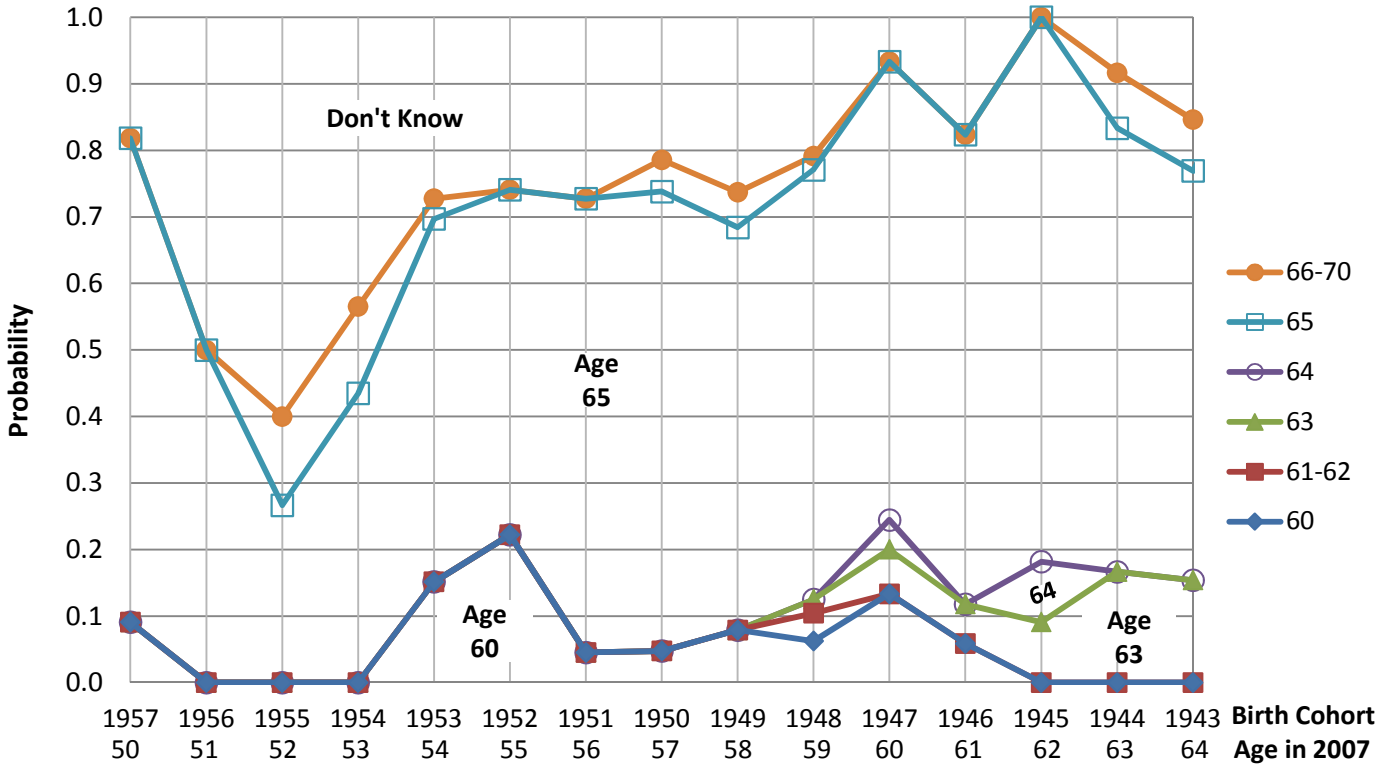
Okumura, Tsunao, and Emiko Usui. 2011. “Effect of Pension Reform on Pension-Benefit Expectations and Savings Decisions in Japan.” RIETI Discussion Paper Series 11-E-065.

Oshio, Takashi, Satoshi Shimizutani, and Akiko Sato Oishi. 2010. “Does Social Security Induce Withdrawal of the Old from the Labor Force and Create Jobs for the Young? The Case of Japan.” In *Social Security Programs and Retirement Around the World: The Relationship to Youth Employment*, eds. Jonathan Gruber and David A. Wise. Chicago: University of Chicago Press: 217-241.

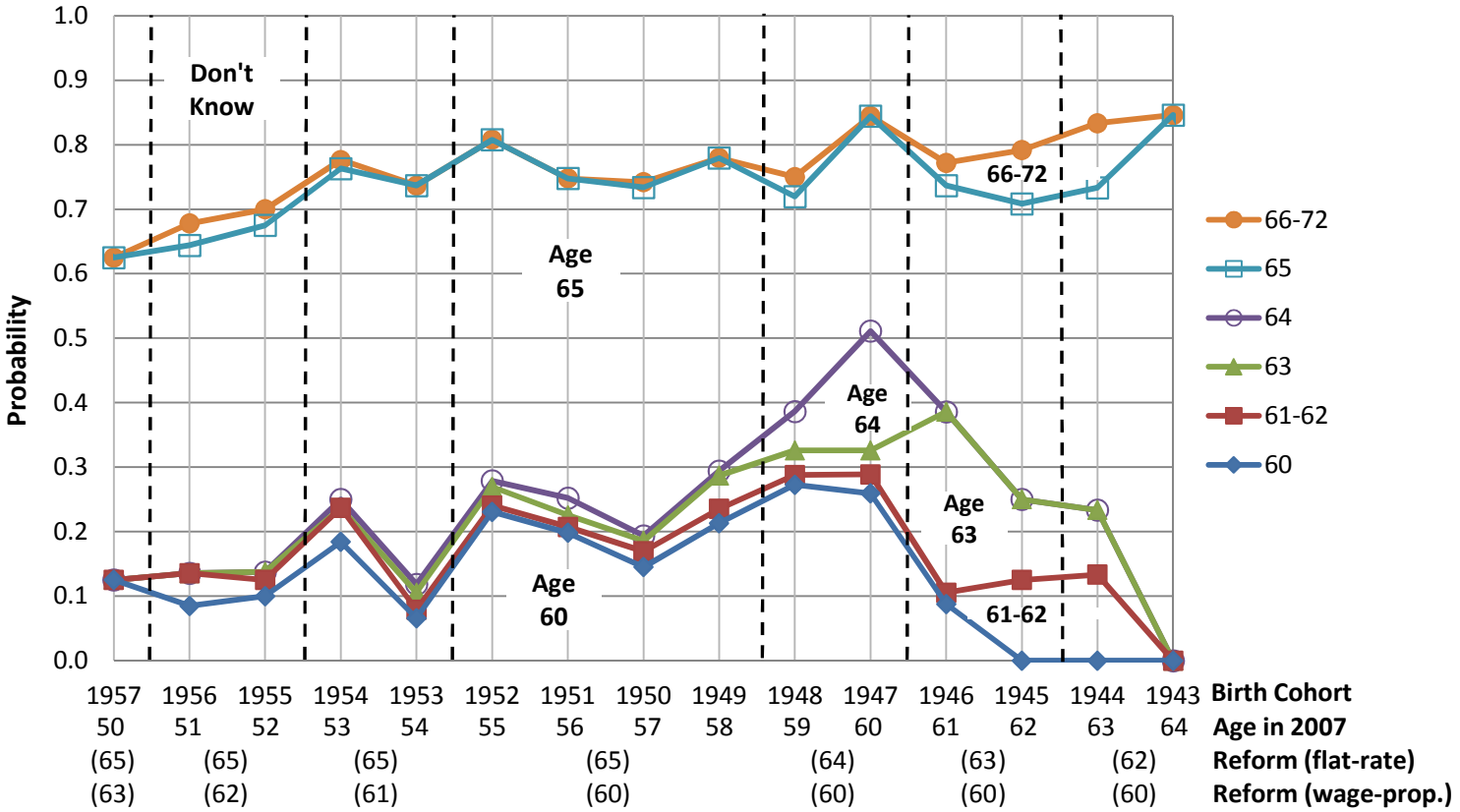
Oshio, Takashi, Akiko Oishi and Satoshi Shimizutani. 2011. “Social Security Reforms and Labor Force Participation of the Elderly in Japan.” *Japanese Economic Review* 62(2): 248-271.

Figure 1: Probability of Respondents by Birth Cohort who Expect Specific Pension Claiming Age

Panel A: Men who Plan to Receive National Pension Insurance (NPI)



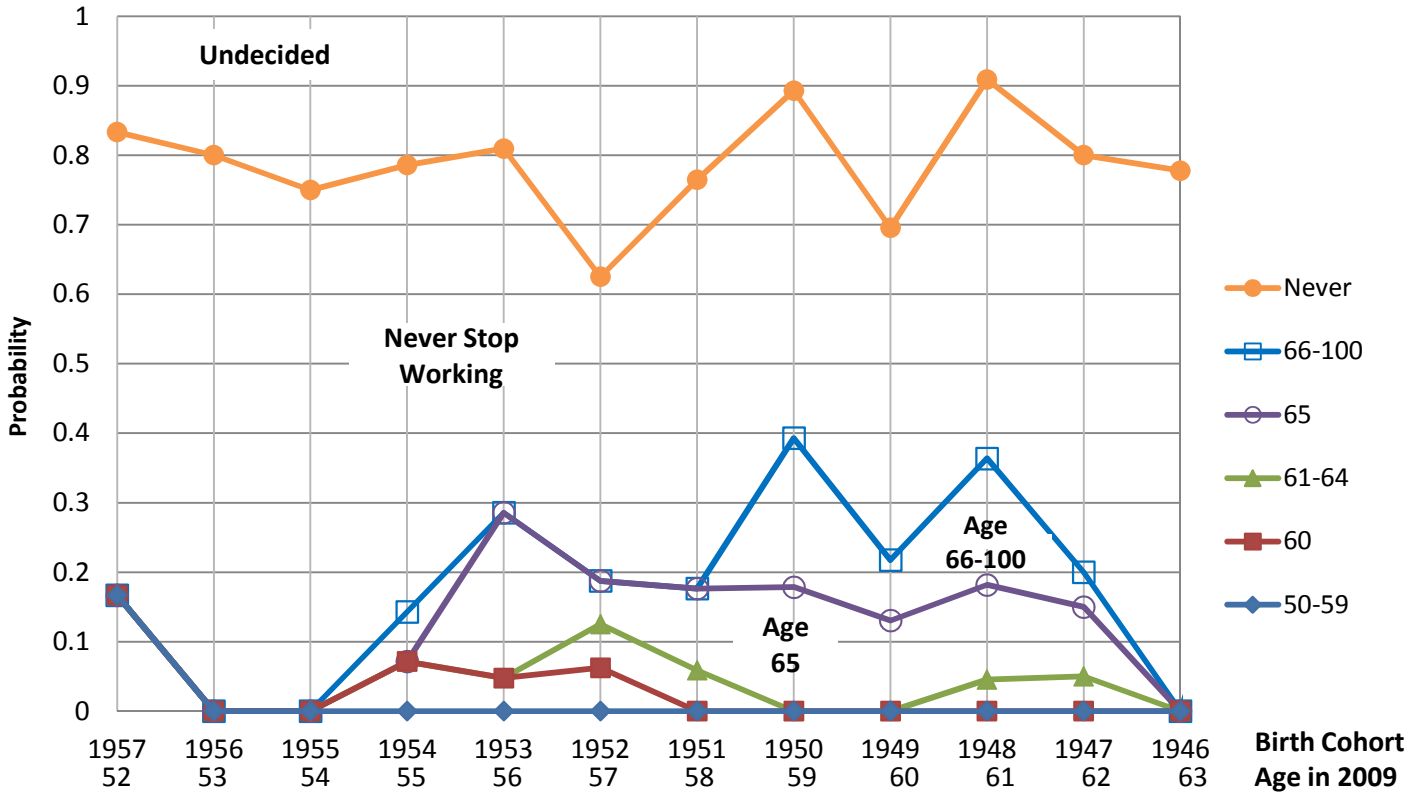
Panel B: Men who Plan to Receive Employee Pension Insurance (EPI)



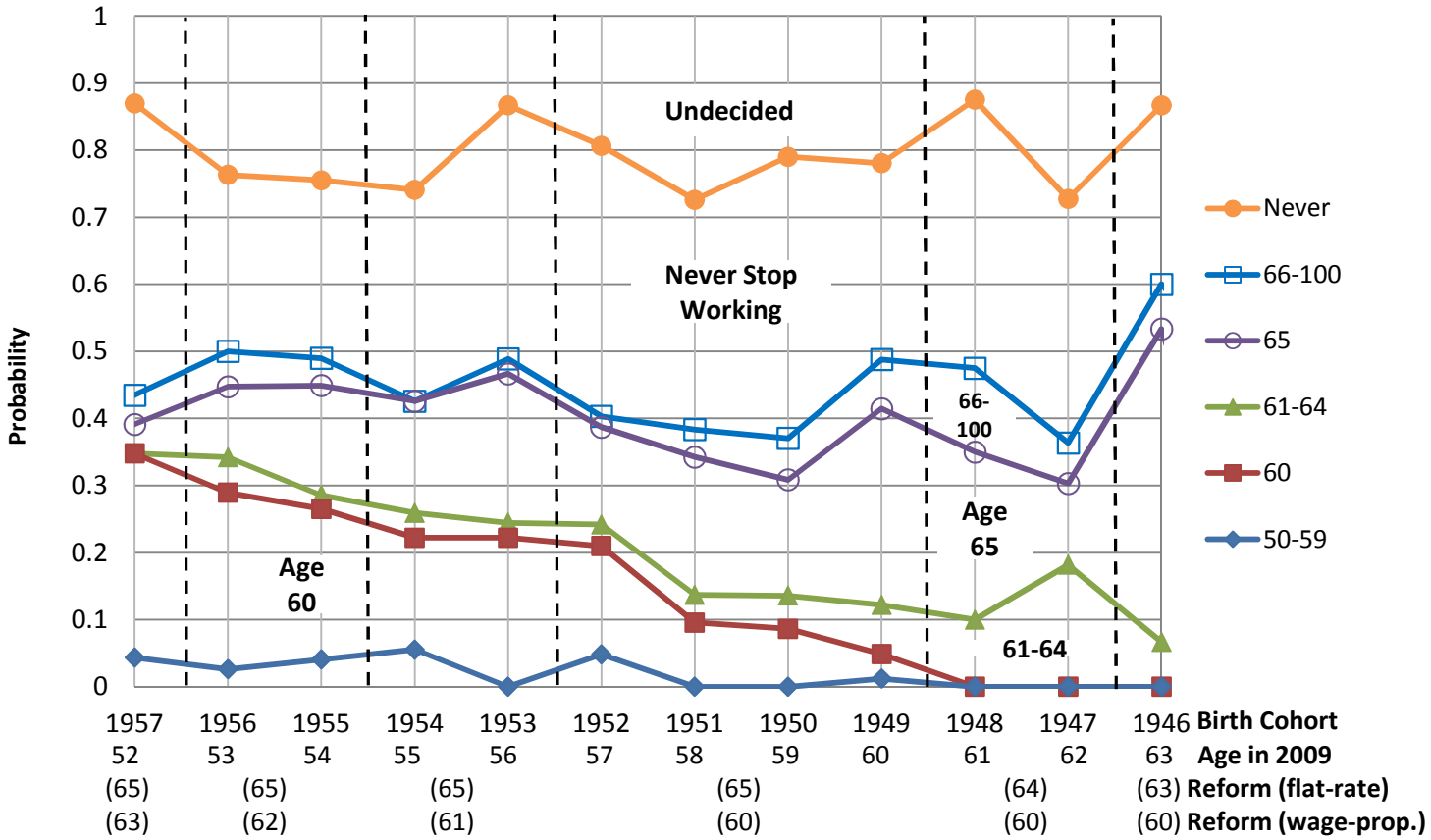
Note: The dotted vertical lines in Panel B represent the birth cohorts for whom the the uniform pensionable ages apply through the EPI pension reform. For these birth cohorts, the numbers in parentheses in the row marked "Reform (flat rate)" indicate the pensionable age of the flat-rate benefit, and those in the row marked "Reform (wage prop.)" indicate the pensionable age of the wage-proportional benefit.

Figure 2: Probability of Respondents by Birth Cohort of Those Expect to Retire at a Specific Age

Panel A: Men who Plan to Receive National Pension Insurance (NPI)



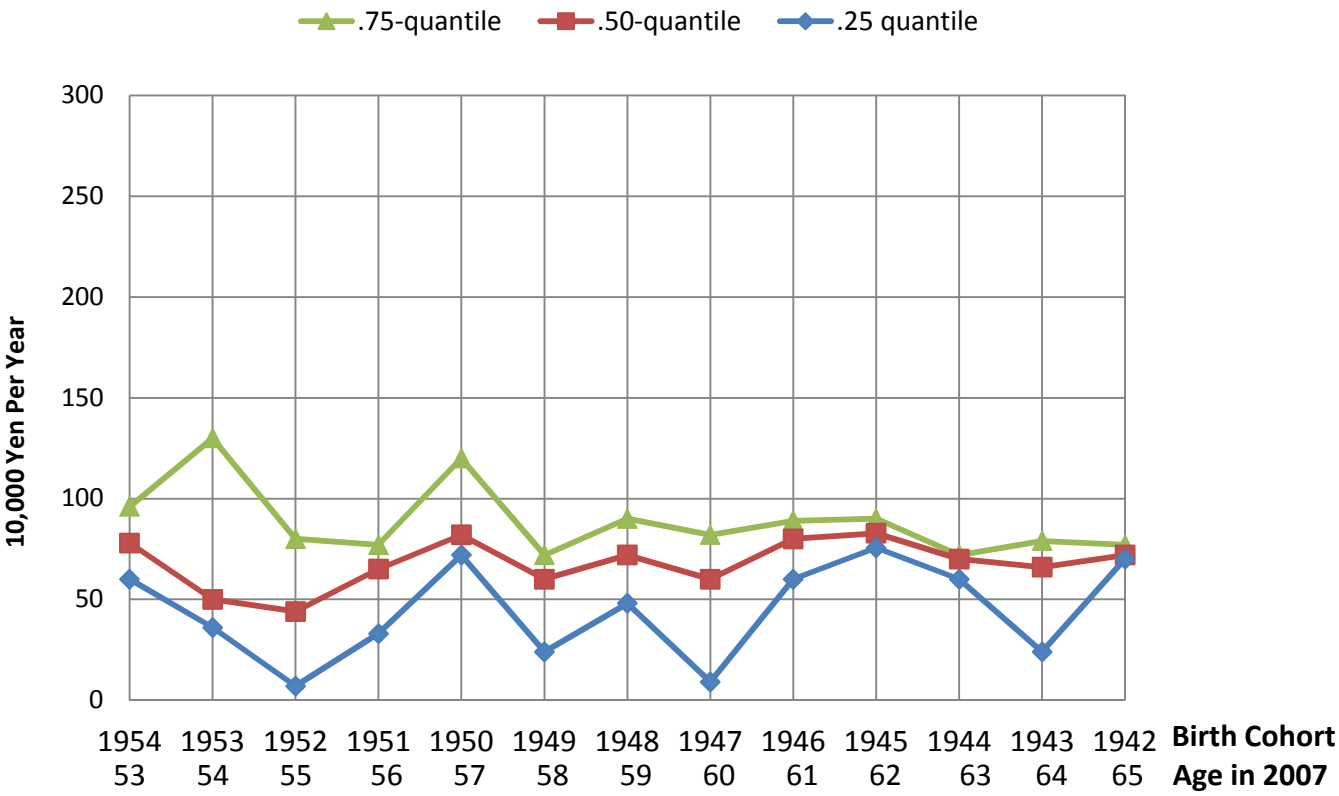
Panel B: Men who Plan to Receive Employee Pension Insurance (EPI)



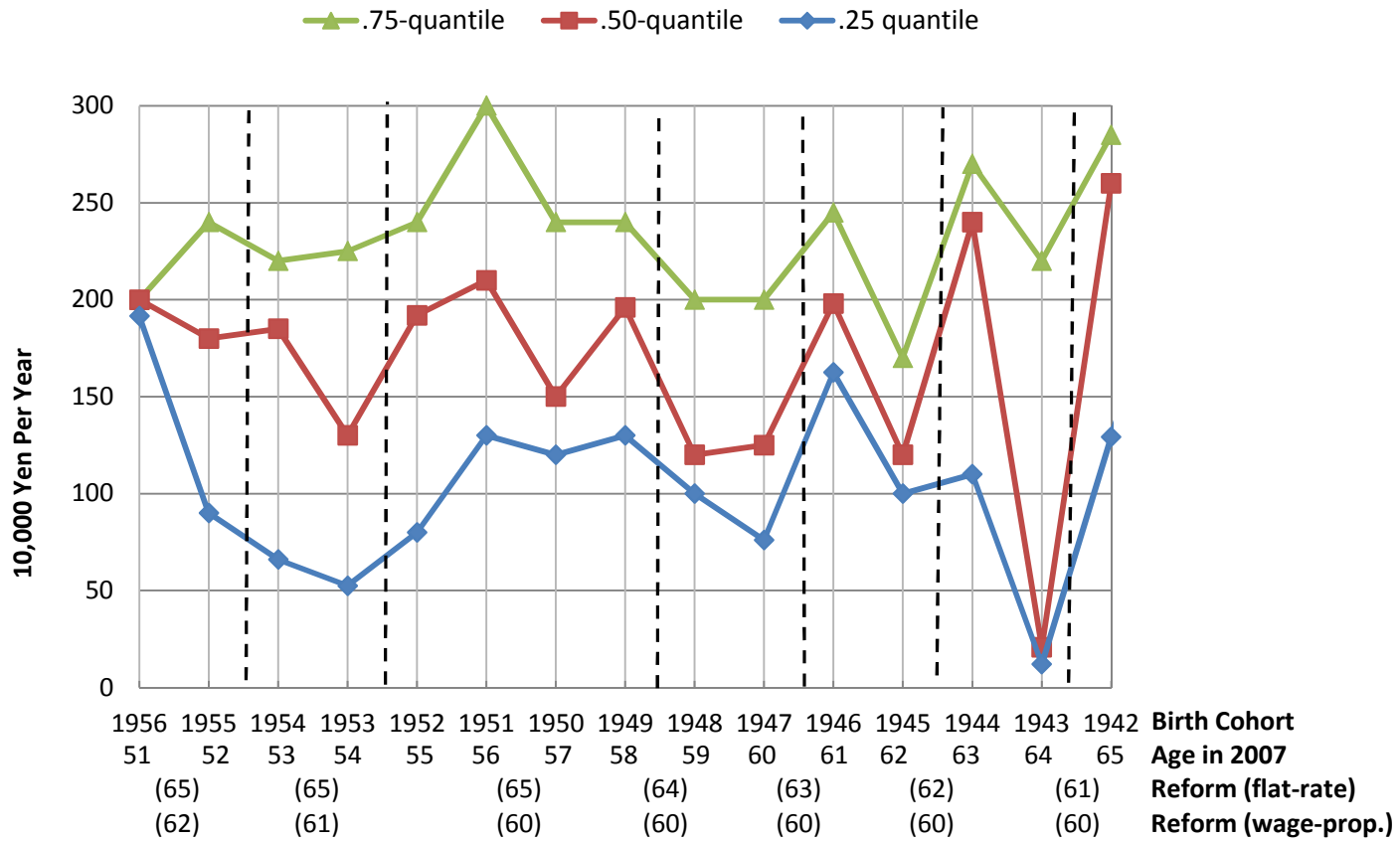
Note: The dotted vertical lines in Panel B represent the birth cohorts for whom the the uniform pensionable ages apply through the EPI pension reform. For these birth cohorts, the numbers in parentheses in the row marked "Reform (flat rate)" indicate the pensionable age of the flat-rate benefit, and those in the row marked "Reform (wage prop.)" indicate the pensionable age of the wage-proportional benefit.

Figure 3: Quantiles for the Expected Amount of Public Pension Benefits Conditional on Birth Cohorts

Panel A: Men who Plan to Receive National Pension Insurance (NPI)



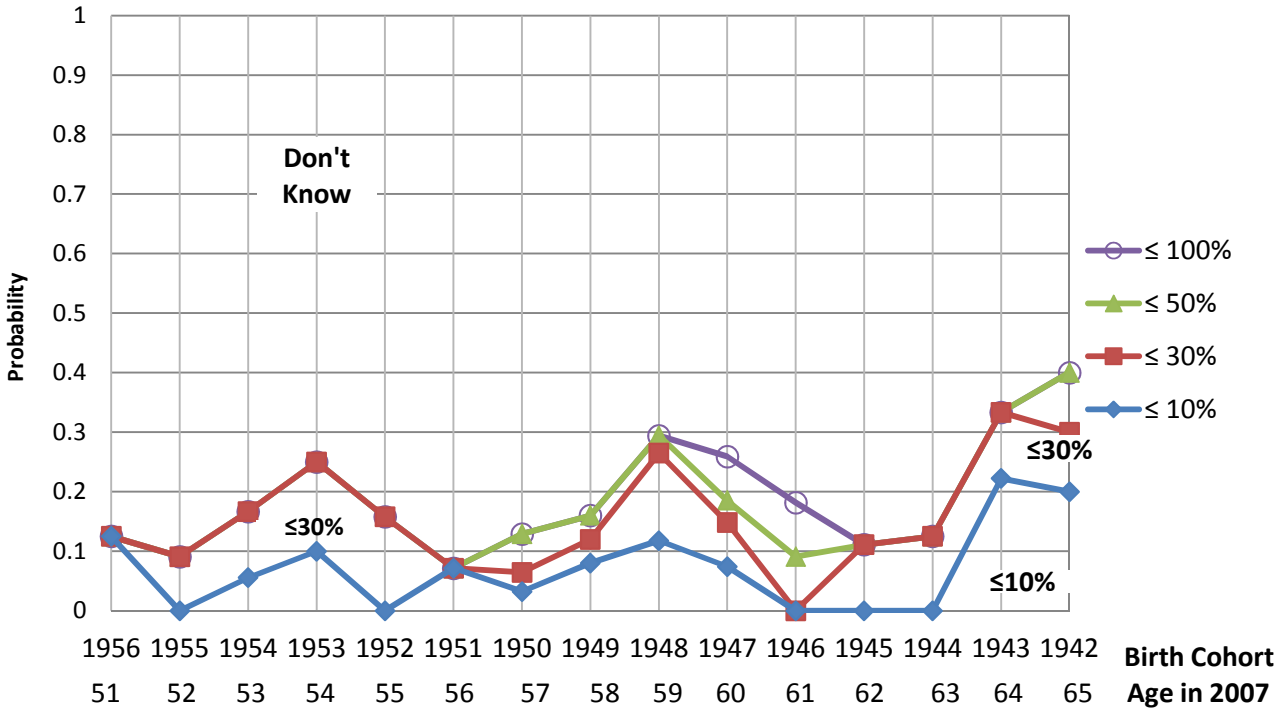
Panel B: Men who Plan to Receive Employee Pension Insurance (EPI)



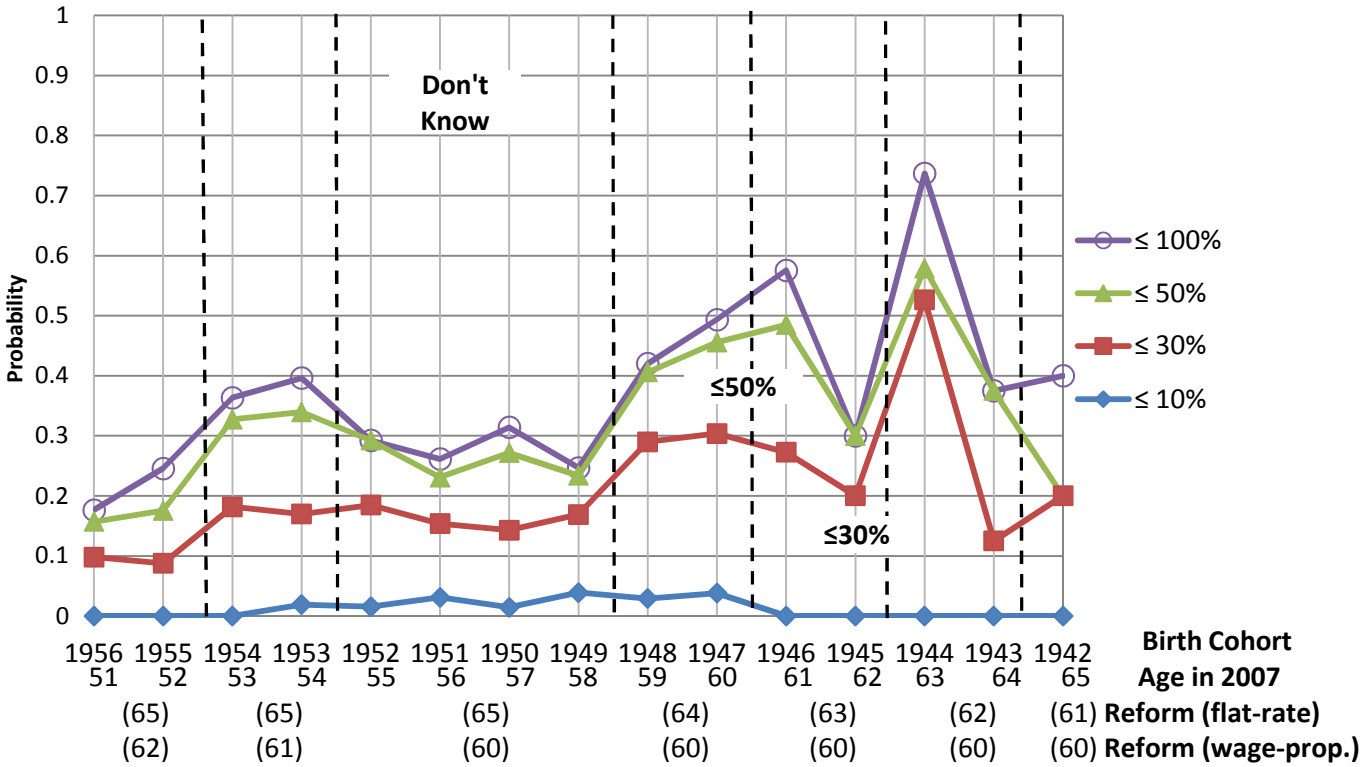
Note: The dotted vertical lines in Panel B represent the birth cohorts for whom the the uniform pensionable ages apply through the EPI pension reform. For these birth cohorts, the numbers in parentheses in the row marked "Reform (flat rate)" indicate the pensionable age of the flat-rate benefit, and those in the row marked "Reform (wage prop.)" indicate the pensionable age of the wage-proportional benefit.

Figure 4: Probability of the Expected Ratio of Public Pension Benefits to Pre-Retirement Earnings Conditional on Birth Cohort

Panel A: Men who Plan to Receive National Pension Insurance (NPI)



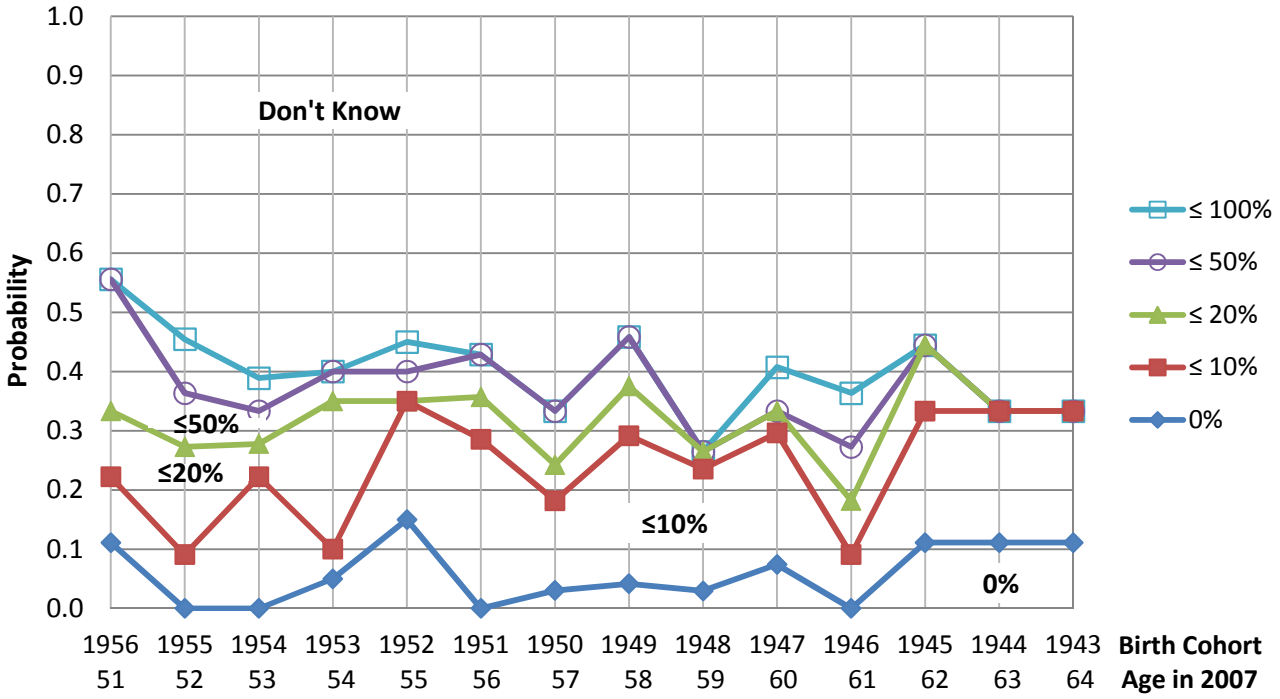
Panel B: Men who Plan to Receive Employee Pension Insurance (EPI)



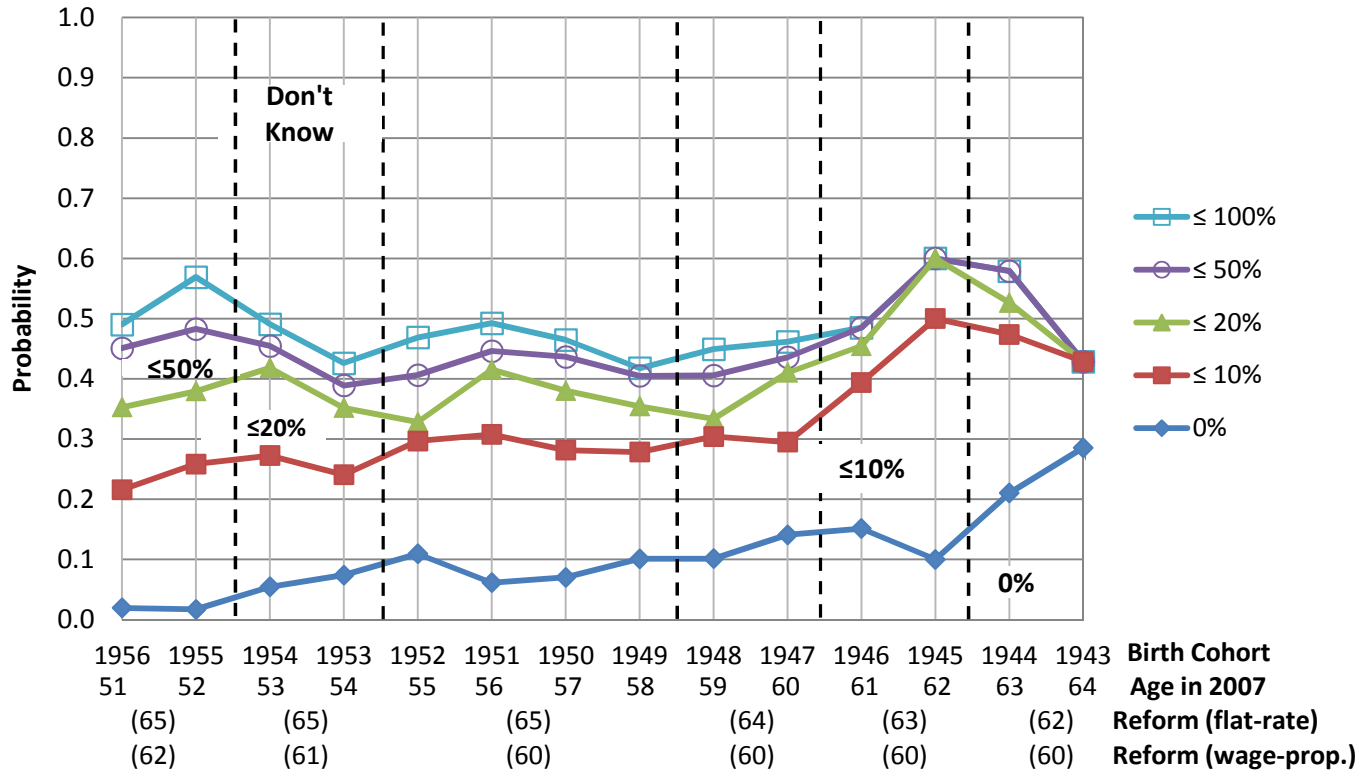
Note: The dotted vertical lines in Panel B represent the birth cohorts for whom the the uniform pensionable ages apply through the EPI pension reform. For these birth cohorts, the numbers in parentheses in the row marked "Reform (flat rate)" indicate the pensionable age of the flat-rate benefit, and those in the row marked "Reform (wage prop.)" indicate the pensionable age of the wage-proportional benefit.

Figure 5: Expected Probability of a More-than-10% Decline in Public Pension Benefits Conditional on Birth Cohort

Panel A: Men who Plan to Receive National Pension Insurance (NPI)



Panel B: Men who Plan to Receive Employee Pension Insurance (EPI)



Note: The dotted vertical lines in Panel B represent the birth cohorts for whom the the uniform pensionable ages apply through the EPI pension reform. For these birth cohorts, the numbers in parentheses in the row marked "Reform (flat rate)" indicate the pensionable age of the flat-rate benefit, and those in the row marked "Reform (wage prop.)" indicate the pensionable age of the wage-proportional benefit.

Table 1: Reforms of Public Pension and Employment Policy for the Elderly

Panel A: Public Pension Reform: Schedule for Raising the Pensionable Age

		National Pension Insurance	Employee Pension Insurance	
		Flat-rate benefit	Flat-rate benefit	Wage proportional benefit
Birth Cohort	**Reform Year**			
Men				
1941.4.2-1943.4.1	2001	65	**61**	60
1943.4.2-1945.4.1	2004	65	**62**	60
1945.4.2-1947.4.1	2007	65	**63**	60
1947.4.2-1949.4.1	2010	65	**64**	60
1949.4.2-1953.4.1	2013	65	**65**	60
1953.4.2-1955.4.1	2013	65	65	**61**
1955.4.2-1957.4.1	2016	65	65	**62**
1957.4.2-1959.4.1	2019	65	65	**63**
1959.4.2-1961.4.1	2022	65	65	**64**
1961.4.2-	2025	65	65	**65**
Women				
1946.4.2-1948.4.1	2006	65	**61**	60
1948.4.2-1950.4.1	2009	65	**62**	60
1950.4.2-1952.4.1	2012	65	**63**	60
1952.4.2-1954.4.1	2015	65	**64**	60
1954.4.2-1958.4.1	2018	65	**65**	60
1958.4.2-1960.4.1	2018	65	65	**61**
1960.4.2-1962.4.1	2021	65	65	**62**
1962.4.2-1964.4.1	2024	65	65	**63**
1964.4.2-1966.4.1	2027	65	65	**64**
1966.4.2-	2030	65	65	**65**

Panel B: Employment Policy Reform

Birth Cohort	Retirement Age
1946.4.1-1947.3.31	63
1947.4.1-1949.3.31	64
1949.4.1-	65

Table 2: Summary Statistics of Key Variables

Sample: Five Municipalities 2007, Naha 2008, and Tosu 2009

	Mean	SD	Min	Max	25th perc.	Median	75th perc.
Age	56.69	3.644	50	65	54	57	59
Female	0.486	0.500	0	1	0	0	1
Married	0.852	0.355	0	1	1	1	1
Less than high school	0.155	0.362	0	1	0	0	0
High school	0.457	0.498	0	1	0	0	1
Junior college	0.180	0.385	0	1	0	0	0
University or more	0.206	0.404	0	1	0	0	0
ADL Disability	0.098	0.297	0	1	0	0	0
Income	571.2	539.3	0	11650	280	500	760
Asset	641.2	1360.1	0	16100	0	150	700
Currently working for pay	0.843	0.364	0	1	1	1	1
Labor market experience	26.50	13.26	0	50	17	31	37
Probability of survival until age 75 divided by life table probability	1.020	0.342	0	1.400	0.834	1.131	1.292
Plan to Receive National Pension Insurance (NPI)	0.368	0.482	0	1	0	0	1
Plan to Receive Employer Pension Insurance (EPI)	0.617	0.486	0	1	0	1	1
Expected public pension claiming age	63.78	2.205	60	72	62	65	65
Expected amount of public pension benefits	105.2	86.17	0	500	48	80	150
Expected replacement rate	39.09	20.94	0	100	30	30	50
Expected probability of a more-than-10% drop in public pension benefits	17.97	22.57	0	100	10	10	20

Table 3: Estimates of Public Pension Expectations

	Dependent Variable				
	Expected Pension Claiming Age	**Expected Retirement Age**	**Amount of Expected Public Pension Benefits**	**Expected Replacement Rate**	**Expected Probability of a More-than-10% Decline in Public Pension Benefits**
Independent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Age 55-59	-0.434 **	1.860 **	3.805	-0.093	-1.681
	(0.105)	(0.304)	(7.698)	(1.935)	(1.898)
Age 60-65	-0.006	3.959 **	6.974	0.026	-10.524 **
	(0.118)	(0.336)	(8.613)	(2.526)	(2.240)
Female	-0.588 **	-1.900 **	-58.270 **	8.670 **	0.918
	(0.107)	(0.291)	(6.928)	(2.304)	(2.113)
Less than high school	0.012	0.853 **	-15.720 **	1.300	-0.339
	(0.117)	(0.404)	(6.100)	(3.097)	(1.988)
Junior college	0.295 **	0.446	14.111 *	-1.555	-1.423
	(0.115)	(0.351)	(8.064)	(2.566)	(2.327)
University and over	0.492 **	0.394	10.780	-2.776	0.751
	(0.123)	(0.340)	(9.739)	(1.971)	(2.454)
Self-rated health: Good	-0.192 **	-0.368	3.615	-0.038	1.813
	(0.089)	(0.252)	(6.226)	(1.772)	(1.635)
Self-rated health: Fair/Poor	-0.424 **	0.728	-6.035	-2.221	1.073
	(0.154)	(0.535)	(7.661)	(2.958)	(2.379)
Married	-0.173	-0.077	11.535	3.866 *	5.472 **
	(0.151)	(0.440)	(8.534)	(2.169)	(2.211)
Probability of survival until	0.150	0.944 **	4.373	0.311	-4.170
age 75 divided by life table	(0.162)	(0.404)	(8.914)	(2.787)	(2.687)
Currently working for pay	0.290 **		-1.733	1.635	4.962 **
	(0.116)		(5.347)	(3.507)	(2.312)
Number of years worked	-0.006	0.005	0.086	0.014	-0.007
	(0.004)	(0.013)	(0.207)	(0.097)	(0.079)
Asset	-0.003	-0.013	-0.124	-0.030	0.009
	(0.002)	(0.010)	(0.108)	(0.030)	(0.038)
Income	0.004	-0.053 *	1.830 **	-0.441 **	-0.371 **
	(0.010)	(0.031)	(0.685)	(0.152)	(0.186)
EPI beneficiaries	-1.247 **	-1.714 **	48.252 **	2.551	1.870
	(0.089)	(0.299)	(5.573)	(2.153)	(1.673)
N	2806	1270	977	701	1148

Note: All regressions include indicators for missing variables. The reference catogoery for the age categories is 50-54 years of age. The reference category for education is high school education. The reference category for self-rated health is excellent/very good. Robust standard errors are in parentheses. *Significant at 10%. **Significant at 5%.

Table 4: Effect of Public Pension Reform

	Dependent Variable				
	Expected Pension Claiming Age	**Retirement Age**	**Expected Amount of Public Pension Benefits**	**Expected Replacement Rate**	**Expected Probability of a More-than-10% Drop in Public Pension Benefits**
Independent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
EPI × Reform Year × 2nd Quarter Dummy	1.234 **	0.634	-28.389	0.760	-7.204
	(0.461)	(1.759)	(26.959)	(12.926)	(9.861)
EPI × Reform Year × 3rd Quarter Dummy	1.145 **	-1.210	-62.015 **	3.134	-9.815
	(0.455)	(1.513)	(30.028)	(11.475)	(9.173)
EPI × Reform Year × 4th Quarter Dummy	1.092 **	0.203	24.969	17.206	2.261
	(0.445)	(1.357)	(26.044)	(10.533)	(8.478)
N	2806	1270	977	701	1148

Note: All regressions include indicators for missing variables. All regressions control for age, education (high school or less, junior college, university or over), gender, marital status (never married, divorced, widowed), health status (good, poor/fair), employment status (working for pay), number of years worked, asset, household income, probability of survival until age 75 divided by life table probability, region, and year. Robust standard errors are in parentheses. *Significant at 10%. **Significant at 5%.

Table 5: Estimates of Public Pension Expectations on Log of Final Savings Goals

Independent Variables	OLS (1)	IV (2)	OLS (3)	IV (4)
Expected Probability of a More-than-10%	0.0110 **	0.0105 *	0.0120 **	0.0120 *
Drop in Public Pension Benefits	(0.0055)	(0.0061)	(0.0057)	(0.0064)
Expected Pension Claiming Age	-0.0260	0.0796	-0.0335	-0.0222
	(0.0458)	(0.1636)	(0.0470)	(0.1567)
Expected Amount of Public Pension	0.0008	0.0007		
Benefits	(0.0021)	(0.0021)		
Expected Replacement Rate			0.0007	0.0005
			(0.0069)	(0.0068)
N	786	786	742	742

Note: All regressions include indicators for missing variables. All regressions control for age, education (high school or less, junior college, university or over), gender, marital status (never married, divorced, widowed), health status (good, poor/fair), employment status (working for pay), number of years worked, asset, household income, probability of survival until age 75 divided by life table probability, region, and year. The IV estimates use the pension reform variables as instruments for the expected pension claiming age. Robust standard errors are in parentheses. *Significant at 10%. **Significant at 5%.