Social Security Reforms and Inequality in Japan

[revised draft]

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Abstract

We examined the heterogeneous impacts of social security reforms in Japan over the past 40 years. We utilize a nationwide large-scale micro-dataset to compute individual-level social security wealth (SSW) and mortality rates by lifetime earning groups. We found that SSW declined for all groups after the social security reforms, which aimed to reduce generosity; however, the size of the negative impact was larger for richer individuals. These results indicate that a series of recent social security reforms have reduced inequality in SSW.

1. Introduction

Social security programs play a significant role in providing material livelihoods for individuals and families in need. Japan's public pension programs, which introduced universal coverage in the 1960s, were established based on the idea of all working people working together to support the livelihoods of those in need, including older people, people with disabilities, and survivors.[1] Thus, the essential characteristics of social security programs are relevant to income redistribution policies. While the redistributive function of social security programs is common across countries, the underlying social security policies differ significantly in the treatment of beneficiaries with different income histories. From an international perspective, the Japanese public pension programs are characterized by "modest" progressivity in terms of net pension wealth relative to individual net earnings: 7.6 times for men and 9.2 times for women for average earners[2]. These figures are lower than the OECD average (11.8 times for males and 13.1 times for females) and those of most European countries except the United Kingdom in 2017. If we compare net pension wealth between rich (1.5 times mean) and poor (0.5 times mean) individuals, the figures are 6.7 and 10.0 for males and 8.1 and 12.0 for females in Japan, which are comparable with those in the US.

Meanwhile, the rapid speed of population aging has posed significant pressure on the social security program in Japan and raised serious concerns about its financial sustainability, which is operated under the pay-as-you-go scheme. Since the mid-1980s,

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[1] See Japan Pension Service's website (https://www.nenkin.go.jp/international/japanese-system/overview/overview.html).

[2] OECD (2017) "Pensions at a Glance" (Figure 4.15) (https://www.oecd-ilibrary.org/docserver/pension_glance-2017-18-en.pdf?expires=1704672734&id=id&accname=guest&checksum=10D4544C682BB3E864008A948A7B1EF6). Net pension wealth relative to individual net earnings measures the total discounted value of the lifetime flow of all retirement incomes in mandatory pension schemes at retirement age.

the Japanese government has started to reduce the generosity of the public pension program in some forms, such as by increasing the eligibility age, which has been further strengthened since the 2000s (see the next section). We examined the impact of a series of recent social security reforms on working and retirement decisions and found that a higher implicit tax on working, *on average,* led to individuals retiring and claiming benefits earlier, especially males, in Phase 10 of this project (Oshio et al., 2023). In other words, the lower generosity of public pension benefits encouraged older individuals to work longer and retire later, *on average*.

However, the impact of recent social security reforms on benefit entitlement and work is presumably heterogeneous across income groups. Examining the distributional impact of a series of social security reforms is critical for policymakers but has not yet been examined. To the best of our knowledge, this is the first attempt to reveal the heterogeneous impact of recent social security reforms in Japan.

2. Social Security programs and reforms over decades in Japan

The Japanese public pension program benefit has a two-tier structure: the first tier is a flat-rate basic benefit, and the second is a wage-proportional benefit. Self-employed workers covered by the National Pension Insurance (NPI) program receive only basic benefits and contribute a flat-rate premium. Hence, the net NPI benefit over a lifetime is flat, meaning that the NPI program is progressive because the ratio of benefits to lifetime earnings is lower for higher-income individuals. Employed workers covered by the Employees' Pension Insurance (EPI) program receive both flat-rate and wage-proportional benefits and contribute to a wage-proportional premium. The flat-rate benefit is progressive, and the wage-proportional component is neutral, making the total benefit progressive[3].

A series of reforms in social security and employment programs, illustrated in Figure 1, have been implemented since the early 2000s to reduce the generosity of pension benefits and encourage older people to work longer (Oshio et al., 2011; 2020). There are four major reforms in the program: (1) a gradual increase in eligibility ages; (2) a reduction in benefit multipliers; (3) revisions to the earnings-tested (*Zaishoku*) pension program; (4) a revision of the Elderly Employment Stabilization Law.

While the impacts of these reforms on retirement are likely to overlap, extending the eligibility age to receive pension benefits is a key driver of the generosity of the public pension scheme. The EPI program, which covers company employees and public-sector workers, gradually extended the eligibility age (Figure 2). For men, the eligibility age for the flat-rate (first-tier) benefit, indicated by the [normal retirement age] in the figure, was raised to 61 in 2001 and subsequently increased to 65 in 2013. For women, the corresponding eligibility age for the flat-rate component was 61 years in 2005, which was further revised to 65 years in 2018, with a five-year lag for men. Meanwhile, men's eligibility age for the wage-proportional (second-tier) benefits – which is indicated by ERA [early retirement age] in the figure – began increasing from 60 to 61 in 2013 and was scheduled to gradually increase to 65 in 2025; for women, the increase was scheduled to follow the increase with a five-year lag with men.

Moreover, the computation of benefits has been adjusted for decades to reduce generosity. The size of the multiplier for the wage-proportional second-tier was reduced for EPI beneficiaries from 7.5/1000 to 7.125/1000 in 2001 and, since then, has remained

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[3] Denote the multiplier of the wage-proportional benefit, flat-rate benefit, the premium rate, and average lifetime earnings by m, b, t, and w, respectively. Then, the ratio of the net EPI benefit to average lifetime earnings is expressed by $(m-t+b)/w$, which is a decreasing function of w.

at the same level, implying a 5% reduction in the benefit. During the same period, the flat-rate, first-tier benefit was reduced by 30.9% (from 96,960 yen to 67,000 yen per month) to ensure benefits for housewives without a premium contribution (Oshio et al., 2021).

In addition to reforming core public pension programs, the government has made several revisions to related programs. The government reformed the *Zaishoku* pension program, which is an earnings-tested pension program applied to those who remain in the labor force after their eligibility age (Shimizutani and Oshio, 2013). Starting with a 20% reduction in the benefits given to working beneficiaries in the 1950s, the effective tax rate on additional work was revised several times. In 2015, 34.0% of the new EPI beneficiaries claimed a *Zaishoku* pension benefit. In 1995, the government introduced a wage subsidy program for elderly people. This program started by subsidizing 25% of the wages of individuals aged 60–64 who continued to work for the same firm at a wage rate less than 64% of the pre-retirement level. Since 1998, the *Zaishoku* pension benefit has been reduced for those who receive wage subsidies, and the subsidy rate was reduced to 15% in 2003. Despite this reduced generosity, this wage subsidy is expected to encourage workers to continue working by partially offsetting the expected reduction in wage earnings after mandatory retirement at the age of 60 (Oshio et al., 2020).

Finally, an increase in the eligibility age for claiming pension benefits prompted the government to consider policy measures to allow a smooth transition from work to retirement for those aged 65 years or above. In 1973, the government enforced the Elderly Employment Stabilization Law (EESL) to encourage firms to raise their mandatory retirement age to 60 years, which was set as an obligatory target in 1986. In 2004, the government revised this law to propose that firms either abolish the mandatory retirement age completely or raise it to 65 years. The revised EESL became effective in 2006. In 2013, the government further amended the law to oblige firms to continue hiring individuals who wished to work until 65 years old, albeit on a part-time basis in most cases. Combined with an increase in the eligibility age to 65 years for claiming EPI benefits, these employment policies are expected to increase the chances of the older adults staying in the labor force, even if they are not likely to have a direct impact on the incentive to work (Oshio et al., 2020).

A combination of these policy reforms is expected to have mixed effects on income distribution. Most notably, reduced-benefit multipliers may have had an equalizing effect by increasing the weight of flat-rate benefits, whereas reduced-flat-rate benefits may have had the opposite effect. The impact of a change in the *Zaishoku* Program may have been concentrated on higher-income individuals, while the impact of the changes in wage subsidy rates may be proportional to income. The overall impact of these reforms warrants further empirical investigation. We examine the direction and magnitude of the overall effects of these reforms on income inequality.

3. Data description

We use two datasets in the study. First, we use a panel dataset from "The Longitudinal Survey of Middle-Aged and Older Adults (LSMOA)" in 2005 to 2021. This survey is nationwide, population-based, and is conducted annually by the Japanese Ministry of Health, Labour and Welfare (MHLW) to track the same individuals. Individuals in the first wave were selected in 2005 using a two-stage random sampling procedure.[4] A total of 34,240 individuals responded (response rate: 83.8%), and 20,677

[4] First, 2,515 districts were randomly selected from the 5,280 districts that were included in the CSLC that

individuals continued to participate in the study until the seventeenth wave in 2021.[5] No new respondents were added after the first wave. We used data from ten cohorts – born between 1945 and 1954. The questionnaires were distributed to respondents' homes and completed by the respondents themselves. The survey covered a variety of variables, including employment, health, education, and family status. The unit of the survey was an individual, as opposed to a couple, and information concerning spouses was rare.[6]

Second, we use microdata from the "Comprehensive Survey of Living Conditions (CSLC)" conducted by the MHLW from 1986 to 2019. In contrast to the LSMOA, the CSLC uses repeated cross-sectional data collected every three years. The CSLS covers a wide variety of variables, including health, economic status, and family status. The survey contained detailed information about the health status. Survey samples were collected nationwide using a two-stage random sampling procedure.[7] Over the 12 waves, 224,641 households and their members (568,425 individuals) responded. The average response rate was 77.6% at the household level over all waves. We limited the sample to individuals aged between 55 and 69 years and excluded respondents who were missing key variables, resulting in a final sample of 196,375 observations (92,253 men and 104,122 women).

4. Development of inequality measures over decades

This section describes a set of variable figures to show how the distribution of

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was conducted in 2004. The 5,280 districts of this survey were, in turn, randomly selected from approximately national census districts. Then, 40,877 residents aged 50–59 years old were randomly selected from each of the selected districts based on the population of each district.

[5] The attrition rate per wave is quite low at 4.0% on average.

[6] The survey asked a spouse's income and its source (work or pension benefit) but did not require the work or pension status of a spouse in detail.

[7] First, 5,410 districts were randomly selected from the national census districts. Second, 290,000 households were randomly selected from each selected district, according to its population size.

income variables has evolved over the past few decades in terms of the Gini coefficient. For men and women, each figure compares individuals working and those not working. At the same time, we note that there is a substantial portion of "working pensioners" who receive pension benefits while working; 40.3% of pensioners aged 50-69 years (52.5% and 28.8% for men and women, respectively) were working in the pooled sample over 1986-2019 waves.

Figure 3 depicts the distribution of total retirement income, public pension income, and financial assets among those aged 55-69 years in terms of the Gini coefficient using the CSLC dataset. For both working and non-working individuals, the inequality in total retirement income was almost flat. Meanwhile, public pension income and financial assets are somewhat equally distributed.

Figure 4 focuses on the Gini coefficients of average lifetime earnings (ALTE), total retirement income, public pension income, financial assets, and SSW at the ages of 60 (upper panel) and 65 (lower panel) using the LSMOA dataset. At 60 years of age, both the total retirement income and pension income became more unevenly distributed from 2006 to 2015. This is presumably because EPI benefits at the age of 60 years have been limited to the wage-proportional component for younger cohorts, making the distribution of public pension income more affected by inequality in ALTE. No other variable exhibits a clear trend in inequality. At the age of 65 years, the Gini coefficients of all variables remained in narrow ranges during 2011 and 2021.

5. Mortality rates by lifetime earnings

Japan has no official lifetime table stratified by lifetime earnings. Hence, we combine two observations to examine mortality by lifetime earnings group. First, we used the (age-standardized) mortality rates by educational level (high, middle, and low) for those aged 40–79 years in 2000-2005 and 2010-2015 (Tanaka et al., 2023).[8] Second, we estimate lifetime earnings by educational level based on the *Wage Census* in 2005 and 2015. Finally, we combine the mortality rate and lifetime earnings using educational level as a mediating variable and employ linear regression models to estimate the gradient of the mortality rate in terms of lifetime earnings. This exercise was conducted separately for men and women.

Table 1 summarizes the age-standardized mortality rates and lifetime earnings. We observe that higher education levels are negatively associated with mortality rates and positively associated with lifetime earnings. Although mortality rates have negative gradients in terms of lifetime earnings for both men and women, the gradient is slightly steeper for men. The weighted regression models are estimated as follows:

$$\text{Men:} \quad ASMR = 1231.3 - 130.1 \times (LTE - 173.6)/28.5, \quad R^2 = 0.708 \tag{1}$$

$$\text{Women:} \quad ASMR = 661.4 - 60.6 \times (LTE - 124.4)/23.4, \quad R^2 = 0.473 \tag{2}$$

where *ASMR* is the age-standardized mortality rate (per 100,000 person-years), and *LTE* is lifetime earnings (million JPY, 2015 prices). The means of lifetime earnings are 173.6 and 124.4 and their standard deviations are 28.5 and 23.4 for men and women, respectively, which are obtained from *Wage Census*. Meanwhile, the average mortality rates (per 100,000 person-years) were 1231.3 and 661.4 for men and women,

[8] Tanaka et al. (2023) used data collected in 2000, 2010, and 2015 from *Population Census* and *National Vital Statistics*. Three education levels (low, middle, and high) correspond to 1–2, 3–4, and 5–8, respectively, on the International Standard Classification of Education (https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf).

respectively, which were available from *National Vital Statistics.* Comparing the estimation results between men and women shows that the women's gradient (60.6) is flatter than that of men (130.1), which partially reflects a sample selection bias: women tend to live longer than men regardless of lifetime earnings.

Next, we estimated the mortality rate at each age as a function of lifetime earnings, using the relationship between lifetime earnings and age-standardized mortality rates. To this end, we first consider the actual accumulated discount factor D to compute the social security wealth (SSW):

$$D = 1 + \frac{1-d}{1+r} + \frac{(1-d)(1-d_{+1})}{(1+r)^2} + \cdots$$

where d indicates the average mortality rate at each age and r indicates the interest rate, which is tentatively fixed at 3%. The values of d, d_{+1}, … are collected from *National Vital Statistics*, and D is calculated based on them. From D and r, we compute the "implicit mortality rate," $\tilde{d}$, at each age, such that

$$D = 1 + \frac{1-\tilde{d}}{1+r} + \frac{\left(1-\tilde{d}\right)^2}{(1+r)^2} + \cdots = \frac{1+r}{\tilde{d}+r}$$

or

$$\tilde{d} = \frac{1+r}{D} - r$$

Here, the implicit mortality rate is the mortality rate, which is assumed to be fixed at a given age and beyond and is consistent with the accumulated discount factor to compute the SSW at that age.

We then compute the lifetime earnings-related mortality rate, d^*, for men as

$$d^* = \tilde{d} - 130.1 \times (y - 167.6)/118.3/100000$$

where y indicates lifetime earnings at each age, 167.6 and 118.3 are the mean and standard deviation of lifetime earnings obtained from our dataset, respectively, and

-130.1 is the estimated coefficient of the standardized lifetime earnings in equation (1) to explain the mortality rate. Similarly, we compute the lifetime earnings-related mortality rate d^* for women from Equation (2) as

$$d^* = \tilde{d} - 60.6 \times (y - 711.2)/746.9/100000.$$

We use these lifetime earnings-related mortality rates to compute the lifetime earnings-related discount factor D^*, which is used to estimate lifetime earnings-related SSW. D^* is given by

$$D^* = \frac{1 + r}{d^* + r}.$$

Using the lifetime earnings-related discount factor, we examine how the impact of social security reforms differs according to lifetime earnings.

Figure 5 compares the mortality rates by ALTE at its mean and mean plus/minus its one and two standard deviations (0, $\pm\sigma$, and $\pm 2\sigma$) at age 50 years for men and women born in 1930 and 1960. We confirmed that life expectancy is higher among women than among men and is positively related to ALTE at both ages and in both cohorts. The ALTE gradient of life expectancy is flatter among men than among women, and among the younger than among the older cohort.

6. The effects of social security reforms stratified by lifetime earnings

Based on the preparations in the previous sections, we examine how a series of social security reforms since 1986 have affected retirement probabilities and SSW, stratified by lifetime earnings. First, we estimate fixed-effect linear probability models to explain the probability of retirement using ITAX, SSW, lifetime earnings, and covariates. We conducted the regression analysis separately for men and women aged 51-69 years, using longitudinal data obtained from the LSMOA. Before the regression analysis, Figure 6 shows no substantial difference in the distribution of retirement age by lifetime earnings, with retirement ages concentrated heavily at 60 or 61 years among both men and women, although higher-income individuals tend to retire somewhat later than low-income ones, especially men.

Table 2 reports the estimation results for men and women. The coefficient on ITAX is positive and significant for both sexes to show a higher ITAX increases the probability to retire, and the size is larger for men. The coefficient on SSW relative to lifetime earnings is also positive and significant and the size is larger for men. The coefficient on lifetime earnings per se is negative and significant for men. The coefficient on full-time working status is negative and significant to show that individuals who are working on a full-time basis are less likely to retire. Some coefficients on health status are statistically significant: positive for stroke (males) and cancer (both sexes) while negative for hypertension (females), dyslipidemia (both sexes), ADL problems (both sexes) and smoking (males). Moreover, the coefficient on caregiving is negative and significant for both sexes and that on being married is not significant.

Second, we explore how a series of social security reforms have affected SSW and retirement probabilities, stratified by lifetime earnings. We begin by comparing SSW with and without reforms across different lifetime earnings groups, assuming no change in retirement probability. We compute SSW without reforms by assuming that the series of social security reforms since 1986 would not have been implemented.

To illustrate the effect of the reforms, Figure 7 compares SSW with and without reforms at age 60 for the cohort born in 1948 across the ALTE tertiles. The SSW curves shifted downward for all tertiles, reflecting the lower generosity caused by a series of social security reforms. We also observed that the magnitude of the reduction in SSW was larger for higher-income individuals than for lower-income individuals among both men and women. Specifically, SSW at the age of 65 years was reduced by 20.3% for the highest tertile compared to 13.2% for the lowest tertile among men and by 18.9% for the highest tertile compared to 10.8% for the lowest tertile among women. Hence, the reforms had a redistributive impact on SSW in favor of lower-income individuals for both men and women.

However, this comparison ignores changes in retirement probabilities in response to reforms. Figure 8 illustrates how the distribution of retirement probabilities changed after the reforms in the cohort born in 1948. The most notable finding is that the peak retirement probability observed at the age of 60 flattened after the reforms for all groups, especially among men. This means that retirement was postponed beyond 60 years in response to a series of pension reforms. No substantial difference is observed in the shifts in the distribution of retirement probabilities across the lifetime earnings groups.

Finally, we compute the overall effect of the reforms on the distribution of SSW based on the estimated association between retirement probability and ITAX. Social security reforms not only alter the incentive effects to retire earlier or later but also change the distributive effects of social security, either mechanically (through a change in program provisions, such as benefit formula) or behaviorally (through correlations with longevity and other socioeconomic factors). Thus, the total effect was divided into two components. The first is the *mechanical* effect of the reforms on the SSW. Assuming no change in the retirement age distribution, we estimate a change in the distribution of pension benefits. By summing the pension benefits and weighting them by stratified survival probabilities, we obtain the mechanical effects of the reforms. The second is the *behavioral* effect, which is caused by changes in retirement patterns in response to reforms. To calculate this behavioral effect, we assumed no change in the distribution of benefit levels.

Table 3 and Figure 9 (which graphically illustrates the results from Table 3), summarize the effects of the reforms on SSW stratified by lifetime earnings and decompose them into separate mechanical and behavioral effects for men and women. We have several important observations. First, the reduction in SSW after the reforms is larger for higher-income individuals among both men (66,400 euro for the highest tertile compared to 18,700 euro for the lowest tertile) and women (39,400 euro compared to 13,100 euro), presumably because higher-income individuals face a larger reduction in wage-proportional benefits. This result indicates the redistributive effect of the reforms, which contributed to a reduction in SSW inequality across lifetime earnings.

Second, consistent with the first point, the relative magnitude of the reduction in SSW after the reforms were larger for higher-income individuals than for lower-income ones among both men (19.3% for the highest tertile compared to 16.6% for the lowest tertile) and women (18.4% compared to 11.2%).

Third, the relative magnitude of the reduction in SSW after the reforms was larger for men (16.6% on average) than for women (14.8% on average). This is presumably because a reduction in the wage-proportional component, which has a higher share of the total benefit for men due to their higher earnings, affects the total benefit for women more substantially.

Fourth, the behavioral effects were positive, albeit modest, and partly offset the negative mechanical effects in all cases. Postponed eligibility ages and reduced benefits, which mechanically reduced SSW, encouraged individuals to work longer and, accordingly, added to SSW. In terms of the proportion of SSW without reforms, this impact is somewhat larger among lower-income men (3.6% for the lowest tertile compared to 2.0% for the highest), suggesting a higher sensitivity of their work to a change in institutional disincentives. However, no substantial difference was observed among women (1.4%–1.6%).

7. Conclusion

In this study, we examined the heterogeneous impact of social security reforms over the decades in Japan, which has not yet been explored. We utilized a nationwide large-scale micro-dataset to compute SSW at the individual level by lifetime earnings group. We found that SSW declined for all groups after the social security reforms to reduce generosity; however, the negative impact was larger for higher-income individuals in both absolute and relative terms. Our findings show that the recent less generous social security program has enhanced its redistributive function.

To the best of our knowledge, this is the first attempt to examine the heterogeneous impact of the recent social security reforms in Japan, which are most relevant to policymaking. Future studies should explore the impact in greater depth to identify which factors in the reforms contributed to larger or smaller inequalities across different groups.

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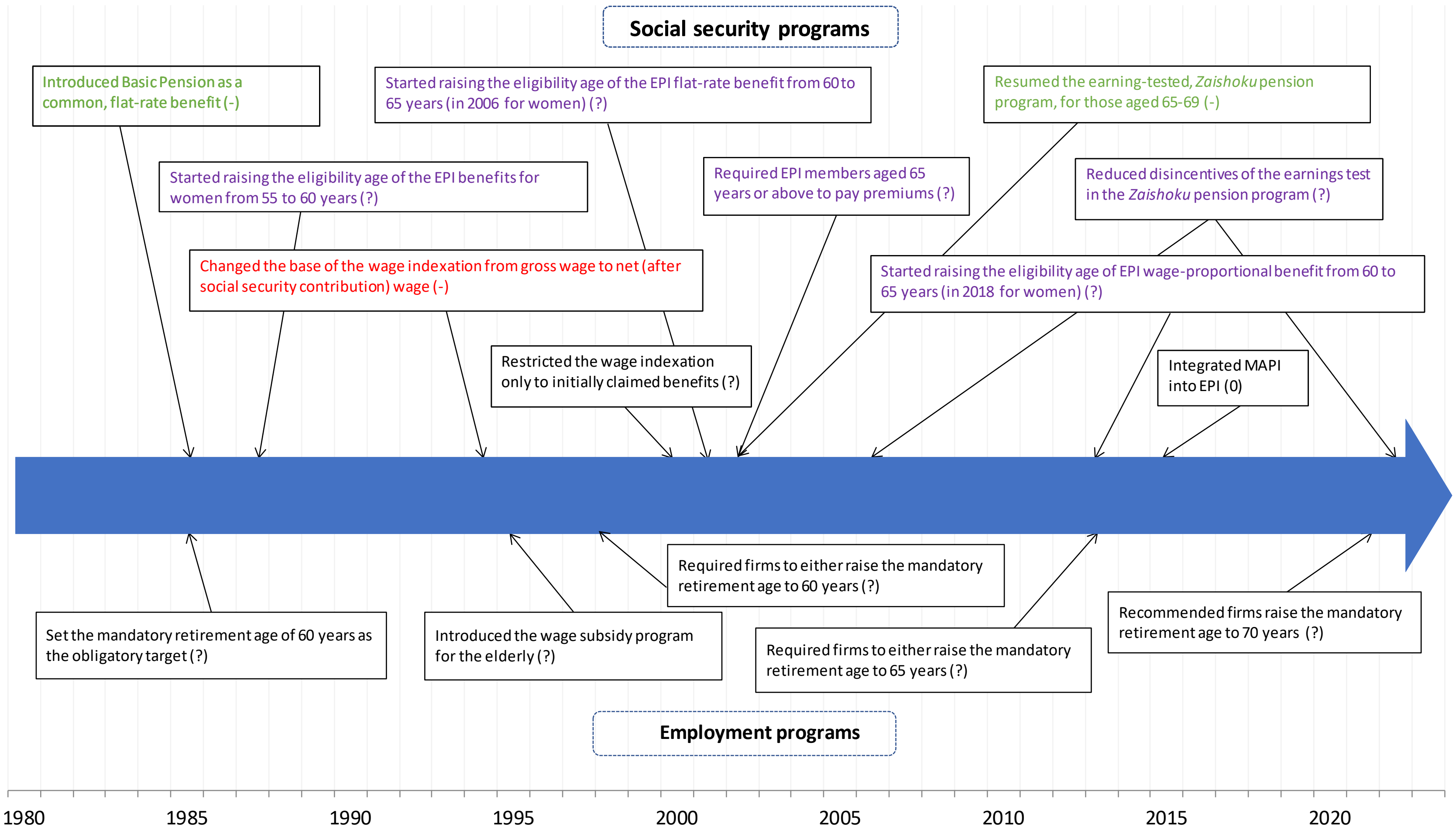
Figure 1. History of reforms in social security and employment programs



Note: +, -, 0, and ? indicate an increase in inequality, a decrease in inequality, and indeterminate, respectively.

Figure 2. Eligibility ages for public pension benefits

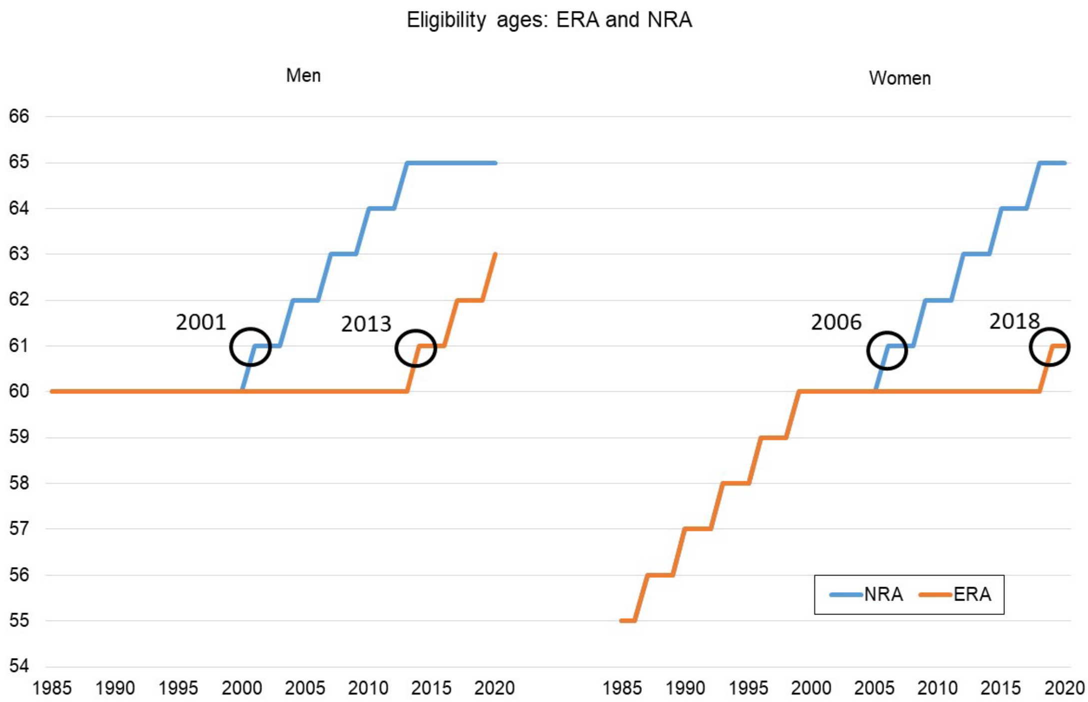
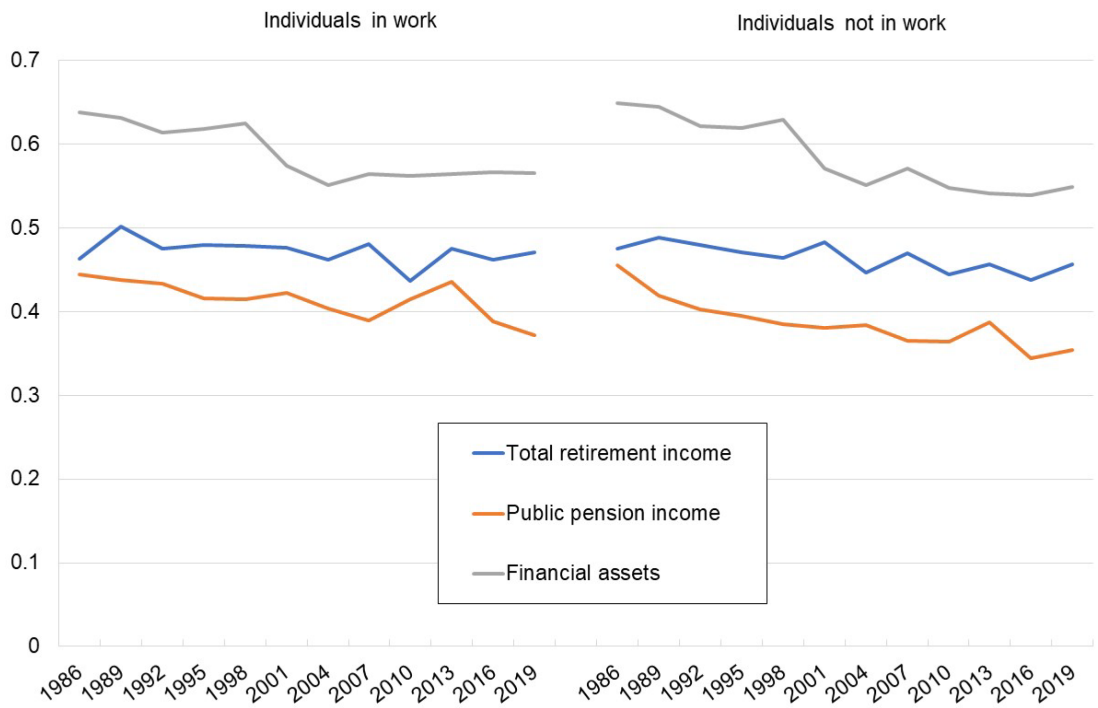
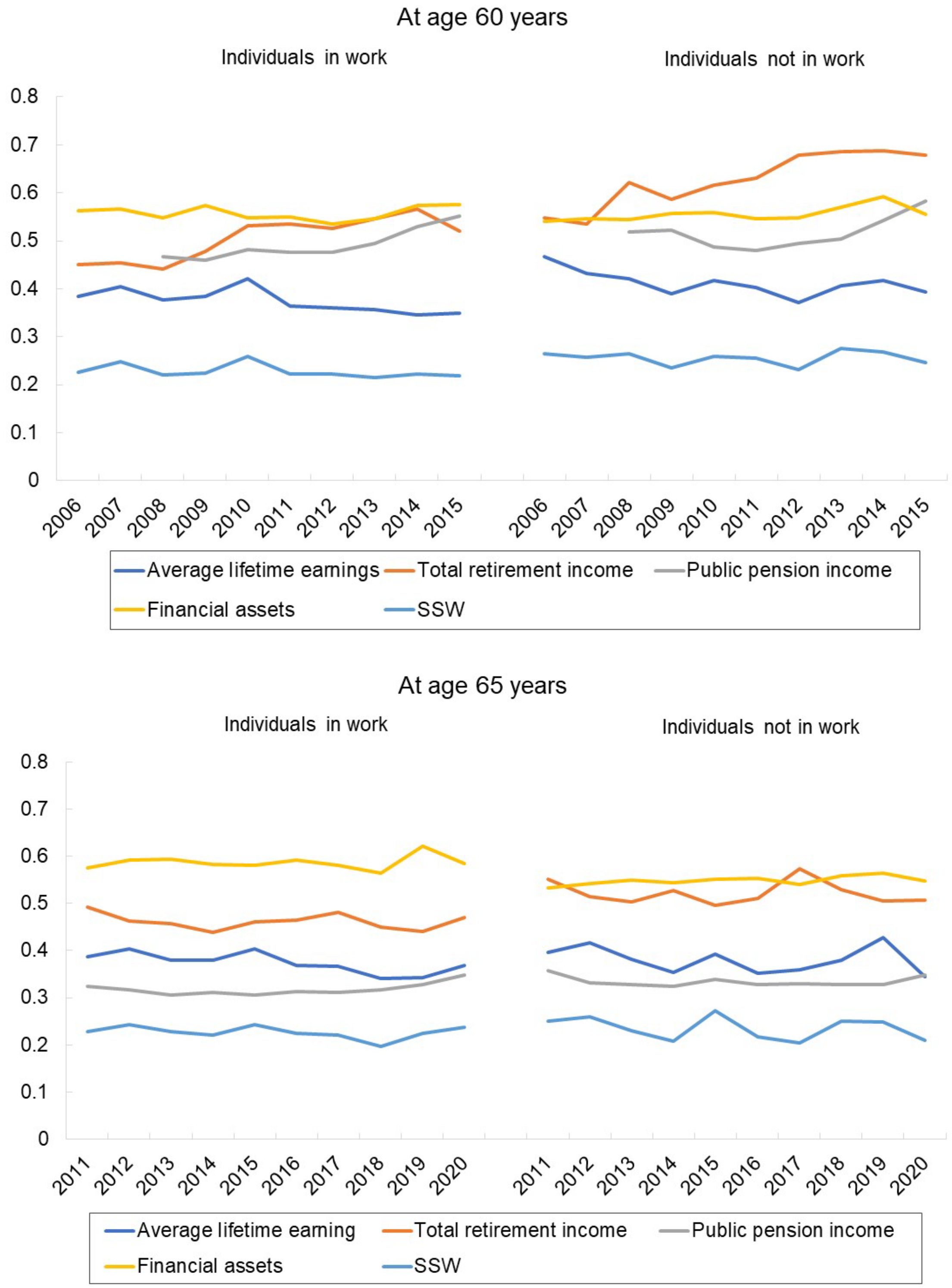


Figure 3. Gini coefficients of total retirement income, public pension income, and financial assets among those aged 55-69 years



Source: CSLC

Figure 4. Gini coefficients of average lifetime income, total retirement income, public pension income, and financial assets and SSW



Source: LSMOA

Table 1. Age-standardized mortality rates and lifetime earnings by education

		Age-standardized mortality rate (per 100,000 person-years)		Lifetime income (million JPY, 2015 price)		*N*
Men	2000-2005	Low	1581	2005	124.3	111,749
		Middle	1371		142.5	716,592
		High	1097		174.9	679,353
		Total	1530		163.6	1,507,694
	2010-2015	Low	1670	2015	148.1	55,304
		Middle	1299		166.6	670,145
		High	1078		216.5	767,271
		Total	1373		192.4	1,492,720
Women	2000-2005	Low	815	2005	82.2	34,319
		Middle	743		98.7	328,162
		High	749		126.7	316,369
		Total	751		112.2	678,850
	2010-2015	Low	777	2015	95.7	15,469
		Middle	601		110.8	301,133
		High	561		156.2	431,329
		Total	632		135.7	747,931

Source: Tanaka et al. (2023), Wage Census 2005 and 2015.

Figure 5. Estimated and projected life expectancy at age 50 years for men and women born in 1930 and 1960

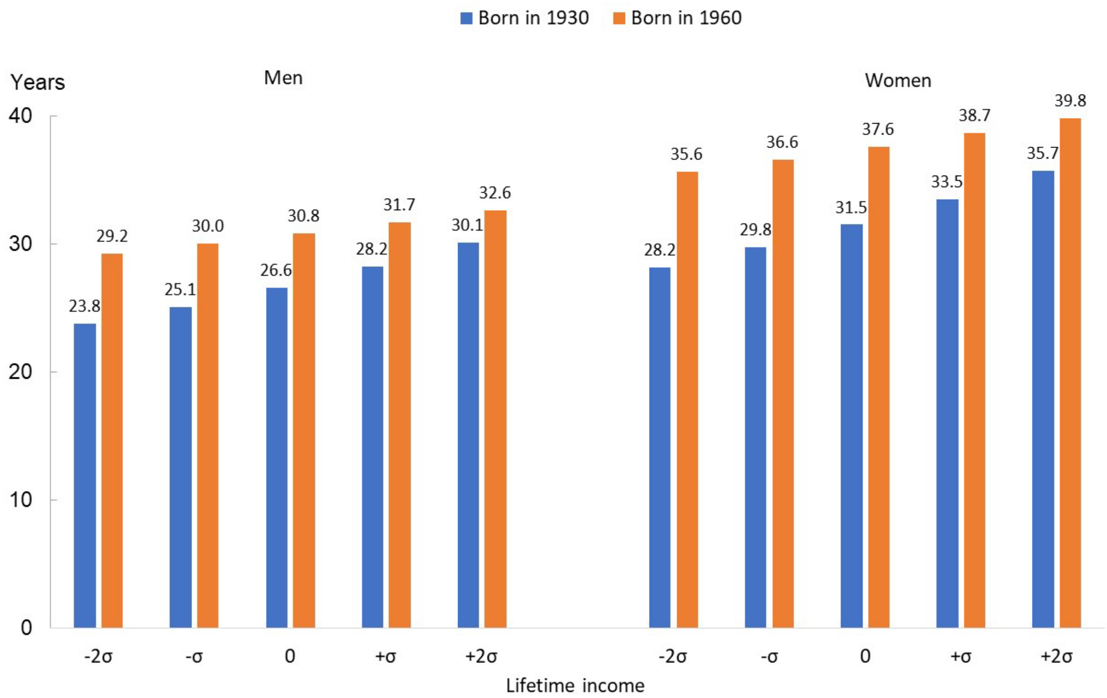


Figure 6. Probability to retire at specific ages

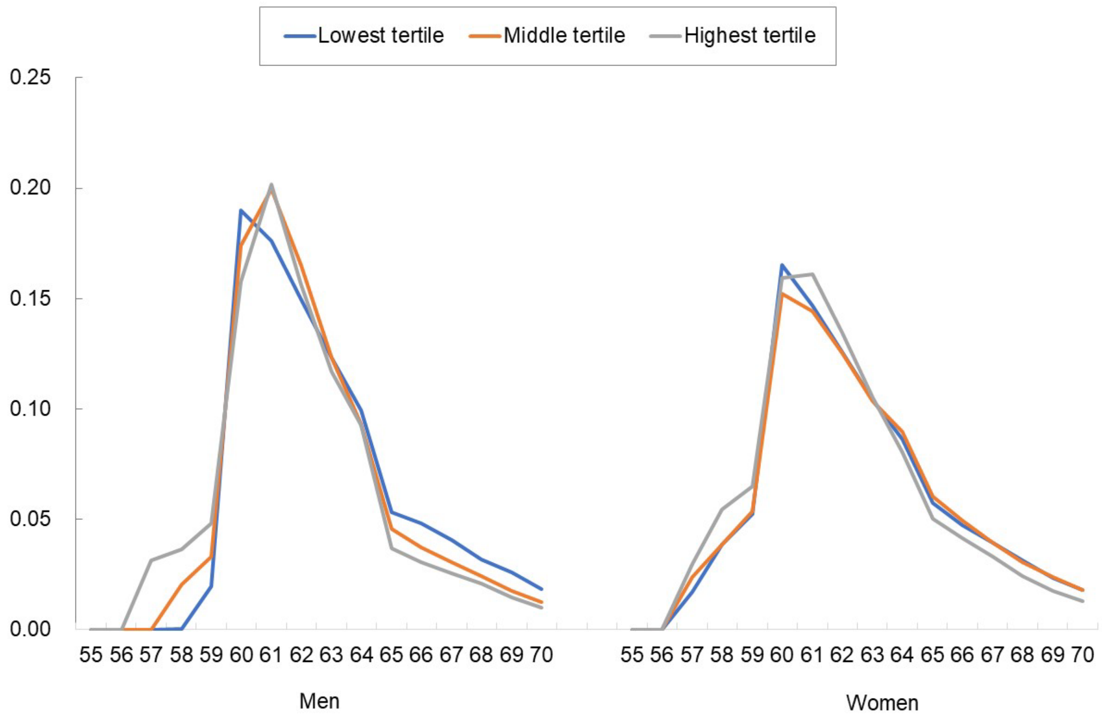


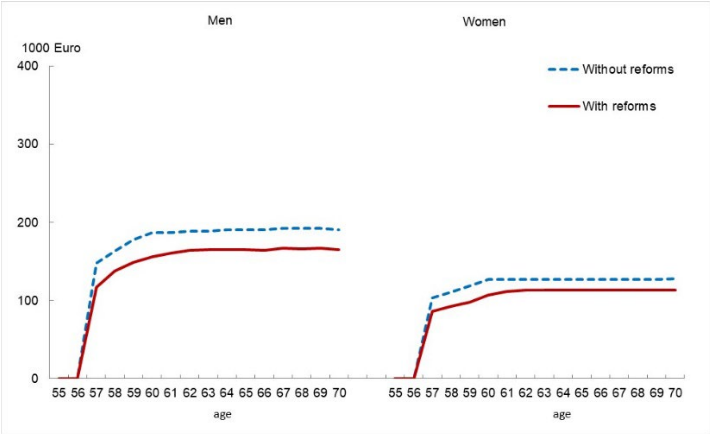
Table 2. Estimation results on the probability of retirement

	Men			Women		
	Coef.		SE	Coef.		SE
ITAX	0.234	***	(0.011)	0.151	***	(0.012)
SSW/lifetime earnings	0.007	***	(0.001)	0.004	***	(0.001)
Lifetime earnings (/100)	-0.043	***	(0.011)	0.025		(0.016)
Full-time job	-0.040	***	(0.005)	-0.018	***	(0.005)
White collar	-0.001		(0.004)	-0.008		(0.006)
Diabetes	-0.001		(0.007)	-0.005		(0.011)
Heart disease	0.004		(0.008)	0.017		(0.014)
Stroke	0.087	***	(0.013)	0.033		(0.019)
Hypertension	-0.002		(0.004)	-0.015	*	(0.006)
Dyslimidemia	-0.018	***	(0.005)	-0.009		(0.005)
Cancer	0.058	***	(0.009)	0.093	***	(0.012)
Poor self-rated health	0.006		(0.004)	0.017	***	(0.005)
ADL problem	-0.042	***	(0.006)	-0.036	***	(0.006)
Smoking	-0.039	***	(0.005)	0.005		(0.011)
Caregiving	-0.026	***	(0.005)	-0.036	***	(0.005)
Married	0.009		(0.013)	-0.005		(0.010)
Age	-0.037	***	(0.007)	0.052	***	(0.009)
Age-squared	0.041	***	(0.006)	-0.031	***	(0.007)
N	65339			47487		

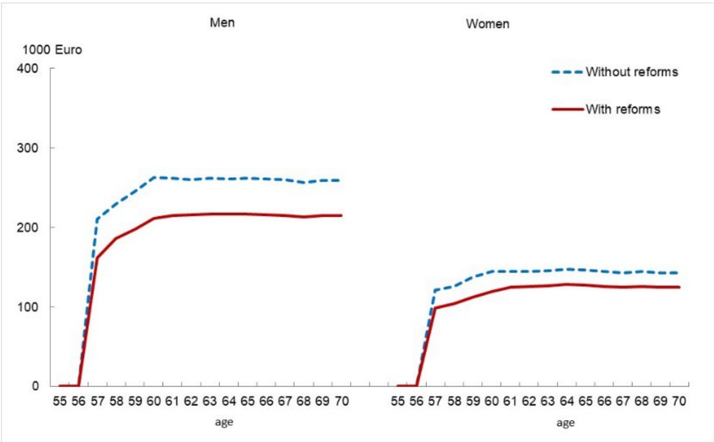
$^{***}p < .001$, $^{**}p < .01$, $^{*}p < .01$

Figure 7. Distributions of SSW with and without reforms: in the case of the cohort born in 1948

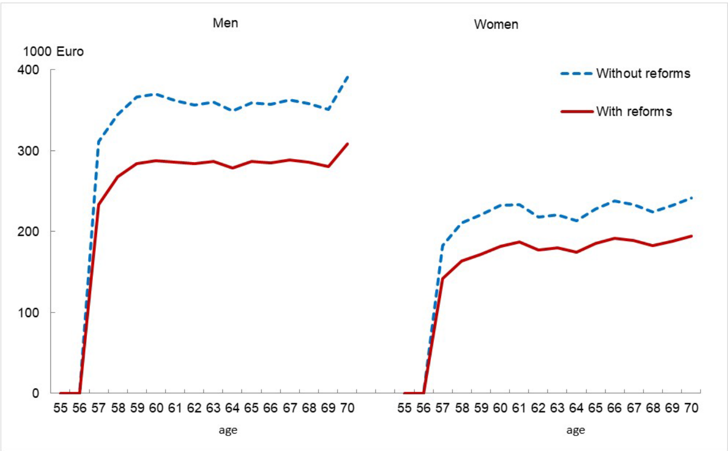
Lowest tertile



Middle tertile



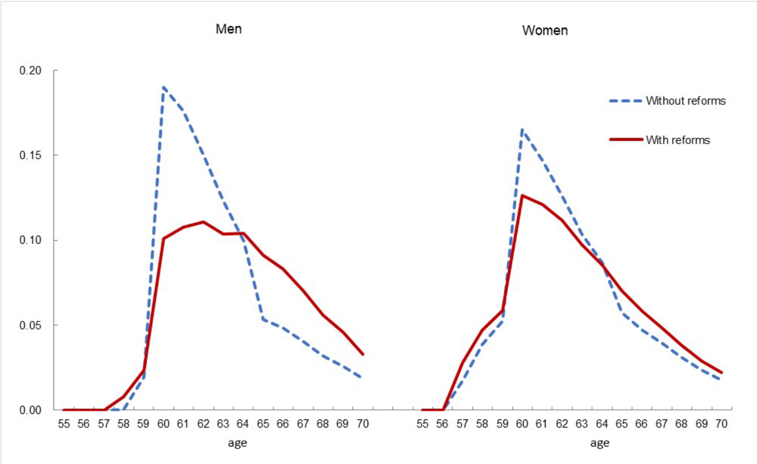
Highest tertile



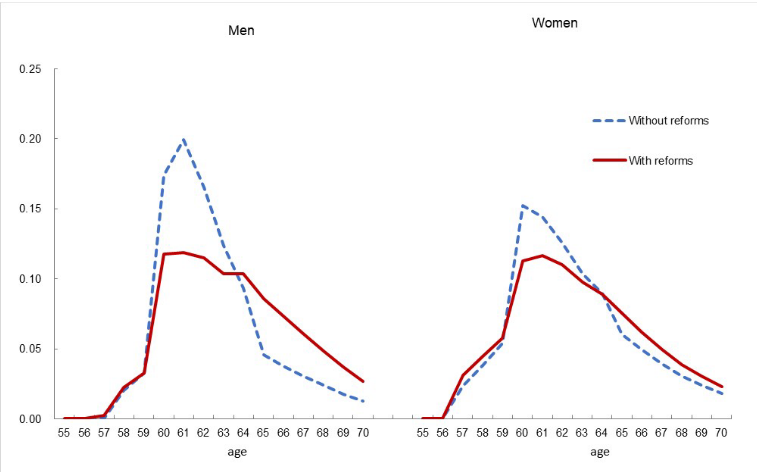
Note. Based on 1 Euro = 151.41 JPY in 2023.

Figure 8. Distributions of retirement probabilities with and without reforms: in the case of the cohort born in 1948

Lowest tertile



Middle tertile



Highest tertile

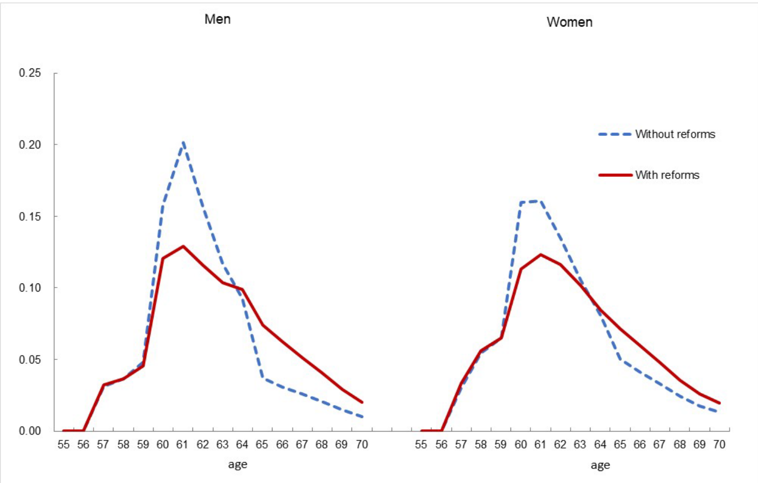


Table 3. Impact of social security reforms on SSW by lifetime earnings: the case of the cohort born in 1948

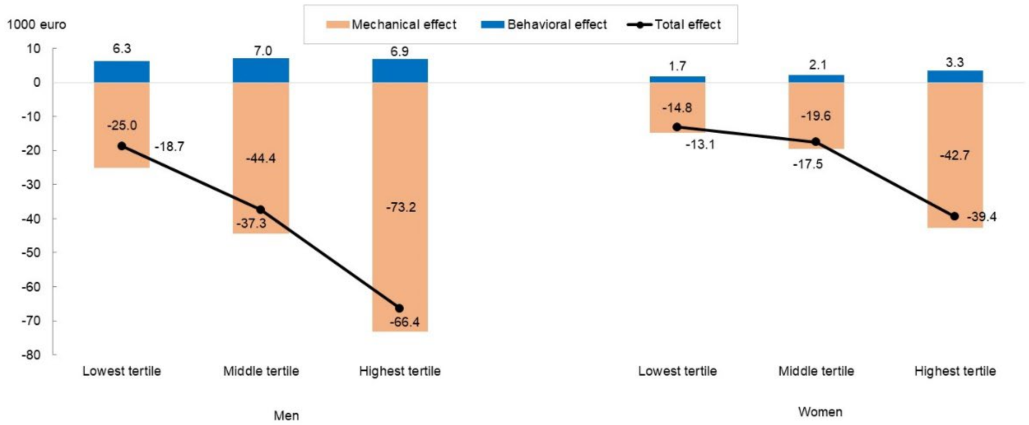
(1000 Euro)

	With reforms	Without reforms	Difference		Mechanical effect		Behavioral effect	
	(A)	(B)	(C) = (A) - (B)	(C) / (B) %	(D)	(D) / (B) %	(E)	(E) / (B) %
Men								
All	202.2	242.4	-40.2	[-16.6]	-43.6	(-18.0)	3.4	(1.4)
Lowest tertile	158.3	177.0	-18.7	[-10.6]	-25.0	(-14.1)	6.3	(3.6)
Middle tertile	208.8	246.1	-37.3	[-15.2]	-44.4	(-18.0)	7.0	(2.9)
Highest tertile	277.5	343.8	-66.4	[-19.3]	-73.2	(-21.3)	6.9	(2.0)
Women								
All	128.0	149.9	-21.9	[-14.6]	-24.3	(-16.2)	2.4	(1.6)
Lowest tertile	104.6	117.7	-13.1	[-11.2]	-14.8	(-12.6)	1.7	(1.4)
Middle tertile	116.4	133.9	-17.5	[-13.1]	-19.6	(-14.6)	2.1	(1.6)
Highest tertile	174.1	213.5	-39.4	[-18.4]	-42.7	(-20.0)	3.3	(1.6)

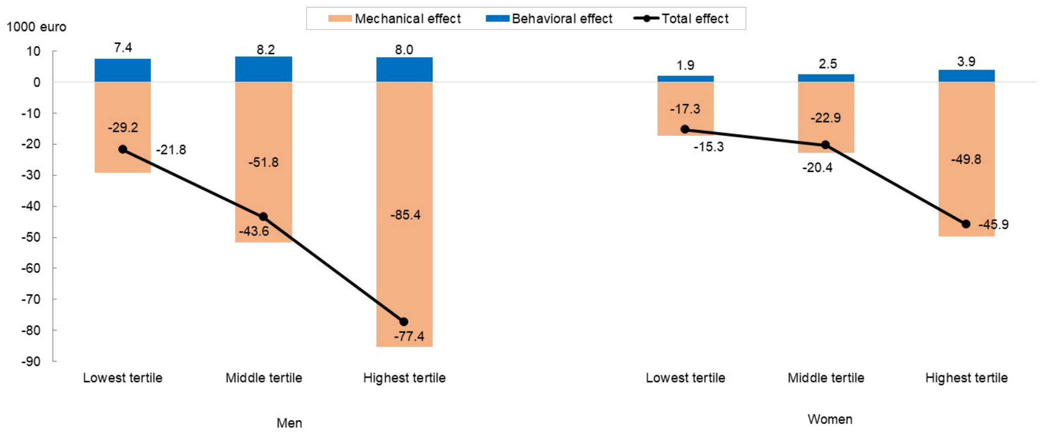
Note. Based on 1 Euro = 151.41 JPY in 2023.

Figure 9. Decomposition of the impact of social security reforms on SSW by lifetime earnings

(A) In terms of amount



(B) In terms of % proportion of before-reform SSW



Note. Based on 1 Euro = 151.41 JPY in 2023.