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How Well-prepared Are Women for Old Age? Evidence from Japan

Yoko Niimi

(Doshisha University and the Asian Growth Research Institute)

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Yoko Niimi

Doshisha University and the Asian Growth Research Institute

Email: yniimi@mail.doshisha.ac.jp

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Abstract

One of the key challenges that population aging poses is to ensure that people have an adequate level of saving for old age. The gendered aspect of old-age saving is particularly important given that women tend to contribute less than men to pension programs because of their weaker labor market attachment and lower earnings over their life cycles even though women tend to live longer than men and thus need to save more than men. Using unique data from the Japanese Panel Survey of Consumers, this paper examines whether or not women are saving for old age and how much they are trying to save for that purpose outside of pension programs. It finds that, in comparison to married women, unmarried women are less likely to be saving for old age. The regression results also suggest that women in irregular employment are less likely to be saving for old age and that women with greater financial resources are in a better position in terms of preparation for old age. These results raise serious concerns about the possible risk of old-age poverty among unmarried women, particularly those who have worked mainly as irregular workers, if they worked at all, as they are less likely to be covered by the Employees' Pension Insurance System.

Keywords: gender, old age, pension, retirement, saving

JEL Classification: D14, D31, J14, J16

1. Introduction

One of the key challenges that population aging poses is to ensure that people have an adequate level of saving for old age. While public pension programs continue to play a major role in people's old-age saving in most developed countries, rapid population aging imposes a serious fiscal burden on these programs. Individuals are therefore increasingly being encouraged to take more responsibility for their old-age saving. In the case of Japan, even for those who have contributed to pension programs throughout their working lives, it is generally thought that it may still be necessary to do additional saving for old age. According to a report issued in 2019 by the Working Group of the Financial System Council of the Financial Services Agency, an average elderly couple would need 20 million yen (about US\$133,000)¹ in addition to their public pensions to fund a 30-year post-retirement life.² This warning, which later came to be called the "20 Million Yen Problem," has received considerable public attention and raised awareness of the importance of saving for old age outside of pension programs.

According to the life-cycle model (e.g., Modigliani and Brumberg, 1954), people accumulate wealth during their working lives and decumulate wealth after retirement to smooth consumption over the life cycle. One of the important questions we need to ask in this context is how well-prepared women are for old age. The gendered aspect of old-age saving is particularly important given that women tend to contribute less than men to pension programs because of their weaker labor market attachment and lower earnings over their life cycles even though women tend to live longer than men and thus need to save more than men. Women's fewer available resources and longer life expectancies suggest that women's financial security in old age is potentially more at risk than men's (Angelici et al., 2022).

While the gender gaps in old-age saving and in wealth more generally remain understudied in comparison to other aspects of the gender gap, such as income and education, recent years have seen an increasing number of empirical studies that examine the gender gap in old-age saving. Previous studies predominantly show that women have less pension wealth than men (e.g., Warren, 2006; Feng et al., 2019). According to OECD (2021), the average gender gap in pensions (both public and private), defined as the difference between the mean retirement income of men and women divided by the mean

¹ Conversions are made based on an exchange rate of US\$1 = 150 Japanese yen throughout the paper.

² Financial Services Agency (https://www.fsa.go.jp/singi/singi_kinyu/tosin/20190603.html)

retirement income of men among pension beneficiaries aged 65 and above, was found to be about 26% among OECD member countries. Such a significant gap in retirement income raises serious concerns about whether women are saving adequately for old age outside of pension programs.

The main aim of this paper is to examine whether women are saving specifically for old age by using unique data from the Japanese Panel Survey of Consumers. Given that pension programs are closely linked to employment and that women tend to have relatively weak attachment to the labor market, it is important to know how women are preparing for old age outside of pension programs. The key contributions of this paper to the literature are twofold. First, since previous studies on old-age saving tend to focus more on pension wealth, this paper tries to extend existing work by specifically looking at women's saving behavior for old age outside of pension programs. It would be interesting to examine whether women are saving for old age and what determines their saving behavior.

Second, while existing studies primarily look at the case of Western societies, this paper examines the situation in Japan. Japan offers an interesting case to study given the persistence of a relatively large gender gap compared to other countries. This is partly because gender roles within households remain more clearly delineated in Japan than in Western societies. According to the Global Gender Gap Index of the World Economic Forum, Japan was in 118th place out of 148 countries in 2025 (World Economic Forum, 2025). Indeed, while the OECD average gender gap in pensions was about 26%, as noted earlier, the gap for Japan was found to be about 47%, which was by far the largest among OECD member countries for which data were available (OECD, 2021). This is despite the fact that Japanese women have the longest life expectancy at age 65 (24.4 years old) and that Japan's gender gap in this measure (4.9 years old) is one of the largest among OECD member countries.³

The rest of this paper is structured as follows. The next section reviews the literature with particular focus on empirical work on the gender gap in old-age saving. Section 3 describes the institutional context of Japan. Section 4 describes the data and empirical methods. Section 5 presents the estimation results. Section 6 contains some concluding remarks.

³ The figures on life expectancy at age 65 are for 2023 and come from OECD Data Explorer (available at <https://data-explorer.oecd.org/>)

2. Literature review

Recent years have seen an increasing number of empirical studies that examine the gender wealth gap although it remains understudied in comparison to other aspects of the gender gap, such as income and education. This section reviews the literature with a focus on the gender gap in old-age saving.⁴

Previous studies have shown that women tend to have less old-age saving than men. Given that public pension systems and occupational pension plans are based on earnings, women's weaker labor market attachment and their lower wages are found to be some of the key drivers behind the gap. Warren (2006) finds a gender gap in pension wealth in the United Kingdom (UK). She argues that the gap is the outcome of women's fewer years of pension scheme membership, their greater reliance on public pensions rather than on occupational pensions, and their lower contributions due to their weaker labor market attachment and their concentration in lower waged jobs when in paid employment.

Using administrative data from a pension fund in Australia, Feng et al. (2019) look at the cumulative effect of women's labor market characteristics on their retirement saving. They find that the gender gap in retirement saving arises at an early stage of paid working life and that it persists over time. This reflects the fact that women are more likely to leave paid work or move to part-time and/or casual work than men to accommodate caregiving responsibilities, interrupting women's contribution flows (Feng et al., 2019). They also point out that even when women return to full-time work, the gap remains because of foregone wages and associated retirement saving as well as of the adverse effect of career breaks on future incomes.

Similarly, Austen and Mavisakalyan (2018) show that, in Australia, the gender gap in long-term earnings and hence in retirement wealth largely reflects the economic consequences of the gendered roles associated with parenthood. They argue that having a Bachelor's degree improves women's earnings, but it does not eliminate the gap because of the negative effect of parenthood on women's earnings. Best and Saba (2021) also look at the gender superannuation gap in Australia and find that women's work patterns and wage rates adversely affect their contributions, explaining about 30% of the total

⁴ For a more comprehensive review of the literature on women and retirement wealth, see, for example, Jefferson (2009).

superannuation gap.

Weller and Tolson (2020) specifically look at the implications of women's caregiving burden for their retirement saving in the United States (US). They show that the potential risk of caring for someone has a greater adverse effect on retirement saving among women than among men. They find that women facing caregiving risks are less likely to participate in a retirement plan than those without such risks while such a gap is either nonexistent or much smaller in the case of men. One way to address the adverse effect of women's caregiving burden on their retirement saving is to provide contribution credits for the period allocated to caring for others (Jefferson, 2009). Cordova et al. (2022) find that, in Germany, pension wealth helps reduce the gender wealth gap in the lower half of the wealth distribution due to the redistributive nature of the statutory pension scheme, such as caregiver credits.

Despite the observed gender gap in retirement saving, it should be noted that married women can potentially benefit from their spouses' pensions. However, while widows can still enjoy survivors benefits even if they become single, the same may not apply to women who are divorced or separated. LaRoche-Côté et al. (2012) examine the effect of the death of a spouse and divorce on income replacement rates during the retirement years in Canada. They find that the negative effect of separation or divorce is greater than that of widowhood in the case of women. The greatest effect is found among women from the top income quintile families who rely more on private pension and investment income whereas reliance on public pension income reduces the effect of divorce for women from lower-income families. By contrast, among men, separation or divorce has little effect on replacement rates.

If women are conscious of their lower retirement income compared to men due to their lower contributions to pension schemes, women may do more private saving for old age more than men do. Based on individual-level data on the use of financial products in more than 140 countries, Demirgüç-Kunt et al. (2016) show that about 25% of adults across the world save for old age and that women are slightly less likely than men to save for this purpose. Similarly, Fernández-López et al. (2015) find that, in European countries, women are less likely to save for old age than men, although the determinants of this decision are similar for women and men.

Lehrer et al. (2023) find that, in Canada, while women are more likely to save at all ages,

conditional on participation in pension and retirement saving plans, they save a smaller amount. Excluding tax-advantaged saving plans, women tend to choose investments that, on average, offer a lower rate of return than their male counterparts. This might be partly explained by differences in financial literacy and/or risk aversion between women and men. Men are generally found to have a higher level of financial literacy than women (Lusardi and Mitchell, 2008; Tinghog et al., 2021), and women tend to be more risk-averse than men (Croson and Gneezy, 2009). Indeed, Preston and Write (2023) show that, in Australia, the gender gap in financial literacy is an important determinant of the gender gap in retirement saving. Best and Saba (2021) also point out the role of gender differences in financial literacy and risk aversion in explaining the gender superannuation gap in Australia. Moreover, Giannikos and Korkou (2023) show that, in the US, single women tend to take less risk than single men in their retirement wealth building, though this gender gap has become smaller over time. On the other hand, Neelakantan and Chang (2010) argue that while gender differences in risk aversion partly explain the gender gap in retirement saving, a fraction of the gap remains unexplained.

Mandal and Brady (2020) look at the role of marriage and gender on asset allocation and find that, in the US, while married men are more likely to hold a greater share of their funds in equities in individual retirement accounts than married women in their early to mid-30s, this gender gap becomes negligible by retirement age as husbands and wives closely mimic each other's asset allocations. They also show that at retirement, married men and women have greater shares of stocks than divorced or widowed individuals with women having particularly low shares. In addition, Tamborini and Purcell (2016) find a difference between single-female and couple households in the effect of children on retirement preparation. They find that, in the US, additional children are associated with reduced retirement saving motives and with a reduced likelihood of household ownership of a retirement account among single-female households while such associations are not found for couple households.

As far as the literature on Japan is concerned, to the best of the author's knowledge, there is no previous work that examines specifically Japanese women's preparedness for old age. There are a number of studies that look at old-age saving behavior in Japan (e.g., Horioka and Watanabe, 1997; Horioka and Okui, 1999). For instance, Horioka and Watanabe (1997) find that, out of 12 different saving motives examined, saving for old-age and precautionary motives is of dominant importance. These studies, however, do not look at the gender dimension.

Previous studies that are relatively close to the present work are the studies by Kureishi and Wakabayashi (2013) and Sekita (2011). Using the same dataset that the present work uses, Kureishi and Wakabayashi (2013) examine what motivates never married women to save. They find that when young women face a relatively high risk of income fluctuation due to marrying late or remaining unmarried, they are more likely to save for precautionary purposes than otherwise. As for Sekita (2011), she examines the level of financial literacy in Japan and finds that women tend to have a lower level of financial literacy than men. Since she also finds that the level of financial literacy is positively associated with the probability of having a retirement savings plan, we can infer that women are likely to be less prepared for old age than men. While both studies help us better understand women's saving behavior in Japan, this paper aims to more specifically examine how women are preparing themselves for old age.

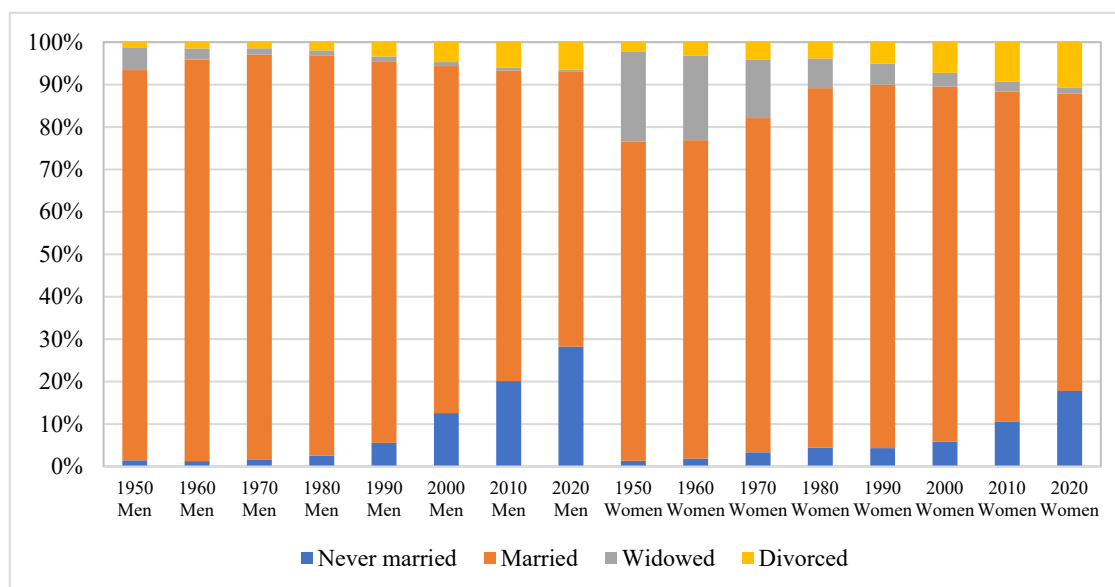
3. Japanese context

Japan offers an interesting case to examine how women are preparing for old age and how that has changed over time given the country's unique institutional setting as well as significant changes observed in women's marital and employment status over the years.

3.1 Marital status

The marital behavior of women has gone through significant changes in recent decades in Japan, as in many other developed countries. Figure 1 shows the composition of men and women at age 50 by marital status since 1950. The figure shows that the proportion of men and women who had never married by the age of 50 has increased steadily from 1.5% and 1.4% in 1950 to 28.3% and 17.8% in 2020, respectively. These figures show that the nontrivial share of men and women never marry in Japan today. Moreover, the proportion of men and women who are divorced has also increased—from 1.2% and 2.2% to 6.5% and 10.6%, respectively, during the same period. This is likely to have important implications for the wellbeing of women, especially in old age.

Figure 1. Composition by marital status of men and women at age 50



Source: Population Statistics 2025
 (available at https://www.ipss.go.jp/syoushika/tohkei/Popular/P_Detail2025.asp?fname=T06-23.htm).

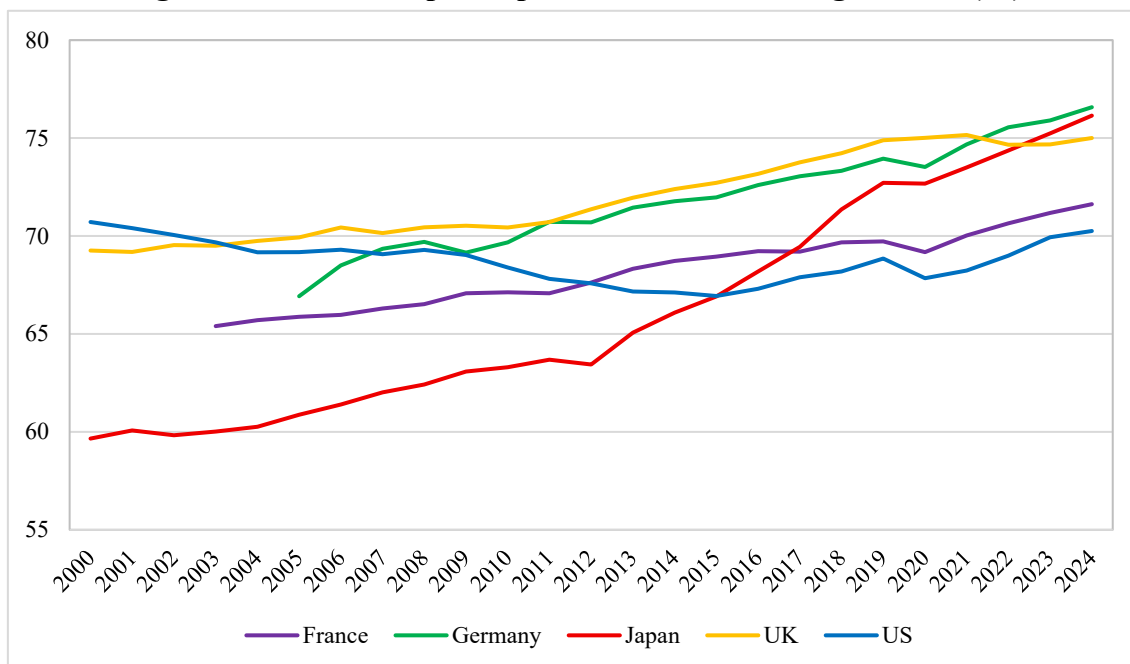
3.2 Employment

Japan has also seen significant changes in women’s employment status over the past few decades. Figure 2 shows the labor force participation rate of women aged 15-64 for selected countries. Japan saw a significant increase in women’s labor force participation rate from about 60% in 2000 to about 76% in 2024, reaching a level more comparable to that in other countries. Nevertheless, a relatively large share of women in Japan is in irregular employment, which tends to be low paid and insecure.⁵ The share of women aged 15-64 in irregular employment was as high as about 49% in 2024 while this share was only about 17% among men.⁶ The fact that women become more likely to be in irregular employment as they become older suggests that the relatively large share of irregular workers among women can be explained, at least partly, by the fact that women switch to part-time work upon marriage and/or childbirth. Moreover, the beneficial provisions of the tax and social insurance systems for married couples described in detail below also discourage married women from working full-time.

⁵ Irregular employees comprise part-time workers, temporary workers, fixed-term workers, and dispatched workers from a temporary agency.

⁶ These figures are calculated based on annual averages from the 2024 Labor Force Survey (available at <https://www.stat.go.jp/data/roudou/sokuhou/nen/dt/index.html>).

Figure 2. Labor force participation rate of women aged 15-64 (%)



Source: OECD Data Explorer (available at <https://data-explorer.oecd.org/>)

Women in Japan also face a relatively large gender wage gap. Defined as the difference between male and female median earnings relative to male median earnings based on gross earnings of full-time employees, the gap was found to be about 22% for Japan in 2023, which is significantly higher than the OECD average of about 11% and is the third largest after South Korea and Estonia.⁷

In sum, while women's labor market participation rate has been rising over the past few decades in Japan, their labor supply remains relatively limited as many of them work part-time and they also continue to be disadvantaged in the labor market in terms of working conditions and wage levels. This is likely to have an important bearing on their wealth accumulation capacity.

3.3 Institutional context

Separation of property regime

Japan has a unique institutional context, which makes it difficult for married couples to share their wealth, at least in legal terms. Japan follows a separation of property regime.

⁷ The figures for the gender wage gap come from OECD (available at <https://www.oecd.org/en/data/indicators/gender-wage-gap.html>).

Joint bank accounts are virtually non-existent and saving is held individually even within married couples. Even wealth transfers between spouses are subject to gift taxes although there is an annual exemption of 1.1 million yen (about US\$7,300).⁸ In the case of divorce, the spouse can claim part of the wealth accumulated during marriage even if it is in the other spouse's name, except for the wealth acquired through transfers such as bequests and *inter vivos* transfers, which will remain in the hands of the recipient.

There is also a special provision for a gift tax exemption of up to 20 million yen (about US\$133,000) when a residential property or money for acquiring a residential property is transferred between spouses. However, only couples who have been married for 20 years or more are eligible for this exemption and a given couple can use this exemption only once in a lifetime. In other words, if a young couple that has been married for less than 20 years decides to purchase a residential property and the wife does not have sufficient saving to pay for her share or does not have sufficient income to obtain a housing loan for her share, purchasing the property jointly with her husband will require the payment of gift taxes as the tax office will assume that the husband transferred part of his wealth to his wife to enable her to purchase the property jointly with him. This is likely to discourage married couples from having joint ownership of their residence if the wife does not have her own income or sufficient wealth. Indeed, Niimi (2022) does not find any marriage wealth premium for women in Japan although previous work on Germany finds that marriage helps women accumulate wealth mainly through joint investments with their husbands in residential property (Lersch, 2017).

Pension system

Japanese public pension system consists mainly of the Basic Pension System (National Pension) and the Employees' Pension Insurance System. All registered residents of Japan aged 20-59 years must be covered by the Basic Pension System and its monthly contribution is fixed. Those who work for companies are also enrolled in the Employees' Pension Insurance System, and under this system, the employer and the employee each contribute one half of the total amount and the amount of the total contribution depends on the employee's salary. In the past, only regular workers were covered by occupation-based social insurance (both pension and health insurance), but its coverage has been gradually expanding to irregular workers since 2016. Today, a person is eligible for occupation-based social insurance if he/she works for more than 20 hours per week,

⁸ Transfers for financing expenses such as living expenses and children's education expenses are also exempt from gift taxes.

his/her basic monthly wage is equal to or more than 88,000 yen (about US\$590), he/she plans to work for more than 2 months, he/she is not a student, and the company he/she works for has 50 or more employees.

Given women's relatively weak labor market attachment and low wages as well as the limited coverage of the Employees' Pension Insurance system until recently, it is not surprising that women receive less pension benefits than men. As noted earlier, the gender gap in pensions calculated as the difference between the mean retirement income of men and women divided by the mean retirement income of men among pension beneficiaries aged 65 and above is found to be about 47% for Japan (OECD, 2021). It is significantly greater than the OECD average of about 26% and is by far the largest among the OECD member countries. These figures are based on the latest available data and the figure for Japan was based on data for 2013. Since women's labor market participation has been increasing and the coverage of the Employees' Pension Insurance System has been expanding in recent decades, the gender pension gap is expected to narrow over time. Nevertheless, according to the official outlook for public pension benefits, the gender pension gap is expected to still be about 30% in 2039 when those who were born in 1974 reach the age of 65.⁹

Spousal tax deduction

In the case of Japan, married couples can claim a spouse deduction or a special spouse deduction with respect to the primary earners' national and local income taxes if their and their spouses' incomes fall below certain thresholds. In the case of the national income tax, for example, the 2017 tax reform raised the upper limit of spouses' annual employment income for claiming the full special spouse deduction of 380,000 yen (about US\$2,500) to 1.5 million yen (about US\$10,000) from the previous threshold of 1.03 million yen (about US\$6,900). The 2025 tax reform further raised this upper limit to 1.6 million yen (about US\$10,700). Beyond this upper limit, the deduction amount is staggered according to the income level of the primary earner and that of the spouse. If the primary earner's employment income or the spouse's employment income exceeds 11.95 million yen (about US\$79,700) or 2.016 million yen (about US\$13,400), respectively, no special spouse deduction can be claimed.¹⁰

⁹ Ministry of Health, Labour and Welfare (2024) Financial Outlook for Public Pensions (Financial Verification) (available at <https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/nenkin/nenkin/zaisei-kensyo/index.html>).

¹⁰ These thresholds apply when the primary earner and the spouse have only employment income.

Additionally, spouses are exempted from paying social insurance premium if their income falls below a certain threshold. Under the current system, for example, if the total annual income of a woman married to someone covered by the Employees' Pension Insurance System is equal to or below 1.3 million yen (about US\$8,700),¹¹ she is classified as a dependent spouse, and as such, she is covered by the Basic Pension System and her husband's Employees' Health Insurance System, both at no cost. Beyond this threshold, she is required to enroll in the Employees' Pension Insurance System and Employees' Health Insurance System of her own employer (or to start paying premium for the Basic Pension System and enroll in the National Health Insurance System).

These provisions of the tax and social insurance systems provide financial benefits to married couples in which one spouse does not work or works only part-time. At the same time, these provisions tend to discourage married women from working more than a certain number of hours, and as a result, they have been subject of public debate and scrutiny over the years. The limited labor supply of married women arising from the disincentives to work full-time created by the tax and social insurance systems is likely to have important implications for their wealth accumulation.

4. Data and estimation methods

4.1 Data

The data used for the empirical analysis in this paper are taken from the Japanese Panel Survey of Consumers (JPSC), which was conducted annually by the Institute for Research on Household Economics from 1993 to 2016 and by the Panel Data Research Center at Keio University from 2017 to 2021. One of the unique features of this survey is that it focused on young women, both unmarried and married, and traced the same individuals yearly. The respondents of the JPSC were therefore women only, though if they were married (or once they got married), information on their husbands was also collected in every wave. The initial sample at the start of the survey in 1993 comprised 1,500 women aged 24–34. Subsequently, the survey added 500 women aged 24–27 in 1997, 836 women aged 24–29 in 2003, 636 women aged 24–28 in 2008, and 648 women aged 24–28 in

¹¹ If her monthly basic wage is equal to or more than 88,000 yen and she meets the other conditions described above, she is also required to enroll in the Employees' Pension Insurance and Employees' Health Insurance Systems even if her total annual income does not exceed 1.3 million yen.

2013. Each time, two-stage stratified random sampling was used to ensure that the sample was nationally representative. The relatively high response rate (e.g., approximately 96% in the case of the 2021 wave) helped ensure the representativeness of the sample for the age group in question.

Another unique feature of the JPSC is that it asked the respondent for what motives she (in the case of a married respondent, the respondent and her husband) was saving. If the respondent replied that she was saving for a particular motive, she was also asked how much she aimed to save for that purpose. One of the saving motives listed in the questionnaire was the old-age saving motive. By exploiting such unique information included in the JPSC, this paper examines how women are preparing themselves for old age. While the amount indicates only the target amount rather than the actual amount, it is still an important piece of information that will help us understand how women are preparing for old age.

Because there was a change in the way the saving motive-related questions were framed in the 2001 wave, I use data from the 2001-2021 waves for the empirical analysis. Note that the data used for the present analysis are unbalanced panel data. The estimation sample comprises 3,450 respondents with 38,233 individual-year observations after removing observations with missing information.

4.2 Empirical methods

The empirical analysis of how women are preparing for old age consists of two parts. In the first part, given that the JPSC data contain information on whether the respondent is covered by the Employees' Pension Insurance System, I will look at how the respondent's pension status changes as she becomes older and whether we observe any changes in this pattern across different cohorts. While the first part will be a descriptive analysis, it will still help us assess whether there has been any improvement in pension coverage among women in Japan reflecting their increased labor market participation over time.

In the second part, I will focus on the respondent's saving behavior outside of pension programs. More specifically, I will conduct a regression analysis of the determinants of whether or not women are saving for old age and how much they are trying to save for that purpose. Toward this end, I estimate a linear probability model with fixed effects in which the dependent variable is a binary variable that equals one if the respondent is

saving for old age and zero otherwise as well as a fixed effects model with the target amount of saving for old age as the dependent variable. In the case of unmarried respondents, the variable indicates how much the respondent aims to save for old age. In the case of married respondents, the saving motive-related questions are designed in such a way that the answers reflect the joint saving behavior of the respondent and her husband. Hence, in the case of married respondents, I express the dependent variable as an equalized target amount by dividing the target amount of saving for old age by the square root of two (i.e., the respondent and her husband). Moreover, given that, by construction, this variable is truncated at 0, I also estimate a Tobit model as a robustness check.¹²

The main explanatory variables of interest in the present analysis are the respondent's marital and employment status. I include a variable that indicates whether the respondent is never married, married, divorced, or widowed. Marriage is generally thought to help save more due to such factors as efficiency gains from the division of labor, economies of scale in consumption, resource pooling, and a more future-oriented mindset.¹³ On the other hand, being unmarried may encourage women to better prepare for old age as they do not have spouses to rely on. How marital status affects one's saving behavior for old age is therefore an empirical question.

As for employment status, I include a variable that indicates whether the respondent is out of labor force, a regular worker, an irregular worker, or self-employed (includes being an employee in family business). Given that regular employment tends to be more secure and pays higher wages, being in regular employment helps save more for old age than being out of labor force or in irregular employment. On the other hand, if the respondent is in regular employment, she is likely to be covered by the Employees' Pension Insurance System in addition to the Basic Pension System. As a result, she may feel less need to save more privately for old age than those who are in irregular employment or those who are self-employed. Hence, it is not clear a priori what will be the direction of the impact of employment status on one's saving behavior.

As for other explanatory variables, I include in the estimation model the respondent's age, age squared, the number of children, and a variable for residing with parents/parents-in-

¹² It would have been more ideal to estimate a Heckman selection model, but I could not find appropriate variables that meet the exclusion restriction of the model.

¹³ See Niimi (2022) for the discussion of how marriage is related to wealth accumulation.

law. The coresiding variable equals one only if the respondent resides with her parents/parents-in-law and shares living expenses with them. I also control for income: in the case of unmarried respondents, I use their personal income, and for married respondents, I use the sum of their personal income and that of their husbands and adjust it for economies of scale in consumption by dividing it by the square root of two, as I do for the target amount of saving for old age. To correct for skewness, the target amount of saving and income variables are transformed using the inverse hyperbolic sine (IHS) function, which allows us to retain zero values, unlike in the case of a logarithmic transformation. These variables are expressed in 2020 prices. Finally, I also include year dummies, regional dummies, and a dummy variable for residing in a major city.

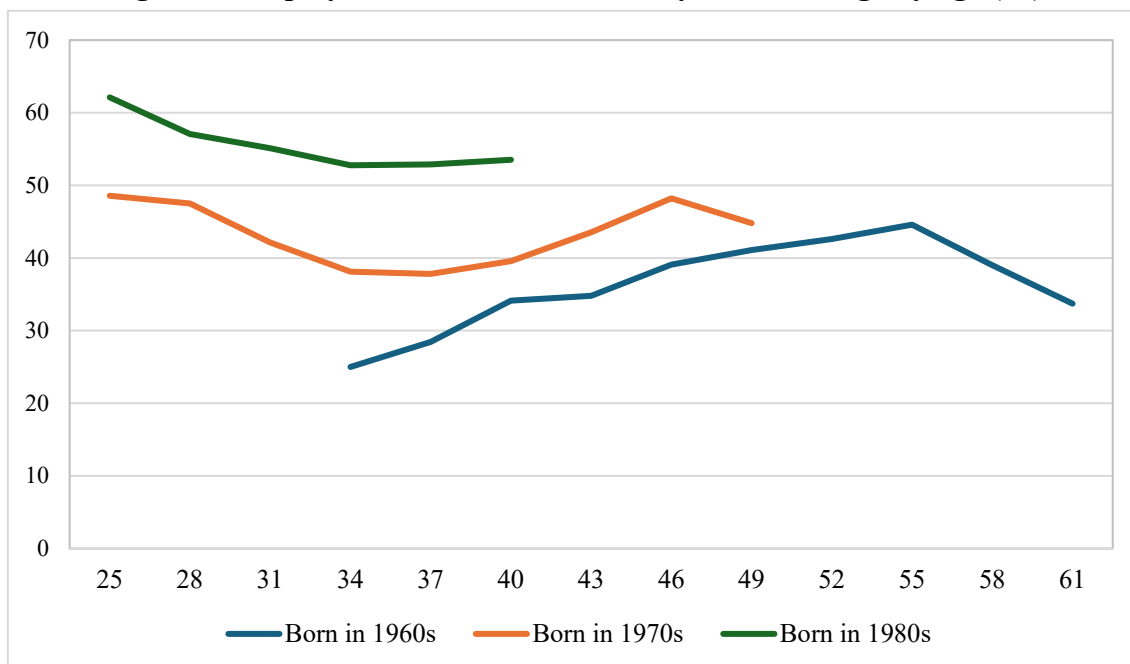
5. Empirical results

5.1 Pension coverage

Before analyzing how women are preparing for old age through a regression analysis, it is worth looking at what proportion of women is covered by the Employees' Pension Insurance System in Japan. Figure 3 shows the average percentage of women who are covered by the Employees' Pension Insurance System for every three-year age group (e.g., the figure for 25 indicates the average percentage for women aged 24-26). The figure also shows the trend separately for each cohort.

Figure 3 shows that there is a decline in the proportion of women who are covered by the Employees' Pension Insurance System in the mid-30s. Given that the coverage of the Employees' Pension Insurance System is directly linked to employment status, to regular employment more specifically, in Japan, as described in Section 3, the decline is likely to be explained by the fact that women tend to leave work or switch to irregular employment to accommodate family responsibilities. However, it is interesting to observe that the magnitude of the decline in the coverage rate seems to have become smaller over time. In the case of the youngest cohort, more than half of women remained covered even in their mid-30s. This is an encouraging trend given that remaining in the Employees' Pension Insurance System allows women to receive greater pension income than when they drop out of the system.

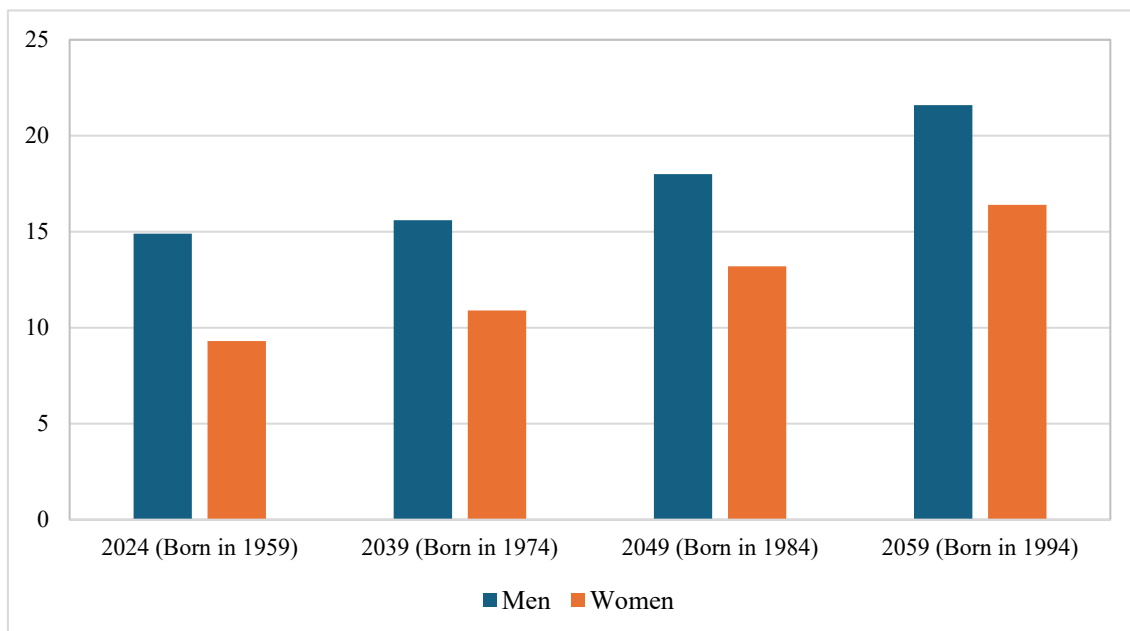
Figure 3. Employees' Pension Insurance System coverage by age (%)



Note: The cohort of those who were born in the 1960s includes those who are born in 1959.

Source: Calculations based on data from the JPSC.

Figure 4. Average monthly pension income per person at 65 (10,000 yen)



Notes The figures are for the growth-oriented economic transition and continuation scenario.

Source: Ministry of Health, Labour and Welfare (2024) *Financial Outlook for Public Pensions (Financial Verification)* (available at <https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/nenkin/nenkin/zaisei-kensyo/index.html>).

This is consistent with the government’s forecast of public pension finances. Ministry of Health, Labour and Welfare issues a financial outlook for public pensions every five years. Figure 4 shows the average monthly pension income expected to be received at age 65 for men and women, respectively, based on the latest forecasts. A relatively large increase in pension income is expected for women due to their greater labor market participation and a longer period of participation in pension programs over time, which is in line with what Figure 3 shows. The gender gap in pension income is therefore expected to decrease from about 38% in 2024 to 24% in 2059, though the gap remains relatively large in comparison with that in Western societies.

5.2 Regression results

Figures 3 and 4 show that while there have been some improvements in women’s pension status over time, there remains a relatively large gender gap in pensions in Japan. It is thus important to know whether women do additional saving for old age outside of pension programs. Toward this end, this subsection conducts a regression analysis of how women are preparing for old age.

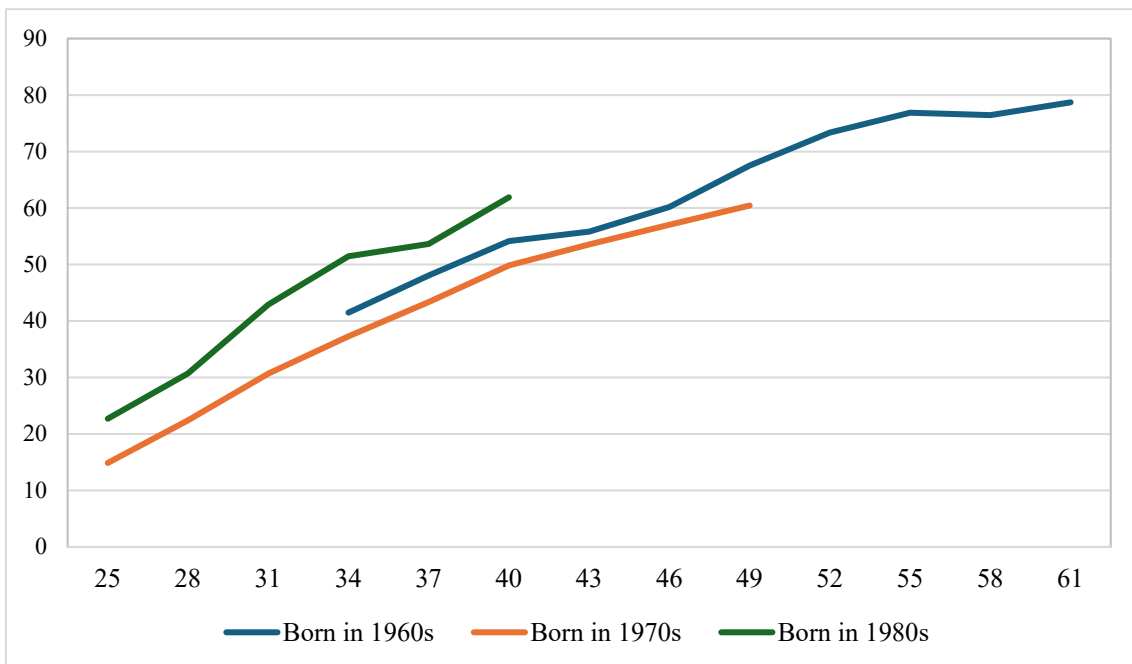
Table 1. Summary statistics

	Mean	SD	Min.	Max.
Saving for old age	0.48		0	1
Target amount of saving for old age (IHS-transformed)	7.84	8.17	0	20.38
Untransformed value (10,000 yen)	502.08	1,094.12	0	35,355.34
Age	38.41	8.48	24	62
Age squared/100	15.47	6.89	5.76	38.44
Marital status				
Never married	0.24		0	1
Married	0.67		0	1
Divorced	0.07		0	1
Widowed	0.01		0	1
Number of children	1.32	1.16	0	7
Residing with parents/parents-in-law	0.27		0	1
Employment				
Not in labor force	0.27		0	1
Regular worker	0.31		0	1
Irregular worker	0.35		0	1
Self-employed (incl. employees in family business)	0.06		0	1
Annual household income (IHS-transformed)	15.59	2.01	0	18.85
Untransformed value (10,000 yen)	432.01	262.92	0	6,264.40
Homeownership	0.66		0	1
Living in a major city	0.29		0	1

	Mean	SD	Min.	Max.
No. of observations			38,233	
No. of individuals			3,450	

Notes: IHS = inverse hyperbolic sine. Annual household income refers to the respondent's annual income in the case of married respondents and the equivalized annual income that is calculated as the sum of the respondent's and her husband's annual income divided by the square root of 2 in the case of married respondents. The target amount of saving for old age is also equivalized in the case of married respondents. Source: Calculations based on data from the JPSC.

Figure 5. The share of respondents who are saving for old age (%)

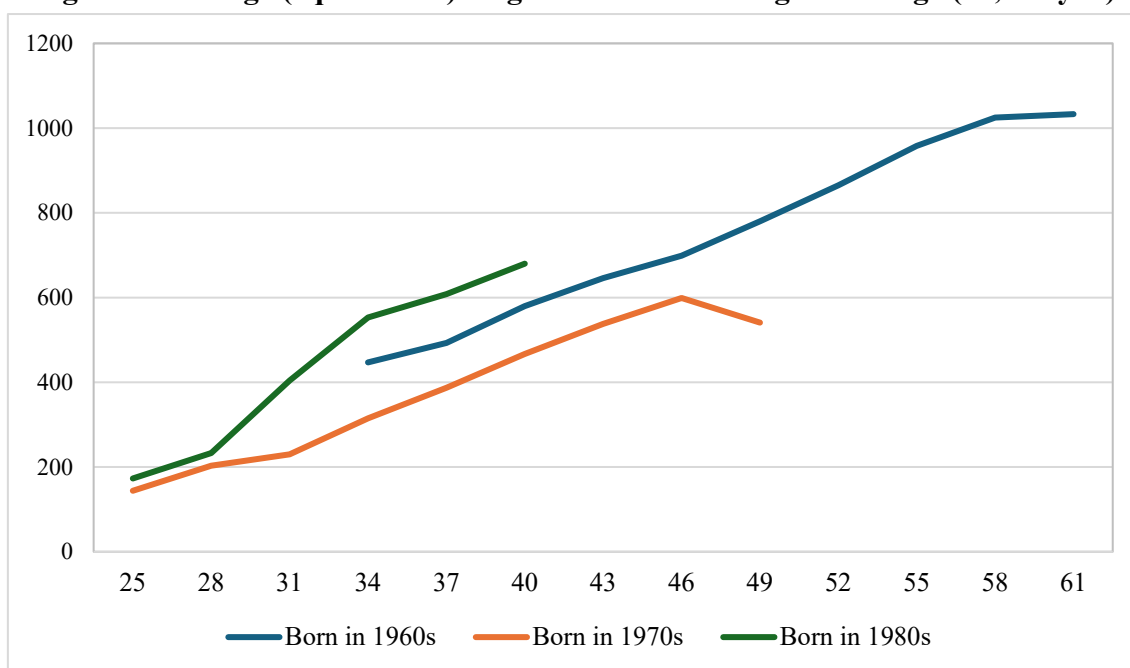


Note: The cohort of those who were born in the 1960s includes those who are born in 1959. Source: Calculations based on data from the JPSC.

Table 1 summarizes the dependent and explanatory variables included in the estimation model. It shows that, on average, about 48% of respondents are saving for old age. The (equivalized) target amount of saving for this purpose is about 5 million yen (about US\$33,000). Figure 5 shows that the proportion of those who are saving for old age increases along with age. It shows that once people reach their 50s, most of them are saving for old age. Figure 5 also shows some interesting differences among cohorts. The youngest cohort seems to start preparing for old age at an earlier age than older cohorts do. On the other hand, the middle cohort seems to be preparing less for old age in comparison to other cohorts. This might be explained, at least partly, by the fact that this cohort falls in the Employment Ice Age Generation who struggled to find a regular (full-time) job as their first job after graduation from university because of the collapse of the Bubble Economy in Japan.

We observe a similar pattern for the target amount of saving for old age. Figure 6 shows that the youngest cohort tries to prepare for old age more than older cohorts do and raises concerns about the middle cohort's preparedness for old age although the drop in the amount from 46 to 49 years old for this cohort might be due to the relatively small sample size. It is interesting to find that the average target amount of saving for old age reaches about 10 million yen by the time the respondent attains retirement age. Since the majority of the sample in that age group are married and the target amount of saving for old age is equivalized in the case of married couples, Figure 6 suggests that Japanese couples are trying to save roughly 20 million yen for old age, the amount that an average elderly couple would need in addition to their public pensions to fund a 30-year post-retirement life according to the Working Group of the Financial System Council of the Financial Services Agency, as noted in the introduction.

Figure 6. Average (equivalized) target amount of saving for old age (10,000 yen)



Note: The cohort of those who were born in the 1960s includes those who are born in 1959.
Source: Calculations based on data from the JPSC.

I turn to the regression analysis to examine what determines women's saving behavior. Table 2 reports the main regression results. The first two columns show the results of a linear probability model with fixed effects in which the dependent variable is a variable that indicates whether or not the respondent is saving for old age. The remaining two columns show the results of a fixed effects model in which the dependent variable is the target amount of saving for old age. Note that the Hausman test results indicate that the

fixed effects model is the preferred model in both cases.

Table 2. Main regression results

	Saving for old age		Target amount of saving for old age	
	Coefficient	S. E.	Coefficient	S. E.
Age	0.228***	0.056	4.049***	0.715
Age squared/100	-0.023***	0.005	-0.359***	0.083
Marital status (Married)				
Never married	-0.183***	0.018	-3.158***	0.302
Divorced	-0.092***	0.022	-1.619***	0.350
Widowed	-0.178***	0.064	-2.847***	1.096
Number of children	-0.013*	0.007	-0.227*	0.120
Residing with parents/parents-in-law	0.002	0.012	0.052	0.198
Employment (Not in labor force)				
Regular worker	0.006	0.012	0.152	0.197
Irregular worker	-0.019**	0.009	-0.319**	0.143
Self-employed	0.038*	0.020	0.660**	0.334
Annual household income	0.004**	0.002	0.063**	0.027
Homeownership	0.041***	0.011	0.711***	0.180
Living in a major city	0.028	0.018	0.501*	0.292
Within R ²	0.073		0.080	
No. of observations	38,233			
No. of individuals	3,450			

Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Regional and year dummies are included in all regressions. Standard errors are robust standard errors clustered at the individual level.

Source: Estimation based on data from the JPSC.

Table 2 shows that marital status is one of the key determinants of saving behavior. In comparison to respondents who are married, a respondent who is never married, divorced, or widowed is less likely to be saving for old age. This raises concerns about the financial wellbeing of unmarried women in old age given the significant gender gap in pensions in Japan. As for employment status, the results show that if the respondent is in irregular employment, she is less likely to be saving for old age in comparison to those who are out of the labor force. In the case of married couples in Japan, the wife tends to return to work as an irregular worker out of necessity rather than to pursue her own career if she previously left regular employment. As a result, regardless of the respondent's marital status, being in irregular employment seems to imply that she lacks the financial means to save for old age. The positive coefficients on annual household income and homeownership also suggest that better-off women are more likely to be preparing for

old age than women with less financial resources. As for the self-employed, the positive coefficient suggests that self-employed women might be consciously saving more for old age because they are not covered by the Employees' Pension Insurance System in Japan. Finally, having children seems to prevent women from preparing for old age. This is not surprising given that the cost of raising children is likely to compete with the need to save for old age as resources are limited. The results for the determinants of the target amount of saving for old age are similar to these results, as shown in Table 2.

Table 3. Robustness check

	Tobit model	
	Coefficient	S. E.
Age	1.615***	0.128
Age squared/100	-1.373***	0.136
Marital status (Married)		
Never married	-6.178***	0.545
Divorced	-3.507***	0.729
Widowed	-4.068**	1.713
Number of children	-0.974***	0.189
Residing with parents/parents-in-law	-0.188	0.321
Employment (Not in labor force)		
Regular worker	0.534	0.356
Irregular worker	-0.685**	0.277
Self-employed	1.403**	0.576
Annual household income	0.252***	0.063
Homeownership	1.337***	0.314
Living in a major city	0.977**	0.425
Education (High school)		
Junior college	1.639***	0.472
University +	3.247***	0.554
Cohorts (Born in 1960s)		
Born in 1970s	-2.494***	0.857
Born in 1980s	1.072	1.583
No. of observations	38,233	
No. of individuals	3,450	

Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Regional and year dummies are included in all regressions. Standard errors are bootstrapped standard errors.

Source: Estimation based on data from the JPSC.

As noted earlier, I estimate a Tobit model as a robustness check because one of the dependent variables (i.e., the target amount of saving for old age) is truncated at 0. Given

that it is not possible to estimate a Tobit model with fixed effects, I include in the estimation model variables for the respondent's education and cohort dummy variables. As Table 3 shows, the results remain broadly similar to those reported in Table 2 even when we take into account of the censorship of the dependent variable. The table also shows that more highly educated women are better prepared for old age, which could be interpreted as a sign of the importance of financial literacy for old-age saving. In addition, the results confirm the earlier observation that those who are born in the 1970s appear to be less prepared for old age than other cohorts.

6. Discussion and conclusion

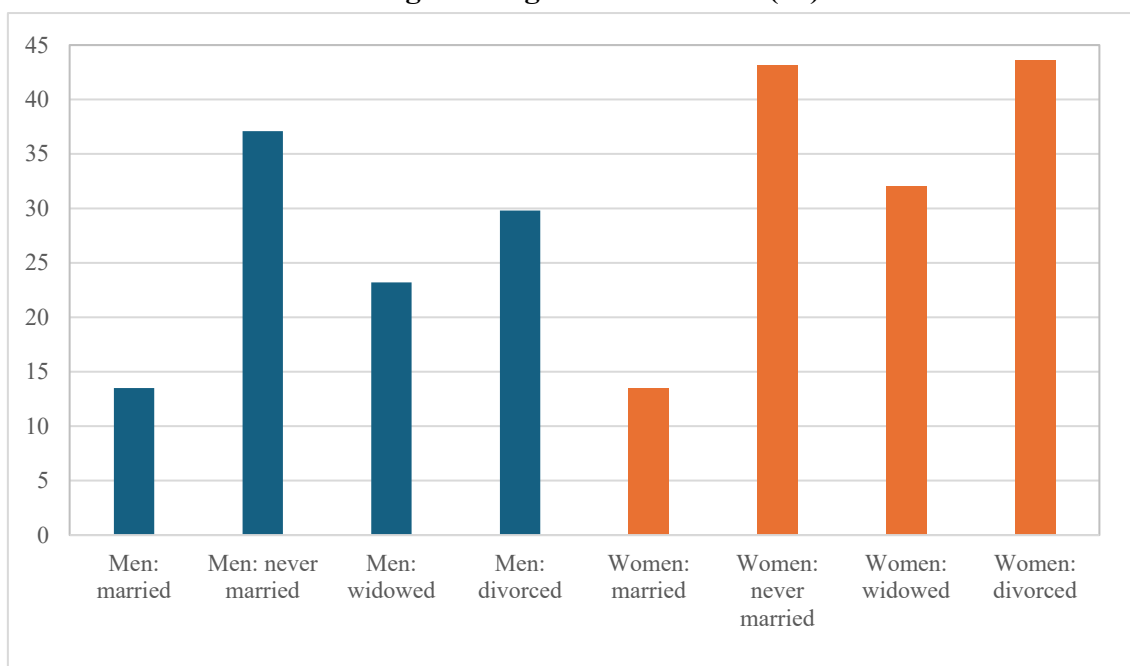
This paper examined how women are preparing themselves for old age in the case of Japan. Reflecting women's enhanced labor market performance over time, we observed a steady increase in the coverage of the Employees' Pension Insurance System among women, which essentially provides additional pension income beyond the basic pension of the Basic Pension System upon retirement. Nevertheless, the gender gap in pensions in Japan remains relatively large in comparison to that in other OECD member countries. This underscores the importance of women to do additional saving for old age outside of pension programs in Japan.

Using data from the Japanese Panel Survey of Consumers (JPSC), the present paper conducted a regression analysis of the determinants of whether or not women are saving for old age and how much they are trying to save for that purpose. I found that, in comparison to married women, unmarried women (i.e., never married, divorced, or widowed) are less likely to be saving for old age. The regression results also suggest that women in irregular employment are less likely to be saving for old age and that women with greater financial resources are in a better position in terms of preparation for old age. These regression results raise serious concerns about the possible risk of old-age poverty among unmarried women, particularly those who have worked mainly as irregular workers, if they worked at all, as they are less likely to be covered by the Employees' Pension Insurance System.

Indeed, old-age poverty among unmarried women is a serious issue in Japan. The poverty rate for those aged 65 and above in 2021 is estimated to be 20.0%, which is higher than that for all ages (15.4%). What is more disturbing is the gender gap in the poverty rate among the elderly (16.6% for men versus 22.8% for women), even though the gap among

the working-age group is relatively small (12.2% for men versus 13.1% for women).¹⁴ Such trends essentially reflect the fact that women receive relatively low pension income in Japan (see Figure 4). Figure 7 shows that the significant gender difference in the poverty rate is driven mainly by the relatively high poverty rate for unmarried women, particularly those who are divorced, in comparison to the rate for their male counterparts. Given that the regression results obtained in this paper indicate that unmarried women are less likely to be saving for old age, unmarried women do not seem to be building sufficient wealth to compensate for their low pension income. The regression results as well as the data on poverty rates in Figure 7 also suggest that married women are in a better position than unmarried women in terms of their preparedness for old age but that they are still in a vulnerable position as they could easily fall into poverty if they get divorced or widowed.

Figure 7. Relative poverty rate by gender and marital status among those aged 65 and above (%)



Source: The figure is drawn based on Abe (2024) *Sotaihinkonritsu no Doko (2022 Chosa Update) (Trends in Relative Poverty Rates (Update on the 2022 Survey) (in Japanese)*, JSPS 22H05098, <https://www.hinkonstat.net/>.

The present analysis is not without caveats. As the JPSC data do not contain information on pension wealth, it was not possible to assess how well-prepared women are for old age

¹⁴ The poverty rates are based on data from the 2022 Comprehensive Survey of Living Conditions, obtained from e-Stat, the portal site of official statistics of Japan (available at <https://www.e-stat.go.jp/>).

in terms of pension wealth. Moreover, while the JPSC data provide information on whether or not the respondent is saving for old age, they only provide the target amount of saving for old age rather than the actual amount of saving for that purpose.

Despite these limitations, the findings of this paper have a number of important policy implications. First, given the observed low coverage rate of the Employees' Pension Insurance System among women, it is important to broaden the coverage of this system to prevent women from falling into poverty in old age. The recent extension of the coverage of the Employees' Pension Insurance System to those in irregular employment is a step in the right direction, but more efforts need to be made. In addition, adopting measures to help women maintain regular employment throughout their working lives and removing the disincentives to work full-time created by the current tax and social insurance systems are equally important for ensuring the financial wellbeing of women in old age.

Second, enabling women to maintain regular employment will not only help them remain covered by the Employees' Pension Insurance System and thus obtain higher pension income upon retirement but will also help them save for old age outside of pension programs. However, at the same time, it might be equally important to raise the level of women's financial literacy as it is found to be relatively low in the case of Japan (Sekita, 2011). It is encouraging to find that the youngest cohort seems to be better prepared for old age than older cohorts. On the other hand, women in the Employment Ice Age Generation may need particular attention as they might be more financially vulnerable than those in other cohorts.

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