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Effect of Married Women's Labor Force Participation on
Japan's Household Savings Rate

Yilin Guo
Graduate School of Economics, Chuo University

Cheng Tang
Faculty of Economics, Chuo University

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INSTITUTE OF ECONOMIC RESEARCH
Chuo University
Tokyo, Japan

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Yilin Guo¹, Cheng Tang²

Abstract

This study aims to unravel the inexplicable rising trend in household savings rates in Japan by clarifying the effect of married women's increased labor force participation on it. Using data from the Japanese Household Panel Survey, we employ fixed effects models, robustness tests, and heterogeneity analyses to expose the underlying factors thereof. We, first and foremost, confirm the role of married women's labor force participation in the rising household savings rates. Second, this effect is subject to heterogeneity, being especially significant for middle-aged and older households (especially those aged 50 years and above), middle-income households, and employed married women. Finally, while married women's labor force participation substantially increases household income levels, its effect on consumption levels is relatively modest, thereby contributing to an increase in the savings rates. This phenomenon is influenced by changes in the household economic environment during the 2010s, including a stagnation in household income growth, increased burdens from educational and housing costs, and concerns about retirement security.

Keywords: married women; labor force participation; household savings rate

JEL Classification Codes: J12, J21, D12

¹ Graduate School of Economics, Chuo University, Tokyo, Japan a23.pbyg@g.chuo-u.ac.jp

² Faculty of Economics, Chuo University, Tokyo, Japan tang@tamacc.chuo-u.ac.jp

1. Introduction

The high household savings rate largely supported Japan's postwar economic growth, but its decline since the mid-1970s is often attributed to the increasing elderly population (Horioka, 1992). Post 1980s, studies on this phenomenon have focused on the savings practices of elderly households, revealing that older individuals are gradually drawing down their assets (Horioka, 2006, 2010; Ohtake, 1991; Yashiro & Maeda 1994). More recent research suggests that the pace of asset depletion among the elderly is far slower than previously predicted by the life cycle hypothesis (Horioka & Niimi, 2017; Murata, 2019; Nakazawa et al., 2015). Some argue that the primary factor behind Japan's declining savings rate at the macroeconomic level is not aging but a reduction in the elderly savings rate (Unayama & Ohno, 2017).

In 2013, however, the household savings rate, which was negative at 1%, began an upward trend. Notwithstanding the sharp increase caused by the COVID-19 pandemic in 2020, the savings rate rose by 4.6 points over the six years until 2019. The savings behavior of elderly households fails to explain this significant increase in the mid-2010s. Simultaneously, the Labour Force Survey of Japan's Ministry of Internal Affairs and Communications reported that the employment rate of married women in Japan increased sharply from 48.0% in 2013 to 54.6% in 2019, contributing significantly to the overall increase in female employment. Could it be that there exists a causal link between the household savings rate and married women's labor force participation? This line of questioning demands further investigation.

The labor participation of married women could potentially increase household income through higher earnings for female employees. Horie (1985) notes that an increase in dual-income households could contribute to a higher savings rate. Miura & Higashi (2017) similarly suggest that an increase in dual-income households supports overall consumption through income growth, while also contributing to a higher savings rate by reducing the propensity to consume. Nevertheless, extant studies do not sufficiently clarify the extent to which the sharp increase in married women's labor force participation affected the rising household savings rate in the mid-2010s.

To address this lacunae in research, we aim to empirically examine whether and how the sharp rise in married women's labor force participation has affected the household savings rate; if such is the case, we also seek to measure the extent of this influence and clarify its underlying mechanisms to accurately capture new shifts in Japanese household savings behavior and assess the potential influence of changes in household structure associated with increased married women's labor force participation in Japan's future economy. Accordingly, we employ panel data from the Japan Household Panel Survey (JHPS).

The remaining paper is organized as follows: In section 2, we review the literature and present the basic framework for understanding how married women's labor force participation affects household savings. In section 3, we present our theoretical model for married women's labor force participation. In section 4, we provide an overview of the panel data, descriptive statistics, and insights into household savings rate characteristics, and posit the hypotheses. In section 5, we present the empirical analysis, robustness checks, and an analysis of heterogeneity in household savings. In section 6, we investigate the factors underlying the increase in household savings rates attributable to married women's participation in the labor force. Section 7 concludes.

2. Literature Review

The extant literature on the household savings rate has two focal points of analyses: the effect of married women's labor force participation on the savings rate and the broader factors affecting this rate. Direct studies on the former are limited; most scholars indirectly address the issue through analyses of household income and consumption. For example, in an early study, Dynarski et al. (1997) suggest that, when households face income fluctuations, wives' labor participation can serve as a means to stabilize income, potentially smoothing consumption. Relatedly, Attanasio et al. (2005) contend that female labor supply can function as insurance for the household, helping to alleviate income risk, while Monteiro (2008) notes that married women's participation in the labor force can reduce precautionary savings by acting as insurance against household income risk.

In the case of Japan, Ozaki & Fujii (2014) theoretically argue that dual-income households can share risks within the household to mitigate income uncertainty owing to unemployment. Similarly, Sakamoto & Morita (2017) analyze whether wives' labor income contributes to widening household income disparities by examining different income groups depending on whether the wife continues to work or switches jobs. Their findings suggest that wives' continuous employment may reduce income disparities across households. Sasaki (2019) reveal that, while husbands' earnings drove the majority of household income disparities, the influence of wives' income and the correlation between spouses' incomes increased over time. Kitamura et al. (2019), analyzing the saving behavior of middle-aged households in Japan, find that spousal income helps restrain the depletion of net savings.

In Japan's aging society, research on household savings behaviors has primarily focused on whether elderly households draw down their assets. For instance, Hayashi et al. (1988), using data from the National Survey of Family Income and Expenditure, note that, aside from single-person elderly households and nuclear family households with household heads over 80 years of age, elderly individuals do not necessarily deplete their assets. Similarly, Nakazawa et al. (2018), using microdata from the 2009 National Survey of Family Income and Expenditure, suggest that the life cycle hypothesis may not hold in the Japanese context.

Conversely, the depletion of assets among non-working elderly households is well established fact. For example, Yashiro and Maeda (1994) use the National Survey of Family Income and Expenditure to highlight asset drawdowns among elderly non-working households. Using the Comprehensive Survey of Living Conditions, Ohtake (1991) shows that elderly individuals without children or living separately generally deplete their assets after the age of 75. Using aggregate data from the Family Income and Expenditure Survey, Horioka (2010) analyzes income and expenditure discrepancies in elderly non-working households, revealing that retirees indeed deplete their assets. Kitamura et al. (2019) conduct an empirical analysis of the savings trends of middle-aged households around retirement and conclude that their findings are consistent with the life cycle model.

However, the pace of asset drawdown may be significantly slower than the simple life cycle hypothesis suggests (Horioka & Niimi, 2017; Murata, 2019; Nakazawa et al., 2018), and this new finding has been attributed to the relatively strong precautionary motives among elderly individuals (Horioka & Niimi, 2017) and inheritance motives (Murata, 2019). Altruistic inheritance motives have also been suggested, wherein

individuals increase their savings rates if they anticipate a decline in their children’s living standards (Hamaaki & Hori, 2019). Tang et al. (2021) comparative study of inheritance motives among elderly people in China and Japan also implicates altruistic inheritance motives.

Despite the finding that dual-income households may have higher savings rates, scholars have not comprehensively examined the magnitude of this effect or its underlying factors. Miura and Higashi (2017), using microdata from the Survey on Household Financial Behavior (2007–2015), suggest that dual-income households could contribute to higher household savings rates. However, their analysis only treats dual-income households as a dummy variable and lacks a detailed examination of why married women’s labor force participation might increase household savings rate. Similarly, Horie (2023) notes a rise in household savings rate owing to increased dual-income households, but does not conduct an empirical analysis. A more detailed and rigorous empirical analysis is essential to address how the sharp increase in married women’s labor force participation since the mid-2010s has influenced household savings rate.

Accordingly, we investigate the sharp increase in married women’s labor force participation—itsself a new change in household structure since the mid-2010s—and its effect on Japan’s household savings rate trends. We are especially interested in the underlying factors and mechanisms of this relationship. Our study has several distinct features that make it a novel contribution to the corpus of literature on Japan’s household savings rate. First, it focuses on the mid-2010s increase in household savings rate and the surge in married women’s labor force participation, aiming to clarify the relationship between these two phenomena. Second, it uses data from the JHPS to provide robust evidence through fixed effects models, robustness tests, and heterogeneity analysis to elucidate why married women’s labor force participation contributes to an increase in household savings rate. All in all, to the best of our knowledge, this study is the first to offer a detailed analysis of how married women’s labor force participation affects Japan’s household savings rate, thus providing new insights into economic policy.

3. Theoretical Model

We develop our household choice model based on Yoshikawa and Ohtake (1989), examining the savings and consumption behavior of households with married women participating in the labor force under the following assumptions: (1) The market interest rate is fixed at r , where $0 < r < 1$. (2) Only the husband’s and wife’s labor income is considered the total household income. (3) A married woman’s labor time within a completed cycle is denoted as t_1 , and her non-labor time is $1 - t_1$. Married women are considered to participate in the labor market when t_1 approaches 1 and otherwise when t_1 approaches zero. (4) During married women’s labor and non-labor periods, household savings are s_1 and s_2 and household consumption is c_1 and c_2 , respectively. (5) The wife’s wage rate is fixed at w_f and the husband’s wage rate is fixed at w_m , assuming that the husband works for the entire cycle. (6) Married women derive utility from both labor and non-labor activities such as consumption and leisure, and the marginal utility gained from labor and non-labor activities remains constant.

The model employs a Cobb–Douglas utility function, and the goal is to maximize the utility of married women subject to the given constraints. The formulas are as follows:

$$\max_{c_1, c_2, t_1} U = c_1^\alpha t_1^\beta + c_2^\alpha (1 - t_1)^\beta$$

$$\begin{aligned}
s. t. \quad & \alpha + \beta = 1 \\
& w_f t_1 + w_m t_1 - c_1 - s_1 = 0 \\
& w_m(1 - t_1) + (1 + r)s_1 - c_2 - s_2 = 0
\end{aligned}$$

Based on the objective function and constraint conditions, we obtain the household savings rate sr :

$$sr = 1 - \frac{\alpha w_f t_1^\beta [(1 + r)^{-\frac{\alpha}{\beta}} (\frac{t_1}{1 - t_1})^{-\alpha} + (1 + r) (\frac{t_1}{1 - t_1})^{-\beta}]}{\beta [(1 - t_1)^{-\alpha} - t_1^{-\alpha} (1 + r)^{-\frac{\alpha}{\beta}} (\frac{t_1}{1 - t_1})^\alpha] (w_f t_1 + w_m)}$$

According to the theory of limits, we can determine the household savings rate in both scenarios: when the wife participates in the labor market and when she does not.

$$\begin{aligned}
sr_p &= \lim_{t_1 \rightarrow 1} sr = 1 - \frac{\alpha w_f (1 + r)^{1 - \frac{1}{\beta}}}{\beta \left[1 - (1 + r)^{1 - \frac{1}{\beta}} \right] (w_f + w_m)} \\
sr_{np} &= \lim_{t_1 \rightarrow 0} sr = 1 - \frac{\alpha w_f (1 + r)}{\beta w_m \left[1 - (1 + r)^{1 - \frac{1}{\beta}} \right]}
\end{aligned}$$

Clearly, $sr_p > sr_{np}$. The theoretical analysis shows that, under the conditions of a constant market interest rate, unchanged wage rates for both the husband and wife, and the independence of married women's labor and non-labor states within a complete cycle, the household savings rate is higher when married women participate in the labor market.

4. Overview of the Data

4.1 Data Source

This study uses data from the Japan Household Panel Survey (JHPS/KHPS) (2015–2019), a nationwide survey conducted by the Panel Data Research Center at Keio University. The JHPS/KHPS combines the previously separate “Japan Household Panel Survey” and “Keio Household Panel Survey” into a single survey, as of 2014. Conducted annually, this survey includes a wide range of items, such as family composition, individual attributes, employment and education status, education level, household assets, housing, and health. This longitudinal project tracks the same individuals nationwide over time.

4.2 Descriptive Statistics of the Data

Let us describe the dependent and independent variables used in the study. For the dependent variable, namely, the household savings rate, we define three variations to enhance the robustness and reliability of the test results. The first measure, *Household Savings Rate 1*, is the ratio of savings (calculated as the difference between household disposable income and annual household consumption expenditure) to disposable household income, aligned closely with the concept of disposable income. The second measure, *Household Savings Rate 2*, is the ratio of savings (calculated as disposable household income minus expenditures considered nonrecurring, such as furniture, electronic appliances, and digital devices) to disposable household income. The

third measure, *Household Savings Rate 3*, follows Chamon and Prasad (2010) and is calculated as the difference between the logarithm of disposable household income and annual household consumption expenditure. All measures are constrained within upper limit of 100% and lower limit of -100%.

(1) *Household Saving Rate 1* =

$$\frac{\text{Annual Disposable Household Income} - \text{Monthly Household Consumption} \times 12}{\text{Annual Disposable Household Income}}$$

(2) *Household Saving Rate 2* =

$$\frac{\text{Annual Disposable Household Income} - \text{Monthly Household Consumption Excluding Furniture, Appliances, and Digital Devices} \times 12}{\text{Annual Disposable Household Income}}$$

(3) *Household Saving Rate 3* =

$$\text{Ln (Annual Disposable Household Income)} - \text{Ln (Monthly Household Consumption} \times 12)$$

To examine the effect of married women’s labor force participation on household savings rates, we select 25,402 samples from data covering the years 2015 to 2019. We then limit the age range of married women to between 20 and 65 years, excluding any samples outside this range as well as those with missing responses. We obtain a final dataset of 12,484 samples. Regarding the participation of married women in the labor force, we consider a married woman to be participating in labor if she answered “Yes” to the question “Did you engage in paid work last month (January)?”

[Table 1]

According to Table 1, the average household savings rate based on the three different definitions are 28.3%, 31.1%, and 32.6%, respectively. At the time of the survey, the average age of married women was 49 years, with a labor participation rate of 66%, which was slightly higher than the national average. Married women had an average of 14 years of education, with 79% enrolled in a pension plan, and 69% covered by employment insurance. The average household size for households with married women participating in the workforce was 3.5 persons, with over 85% having children and approximately 60% having children attending school, most of whom were in high school or above. The average household income was JPY5.46 million, of which the husband’s average income was JPY4.57 million, which roughly aligned with the results of the Ministry of Internal Affairs and Communications Household Survey.

Over the entire period from 2015 to 2019, *Household Savings Rate 1* is 31.0% when married women participate in the workforce compared with 23.0% when they do not, an 8-point difference. This intuitively suggests that married women’s labor participation contributes to a higher household savings rate. In other words, the increase in household income driven by married women’s labor force participation appears to have exceeded the growth in household consumption, thereby raising Japan’s household savings rate in the 2010s. Based on extant findings and the present descriptive statistics, we propose our hypothesis:

H: The labor participation of married women increases the household savings rate.

5. Empirical Analysis

5.1 Estimation Model

To test the hypothesis proposed earlier, we employ estimation model (1) using a fixed effects model:

$$Savingrate_{it} = \alpha_0 + \alpha_1 Womenwork_{it} + \alpha_2 X_{it} + \theta_t + \mu_{it}. \quad (1)$$

Here, the dependent variable $Savingrate_{it}$ represents the household savings rate of household i at time t . The key independent variable $Womenwork_{it}$ indicates the labor status of married women in household i at time t , with a dummy variable that takes the value of one if the married woman is “working.” The control variables included in X_{it} represent the personal characteristics of married women, such as years of education, health status, and pension enrollment status, as well as household attributes, such as family size, number of children, husband’s income, and financial assets. Variables reflecting regional characteristics such as whether the household was located in the Tokyo metropolitan area are included. The term θ_t represents year fixed effects from 2015 to 2019, while μ_{it} denotes the unobserved error term.

5.2 Estimation Results

Table 2 presents the estimation results from the fixed effects model, showing the effect of married women’s labor force participation on the household savings rate. Columns (1)–(3) display the coefficients of *Household Savings Rate 1*, *Household Savings Rate 2*, and *Household Savings Rate 3*, respectively. The coefficients of “labor force participation” of married women were positive and statistically significant at the 1% level, with values of 0.0553, 0.0490, and 0.0650, respectively. This finding indicates a strong positive effect of married women’s labor force participation on household savings rate. For instance, per the results in column (1), when a married woman participates in the labor force, the household savings rate increases by 5.53%. This finding confirms the validity of the hypotheses.

[Table 2]

Next, we examine the estimation results of the control variables, focusing primarily on equation (1) for a *Household Savings Rate 1*. The coefficient of household size is negative and significant at the 1% level, suggesting that households with more family members have a higher proportion of consumption expenditure. The coefficient of pension enrollment for married women is positive and significant at the 5% level, indicating a tendency for individuals to save, even when enrolled in a pension plan. Thus, households may perceive “pension alone is insufficient,” as Taniguchi & Otsuka (2020) note, thereby contributing to an increase in the household savings rate.

The coefficient of mortgage presence is positive and significant at the 1% level across all models. Given that mortgage repayment periods are generally long, households may reduce other consumption expenditures out of concern for future financial burden. This finding aligns with that of Higo et al. (2001), who argue that mortgages contribute to higher savings rate, a view corroborated by this study.

However, households residing in the Tokyo metropolitan area are suggested to have relatively lower savings owing to higher living costs compared with other regions, limiting the amount they can allocate to savings. The association between married women's years of education, presence of children, and household savings rate shows negative coefficients, but is either only significant at the 10% level or not statistically significant. This indicates that the effect on the household savings rate may vary by the presence and ages of children, as different consumption needs arise. This point will be further examined in the heterogeneity analysis in section 6, where the relationship between child attributes and household savings rate is explored in more detail³.

5.3 Robustness Test

When estimating the effect of married women's labor force participation on the household savings rate, many explanatory variables are concentrated around 0 and the error term may not follow a normal distribution, potentially introducing bias into the estimated parameters. To address this, we conduct robustness checks on the fixed effects model results in Table 2 by employing additional estimation methods: the Tobit model and propensity score match (PSM).

Table 3 presents the estimation results of married women's labor force participation and the household savings rate using the Tobit model. The estimated coefficients of married women's labor force participation in *Household Savings 1*, *Household Savings 2*, and *Household Savings 3* are 0.0488, 0.0473, and 0.0621, respectively, all of which are positive and significant at the 1% level. The results of the Tobit analysis are consistent with the findings of the fixed effects model, further supporting our hypothesis that married women's labor force participation contributes to an increase in the household savings rate.

[Table 3]

Next, the contribution of married women's labor force participation to the household savings rate is expected to vary among individuals. To control for errors introduced by the control variables in the estimation results, we perform a robustness check using PSM. We re-estimate using 1:2 and 1:4 PSM, where each observation in the control group is matched with two or four observations from the treatment group. Here, we classify married women's labor force participation into the treatment group for those who are working and the control group for those who are not.

Table 4 shows the estimation results for *Household Saving Rate 1* using the 1:2 and 1:4 PSM methods⁴. The results confirm the robustness of the estimates under

³ One of the key areas of interest in this paper is the relationship between married women's labor participation and the household savings rate. However, whether a married woman participates in the labor force is an endogenous variable. To correct for this endogeneity bias, the instrumental variable (IV) method could be considered. Nonetheless, it has proven challenging to find an appropriate instrumental variable that correlates with the decision-making process for married women's labor force participation but is uncorrelated with the error term. Therefore, a limitation of this study is that there remains the possibility of endogeneity bias in the analysis results.

⁴ We also conduct PSM estimations using *Household Savings Rate 2* and *Household Savings Rate 3*. Both estimations confirm that married women's labor force participation significantly increases the household savings rate. Detailed results are omitted here owing to space

both 1:2 and 1:4 PSM, indicating that married women’s labor force participation positively affects the household savings rate. Specifically, the average treatment effect on the treated shows that, compared with married women who do not participate in the workforce, those who participate exhibit an increase in the household savings rate of 4.21% and 4.52% under 1:2 and 1:4 PSM, respectively. Thus, married women participating in the labor force have a savings rate that is over 4% higher than that of those who are not married⁵. The robustness check using PSM clarifies that married women’s labor force participation has a strong positive effect on household savings rate.

[Table 4]

5.4 Heterogeneity Analysis⁶

So far we have confirmed that married women’s labor force participation increases the household savings rate. To determine whether this effect varied across households with different characteristics, we narrow our analysis to three demographics: “age group,” “per capita income group,” and “employment status group.”

Table 5 presents the estimation results of the heterogeneity analysis. First, in terms of age groups, the coefficient for middle-aged and older individuals (51–65 years) is the highest, showing a positive effect of 6.31% on the household savings rate at a 1% significance level. This finding suggests that married women in this age group may have the greatest need for precautionary savings, possibly owing to education expenses for their children attending high school or university and their retirement planning.

[Table 5]

Second, regarding the per capita household income categories, a positive effect on the household savings rate is observed across all income groups at the 1% significance level. The middle-income group, which constitutes the majority of all households, exhibits the largest estimated coefficient at 4.4%. This result indicates that the labor force participation of married women in this income group has a pronounced effect on the household savings rate.

Finally, we observe a significant effect on the household savings rate in all cases at the 1% significance level for married women’s labor force participation based on employment status and type (self-employment). Specifically, households in which married women are employed or self-employed show a positive savings rate, whereas households in which women are not employed exhibit a negative savings rate. These findings highlight that, while married women’s labor force participation contributes to an increase in the household savings rate, the effect is heterogenous.

constraints, but are available upon request.

⁵ The figures for the PSM are omitted owing to space constraints. According to these results, the covariates were dispersed (black dots) before matching, but after matching, the standardized bias of the covariates moved closer to 0%, and the previously dispersed balance was aligned (marked by×), indicating robustness.

⁶ The estimations using *Household Savings Rate 2* and *Household Savings Rate 3* yield the same results as those for *Household Saving Rate 1*. Detailed results are omitted here owing to space constraints, but are available upon request.

6. Determinants of the Increase in Household Savings Rate

6.1 Effect on Household Income and Consumption

We now clarify the factors underlying the role of married women's labor rate in increasing the household savings rate. We know that married women's labor force participation functions as a form of insurance against household income risk (see section 2), which is expected to reduce precautionary savings. However, our findings present a paradoxical outcome: Rather than lowering precautionary savings, married women's labor force participation appears to have increased the household savings rate. Note that household income and consumption are the two primary factors that directly influence the household savings rate. We must then examine how married women's labor force participation affects household income and consumption.

Table 6 presents the estimation results of the effect on household income and consumption. According to the findings, married women's labor force participation has a positive effect on both household income and consumption; this effect is statistically significant at the 1% level in all cases. Specifically, the estimated coefficients for household income are 0.1677 and 0.1676, whereas those for household consumption are 0.0848 and 0.0843, respectively. Thus, the increase in household income owing to married women's labor force participation exceeds the corresponding increase in household consumption. As the additional income generated by married women's labor force participation exceeds the rising demand for consumption, we can infer a corresponding increase in the household savings rate.

[Table 6]

6.2 Factor Analysis from the Perspective of Savings Categories

Let us know the underlying factors of the relationship under examination. We specifically consider the major household savings categories for this part of the analyses. Household savings are primarily accumulated for future consumption, and primarily for home purchases, children's education, and retirement. Given the economic changes of the 2010s, households faced an increasing need to save money to achieve these financial goals.

The most crucial factor for household savings is disposable income, which has stagnated in recent years. Since the beginning of the 21st century, Japanese corporations have increasingly prioritized profit maximization, leading to stagnation in corporate employee earnings, which constitute a significant portion of household income (Horie, 2023). Consequently, total wages declined in the latter half of the 2010s. This trend is also evident in the data from the Family Income and Expenditure Survey conducted by the Statistics Bureau of Japan. For instance, among working households with two or more members, the average year-on-year change in the household head's real income from 2014 to 2019 was only 0.35%. Data from the JHPS/KHPS also indicate that, during the same period, husbands' income growth averaged only 0.69%.

The stagnation of household income is expected to not only increase the pressure on current consumption expenditure but also affect savings for future consumption. In particular, with stagnant household income, the financial burden of children's education is expected to become even heavier owing to rising university enrollment rates and tuition fees. The university and junior college enrollment rate have steadily risen from 55.1% in 2013 to 60.4% in 2022, with tuition fees at private universities continuing to increase

annually^{8,9}. Comparing with other member states of the Organization for Economic Co-operation and Development, Kobayashi (2018) notes that Japanese households bear the heaviest financial burden for higher education. This is largely attributed to the prevailing belief in Japan that education is the household's responsibility. Consequently, households must accumulate substantial savings to cover educational costs, which further increases the need for precautionary savings.

Another factor contributing to the need to increase household savings is the expansion of household debt, particularly mortgage loans. Since the 2010s, prolonged low-interest rates, mortgage tax deductions, and rising housing prices have led to a continuous increase in individual mortgage loan balances. According to data from the Japan Housing Finance Agency, the outstanding mortgage loan balances increased by JPY37 trillion between FY2010 and FY2022. Similarly, data from the Family Income and Expenditure Survey indicate that the household debt-to-income ratio (total liabilities as a percentage of annual income) for households with two or more members increased from 81.0% to 90.6% over the same period. Horioka et al. (1990) find that households repaying mortgages exhibit significantly higher savings rates than those without mortgages, and that mortgage repayments fully account for differences in savings rates. Despite stagnant household income, the growing burden of mortgage repayment compels households to save more to meet their long-term debt obligations.

From the perspective of retirement security, stagnant income growth during the work years increases the risk of insufficient savings in old age. As previously mentioned, with limited household income growth, many households experience reduced financial flexibility for current consumption, making it challenging to engage in self-directed retirement savings. According to the Public Opinion Survey on Household Financial Behavior 2022 conducted by the Central Council for Financial Services Information, among households whose heads are below 60 years of age, the proportion of respondents expressing concerns about their financial security during retirement has consistently remained in the high 80% range since the 2008 global financial crisis.

Given these changes in the household economic environment, the motivation for saving has become more strongly associated with major savings categories, such as children's education expenses, home purchases, and retirement security. This aligns with the finding that the primary reason for employment among married women, cited by 71%, is "to earn income and support their family."¹⁰ According to the Household Savings and Finance Survey (3rd edition, 2018) conducted by the Japan Post Bank Foundation, when individuals with a motive to save were asked about changes in their savings for specific purposes over the past year, the most frequently cited category for increased savings was children's education expenses (36.2%), followed by housing-related expenses (23.2%) and retirement security (18.6%). Therefore, we infer that the reason behind the increase in household savings rate owing to married women's labor force participation lies in the heightened need for savings driven by changes in the household economic environment, including anticipated future expenditures and concerns about financial security in old age.

⁸ From "2022 Basic School Survey," Ministry of Education, Culture, Sports, Science and Technology-Japan. https://www.mext.go.jp/b_menu/toukei/chousa01/kihon/kekka/k_detail/1419591_00007.htm.

⁹ See https://www.mext.go.jp/content/20211224-mxt_sigakujo-000019681_4.pdf.

¹⁰ A survey on "Work Purpose" was conducted on En Women's Work (<https://women.en-japan.com/>), collecting responses from 630 women aged 20 to 40. See <https://corp.en-japan.com/newsrelease/2017/3496.html>.

To examine this further, we conduct an analysis using the estimation model (2) presented below.

$$Savingrate_{it} = \beta_0 + \beta_1 Womenwork_{it} + \beta_2 Prevent_{it} + \beta_3 Womenwork_{it} * Prevent_{it} + \beta_4 X_{it} + \theta_t + \mu_{it}. \quad (2)$$

Here, the dependent variable $Savingrate_{it}$ represents the household savings rate of household i at time t , using the definition of *Household Savings Rate 1*. The key independent variable $Womenwork_{it}$ indicates the labor force participation status of married women in household i at time t . The proxy variable $Prevent_{it}$ captures a household's savings motives at time t . Although the current JHPS/KHPS does not include a direct question about household savings motives, it provides information on children's schooling status, presence of a mortgage loan, and husband's income. Therefore, we use "child's schooling," "mortgage loan," and "husband's income" as proxy variables for major saving categories. X_{it} represents the control variables, θ_t denotes year fixed effects from 2015 to 2019, and μ_{it} is the unobservable error term. Notably, both the independent and control variables are the same as those used in estimation model (1) in section 5.

First, "Child's Schooling" is a dummy variable that takes the value of 1 if there is a child enrolled in school at the high school level or below within the household. This variable is included based on the increasing university enrollment rate to estimate the presence of a savings motive for future education expenses. Next, "Mortgage Loan" is a dummy variable that takes the value of 1 if the household has an outstanding mortgage loan. Mortgage repayments are generally fixed monthly installments over an extended period. Consequently, mortgage repayment constitutes a long-term financial burden for households, leading them to anticipate future financial obligations and consequently restraining their current consumption expenditures. Finally, the dummy variable "Husband's Low Income" classifies household income into quintiles and defines the bottom 20% as "low-income husbands." According to Taniguchi & Otsuka (2020), a lower household income is associated with greater concern about insufficient financial assets for retirement, inadequate pension benefits, and limited lump-sum retirement payments. Therefore, married women's labor force participation is expected to increase the household savings rate, thereby alleviating concerns about financial security in old age.

The results of the regression analysis in Table 7 reveal the following key findings: First, regardless of whether (1) the Child's Schooling, (2) Mortgage Loans, or (3) Husband's Low Income is controlled for, the regression coefficients for married women's labor force participation are 0.0746, 0.0745, and 0.0427, respectively, all of which are positive and statistically significant at the 1% level.

[Table 7]

Focusing on (1) Children's Schooling, the regression coefficient for the cross-term between married women's labor force participation and children's schooling is -0.0370, which is statistically significant at the 1% level. The regression coefficient for married women's labor force participation alone is 0.0746, leading to a combined effect of 0.0376. This result indicates that in households with children enrolled in high school

or below, married women's labor force participation tends to increase the household savings rate by 3.76% compared with households where the wife does not participate in the labor force. As discussed earlier, married women's labor force participation is likely motivated by the need to prepare for the financial burden of their children's future university education.

Regarding (2) Mortgage Loans, the regression coefficient for the cross-term between married women's labor force participation and the presence of a mortgage loan is -0.0486, and statistically significant at the 1% level. The regression coefficient for married women's labor force participation alone is 0.0745, resulting in a combined effect of 0.0259. Thus, in households with outstanding mortgage loans, married women's labor force participation tends to increase the household savings rate by 2.59% compared with households without a mortgage loan. As household mortgage debt increases, the need for long-term savings to allocate toward loan repayments. Consequently, households may restrain their consumption expenditure and engage in precautionary saving behavior to prepare for future mortgage payments.

Focusing on the (3) Husband's Low Income, the regression coefficient for the cross-term between married women's labor force participation and the husband's low-income status is 0.0428 and statistically significant at the 1% level. The regression coefficient for married women's labor force participation alone is 0.0427, leading to a combined effect of 0.0855. Thus, in households where the husband's income is low, married women's labor force participation tends to increase the household savings rate by 8.55%. This finding implies that in households with insufficient pension savings or financial assets, married women's labor force participation is strongly motivated by the need to prepare for future living expenses, particularly retirement. Kitamura et al. (2019) also find that when a spouse is employed, the household savings rate tends to increase, potentially driven by a precautionary motive to mitigate concerns about a decline in future living standards.

Overall, while married women's labor force participation significantly increases household income levels, its effect on consumption growth is relatively small. Simultaneously, changes in the household economic environment during the 2010s appeared to have strengthened household savings motives for major financial goals such as children's education, home purchases, and retirement. Married women's labor force participation further reinforces these saving motives, which, in turn, may contribute to an overall increase in the household savings rate.

5. Conclusion

Using panel data from the JHPS/KHPS covering 2015 to 2019, this study empirically analyzes how the rapid increase in married women's labor force participation in Japan since the mid-2010s has influenced the household savings rate. We summarize our findings as follows:

- (1) Married women's labor force participation has a strong positive effect on household savings rate. This result remains robust, even when tested using the Tobit model with PSM, suggesting that married women's labor force participation has played a crucial role in increasing the household savings rate since the mid-2010s.
- (2) The effect of married women's labor force participation on household savings

- varies by household characteristics, including age, income, and employment type.
- (3) While married women's labor force participation significantly improves household income levels, its effect on consumption growth is relatively weak, thereby contributing to an increase in the household savings rate. This phenomenon was influenced by changes in the household economic environment during the 2010s, such as stagnant household income growth, rising educational costs, increasing mortgage debt, and concerns about financial security in old age. These factors likely strengthen household savings motives.

These findings have several policy implications. While population aging is expected to exert downward pressure on Japan's household savings rate, the increase in married women's labor force participation appears to partially offset this decline. These shifting dynamics of household structures, driven by rising female labor participation, could significantly influence Japan's economic revitalization.

Notably, economic factors are significant drivers of married women's labor force participation; however, this increase has not led to a marked rise in consumption expenditure. To stimulate private consumption in Japan effectively, policymakers should focus on enhancing household income through sustained economic growth, alleviating the financial burden associated with education, preserving mortgage tax-relief programs, and improving retirement security. Special attention should be directed toward low-income households, which can be addressed through pension system reforms and the introduction of diversified asset management options.

We must note that our study does not account for the effect of the COVID-19 pandemic and post-pandemic changes on household economic behavior, which should be explored in future research. We also recommend a more detailed examination of married women's labor force participation by employment type and occupation to gain a deeper understanding of its effects.

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Table 1
Descriptive Statistics.

Variables	Sample Size	Mean	SD	Min	Max
Household Savings Rate 1	10,702	0.283	0.314	-1.000	0.905
Household Savings Rate 2	9,465	0.311	0.307	-1.000	0.918
Household Savings Rate 3	9,843	0.326	0.384	-1.000	1.000
Married Women's Labor Force Participation (Yes = 1)	12,484	0.662	0.473	0	1
Employment Type of Married Women (Employed = 1, Not Employed = 2, Self-employed/Family Worker = 3)	8,210	1.305	0.692	1	3
Age of Married Women	10,291	48.959	8.561	22	65
Years of Education for Married Women	12,380	13.793	2.885	9	22
Pension Enrollment (Yes = 1)	12,484	0.791	0.407	0	1
Employment Insurance Enrollment (Yes = 1)	12,484	0.685	0.465	0	1
Household Size	12,438	3.476	1.313	1	10
Child Dummy (Yes = 1)	12,484	0.859	0.348	0	1
School Attendance Dummy (Yes = 1)	12,484	0.570	0.495	0	1
Child's Grade (Junior High or Below = 1, High School = 2, College or Above = 3)	12,484	2.213	0.880	1	3
Home Ownership (Yes = 1)	12,484	0.841	0.366	0	1
Mortgage (Yes = 1)	12,407	0.4036	0.491	0	1
Husband's Income (JPY10,000)	10,888	457.392	320.244	0	1,236
Household Financial Assets (JPY10,000)	11,697	996.103	1,474.72	0	7,000
Household Annual Income (JPY10,000)	11,241	546.073	264.53	108	1,373
Household Consumption (JPY10,000)	11,988	359.430	162.63	131	924
Household Income per Capita (JPY10,000)	11,206	172.884	97.43	40	500
Regional Dummy (Tokyo Metropolitan Area = 1)	12,484	0.352	0.478	0	1
Good Health Status	12,484	0.421	0.494	0	1
Poor Health Status	12,484	0.159	0.366	0	1

Source: Compiled by the author based on the 2015–2019 Japan Household Panel Survey (JHPS/KHPS).

Table 2.*Results of the Effect of Married Women's Labor Force Participation on the Household Savings Rate.*

Variables	(1) Household Savings Rate 1	(2) Household Savings Rate 2	(3) Household Savings Rate 3
Married Women's Labor Force Participation	0.0553*** (0.0068)	0.0490*** (0.0070)	0.0650*** (0.0088)
Household Size	-0.0102*** (0.0026)	-0.0134*** (0.0028)	-0.0091*** (0.0034)
Child Dummy	-0.0087 (0.0099)	-0.0081 (0.0102)	-0.0179 (0.0130)
Pension Enrollment	0.0231** (0.0109)	0.0243** (0.0113)	0.0061 (0.0140)
Good Health	0.0016 (0.0065)	0.0007 (0.0067)	-0.0041 (0.0085)
Poor Health	-0.0388*** (0.0090)	-0.0401*** (0.0092)	-0.0499*** (0.0115)
Residence in Tokyo Metropolitan Area	-0.0165*** (0.0064)	-0.0182*** (0.0066)	-0.0211** (0.0082)
Home Ownership	0.0720*** (0.0092)	0.0792*** (0.0094)	0.0750*** (0.0117)
Mortgage	0.0461*** (0.0072)	0.0473*** (0.0075)	0.0631*** (0.0094)
Employment Insurance Enrollment	-0.0174** (0.0088)	-0.0089 (0.0092)	-0.0079 (0.0116)
Education Years of Married Women	-0.0020* (0.0011)	-0.0016 (0.0011)	-0.0014 (0.0014)
Ln (Husband's Income)	0.1097*** (0.0053)	0.1006*** (0.0054)	0.1330*** (0.0069)
Ln (Household Financial Assets)	0.0325*** (0.0027)	0.0323*** (0.0027)	0.0366*** (0.0035)
Year control	YES	YES	YES
<i>N</i>	9,312	8,420	8,536
<i>R</i> ²	0.1339	0.1333	0.1240

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Figures in parentheses are robust standard errors.

Table 3.
Robustness Test Results (Tobit Model).

Variables	(1) Household Savings Rate 1	(2) Household Savings Rate 2	(3) Household Savings Rate 3
Married Women's Labor Force Participation (0.0058)	0.0488***	0.0473***	0.0621***
Household Size (0.0023)	-0.0095***	(0.0059) -0.0130***	(0.0083) -0.0096***
Child Dummy (0.0085)	-0.0133	(0.0023) -0.0120	(0.0032) -0.0151
Pension Enrollment	0.0174* (0.0094)	(0.0086) 0.0191**	(0.0122) 0.0003 (0.0079)
Pension Enrollment Good Health	0.0027 (0.0055)	0.0026 (0.0057)	-0.0023 (0.0079)
Poor Health	-0.0324*** (0.0077)	-0.0330*** (0.0078)	-0.0459*** (0.0109)
Residence in Tokyo Metropolitan Area	-0.0148*** (0.0054)	-0.0145*** (0.0055)	-0.0188** (0.0077)
Home Ownership	0.0795*** (0.0079)	0.0865*** (0.0080)	0.0879*** (0.0111)
Mortgage	0.0436*** (0.0061)	0.0447*** (0.0063)	0.0648*** (0.0088)
Employment Insurance Enrollment	-0.0152** (0.0075)	-0.0110 (0.0078)	-0.0003 (0.0109)
Education Years of Married Women	-0.0020** (0.0009)	-0.0014 (0.0009)	-0.0010 (0.0013)
Ln (Husband's Income)	0.0934*** (0.0045)	0.0881*** (0.0045)	0.1207*** (0.0065)
Ln (Household Financial Assets)	0.0318*** (0.0023)	0.0324*** (0.0023)	0.0377*** (0.0033)
Year control	YES	YES	YES
<i>N</i>	9,312	8,420	8,536
<i>Pseudo R</i> ²	0.3321	0.4209	0.1384

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Figures in parentheses are robust standard errors.

Table 4*Estimation Results of Propensity Score Matching.*

Dependent Variable	Matching Method	Treatment Group	Control Group	ATT	S.E.	T-value	Year control
Household Savings Rate	Nearest Neighbor Matching(1:2)	0.3171	0.2750	0.0421***	0.0095	4.42	YES
	Nearest Neighbor Matching(1:4)	0.3171	0.2719	0.0452***	0.0090	5.01	YES

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Figures in parentheses are robust standard errors.

Table 5.*Heterogeneous Effects of Married Women's Labor Force Participation on the Household Savings Rate.*

Household Savings Rate 1	Married Women's Labor Force Participation	S.D.	<i>N</i>	<i>R-squared</i>	Control Variables Year Control
1. Age Group					
20-35 years	0.0431**	(0.0213)	575	0.2463	YES
36-50 years	0.0472***	(0.0098)	3,960	0.1709	YES
51-65 years	0.0631***	(0.0102)	4,777	0.1259	YES
2. Per Capita Income Group[†]					
Low income	0.0319***	(0.0112)	2,121	0.4879	YES
Middle income	0.0440***	(0.0049)	4,725	0.7354	YES
High income	0.0295***	(0.0069)	2,466	0.6738	YES
3. Employment Status Group					
Employed	0.0435***	(0.0066)	5,371	0.1318	YES
Not employed	-0.0569***	(0.0188)	241	0.1286	YES
Self-employed Family worker	0.0561***	(0.0120)	671	0.1298	YES

*Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Figures in parentheses are robust standard errors. † Household income levels are categorized as follows: the lowest 25% of household income is classified as low income, the highest 25% as high income, and the middle range as middle income.

Table 6

The Effect of Married Women's Labor Force Participation on Household Income and Household Consumption.

	(1)	(2)	(3)	(4)
	Household Income (FE)	Household Income (OLS)	Household Consumption (FE)	Household Consumption (OLS)
Married Women's Labor Force Participation	0.1677*** (0.0093)	0.1676*** (0.0093)	0.0848*** (0.0087)	0.0843*** (0.0087)
Control Variables	YES	YES	YES	YES
Year Control	YES	NO	YES	NO
<i>N</i>	9,701	9,701	10,133	10,133
<i>R</i> ²	0.3630	0.3629	0.1583	0.1575

*Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Figures in parentheses are robust standard errors. FE: Fixed effect; OLS: Ordinary least squares.

Table 7*Analysis Results on Married Women's Labor Force Participation and Saving Motives.*

	(1)	(2)	(3)
	Household	Household	Household
	Savings Rate 1	Savings Rate 1	Savings Rate 1
Married Women's Labor Force Participation	0.0746*** (0.0092)	0.0745*** (0.0087)	0.0427*** (0.0080)
Child's Schooling	-0.0402*** (0.0111)		
Married Women's Labor Force Participation * Child's Schooling	-0.0370*** (0.0128)		
Mortgage Loan		0.0817*** (0.0123)	
Married Women's Labor Force Participation * Mortgage Loan		-0.0486*** (0.0136)	
Husband's Low Income			-0.0338* (0.0175)
Married Women's Labor Force Participation * Husband's Low Income			0.0428*** (0.0144)
Control Variables	YES	YES	YES
Year Control	YES	YES	YES
<i>N</i>	9,312	9,312	9,312
<i>R</i> ²	0.1488	0.1351	0.1347

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Figures in parentheses are robust standard errors.

中央大学経済研究所
(INSTITUTE OF ECONOMIC RESEARCH, CHUO UNIVERSITY)
代表者 阿部 顕三 (Director: Kenzo Abe)
〒192-0393 東京都八王子市東中野 742-1
(742-1 Higashi-nakano, Hachioji, Tokyo 192-0393 JAPAN)
TEL: 042-674-3271 +81 42 674 3271
FAX: 042-674-3278 +81 42 674 3278
E-mail: keizaiken-grp@g.chuo-u.ac.jp
URL: <https://www.chuo-u.ac.jp/research/institutes/economic/>