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Analyzing the Effect of Number of Children on Japan's Household  
Savings Rate Using the Japan Household Panel Survey

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# **Analyzing the Effect of Number of Children on Japan's Household Savings Rate Using the Japan Household Panel Survey**

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## **Abstract**

Despite an increase in Japan's household savings rate since 2010s, the number of births and child dependency ratio have been declining, in line with low fertility and aging trends. We investigate the effect of number of children on the household savings rate, a key characteristic of Japan's demographic structure. Using both a theoretical model and an empirical analysis, we employ panel data from the Japan Household Panel Survey from 2011 to 2019. A fixed effects model, robustness tests, and heterogeneity analysis examined the influence of number of children and child dependency ratio on the household savings rate and mechanisms thereof. Evidently, a decline in number of children has a positive effect on the household savings rate. Further, the effect of this decline on the savings rate varies by the child's gender, education level, number of children, household income, and family structure, with the most pronounced effect for households with male children, high-school-aged children, four or more children, single-parent households, and low-income households. Moreover, a decline in number of children increases household income and reduces household consumption, particularly education and living costs, thereby increasing the household savings rate. Finally, parents with higher education aspirations for their children tend to invest more in education. Overall, although the decline in number of children may have contributed to the rise in Japan's household savings rate in the 2010s, this trend is unlikely to persist in the long run. Optimizing childbirth policies and improving birth rates are essential for sustaining Japan's future economic growth.

*Keywords:* Household Savings Rate; Number of Children; Child Dependency Ratio

*JEL Classification Codes:* D14 J13 C23

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## 1. Introduction

The rapid decline of the birth rate in Japan has significant socioeconomic implications. According to vital statistics from the Ministry of Health, Labour and Welfare, the number of births fell from 1.187 million (birth rate: 9.6%) in 1995 to a record low of 777,000 (birth rate: 6.3%) in 2022, with a particularly sharp decline during the 2010s. In addition, the total fertility rate (i.e., the average number of children a woman is expected to have in her lifetime) reached a historic low of 1.2 in 2023<sup>3</sup>. This figure is among the lowest globally, ranking 212th out of 227 countries as of 2024, classifying Japan as an “ultralow-fertility country.”<sup>4</sup> The decline in birth rates has also influenced household structure. According to the National Livelihood Survey by the Ministry of Health, Labour, and Welfare, the proportion of households with children decreased by 27.9% between 1986 and 2022 (Figure 1), with a particularly notable decline in households with two or more children.

Several social factors, including a decline in the number of marriages and an increase in non-marriage rates, have been closely linked to this demographic shift. The number of marriages per year dropped from approximately 600,000 in 2010 to 500,000 in 2021, marking a record low. The proportion of unmarried individuals aged 50 years is projected to increase from 20% for men and 11% for women in 2010 to 28% and 18%, respectively, by 2020<sup>5</sup>. The deterioration of these marriage-related indicators is a major contributing factor to the ongoing decline in birth rates.

Economic constraints, particularly the rising cost of child-rearing, including education, also play a crucial role. Household contributions to higher education expenses in Japan exceed 50%, making it among the highest among member states of the Organization for Economic Co-operation and Development. This financial burden may be leading to a decline in the desired number of children (Kobayashi 2018). Having children is increasingly perceived as an economic challenge, further exacerbating the birth rate decline.

Importantly, the progression of low birth rates is also due to the interaction between the aforementioned social and economic factors. To elaborate, first, declining marriage rates and delayed marriages among highly educated women have significantly contributed to lower fertility rates (Iwasawa 2008; Kamata 2012; Ogawa et al. 2015; Tsuya 2011). These demographic shifts have altered traditional family structures and reproductive behaviors, accelerating the decline in birth rates. Second, job instability among the younger generations, particularly the increase in non-regular employment among men, has delayed or discouraged marriage (Sakai and Higuchi 2005; Piotrowski et al. 2015). In Japan, the prevailing social perception is that stable employment is a prerequisite for marriage and parenthood. The expansion of nonregular employment has heightened economic uncertainty among young people, leading them to postpone marriage. This effect is significant, as approximately 90% of the decline in Japan’s total fertility rate since 2010 has been attributed to changes in marriage behavior (Iwasawa 2015). Third, labor market norms in Japan reinforce traditional gender roles within households, pressuring women to either forgo their careers or limit their number of children to one (Brinton and Oh 2019). These norms make it difficult to balance the work

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<sup>3</sup> From the 2022 Vital Statistics Report by the Ministry of Health, Labour and Welfare.

<sup>4</sup> From The World Factbook published by the United States’ Central Intelligence Agency.

<sup>5</sup> From the Population Statistics Collection (2013 Edition and 2023 Revised Edition) by the National Institute of Population and Social Security Research.

and family lives, resulting in a further decline in fertility rates.

The declining birth rate is not merely a demographic issue but also has far-reaching economic and household financial implications. Multiple socioeconomic challenges arise from declining fertility: The shrinking labor force due to low fertility rates poses significant constraints on economic growth. In particular, decreasing labor supply weakens productivity and competitiveness, making it more difficult to establish a sustainable growth model (Kondo 2013; Bloom et al. 2010). Declining fertility also alters household consumption behavior and asset allocation by reducing the child dependency ratio (Modigliani and Cao 2004; Hock and Weil 2012). Households with fewer or no children allocate less spending to education and child-related expenses; instead, they direct more resources toward saving and retirement planning. These shifts in household financial behavior contribute to a shrinking domestic market and declining investment demand, potentially reducing overall economic dynamism.

Keeping this concerns in mind, we bring to focus the relationship between declining birth rates and household financial behavior, specifically its effect on the household savings rate. Based on an analysis of panel data from the Japan Household Panel Survey (JHPS/KHPS), we theoretically and empirically examine how the number of children influenced the household savings rate in Japan during the 2010s.

Japan's household savings rate has been on an upward trend since the mid-2010s—a movement attributed to population aging (Horioka and Niimi 2017; Murata 2019). However, declining fertility may also play a critical role in shaping household-saving behaviors, and international studies have documented a negative correlation between the number of children and household savings rate (Curtis et al. 2017; Lugauer et al. 2019). A similar mechanism may be at work in Japan, where a declining birth rate can drive higher household savings.

This study makes several novel contributions to literature. First, by examining household saving behavior from the perspective of the number of children, we offer new insights into the upward trend in the household savings rate observed in Japan during the 2010s, a period characterized by declining fertility rates and an aging population.

Second, we seek to elucidate the underlying mechanisms by which a decrease in the number of children leads to an increase in household savings rates, as suggested by theoretical models.

Third, by focusing on different household structures, we uncover heterogeneity in household saving behavior, offering a more nuanced understanding of how demographic and economic factors interact.

The remainder of this paper is organized as follows. In section 2, we review the literature, establish the theoretical framework, and clarify the positioning and originality of the study. In section 3, we develop the theoretical model for examining the role of the number of children in household-saving behavior. In section 4, we present an overview of the panel data (i.e., from JHPS/KHPS) and the key descriptive statistics in order to highlight the characteristics of the household savings rate. Here, we also formulate the hypotheses. In section 5, we empirically test the theoretical model using a regression analysis to quantify the relationship between the number of children and household savings rate. Robustness checks were conducted and the heterogeneity of household structures was explored to deepen the interpretation of the results. In section 6, we investigate the mechanisms underlying the observed relationship, focusing on changes in household asset allocation and consumption behavior. The theoretical framework is

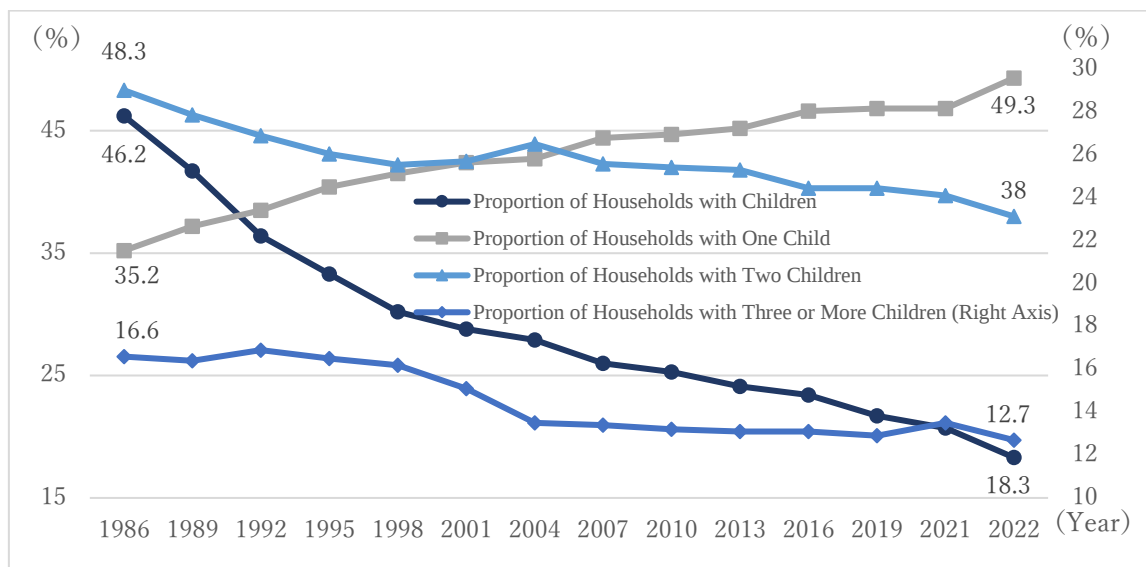


Figure 1: Trends in the Proportion of Households with Children in Japan.

Source. Compiled by the author based on the 2023 Comprehensive Survey of Living Conditions by the Ministry of Health, Labour and Welfare.

linked to empirical findings. In Section 7, key findings are summarized, policy implications discussed, and the study's contributions to addressing declining birth rates considered. Limitations are noted, and future research questions proposed.

## 2. Literature Review

Studies on the historical development of Japan's household savings rate show that, from the post-war period to the 1970s, Japan's household savings rate exceeded 20% and drove rapid economic growth. Horioka (1986, 1989) attributed this upward trend to the low ratio of retirees to the working-age population. Other major drivers of higher savings rates include rising income during periods of high economic growth, corporate bonus systems, and increasing housing prices (Hayashi 1986; Christiano 1989; Horioka 1990; Dekle and Summers 1991).

From the 1980s onward, the household savings rate entered a downward trend, thought to be due to demographic changes, particularly the effects of population aging (Horioka 1997; Koga 2006; Braun et al., 2009). Horioka (2010) and Kan and Horioka (2010) highlight that, while working elderly households tend to accumulate assets, retired elderly households tend to deplete their savings. Yashiro and Maeda (1994) identify a rapid decline in savings among unemployed households headed by individuals aged 60 years and above, further supporting the causal relationship between aging and the decline in the savings rate.

Since the 2010s, scholars have narrowed their analyses to bequest motives and precautionary savings among the elderly. Nakazawa et al. (2018) argue that the life cycle hypothesis cannot fully explain fluctuations in saving rates, while Horioka (2014) and Horioka et al. (2018) report that elderly households, driven by bequest motives and precautionary savings, have depleted their assets at a lower rate than expected. Hamaaki and Hori (2019) similarly suggest that altruistic bequest motives may influence saving behavior, and Ogawa (2020) implicates the public pension system for the increase in

precautionary household savings.

In the Japanese literature, rarely is the effect of the number of children on the household savings rate a primary objective, but some evidences are insightful. For instance, Matsuba (2021) highlights that households with multiple births face significantly greater financial burdens than do general households. Horioka (2024) suggests that the increase in the household savings rate during the 1970s may have been driven by a sharp decline in the population of those below 19 years of age. At least some of this evidence implies an influence of the number of children on the household savings rate. More critically, international studies do identify a negative relationship between the number of children and household savings rates (Curtis et al. 2017; Lugauer et al. 2019), which prompts us to question whether a similar mechanism is at play in Japan.

Understanding the effect of declining fertility on the household savings rate is essential for interpreting the changes in the savings behavior of Japanese households since the 2010s; and yet this perspective is underexplored. We address this lacunae in the corpus of literature on the Japanese household savings rate by theoretically and empirically analyzing how the number of children affects the household savings rate while accounting for household heterogeneity and the underlying mechanisms. We provide a comprehensive understanding of household savings behavior in Japan amid declining birth rates—a subject with serious policy implications for future economic planning.

### 3. Theoretical Model

Becker and Barro (1988) (1989) proposed a model that endogenizes the population growth rate (birth rate) using an Overlapping Generations (OLG) model. Building on their framework, Curtis et al. (2017) and Lugauer et al. (2019) theoretically derived a savings rate function that incorporates the number of children and empirically examined the relationship between savings rates and declining fertility in countries such as China and India. This study organizes the theoretical model necessary to analyze the relationship between declining fertility and savings rates in Japan empirically. Using data from the Japanese Household Panel Survey (JHPS/KHPS) from 2011 to 2019, this study aims to elucidate the relationship between Japan's declining birth rate and savings behaviors.

Based on the dynastic altruism model by Becker and Barro (1988), we construct a two-period overlapping generations (OLG) model to analyze how a reduction in the number of children affects household saving rates. The model simplifies notation and focuses on core mechanisms. The representative household's lifetime utility includes youth consumption, altruistic utility from children's consumption, and old-age consumption:

$$U_t = \frac{C_{y,t}^{1-\theta}}{1-\theta} + \beta \cdot \frac{(k_t^{1-\phi} C_{k,t})^{1-\theta}}{1-\theta} + \frac{1}{1+\gamma} \cdot \frac{C_{o,t+1}^{1-\theta}}{1-\theta} \quad (1)$$

where:

$C_{y,t}, C_{y,t}, C_{k,t+1}$ : Consumption during youth, per-child consumption, and old-age consumption.

$k_t$ : Number of children in the household at time  $t$ . This variable reflects the household's fertility decision and its impact on resource allocation.

$\theta$ : Inverse of the intertemporal elasticity of substitution ( $\theta > 0$ ). This parameter measures the household's willingness to shift consumption across different time periods. A higher

$\theta$  indicates a stronger preference for smoothing consumption over time.

$\phi$ : Elasticity of altruism, capturing the diminishing marginal utility of consumption per child as the number of children ( $k_t$ ) increases. This parameter reflects the degree to which parents value the well-being of each additional child.

$\beta = \psi k_t^{-\phi}$ : Altruism weight, where  $\psi > 0$  is a constant. This term represents the weight parents assign to their children's utility in the household's overall utility function. As the number of children increases, the altruism weight per child decreases due to diminishing marginal altruism.

$\gamma$ : Time preference rate, reflecting the household's preference for current consumption over future consumption. A higher  $\gamma$  indicates a stronger preference for immediate consumption.

These variables and parameters form the foundation of the theoretical model, enabling the analysis of how changes in the number of children influence household savings behavior through income and consumption channels.

The budget constraint in the two-period OLG model that incorporates altruism is expressed as follows: As shown in Equation (2a), in addition to considering children's consumption ( $k_t C_{k,t}$ ) in youth consumption, the following budget constraints remain consistent with those of the standard OLG model.

$$Y_t = S_t + C_{y,t} + k_t C_{k,t} \quad (2a)$$

$$C_{o,t+1} = (1 + r_{t+1})S_t \quad (2b)$$

Maximizing utility yields the optimal saving rate:

$$s_t^* = \frac{S_t}{Y_t} = \frac{(1+\gamma)^{\frac{1}{\theta}} (1+r_{t+1})^{\frac{\theta-1}{\theta}}}{(\psi k_t^{\theta-\phi})^{\frac{1}{\theta}} + (1+\gamma)^{\frac{1}{\theta}} (1+r_{t+1})^{\frac{\theta-1}{\theta}} + 1} \quad (3)$$

The key conclusions of the theoretical model are:

When  $\phi > \theta$ , a decrease in the number of children increases the savings rate. This occurs because households with fewer children allocate more resources to savings as the marginal utility of consumption per child declines. The number of children affects the savings rate through household income and consumption, particularly education-related expenses. More children reduce income (due to reduced working hours) and increase consumption (due to higher education and living costs), lowering the savings rate. Conversely, fewer children ease these financial burdens, raising the savings rate.

These findings highlight the dual channels—income and consumption—through which fertility impacts household savings behavior.

## 4. Overview of the Data

### 4.1 Data Source

This study conducts an empirical analysis using panel data from the Japan Household Panel Survey (JHPS/KHPS), a nationally representative survey conducted by the Panel Data Research Center of Keio University. The JHPS/KHPS was established in 2014 by integrating two preexisting surveys, the Japan Household Panel Survey (JHPS) and the Keio Household Panel Survey (KHPS). The survey is conducted annually and

tracks the same individuals nationwide, collecting extensive data on various aspects including household composition, individual attributes, employment and education status, educational background, household assets, housing conditions, and health status. This study examines the impact of the number of children in a household on the household savings rate. The analysis utilizes panel data from the JHPS/KHPS covering the period from 2011 to 2019.

#### 4.2 Descriptive Statistics

Table 1 presents the descriptive statistics of the dependent and independent variables used in this study. First, regarding the dependent variable, the household savings rate, this study adopted three different definitions based on previous research to enhance the robustness and reliability of the estimation results. The definitions are as follows: Household Savings Rate 1 is calculated as the ratio of the household's annual savings to the household net income (a definition close to disposable income). The savings amount was derived by subtracting the annual household consumption expenditure from net household income.

Table 1: Descriptive Statistics

| Variables                                    | Sample Size | Mean     | SD       | Min    | Max   |
|----------------------------------------------|-------------|----------|----------|--------|-------|
| Household Savings Rate 1                     | 25,492      | 0.246    | 0.337    | -1.000 | 0.921 |
| Household Savings Rate 2                     | 23,027      | 0.276    | 0.327    | -1.000 | 0.958 |
| Household Savings Rate 3                     | 23,775      | 0.279    | 0.402    | -1.000 | 1.000 |
| Household Size                               | 30,389      | 3.127    | 1.419    | 1      | 11    |
| Age of Household Head                        | 30,465      | 55.138   | 13.688   | 22     | 92    |
| Squared Age of Household Head                | 30,465      | 3.996    | 0.259    | 3.135  | 4.533 |
| Good Health Status                           | 30,465      | 0.423    | 0.494    | 0      | 1     |
| Poor Health Status                           | 30,465      | 0.159    | 0.366    | 0      | 1     |
| Home Ownership (Yes = 1)                     | 30,465      | 0.810    | 0.393    | 0      | 1     |
| Mortgage (Yes = 1)                           | 30,223      | 0.566    | 1.445    | 0      | 1     |
| Number of Elderly (Aged 65 and Above)        | 30,465      | 0.872    | 1.130    | 0      | 5     |
| Number of Children (Aged 18 and Below)       | 30,465      | 0.518    | 0.908    | 1      | 6     |
| Number of Adults (Aged 19–64)                | 30,465      | 1.722    | 0.667    | 1      | 6     |
| Child Dependency Ratio                       | 30,465      | 0.253    | 0.450    | 0      | 4     |
| Regional Dummy (Tokyo Metropolitan Area = 1) | 30,465      | 0.337    | 0.473    | 0      | 1     |
| Household Financial Assets (10,000 yen)      | 28,466      | 1034.226 | 1522.172 | 0      | 7000  |
| Household Annual Income (10,000 yen)         | 27,006      | 487.866  | 266.989  | 70     | 1300  |
| Household Consumption (10,000 yen)           | 29,228      | 335.776  | 169.996  | 102    | 923   |
| Household Income per Capita (10,000 yen)     | 26,949      | 173.927  | 100.542  | 35     | 501   |

Source: Compiled by the author based on the (2011–2019). Japan Household Panel Survey (JHPS/KHPS)

Household Savings Rate 2 refines the savings calculation by excluding expenditure on durable goods (e.g., furniture, home appliances, and digital electronics) from household consumption expenditure. The savings amount is then divided by the household net income. Household Savings Rate 3 follows the methodology of Chamon and Prasad (2010), defining the saving rate as the difference between the logarithm of household net income and the logarithm of annual household consumption expenditures. For all three definitions, the saving rate is constrained within a range of -100% to 100%. Denote the annual disposable household income, the monthly household consumption, and the monthly household consumption excluding furniture, appliances, and digital devices as  $HI_{AD}$ ,  $HC_M$ , and  $\widetilde{HC}_M$ , respectively.

(1) *Household Saving Rate 1* =

$$\frac{HI_{AD} - HC_M \times 12}{HI_{AD}}$$

(2) *Household Saving Rate 2* =

$$\frac{HI_{AD} - \widetilde{HC}_M \times 12}{HI_{AD}}$$

(3) *Household Saving Rate 3* =

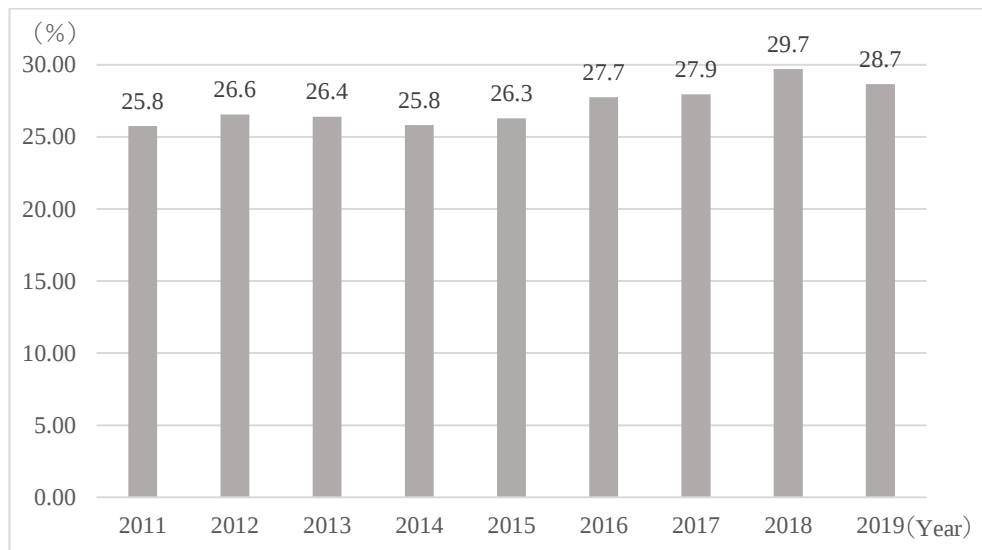
$$\text{Ln}(HI_{AD}) - \text{Ln}(HC_M \times 12)$$

Next, we describe the independent variables. To examine the impact of the number of children in a household on the household savings rate, we select 30,465 participants from the Japan Household Panel Survey (JHPS/KHPS) from 2011 to 2019. After restricting the definition of children to those aged 18 years and below and excluding missing or non-eligible responses, the final analytical sample consisted of 24,488 observations. To further enhance the robustness of the analysis, this study introduces a child dependency ratio following the methodology of Liu (2022). This indicator is calculated as the number of children aged 18 years and below divided by the number of adults aged 19–64 years within the household.

Descriptive statistics revealed that the average household savings rate based on the three different definitions were 24.6%, 27.6%, and 27.9%, respectively. Regarding household composition, the average number of children aged 18 and below per household was 0.5, whereas that of older individuals aged 65 and above was 0.9. The average household size was three members, and the child-dependency ratio had an average value of 0.3. The average age of the household heads was 55 years. In terms of housing, the homeownership rate was 81%, with 57% of homeowners carrying outstanding mortgage loans. From a financial perspective, the average annual household income is 4.88 million JPY, whereas the average household financial assets amount to 10.34 million JPY.

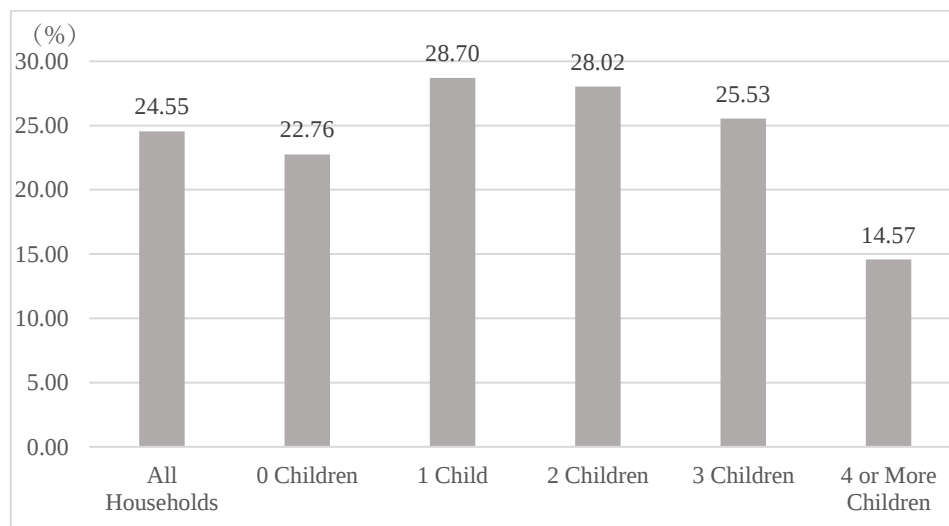
#### 4.3 Household Characteristics Based on the Data Used

Figure 2 illustrates Japan's micro-level Household Saving Rate calculated based on the definition of a household saving rate of 1. Over the nine years from 2011 to 2019, the household savings rate exhibited a general upward trend, with an increase of approximately five percentage points. This increase was particularly pronounced after 2015, reaching nearly 30% by 2019. This trend aligns with macro-level household savings rate movements, confirming a similar upward trajectory.



**Figure 2: Trends in Japan's Micro-Level Household Savings Rate (2011–2019)**

Source: Compiled by the author based on the (2011–2019). Japan Household Panel Survey (JHPS/KHPS)



**Figure 3: Household Savings Rate in Japan by Number of Children**

Source: Compiled by the author based on the (2011–2019). Japan Household Panel Survey (JHPS/KHPS)

Figure 3 illustrates the Household Saving Rate by the number of children, calculated based on the definition of a household saving rate of 1. The average household savings rate across all the samples was 24.6%. By contrast, households without children exhibited a slightly lower savings rate of 22.8%. Households with one child had the highest savings rate at 28.7%. However, as the number of children increases, a declining trend in the household savings rate is observed. Households with two children have a savings rate of 28.0%, whereas those with three children account for 25.5%. Households with four or more children experienced a significant decline, with a savings rate of 14.6%.

These findings suggest that the financial burden associated with raising children has a substantial impact on household saving behavior, potentially exerting a greater influence than aging in determining the household savings rate. Furthermore, the decline

in the number of children in the 2010s may have contributed to the observed increase in the household savings rate. Based on these observations, this study proposes the following hypothesis:

**Hypothesis:** An increase in the number of children reduces the household savings rate.

## 5. Empirical Analysis of the Impact of the Number of Children on Household Savings Rate

### 5.1. Estimation Model

To empirically examine the relationship between the number of children and household savings rates, we specify the following regression model:

$$SavingRate_{it} = a_0 + a_1 Children_{it} + a_2 Income_{it} + a_3 Consumption_{it} + a_4 X_{it} + \mu_{it} + \epsilon_{it} \quad (1)$$

Where, the dependent variable  $Savingrate_{it}$  represents the household savings rate of household  $i$  at time  $t$ , defined as the ratio of savings to disposable income. The key explanatory variable in this study,  $Children_{it}$  indicates the number of children aged 18 and below in household  $i$  at time  $t$ . This variable captures the direct effect of fertility on household savings behavior, as well as the child dependency ratio. Mediating Variables are  $Income_{it}$  and  $Consumption_{it}$ . Household income, which reflects the potential reduction in earnings due to child-rearing responsibilities. Household consumption, particularly expenditures on education and living expenses, which are expected to increase with the number of children. The control variables in  $X_{it}$  include those that capture household and regional characteristics, such as household composition, household head's age, household financial assets, housing conditions, health status, and regional dummies (e.g., whether the household is located in a metropolitan area).  $\mu_{it}$  represents Household fixed effects for the period 2011 to 2019, included to control for time-invariant unobserved heterogeneity across households, while  $\epsilon_{it}$  denotes the unobserved error term.

### 5.2 Estimation Results

Table 2 presents the estimation results from the fixed-effects model analyzing the impact of the number of children on the household savings rate. Columns (1)–(3) display the estimated coefficients for household saving rates 1, 2, and 3. A key observation is that the coefficient for the number of children aged 18 and below is statistically significant at the 1% level across all three specifications, with values of -0.0331, -0.0283, and -0.0232, respectively. These negative coefficients indicate that an increase in the number of children has a strong negative impact on the household savings rate.

Specifically, based on the results in Column (1), an increase of one additional child aged 18 years and below is associated with a 3.31 percentage point decrease in the household savings rate. This empirical finding strongly supports the hypotheses proposed in this study.

Table 2: Estimation Results of the Impact of the Number of Children (Aged 18 and Below) on Household Savings Rate (2011–2019)

|                                                              | (1)FE<br>Household<br>Savings Rate 1 | (1)FE<br>Household<br>Savings Rate 2 | (1)FE<br>Household<br>Savings Rate 3 |
|--------------------------------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Number of Children<br>(Aged 18 and Below)                    | -0.0331***<br>(0.0030)               | -0.0283***<br>(0.0030)               | -0.0232***<br>(0.0037)               |
| Household Size                                               | 0.0186***<br>(0.0019)                | 0.0136***<br>(0.0019)                | 0.0204***<br>(0.0023)                |
| Age of Household<br>Head                                     | -0.0170***<br>(0.0011)               | -0.0162***<br>(0.0011)               | -0.0192***<br>(0.0014)               |
| Squared Age of<br>Household Head                             | 0.6426***<br>(0.0586)                | 0.6079***<br>(0.0592)                | 0.7331***<br>(0.0731)                |
| Good Health                                                  | 0.0115**<br>(0.0045)                 | 0.0118**<br>(0.0046)                 | 0.0135**<br>(0.0057)                 |
| Poor Health                                                  | -0.0552***<br>(0.0062)               | -0.0577***<br>(0.0063)               | -0.0683***<br>(0.0076)               |
| Residence in Tokyo<br>Metropolitan Area                      | -0.0082*<br>(0.0044)                 | -0.0100**<br>(0.0045)                | -0.0063<br>(0.0055)                  |
| Home Ownership                                               | 0.1272***<br>(0.0059)                | 0.1354***<br>(0.0059)                | 0.1380***<br>(0.0071)                |
| Mortgage                                                     | 0.0076***<br>(0.0016)                | 0.0067***<br>(0.0016)                | 0.0087***<br>(0.0019)                |
| Number of Elderly<br>(Aged 65 and Above)                     | -0.0061**<br>(0.0024)                | -0.0068***<br>(0.0025)               | -0.0020<br>(0.0030)                  |
| Ln (Household<br>Financial Assets)                           | 0.0320***<br>(0.0018)                | 0.0345***<br>(0.0018)                | 0.0330***<br>(0.0022)                |
| Year control                                                 | YES                                  | YES                                  | YES                                  |
| <i>N</i>                                                     | 24,488                               | 22,232                               | 22,838                               |
| <i>R</i> <sup>2</sup> (Tobit: <i>Pseudo R</i> <sup>2</sup> ) | 0.0764                               | 0.0814                               | 0.0702                               |

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

Next, we examine the control variables, focusing on the estimation of equation (1) for a household savings rate of 1. According to the results in Table 2, the coefficients for household size and household financial assets are both positive and statistically significant at the 1% level, suggesting that households with more family members tend to allocate a higher proportion of household income to savings. Additionally, the coefficient of the household head's age is negative and statistically significant at the 1% level, indicating that an increase in the number of elderly individuals aged 65 years and above is associated with a 0.6 percentage point decline in the household savings rate, with significance at the 5% level.

Furthermore, the coefficients of homeownership and mortgages are positive and statistically significant at the 1% level. This finding is consistent with that of Higo et al. (2001), who suggest that households may curtail other consumption expenditures to prioritize long-term mortgage repayments, leading to an increase in savings. Regarding health status, the variable "Good Health" exhibits a positive and statistically significant

effect at the 5% level, whereas "Poor Health" shows a negative and statistically significant effect at the 1% level on the household savings rate.

Finally, the coefficient of residence in a metropolitan area is negative and statistically significant at the 10% level. This result suggests that higher living costs in metropolitan areas may limit the capacity for savings compared with other regions.

Table 3 presents the estimation results from the fixed effects model, analyzing the impact of the number of children aged 22 and below on the household savings rate. Although the legal age of adulthood in Japan is 18 years, many university students aged 18–22 continue to receive financial support from their parents. Considering this, this study introduces a new variable that includes children up to 22 years old and conducts a regression analysis.

Table 3: Estimation Results of the Impact of the Number of Children (Aged 22 and Below) on Household Savings Rate (2011–2019)

|                                                              | (1) FE                   | (2) FE                   | (3) FE                   |
|--------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
|                                                              | Household Savings Rate 1 | Household Savings Rate 2 | Household Savings Rate 3 |
| Number of Children (Aged 22 and Below)                       | -0.0339***<br>(0.0028)   | -0.0291***<br>(0.0029)   | -0.0241***<br>(0.0035)   |
| Household Size                                               | 0.0206***<br>(0.0019)    | 0.0153***<br>(0.0020)    | 0.0219***<br>(0.0024)    |
| Age of Household Head                                        | -0.0186***<br>(0.0011)   | -0.0176***<br>(0.0012)   | -0.0204***<br>(0.0014)   |
| Squared Age of Household Head                                | 0.7298***<br>(0.0592)    | 0.6827***<br>(0.0600)    | 0.7964***<br>(0.0739)    |
| Good Health                                                  | 0.0119***<br>(0.0045)    | 0.0122***<br>(0.0046)    | 0.0139**<br>(0.0057)     |
| Poor Health                                                  | -0.0556***<br>(0.0062)   | -0.0579***<br>(0.0063)   | -0.0686***<br>(0.0076)   |
| Residence in Tokyo Metropolitan Area                         | -0.0079*<br>(0.0044)     | -0.0098**<br>(0.0045)    | -0.0060<br>(0.0055)      |
| Home Ownership                                               | 0.1278***<br>(0.0059)    | 0.1358***<br>(0.0059)    | 0.1385***<br>(0.0071)    |
| Mortgage                                                     | 0.0078***<br>(0.0016)    | 0.0068***<br>(0.0016)    | 0.0088***<br>(0.0019)    |
| Number of Elderly (Aged 65 and Above)                        | -0.0066***<br>(0.0024)   | -0.0072***<br>(0.0025)   | -0.0024<br>(0.0030)      |
| Ln (Household Financial Assets)                              | 0.0313***<br>(0.0018)    | 0.0340***<br>(0.0018)    | 0.0325***<br>(0.0022)    |
| Year control                                                 | YES                      | YES                      | YES                      |
| <i>N</i>                                                     | 24,488                   | 22,232                   | 22,838                   |
| <i>R</i> <sup>2</sup> (Tobit: <i>Pseudo R</i> <sup>2</sup> ) | 0.0771                   | 0.0819                   | 0.0704                   |

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

According to a survey by the Japan Student Services Organization (JASSO)<sup>6</sup>, 55.8% of university students receive financial support from their families, with an average annual support amount of 1,096,900 JPY. Based on this context, columns (1) to (3) of Table 3 report the regression results using three different definitions of the household savings rate.

The estimation results indicate that the coefficient for the explanatory variable “Number of Children Aged 22 and Below” is statistically significant at the 1% level, with values of -0.0339, -0.0291, and -0.0241, respectively. These findings suggest that an increase in the number of children aged 22 and below has a strong negative impact on the household savings rate, with a greater effect than the results based on the number of children aged 18 and below.

### 5.3 Robustness Checks<sup>7</sup> (Tobit Model Estimation / Alternative Explanatory Variables)

The estimation results confirm that the number of children has a significant effect on the household savings rate. To enhance the reliability and robustness of these findings, we first re-estimate the model using the Tobit approach. Additionally, to further validate the results, the explanatory variable “the number of children” is replaced with an alternative measure, “child dependency ratio.” This approach aims to provide a precise and reliable analysis.

Table 4: Robustness Check of the Impact of the Number of Children on Household Savings Rate (2011–2019)

|                                        | (1)Tobit                 | (2) Tobit                | (3) Tobit                |
|----------------------------------------|--------------------------|--------------------------|--------------------------|
|                                        | Household Savings Rate 1 | Household Savings Rate 2 | Household Savings Rate 3 |
| Number of Children (Aged 18 and Below) | -0.0359***<br>(0.0025)   | -0.0329***<br>(0.0025)   | -0.0297***<br>(0.0035)   |
| Household Size                         | 0.0171***<br>(0.0016)    | 0.0131***<br>(0.0016)    | 0.0202***<br>(0.0022)    |
| Age of Household Head                  | -0.0162***<br>(0.0009)   | -0.0157***<br>(0.0010)   | -0.0203***<br>(0.0013)   |
| Squared Age of Household Head          | 0.6229***<br>(0.0490)    | 0.6025***<br>(0.0497)    | 0.7869***<br>(0.0692)    |
| Good Health                            | 0.0136***<br>(0.0038)    | 0.0131***<br>(0.0039)    | 0.0162***<br>(0.0053)    |
| Poor Health                            | -0.0434***<br>(0.0052)   | -0.0463***<br>(0.0053)   | -0.0621***<br>(0.0073)   |
| Residence in Tokyo Metropolitan Area   | -0.0072**<br>(0.0037)    | -0.0080**<br>(0.0038)    | -0.0062<br>(0.0052)      |

<sup>6</sup> From the "FY 2022 Student Life Survey Results" by the Japan Student Services Organization (JASSO), an independent administrative agency.

<sup>7</sup> This paper also estimates the effect of the number of children on the household savings rate using fixed effects and Tobit models with the number of children under age 22 and the child dependency ratio under age 22. The results confirm that an increase in both the number of children and the child dependency ratio significantly reduces the household saving rate. Due to space limitations, a detailed discussion of these results is omitted.

|                                                              |                        |                        |                       |
|--------------------------------------------------------------|------------------------|------------------------|-----------------------|
|                                                              | 0.1226***<br>(0.0050)  | 0.1298***<br>(0.0050)  | 0.1451***<br>(0.0068) |
| Home Ownership                                               |                        |                        |                       |
|                                                              | 0.0073***<br>(0.0013)  | 0.0071***<br>(0.0014)  | 0.0091***<br>(0.0018) |
| Mortgage                                                     |                        |                        |                       |
| Number of Elderly<br>(Aged 65 and Above)                     | -0.0058***<br>(0.0020) | -0.0057***<br>(0.0021) | -0.0038<br>(0.0029)   |
| Ln (Household<br>Financial Assets)                           | 0.0313***<br>(0.0015)  | 0.0329***<br>(0.0015)  | 0.0352***<br>(0.0021) |
| Year control                                                 | YES                    | YES                    | YES                   |
| <i>N</i>                                                     | 24,488                 | 22,232                 | 22,838                |
| <i>R</i> <sup>2</sup> (Tobit: <i>Pseudo R</i> <sup>2</sup> ) | 0.1487                 | 0.1771                 | 0.0726                |

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

Columns (1) to (3) of Table 4 present the Tobit model estimation results for household saving rates 1, 2, and 3, respectively, to verify the robustness of the fixed-effects model estimates. The results indicate that the estimated coefficients for the number of children aged 18 and below are -0.0359, -0.0329, and -0.0297, all of which are negative and statistically significant at the 1% level. This pattern is consistent with the findings of the fixed-effects model, confirming the robustness of the results. Thus, the Tobit model estimation also supports this study's hypothesis, indicating that an increase in the number of children contributes to a decline in the household savings rate.

Table 5: Robustness Check of the Impact of Child Dependency Ratio on Household Savings Rate (2011–2019)

|                                                  | (1) FE<br>Household<br>Savings Rate 1 | (2) FE<br>Household<br>Savings Rate 2 | (3) FE<br>Household<br>Savings Rate 3 |
|--------------------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| Child Dependency<br>Ratio (Aged 18 and<br>Below) | -0.0657***<br>(0.0058)                | -0.0569***<br>(0.0059)                | -0.0467***<br>(0.0073)                |
| Household Size                                   | 0.0180***<br>(0.0018)                 | 0.0131***<br>(0.0019)                 | 0.0200***<br>(0.0023)                 |
| Age of Household<br>Head                         | -0.0172***<br>(0.0011)                | -0.0165***<br>(0.0011)                | -0.0194***<br>(0.0014)                |
| Squared Age of<br>Household Head                 | 0.6582***<br>(0.0586)                 | 0.6216***<br>(0.0593)                 | 0.7446***<br>(0.0732)                 |
| Good Health                                      | 0.0115**<br>(0.0045)                  | 0.0118**<br>(0.0046)                  | 0.0136**<br>(0.0056)                  |
| Poor Health                                      | -0.0554***<br>(0.0062)                | -0.0579***<br>(0.0063)                | -0.0684***<br>(0.0076)                |
| Residence in Tokyo<br>Metropolitan Area          | -0.0080*<br>(0.0044)                  | -0.0098**<br>(0.0045)                 | -0.0061<br>(0.0055)                   |
| Home Ownership                                   | 0.1269***<br>(0.0059)                 | 0.1351***<br>(0.0059)                 | 0.1378***<br>(0.0071)                 |

|                                                              |                       |                        |                       |
|--------------------------------------------------------------|-----------------------|------------------------|-----------------------|
|                                                              | 0.0076***             | 0.0067***              | 0.0087***             |
| Mortgage                                                     | (0.0016)              | (0.0016)               | (0.0019)              |
| Number of Elderly<br>(Aged 65 and Above)                     | -0.0059**<br>(0.0024) | -0.0066***<br>(0.0025) | -0.0019<br>(0.0030)   |
| Ln (Household<br>Financial Assets)                           | 0.0320***<br>(0.0018) | 0.0346***<br>(0.0018)  | 0.0330***<br>(0.0022) |
| Year control                                                 | YES                   | YES                    | YES                   |
| <i>N</i>                                                     | 24,488                | 22,232                 | 22,838                |
| <i>R</i> <sup>2</sup> (Tobit: <i>Pseudo R</i> <sup>2</sup> ) | 0.0765                | 0.0815                 | 0.0703                |

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

Table 5 presents the estimation results using the “Child Dependency Ratio” as an alternative explanatory variable. Columns (1) to (3) report the estimated coefficients for household saving rates of 1, 2, and 3, respectively, yielding the following findings:

The coefficient of Child Dependency Ratio is negative and statistically significant at the 1% level across all specifications. Specifically, the estimated values are -0.0657 for household savings rate 1, -0.0569 for household savings rate 2, and -0.0467 for household savings rate 3. These results indicate that an increase in the proportion of children aged 18 years and below within a household has a strong negative impact on the household savings rate.

For instance, based on the results in Column (1), a one-percentage-point increase in the Child Dependency Ratio leads to a 6.57% decrease in the household savings rate. Thus, the use of a new indicator, the “child support ratio,” further illustrates the strong negative impact of an increase in the number of children on the household savings rate.

#### 5.4 Heterogeneity Analysis

This regression analysis reveals that a decrease in the number of children increases the household savings rate. Therefore, this section provides a more detailed analysis of the impact of heterogeneity by household characteristics on the household savings rate from the following perspectives, “Gender of Children,” “Grade of Children,” “The Number of Children,” “Household Per Capita Income,” and “Household Structure.” By examining these aspects, this study identifies the distinct effects of each household characteristic on savings behavior.

Table 6: Heterogeneity Analysis of the Impact of the Number of Children on Household Savings Rate

| Household Savings Rate 1 | Number of Children<br>(Aged 18 and Below) | S.D.     | <i>N</i> | <i>R</i> -<br><i>squared</i> | Control Variables<br>Year Control |
|--------------------------|-------------------------------------------|----------|----------|------------------------------|-----------------------------------|
| 1. Gender of Children    |                                           |          |          |                              |                                   |
| Boy                      | -0.0227***                                | (0.0058) | 24,488   | 0.0723                       | YES                               |

|                                                   |            |          |        |        |     |
|---------------------------------------------------|------------|----------|--------|--------|-----|
| <b>2. Grade of Children</b>                       |            |          |        |        |     |
| University or Higher                              | -0.0025    | (0.0085) | 24,488 | 0.0781 | YES |
| High School                                       | -0.0373*** | (0.0071) | 24,488 | 0.0781 | YES |
| <b>3. The Number of Children</b>                  |            |          |        |        |     |
| 0 Children                                        | 0.0136**   | (0.0068) | 24,488 | 0.0779 | YES |
| 2 Children                                        | -0.0400*** | (0.0076) | 24,488 | 0.0779 | YES |
| 3 Children                                        | -0.0923*** | (0.0110) | 24,488 | 0.0779 | YES |
| 4 or More Children                                | -0.1950*** | (0.0232) | 24,488 | 0.0779 | YES |
| <b>4. Household Per Capita Income<sup>8</sup></b> |            |          |        |        |     |
| Low-Income                                        | -0.2947*** | (0.0049) | 24,488 | 0.2704 | YES |
| High-Income                                       | 0.2018***  | (0.0048) | 24,488 | 0.2704 | YES |
| <b>5. Household Structure</b>                     |            |          |        |        |     |
| Single-Parent Household                           | -0.1436*** | (0.0046) | 24,488 | 0.0783 | YES |

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

Table 6 presents the estimation results of the heterogeneity analysis on the impact of household characteristics on the household savings rate. (1) Children's Gender Compared with households with daughters, those with sons experience a 2.27 percentage point decrease in the household savings rate, which is statistically significant at the 1% level. This result suggests that Japanese households may invest more heavily in the education of boys than in girls.

(2) Number of children. Compared with single-child households, households with two or more children show a statistically significant negative impact on the saving rate at the 1% level. Notably, in households with four or more children, the savings rate decreases by 19.5 percentage points. However, childless households exhibited a statistically significant positive effect on savings rates at the 1% level, suggesting that these households can allocate more income to savings by avoiding child-rearing expenses.

(3) Children's grades Compared to households with children in junior high school or below, those with high school students experienced a 3.73% decrease in the household savings rate, which is statistically significant at the 1% level. However, no

<sup>8</sup> Household income classification is defined as follows: the bottom 25% of household income is categorized as low income, the top 25% as high income, and the middle 50% as middle income.

significant effects were observed in households with university students. This result may be attributed to the financial burden of university entrance exam preparation, private tutoring expenses, and participation in international exchange programmes. According to the 2021 Child Learning Expenses Survey by the Ministry of Education, the annual private tutoring costs for public high school students amount to 363,000 JPY, exceeding 356,000 JPY for public junior high school students. Furthermore, spending on international exchange programs is 404,000 JPY for high school students, which is significantly higher than 94,000 JPY for junior high school students, highlighting the increasing cost of education at this stage.

(4) Household Per Capita Income: Compared to middle-income households, high-income households exhibit a 10.18 percentage point increase in savings rate, which is statistically significant at the 1% level. By contrast, low-income households experience a 29.47 percentage point decline, which is also significant at the 1% level, suggesting that a lack of financial stability in low-income households directly contributes to lower the household savings rate.

(5) Household Structure: Compared with households consisting of married couples and children, single-parent households with children exhibit a statistically significant negative impact on savings rates at the 1% level. As single-parent households tend to have lower income levels and bear both child-rearing and household expenses alone, their savings tend to be lower.

These findings confirm that, while an increase in the number of children reduces the household savings rate, childless households show different patterns. Moreover, the results highlight the existence of heterogeneity based on household characteristics, demonstrating the diverse impacts of household composition on saving behavior.

### 5.5 Determinants of the Impact of the Number of Children on Household Savings Rate

This section analyzes the mechanisms underlying the observed decline in the household savings rate as the number of children increases. Specifically, household-saving behavior was examined from the following perspectives: First, from the perspective of household income and consumption, this study analyzes the relationship between income fluctuations and consumption behavior to determine how an increase in the number of children affects the disposable income available for savings. Second, from the perspective of parental expectations of children, this study explores how future expectations of children influence household-saving behavior. From these perspectives, this study seeks to analyze the impact of the number of children on the household savings rate from multiple perspectives and clarify the underlying mechanisms driving this relationship.

Table 7: Analysis Results of the Number of Children, Household Income, and Household Consumption

|                                           | (1)                    | (2)                   |
|-------------------------------------------|------------------------|-----------------------|
|                                           | Household Income       | Household Consumption |
| Number of Children<br>(Aged 22 and Below) | -0.0411***<br>(0.0044) | 0.0244***<br>(0.0036) |
| Control Variables                         | YES                    | YES                   |
| Year control                              | YES                    | YES                   |

|                       |        |        |
|-----------------------|--------|--------|
| <i>N</i>              | 25,853 | 27,561 |
| <i>R</i> <sup>2</sup> | 0.2635 | 0.1912 |

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

Table 7 presents the impact of the number of children on household income and consumption. The results indicate that an increase in the number of children has a statistically significant negative effect on household income at the 1% level and a positive effect on household consumption. First, regarding the decline in household income, one possible explanation is that parental working hours may decrease because of child-rearing responsibilities, which in turn leads to a reduction in household earnings. Second, regarding the increase in household consumption, raising children requires expenditure on education, living expenses, and other child-related costs, which serve as key factors driving upward household consumption. According to the altruism model proposed by Becker and Barro (1988, 1989), child-rearing costs are comprised of two key factors. The first is opportunity cost, in which parents may experience a reduction in working hours due to child-rearing responsibilities, leading to a decline in household income. The second is the support cost, which includes increased expenditures on education, living expenses, and other necessities associated with raising children. Based on this theoretical framework, as child-rearing costs rise, households are likely to experience a decline in their savings rates, as more financial resources are allocated to cover these expenses.

According to the Cabinet Office's National Life White Paper titled "Awareness and Life of Child-Rearing Households," child-rearing costs include several components. The first is direct expenses related to children, such as education and food expenses. Second, income reduction may occur owing to career interruptions caused by parenting responsibilities. Third, the cost of utilizing childcare support services adds to households' financial burden. These factors can significantly increase the household financial strain. Angrist and Evans (1998) and Cruces and Galiani (2007) indicate that the opportunity cost of child rearing contributes to a decline in household income. Additionally, Ge et al. (2018) and Oliveira (2016) highlight that as the number of children increases, support costs increase, leading to an expansion in household consumption.

These findings support the hypothesis that an increase in the number of children leads to a decline in household income and support costs. Consequently, the combination of income reduction and increased consumption due to child-rearing has been confirmed as a key factor contributing to the decline in the household savings rate, as demonstrated by both theoretical models and empirical data. Understanding this mechanism is crucial for gaining deeper insights into household saving behavior.

Table 8: Analysis Results of the Number of Children and Household Consumption by Category

|                                              | (1)<br>Food<br>Expenses | (2)<br>Living<br>Expenses | (3)<br>Education<br>Expenses | (4)<br>Other<br>Expenses |
|----------------------------------------------|-------------------------|---------------------------|------------------------------|--------------------------|
| Number of Children<br>(Aged 22 and<br>Below) | 0.0575***<br>(0.0031)   | 0.0609***<br>(0.0039)     | 0.8508***<br>(0.0095)        | 0.0458***<br>(0.0080)    |
| Control Variables                            | YES                     | YES                       | YES                          | YES                      |

| Year control          | YES    | YES    | YES    | YES    |
|-----------------------|--------|--------|--------|--------|
| <i>N</i>              | 25,222 | 22,218 | 23,837 | 22,814 |
| <i>R</i> <sup>2</sup> | 0.2341 | 0.2229 | 0.3883 | 0.1589 |

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

Table 8 presents the impact of number of children on various household consumption categories. Household living expenses include rent, utilities, household appliances, daily necessities, healthcare, transportation, and Internet communication costs, which represent essential daily expenditures. Additionally, the "other expenses" category consists of remittances and social expenses.

The results indicate that an increase in the number of children has a statistically significant positive impact at the 1% level for all consumption categories. Notably, the estimated coefficients of food expenses (0.0575), living expenses (0.0609), and educational expenses (0.8508) suggest that education and living expenses were most significantly affected by the number of children.

These findings suggest that having more children increases the overall household consumption. Furthermore, the analysis highlights that the number of children and parents' expectations regarding education strongly influence household consumption patterns. Particularly, the significant increase in education and living expenses underscores the critical role of parental investment in children as a major determinant of household savings.

Table 9 presents the impact of parental educational expectations on household consumption by children. In this analysis, high parental educational expectations were defined based on survey responses to the question, "What level of education do you wish your child to attain?" If respondents answered "junior college or higher," they were categorized as having high educational expectations for their children.

The estimation results indicate that households with higher educational expectations for their children exhibit a statistically significant positive impact on both educational and non-educational expenditures at the 5% level. Notably, the estimated coefficient for educational expenditure was 7.94%, suggesting that parents who expect their children to attain higher education levels tend to invest more in education. This finding implies that higher parental educational expectations contribute to a decline in the household savings rate in families with children because of the increased financial burden of education-related expenses.

Table 9: Analysis Results of Parental Educational Expectations for Children and Household Consumption

|                                                     | Education Expenditure<br>(OLS) | Non-Education Expenditure<br>(OLS) |
|-----------------------------------------------------|--------------------------------|------------------------------------|
| High Parental Educational Expectations for Children | 0.0794**<br>(0.0366)           | 0.0496**<br>(0.0240)               |
| Control Variables                                   | YES                            | YES                                |
| <i>N</i>                                            | 3,573                          | 3,322                              |

|                  |        |        |
|------------------|--------|--------|
| <i>R-squared</i> | 0.0569 | 0.2127 |
|------------------|--------|--------|

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

## 6. Conclusion

This study examined the impact of the number of children on household savings rates in the context of Japan's declining birth rate since the 2010s. Through theoretical modeling and empirical analysis using data from the Japanese Household Panel Survey (JHPS/KHPS), the following key findings were obtained: (1) A decrease in the number of children contributed to an increase in household savings. This finding is consistently supported by robustness checks, including Tobit model estimations and alternative specifications for the explanatory variables. (2) Significant variations in the impact of children on household savings are observed across different household characteristics. The most pronounced effects were found in households with boys, high school students, four or more children; single-parent households; and low-income households. (3) Raising children increased household consumption and reduced household income. In particular, education and living expenses were identified as major contributors to the rise in consumption, suggesting that the financial burden of child rearing is a key factor in lowering the household savings rate. (4) Parents with higher educational expectations for their children tend to prioritize educational investment, leading to a further decline in the household savings rate. These findings suggest that the impact of declining birth rates on household financial behavior may surpass that of an aging population, highlighting significant societal implications.

The following policy measures are necessary to maintain sustainable economic growth. First, enhancing childbirth support and reducing the financial burden of education should be prioritized. Policies aimed at alleviating the economic burden of child rearing, particularly education and living expenses, need to be implemented urgently. Specifically, further promotion of free early childhood education and childcare and improving the quality of school education (e.g., securing highly qualified teachers) to reduce reliance on private tutoring are crucial. These measures could ease parents' financial burdens and potentially contribute to an increase in birth rates.

Second, support measures for promoting higher marriage rates should be considered. To enhance birth rates through an increase in marriage rates, it is essential to expand flexible employment systems, create an environment that encourages male participation in child-rearing, and establish policies that support career continuity after childbirth. These initiatives would help individuals balance their family and work responsibilities, and foster a social environment that encourages a more positive outlook on marriage and childbirth.

Third, strengthening support for single-parent and multichild households is essential. To ensure the healthy development of children and financial stability of households, it is necessary to expand economic assistance for single-parent and multichild families. Specifically, measures such as providing childcare support services and establishing consultation systems within local communities could be effective in offering financial and social support to these households.

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