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THE IMPACT OF POPULATION AGING ON THE HOUSEHOLD SAVING RATE: THE CASE OF JAPAN

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The Impact of Population Aging on the Household Saving Rate: The Case of Japan

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Abstract

This paper analyzes the impact of the age structure of the population on the household saving rate using time-series data for Japan for the 1955-2019 period. It finds that there is a cointegrating relationship between Japan's household saving rate and her dependency ratio (the ratio of the dependent population to the working-age population) and that the latter has a negative and statistically significant impact on the former. This implies that the life-cycle model applies in the case of Japan, that trends over time in the age structure of Japan's population can largely explain trends over time in Japan's household saving rate, that the downward trend in Japan's household saving rate since the mid-1970s can largely be explained by the aging of her population, and that further population aging will lead to further declines in Japan's household saving rate, most likely into negative territory, in future years.

Journal of Economic Literature Classification Codes: D12 (Consumer Economics: Empirical Analysis), D14 (Household Saving; Personal Finance), D15 (Intertemporal Household Choice; Life Cycle Models and Saving), E21 (Consumption; Saving; Wealth), J11 (Demographic Trends, Macroeconomic Effects, and Forecasts)

Keywords: age structure of the population; cointegration; cointegrating vector; household saving; Japan; life-cycle hypothesis; life-cycle model; population aging; saving rate; unit roots

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1. Introduction

Population aging is occurring in virtually all developed countries and in many developing countries as well, and it is expected to have profound effects on the economies of these countries. For example, it is often asserted that population aging will lead to saving shortages, labor shortages, a deterioration in government finances, and a slowdown in innovation and entrepreneurship.

In this paper, I will focus on the impact of population aging on the household saving rate using Japan as a case study. I will begin by doing an econometric analysis of the impact of the age structure of the population on the household saving rate using time-series data on Japan for the 1955-2019 period. I will then explore what the findings of my analysis imply about the causes of past and future trends in Japan's household saving rate and what the policy implications of my findings are. I will make use of cointegration techniques to account for the presence of unit roots in the variables used in the analysis.

It is interesting and important to focus on the case of Japan for the following four reasons: First, Japan has traditionally shown one of the highest saving rates in the world, and much of its saving has been used to meet saving shortages abroad. Second, Japan is the most aged major country in the world. Third, Japan is one of the largest economies in the world. Fourth, Japan is an Asian country, and cultural differences between East and West may lead to differences in saving behavior.

A large number of studies have examined the impact of the age structure of the population on the saving rate, but a majority of these studies have used cross-country data or cross-sectional data on smaller administrative units such as provinces and prefectures (see, for example, Modigliani, 1970; Feldstein, 1980; Modigliani and Sterling, 1983; Horioka, 1989; Loayza et al., 2000; and Horioka and Terada-Hagiwara, 2012). Relatively few studies have used time-series data to analyze the impact of the age structure of the population on the saving rate, but some exceptions are Horioka (2000), which uses data for Japan, Thorton (2001), which uses data for the United States, Ahmad (2002), which uses data for Pakistan, and Modigliani and Cao (2004), which uses data for China. All of these studies find that the age structure of the population has a significant impact on the household saving rate in all of the countries analyzed.

Browning and Lusardi (1996) conduct a useful survey of the literature on the United

States and conclude that the decline in the U.S. household saving rate during the 1980s was not due primarily to changes in the age structure of the population because such changes were not very dramatic and because saving rates do not vary all that much across age groups.

The current paper is most similar to Horioka (2000), but improves upon the earlier paper in at least four ways. First, whereas Horioka (2000) takes account only of elderly dependents (those aged 65 or older), the current paper also takes accounts of minor dependents (those aged 0-19). Second, it extends the period of analysis by more than 25 years (from 1955-1993 to 1955-2019), and the period of analysis now includes the period during which the speed of population aging started accelerating (the period after about 1990). Third, it uses newer econometric techniques such as the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test for unit roots. Fourth, it tests for structural breaks.

To preview the main findings of this paper, it finds that there is a cointegrating relationship between Japan's household saving rate and her dependency ratio (the ratio of the dependent population to the working-age population) and that the latter has a negative and statistically significant impact on the former. This implies that the life-cycle model applies in the case of Japan, that trends over time in the age structure of Japan's population can largely explain trends over time in Japan's household saving rate, that the downward trend in Japan's household saving rate since the mid-1970s can largely be explained by the aging of her population, and that further population aging will lead to further declines in Japan's household saving rate, most likely into negative territory, in future years.

The remainder of this paper is organized as follows. Section 2 presents the theoretical model, section 3 discusses the data and data sources, section 4 presents the results of the empirical analysis, section 5 projects future trends in Japan's household saving rate based on our estimation results, and section 6 is a brief concluding section.

2. Theoretical Model

According to the life-cycle model, individuals work and save when they are young, and they retire and dissave (i.e., decumulate their previously accumulated wealth) when they are old. Thus, the higher the ratio of the retirement-age population to the working-age population, the lower should be the aggregate household saving rate. Similarly, those who have not yet begun working consume but do not earn income, and hence the ratio of the number of minors to the working population should also have a negative impact on the aggregate household saving rate.

In fact, if one assumes that individuals begin working when they are D years old, work for W years, retire for R years, and die with certainty at age L, that consumption and income are independent of age, that there is no productivity growth, that there are no bequests or other intergenerational transfers, and that the interest rate is zero, it can be shown, using a simplified version of the model of Modigliani (1970) and Modigliani and Brumberg (1954, 1980), that the aggregate household saving rate HHSR will be as follows:

$$HHSR = (D + R)/L - (W/L)*YOUNG - (W/L)*OLD \qquad (1),$$

where YOUNG = the ratio of the number of minors to the working-age population

OLD = the ratio of the retirement-age population to the working-age population.

In other words, the aggregate household saving rate will be a decreasing function of both YOUNG and OLD, with the coefficients of both variables being the negative of the ratio of working life to lifespan. Moreover, the qualitative result that HHSR is a decreasing function of YOUNG and OLD does not change even when the aforementioned assumptions are relaxed by introducing a non-zero interest rate, income or productivity growth, bequests, etc. (see Modigliani and Brumberg, 1980).

I initially specified HHSR as a function of YOUNG and OLD in the empirical analysis, but since I was not able to find a cointegrating relationship between these variables and HHSR, I combined YOUNG and OLD into DEP, the overall dependency ratio. I assumed that individuals start working at the age of 20 and retire at the age 65, and I therefore defined YOUNG as the ratio of the population aged 0-19 to the population aged 20-64, OLD as the ratio of the population aged 65 or older to the population aged 20-64, and DEP as the ratio of the population aged 0-19 or 65 or older to the population aged 20-64.

If DEP is found to have a negative and statistically significant impact on HHSR and if its coefficient is roughly equal to the negative of the ratio of working span to lifespan, we will be able to conclude that the life-cycle model applies in the real world, at least in the case of Japan.

Another way of testing whether or not the life-cycle model is applicable is to examine how the household saving rate varies by age and, in particular, to see if the retired aged are dissaving (i.e., decumulating their wealth), as predicted by the life-cycle model. For example, Horioka (2010), Horioka and Niimi (2017), Niimi and Horioka (2019), Ventura and Horioka (2020), and Horioka and Ventura (2024) follow this approach, but this is not the approach that we follow here.

3. Data and Data Sources

All of the data used in this paper are taken from official Japanese Government sources. Looking first at data on the household saving rate, I use the net saving rate of the household sector broadly defined (households, private unincorporated nonfinancial enterprises, and private nonprofit institutions serving households), defined as the ratio of net household saving to net household disposable income. These data are included in the "Annual Report on National Accounts (Kokumin Keizai Keisan Nenji Suikei)," which is compiled annually by the Department of National Accounts, Economic and Social Research Institute, Cabinet Office, Government of Japan, and can be downloaded from the following site: https://www.esri.cao.go.jp/jp/sna/kakuhou/kakuhou_top.html

The problem is that a continuous time series for the entire 69-year period from 1955 until 2024 is not available because the United Nations' System of National Accounts (SNA), upon which Japan's national accounts data are based, is periodically updated and because the base year is changed every five years. What I have done is to use the following three series: data for the 1955-1979 period based on the 1968 System of National Accounts with a base year of 1990, data for the 1980-1993 period based on the 1993 System of National Accounts with a base year of 2000, and data for the 1994-2024 period based on the 2008 System of National Accounts with a base year of 2015. However, to ensure the continuity of the three series, I followed standard practice by adjusting earlier series up or down by the amount of the difference between the two series in the overlapping year (either 1980 or 1994).

Population data by age group were taken from the "Population Estimates (Jinkou Suikei)" of the Statistics Bureau of Japan, Ministry of Internal Affairs and Communications, Government of Japan except that data from the "Population Census (Kokusei Chousa)" of the same agency were used for years in which censuses were conducted (years ending in 0 or 5). In the case of census data, population of unknown age was allocated proportionately among all age groups. All of these data can be downloaded from https://www.e-stat.go.jp/stat-search/files?page=1&toukei=00200524&tstat=000000090001

Calendar-year data were used to calculate HHSR, and population data were converted from an October 1 basis to a midyear (July 1) basis by interpolating linearly.

Figure 1 and Table A-1 show trends over time in Japan's household saving rate (hereafter referred to as HHSR) during the 1955-2024 period, and as this figure and table show, Japan's household saving rate shows a humped shape, increasing steadily from a level of about 10-11% in the mid-1950s to a level of 21-22% in the mid-1970s before declining to as low as -1.6% thereafter (except for a temporary spike in 2020-21 due to the Covid-19 pandemic).

[Figure 1]

Figure 2 and Table A-2 show trends over time in the age structure of Japan's population during the 1955-2024 period, and as this figure and table show, YOUNG (the ratio of the population aged 0-19 to the population aged 20-64) has shown a downward trend throughout the period of analysis (except during the 2011-14 period) from its maximum level of 83.8% in 1955 to its minimum level of 28.4% in 2024 due largely to declines in fertility, but the speed of decline decelerated starting in the early 1970s (except for a renewed acceleration in the late 1980s and the 1990s). By contrast, OLD (the ratio of the population aged 65 or older to the population aged 20-64) has shown an upward trend throughout this period, increasing from its minimum level of 10.2% in 1957 to its maximum level of 53.0% in 2024 due largely to increases in life expectancy, but the speed of aging accelerated starting in the early 1970s and accelerated even further after about 1990.

[Figure 2]

Since theory predicts that both YOUNG and OLD will have a similar negative impact on HHSR, I also calculated DEP, the sum of YOUNG and OLD, which is sometimes called the dependency ratio because it represents the ratio of the total dependent population to the working-age population. Figure 2 and Table A-2 also show trends over time in DEP, and as can be seen from this figure and table, DEP started at its maximum level of 94.1% in 1955 and declined steadily to its minimum level of 59.5% in 1996 (except for stabilizing temporarily during the 1970s and early 1980s) because the speed of the decline in YOUNG exceeded the speed of the increase in AGE during this period. By contrast, DEP increased anew after 1996, recovering to a level of 82.0% in 2021 because the speed of the increase in OLD exceeded the speed of the decline in YOUNG during this period. As noted above, HHSR increased until the mid-1970s before declining, and thus, assuming that DEP has a negative impact on HHSR, trends over time in DEP are capable of explaining trends over time in HHSR.

4. Empirical Analysis

In this section, I conduct an econometric analysis of the impact of the age structure of the population on the household saving rate using National Accounts data for Japan for the 1955-2019 period. Although data were available through 2024 for all variables used in the analysis, I intentionally chose to use data only through 2019 because Japan's household saving rate behaved erratically during the Covid-19 pandemic years of 2020-21, rising to 10.2% in 2020 and 4.9% in 2021 although it had been fluctuating in the -1.6% to 1.7% range during the previous 5 years. Needless to say, the temporary spike in Japan's household saving rate in 2020-21 was presumably due to widespread restrictions on travel, eating out, entertainment, etc., which artificially depressed consumption spending. However, I should note that I also tried conducting the analysis for the full 1955-2024 period and that I obtained broadly consistent results when I did so.

The descriptive statistics for the variables used in our analysis are shown in Table 1, and as this table shows, the means of HHSR, YOUNG, OLD, and DEP for the period of analysis (1955-2019) are 10.74%, 46.99%, 22.57%, and 69.57%, respectively.

[Table 1]

4.1. Time-Series Properties of the Data

As my first order of business, I shed light on the times-series properties of the two variables used in my analysis—namely,

HHSR = the household saving rate
DEP = the ratio of the population aged 0-19 or 65 or older to the population aged 20-64

I used primarily the results for the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test (Kwiatkowski et al., 1992), and the results of this test for the levels, first differences, and second differences of the two aforementioned variables are shown in Table 2. As this table shows, both variables have unit roots, their second differences are stationary, and the results for their first differences are mixed depending on how many lags are included, with both series having unit roots if zero or one lags are included and being stationary if two or three lags are included. Since the optimal number of lags was found to be two or more, it appears that both series are I(1) (i.e., their levels have unit roots but their first differences are stationary). Moreover, the Dickey-Fuller (DF) and Augmented Dickey–Fuller (ADF) tests (see Dickey and Fuller, 1979) and the Phillips-Perron tests (Phillips and Perron, 1988) yielded consistent results although the results are not shown due to space limitations. I therefore assumed that both HHSR and DEP are I(1), meaning that the results of ordinary least squares will be spurious, that it is necessary to test for cointegration, and that cointegration techniques must be used to obtain valid estimates of the cointegration vector.

[Table 2]

4.2. Tests of Cointegration

Given the foregoing results regarding the time-series properties of the data, I test whether or not there is a cointegrating relationship between HHSR and DEP using the Engle-Granger and Johansen methods. Table 3 shows the results of the Engle-Granger test (Engle and Granger, 1987) that are based on the case of a drift (constant) term but no trend since the test statistic has a non-zero mean but does not show a linear deterministic trend. As this table shows, the results based on both the Adjusted Dickey-Fuller test (Dickey and Fuller, 1979) and the Phillips-Perron test (Phillips and Perron, 1988) indicate that there is not a cointegrating relationship between HHSR and DEP, regardless of the number of lags included.

[Table 3]

Table 4 shows the results for the Johansen test (Johansen, 1988, 1991, and Johansen and Juselius, 1990), which are also based on the case of one lag and a drift (constant) term but no trend. The results are shown in Table 3, and as this table shows, one cointegrating vector was found to exist for HHSR and DEP. Thus, the Engle-Granger and Johansen tests yield contradictory results, but in light of Shintani's (1994) finding that the Johansen method is more powerful that the Engle-Granger test, I conclude that there is a cointegrating relationship between HHSR and DEP.

[Table 4]

4.3. Estimate of the Cointegrating Vector

Given that I found that there is a cointegrating relationship between HHSR and DEP and that there is a single cointegrating vector, which describes the long-run relationship between these two variables, I calculated the ordinary least squares and Johansen estimates of the cointegrating vector (Johansen, 1988, 1991, and Johansen and Juselius, 1990). The estimation results are shown in Table 5, and as this table shows, DEP has a negative impact on HHSR, as predicted by the life-cycle model in both cases, but that its coefficient is of reasonable magnitude in absolute value (-0.580) and statistically significant only in the case of the Johansen estimates. Since the life-cycle model predicts that the coefficient of DEP should equal the negative of the ratio of working span to lifespan, if one assumes that people start working at age 20, retire at age 65, and pass away at age 85, the coefficient of DEP should equal -45/85 or -0.529, meaning that the estimated coefficient of DEP in the Johansen estimates is broadly consistent with theoretical expectation. The Johansen estimates are more reliable that the ordinary least squares estimates since the variables included in the analysis were found to be non-stationary, and thus these findings constitute strong evidence that the life-cycle model applies in the case of Japan.

[Table 5]

It is quite possible that the Japanese economy experienced a structural break in 1992 when the bubble burst, land and equity prices collapsed, and economic growth rates fell permanently. Thus, I tested for a structural break in 1992 by including a dummy variable BREAK that equals one in 1992 or later and zero otherwise. The results are shown at the bottom of Table 5, and as this table shows, the coefficient of the BREAK variable was found to be positive (implying a higher household saving rate in 1992 or later, other things being equal) but statistically insignificant, indicating that there was no structural break in 1992. Moreover, the coefficient of DEP was somewhat larger in absolute magnitude than the baseline estimate but broadly consistent with it (-0.657 vs. -0.580).

5. Future Trends in Japan's Household Saving Rate

In this section, I project future trends in Japan's household saving rate using our estimates of the cointegrating vector presented in section 4.3 in conjunction with the National Institute of Population and Social Security Research's (2023) "Population Projections for Japan" for 2021-2070. Table 6 shows future trends in YOUNG, OLD, and DEP as calculated from the National Institute of Population and Social Security Research's population projections based on its medium-fertility and medium-life expectancy assumptions, and as this table shows, YOUNG is expected to stabilize in the 26-28% range after decades of secular decline. By contrast, OLD is projected to continue increasing sharply, from 52.9% in 2023 to 79.5% in 2070 due to continuing increases in life expectancy. As a result, the overall dependency ratio DEP is projected to increase sharply as well, from 81.9% in 2023 to 101.5% in 2070. A dependency ratio in excess of 100 implies that each working-age individual will be required to support more than one dependent, and Japan is expected to exceed this threshold in 2045, just over two decades from now.

[Table 6]

Japan's household saving rate was only 1.1% in 2024, but as Table 5 shows, it is projected to decline even further during the next 50 years, to 0.1% in 2030, -6.4% in 2040, -11.7% in 2050, -11.8% in 2060, and -12.9% in 2070 because rapid population aging is projected to continue during this time period. However, it must be borne in mind that these projections assume that there will be no changes in the other variables that affect the household saving rate. For example, it is likely that public pension, health insurance, and long-term care insurance benefits will have to be scaled back as a result of the rapid aging of Japan's population, and this may induce households to save more to prepare for their retirement and future medical and long-term care expenses, thereby moderating the decline in the household saving rate. Thus, our projections must be taken with a grain of salt, but they do suggest the possibility that Japan's household saving rate will continue its long-term decline and become persistently negative in the coming years.

6. Summary, Conclusions, and Implications

This paper analyzes the impact of the age structure of the population on the household saving rate using time-series data for Japan for the 1955-2019 period. It finds that there is a cointegrating relationship between Japan's household saving rate and her dependency ratio (the ratio of the dependent population to the working-age population) and that the latter has a negative and statistically significant impact on the former. This implies that the life-cycle model applies in the case of Japan, a conclusion that is consistent with other types of evidence concerning the applicability of the life-cycle model to Japan (see Hayashi, 1986, 1997, and Horioka, 1984, 1993, 2017, 2026, for surveys of this literature). My findings also imply that trends over time in the age structure of Japan's population can largely explain trends over time in Japan's household saving rate, that the downward trend in Japan's household saving rate since the mid-1970s can largely be explained by the aging of her population, and that further population aging will lead to further declines in Japan's household saving rate, most likely into negative territory, in future years. This is a somewhat worrisome prospect unless there are offsetting increases in corporate saving and/or government saving and/or if capital inflows from abroad can be used to augment domestic saving shortages.

In closing, I would like to speculate about what our findings imply about how Japan compares to other countries. Our finding that the age structure of the population has a significant impact on the household saving rate in Japan is consistent with the findings for other countries and suggests that the life-cycle model applies in Japan, just as it does in other countries. This is somewhat surprising because Japan is culturally very different from Western countries. For example, family ties are closer in Japan and parents and grown children are more likely to live together and to support each other in various ways, which suggests that there might be less need to save for one's retirement and future medical and long-term care expenses, but this does not necessarily seem to be the case.

What sets Japan apart from other countries is with respect to the levels of its household saving rate and the timing and speed of population aging. Japan's household saving rate used to be virtually the highest in the world but now it is one of the lowest. Similarly, Japan used to have virtually the youngest population in the developed world (as measured by the ratio of the population aged 65 or older to the population aged 20-64), but it now has one of the most aged populations in the world. What we have shown in this paper is that the distinctive trends in Japan's household saving rate and the age structure of her population are inextricably linked and that the former is a primary determinant of the later.

Turning finally to directions for further research, one avenue I plan to pursue in my future research is to try using time-varying parameter models and/or rolling regressions to capture the potential evolution in the relationship between population aging and household saving.

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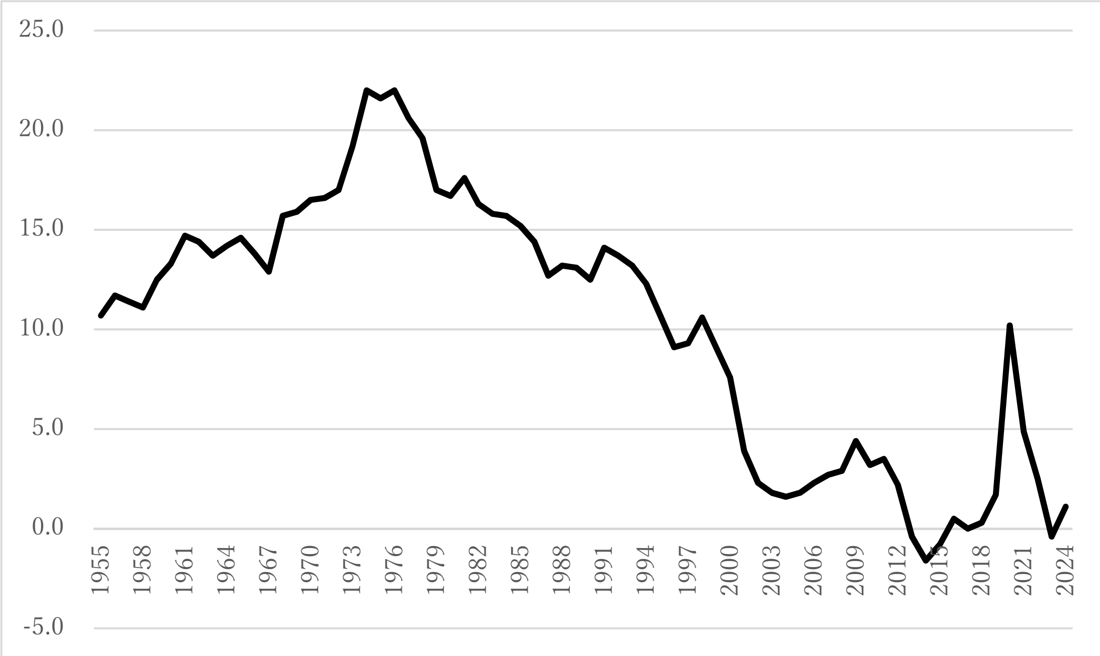
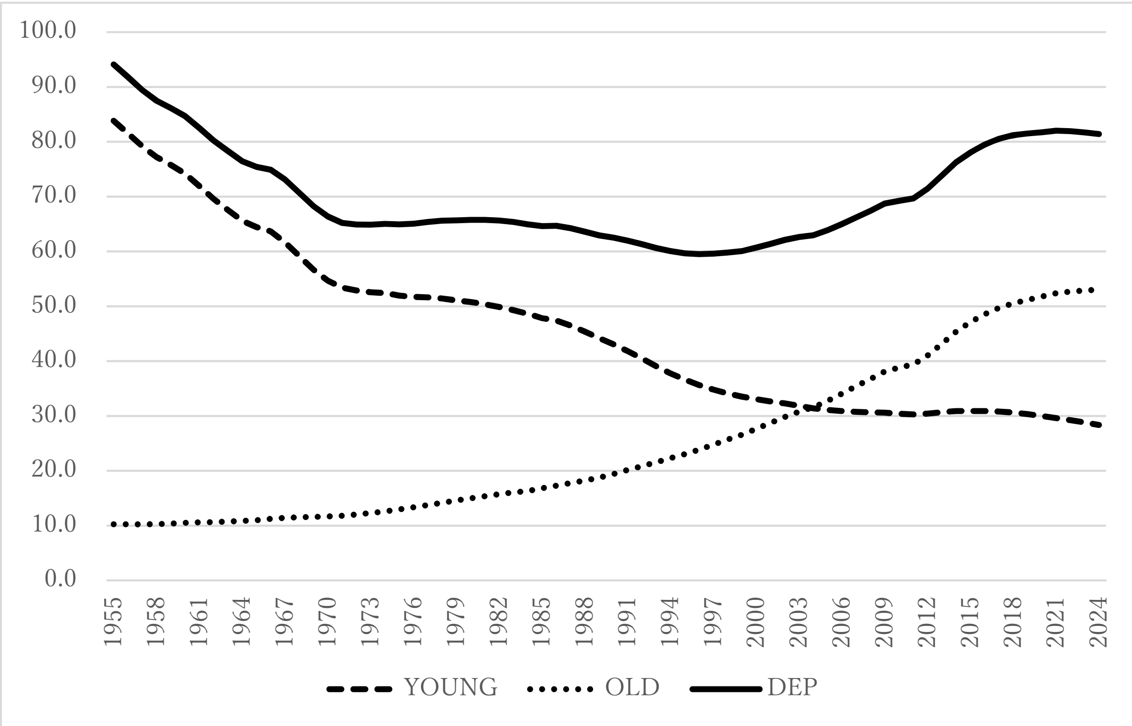
Figure 1: Trends Over Time in Japan's Household Saving Rate



Notes: See the notes to Appendix Table A-1 for details.

Data Source: Appendix Table A-1.

Figure 2: Trends Over Time in the Age Structure of Japan's Population



Notes: YOUNG denotes the ratio of the population aged 0-19 to the population aged 20-64, OLD the ratio of the population aged 65 or older to the population aged 20-64, and DEP the sum of YOUNG and OLD.

Data Source: Appendix Table A-2

Table 1: Descriptive Statistics					
Variable	No. of Obs.	Mean	Std. Dev.	Minimum	Maximum
HHSR	65	10.74	6.58	-1.60	22.00
YOUNG	65	46.99	15.51	30.28	83.83
OLD	65	22.57	12.50	10.24	51.16
DEP	65	69.57	8.88	59.51	94.10

Notes: HHSR denotes the household saving rate, YOUNG the ratio of the population aged 0-19 to the population aged 20-64, OLD the ratio of the population aged 65 or older to the population aged 20-64, and DEP the sum of YOUNG and OLD. The estimation period is 1955-2019.

Data Sources: Appendix Tables A-1 and A-2

Table 2: Results of the Kwiatkowski–Phillips–Schmidt–Shin (KPSS) Unit Root Tests					
Variable	Lag Length	Test Statistic		No. of Obs.	Estimation Period
HHSR	0	1.240	***	64	1956-2019
	1	0.644	***	63	1957-2019
	2	0.445	***	62	1958-2019
	3	0.346	***	61	1959-2019
DHHSR	0	0.151	**	64	1957-2019
	1	0.120	*	63	1958-2019
	2	0.111		62	1959-2019
	3	0.108		61	1960-2019
DDHHSR	0	0.012		64	1958-2019
	1	0.018		63	1959-2019
	2	0.025		62	1960-2019
	3	0.033		61	1961-2019
DEP	0	1.350	***	64	1956-2019
	1	0.707	***	63	1957-2019
	2	0.489	***	62	1958-2019
	3	0.380	***	61	1959-2019
DDEP	0	0.228	**	64	1957-2019
	1	0.128	*	63	1958-2019
	2	0.100		62	1959-2019
	3	0.089		61	1960-2019
DDDEP	0	0.048		64	1958-2019
	1	0.037		63	1959-2019
	2	0.039		62	1960-2019
	3	0.045		61	1961-2019

Notes: HHSR denotes the household saving rate, DHHSR the first difference of HHSR, and DDHHSR the second difference of HHSR, while DEP denotes the dependency ratio, defined as the ratio of the population aged 0-19 or 65 or older to the population aged 20-64, DDEP the first difference of DEP, and DDDEP the second difference of DEP. * denotes significance at the 10% level, ** significance at the 5% level, and *** significance at the 1% level.

Data Source: Appendix Tables A-1 and A-2

Table 3: Results of the Engle-Granger Test for Cointegration

No. of Lags	ADF Statistic	Phillips-Perron Statistic	No. of Obs.	Estimation Period
0	-0.330	-1.605	64	1956-2019
1	-0.775	-1.412	63	1957-2019
2	-0.697	-1.545	62	1958-2019
3	-0.651	-1.605	61	1959-2019
4	-0.605	-1.610	60	1960-2019

Notes: "ADF" denotes Augmented Dickey-Fuller. Shows the results for the case of a drift (constant) term but no trend. * denotes significance at the 10% level, ** significance at the 5% level, and *** significance at the 1% level.

Data Source: Appendix Tables A-1 and A-2

Table 4: Results of the Johansen Test for Cointegration

Rank	Trace Statistic		5% Critical Value	No. of Obs.	Estimation Period
0	59.111		15.41	64	1956-2019
1	3.435	*	3.76		

Notes: Shows the results for the case of one lag with a constant term but no trend. * denotes significance at the 5% level.

Data Source: Appendix Tables A-1 and A-2

Table 5: Estimates of the Cointegrating Vector			
Variable	Coefficient	Std. Error	
Ordinary Least Squares Estimates			
DEP	-0.119	0.092	
Constant	19.039	6.457	***
Johansen Estimates			
DEP	-0.580	0.094	***
Constant	49.808		
Johansen Estimates with Structural Break in 1992			
DEP	-0.657	0.119	***
BREAK	3.273	2.110	
Constant	53.543		
Notes: Shows the results for the case of one lag with constant term but no trend. BREAK is a dummy variable that equals one in 1992 or later and zero otherwise. The estimation period is 1955-2019 for the ordinary least squares estimates and 1957-2019 for the Johansen estimates. * denotes significance at the 10% level, ** significance at the 5% level, and *** significance at the 1% level.			
Data Source: Appendix Tables A-1 and A-2			

Table 6: Future Trends in Japan's Household Saving Rate (%)				
Year	YOUNG	OLD	DEP	HHSR
2024	28.4	53.0	81.4	1.1
2025	28.2	54.0	82.2	0.6
2030	26.8	56.4	83.2	0.1
2035	26.1	60.3	86.4	-1.8
2040	26.6	67.6	94.3	-6.4
2045	27.6	72.6	100.2	-9.8
2050	27.9	75.5	103.4	-11.7
2055	27.3	76.6	103.9	-12.0
2060	26.5	77.2	103.6	-11.8
2065	26.0	78.4	104.5	-12.3
2070	26.0	79.5	105.5	-12.9

Notes: YOUNG denotes the ratio of the population aged 0-19 to the population aged 20-64, OLD the ratio of the population aged 65 or older to the population aged 20-64, DEP the sum of YOUNG and OLD, and HHSR the household saving rate.

Data Source: Appendix Tables A-1 and A-2 for the figures for 2023, and National Institute of Population and Social Security Research (2023), Tables 1-1 and 1-2, for the figures for YOUNG, OLD, and DEP for the 2025-70 period. See the main text for an explanation of how HHSR was computed for the 2025-70 period.

Appendix Table A-1: Trends over Time in Japan's Household Saving Rate

Calendar Year	(1)	(2)	(3)	(4)
1955	11.9			10.7
1956	12.9			11.7
1957	12.6			11.4
1958	12.3			11.1
1959	13.7			12.5
1960	14.5			13.3
1961	15.9			14.7
1962	15.6			14.4
1963	14.9			13.7
1964	15.4			14.2
1965	15.8			14.6
1966	15.0			13.8
1967	14.1			12.9
1968	16.9			15.7
1969	17.1			15.9
1970	17.7			16.5
1971	17.8			16.6
1972	18.2			17.0
1973	20.4			19.2
1974	23.2			22.0
1975	22.8			21.6
1976	23.2			22.0
1977	21.8			20.6
1978	20.8			19.6
1979	18.2			17.0
1980	17.9	17.7		16.7
1981	18.4	18.6		17.6
1982	16.7	17.3		16.3
1983	16.1	16.8		15.8
1984	15.8	16.7		15.7
1985	15.6	16.2		15.2
1986	15.6	15.4		14.4
1987	13.8	13.7		12.7
1988	13.0	14.2		13.2
1989	12.9	14.1		13.1
1990	12.1	13.5		12.5
1991	13.2	15.1		14.1

1992	13.1	14.7		13.7
1993	13.4	14.2		13.2
1994	13.3	13.3	12.3	12.3
1995	13.7	12.6	10.7	10.7
1996	13.4	10.5	9.1	9.1
1997	12.6	10.3	9.3	9.3
1998	13.4	11.4	10.6	10.6
1999		10.0	9.1	9.1
2000		8.7	7.6	7.6
2001		5.1	3.9	3.9
2002		5.0	2.3	2.3
2003		3.9	1.8	1.8
2004		3.6	1.6	1.6
2005		3.9	1.8	1.8
2006		3.8	2.3	2.3
2007		2.4	2.7	2.7
2008		2.2	2.9	2.9
2009		5.0	4.4	4.4
2010			3.2	3.2
2011			3.5	3.5
2012			2.2	2.2
2013			-0.4	-0.4
2014			-1.6	-1.6
2015			-0.8	-0.8
2016			0.5	0.5
2017			0.0	0.0
2018			0.3	0.3
2019			1.7	1.7
2020			10.2	10.2
2021			4.9	4.9
2022			2.5	2.5
2023			-0.4	-0.4
2024			1.1	1.1

Notes: Column 1 shows data based on the 1968SNA, base year=1990; column 2 shows data based on the 1993SNA, base year=2000; column 3 shows data based on the 2008SNA, base year=2015, and column (4) shows a spliced series that was calculated from the 3 other series as explained in the main text.

Data Source: Department of National Accounts, Economic and Social Resarch Institute, Cabinet Office, Government of Japan, "Annual Report on National Accounts." All of these data can be downloaded from https://www.esri.cao.go.jp/jp/sna/kakuhou/kakuhou_top.html

Appendix Table A-2: Trends Over Time in the Age Structure of Japan's Population			
Year	YOUNG	OLD	DEP
1955	83.8	10.3	94.1
1956	81.5	10.3	91.8
1957	79.2	10.2	89.4
1958	77.2	10.3	87.5
1959	75.8	10.4	86.2
1960	74.2	10.5	84.7
1961	71.9	10.6	82.5
1962	69.6	10.6	80.2
1963	67.6	10.8	78.3
1964	65.6	10.9	76.5
1965	64.4	11.0	75.4
1966	63.7	11.3	74.9
1967	61.7	11.4	73.1
1968	59.2	11.5	70.7
1969	56.7	11.6	68.3
1970	54.7	11.7	66.4
1971	53.4	11.8	65.2
1972	52.9	12.0	64.9
1973	52.6	12.3	64.9
1974	52.4	12.6	65.0
1975	52.0	13.0	64.9
1976	51.7	13.3	65.1
1977	51.6	13.8	65.4
1978	51.4	14.2	65.6
1979	51.1	14.6	65.7
1980	50.8	15.0	65.8
1981	50.4	15.4	65.8
1982	49.9	15.7	65.6
1983	49.3	16.1	65.4
1984	48.6	16.3	64.9
1985	47.8	16.8	64.6
1986	47.4	17.3	64.7
1987	46.5	17.8	64.2
1988	45.4	18.2	63.6
1989	44.2	18.8	62.9
1990	43.1	19.4	62.5
1991	41.8	20.1	62.0

1992	40.5	20.9	61.3
1993	39.1	21.6	60.6
1994	37.8	22.3	60.1
1995	36.6	23.0	59.7
1996	35.6	23.9	59.5
1997	34.8	24.8	59.6
1998	34.1	25.7	59.8
1999	33.5	26.6	60.1
2000	33.1	27.7	60.7
2001	32.6	28.8	61.4
2002	32.3	29.8	62.1
2003	31.9	30.8	62.7
2004	31.4	31.6	63.0
2005	31.1	32.8	63.9
2006	30.9	34.1	65.0
2007	30.8	35.4	66.2
2008	30.7	36.7	67.4
2009	30.6	38.1	68.7
2010	30.4	38.8	69.2
2011	30.3	39.4	69.7
2012	30.4	41.0	71.5
2013	30.7	43.2	73.9
2014	30.9	45.4	76.3
2015	30.9	47.1	78.0
2016	30.9	48.6	79.5
2017	30.8	49.7	80.5
2018	30.6	50.6	81.2
2019	30.3	51.2	81.5
2020	30.0	51.8	81.8
2021	29.6	52.4	82.0
2022	29.2	52.7	81.9
2023	28.8	52.9	81.7
2024	28.4	53.0	81.4

Notes: YOUNG denotes the ratio of the population aged 0-19 to the population aged 20-64, OLD the ratio of the population aged 65 or older to the population aged 20-64, and DEP the sum of YOUNG and OLD. The figures were converted from an Oct. 1 basis to a July 1 basis by interpolating linearly.

Data Sources: Population data by age group were taken from the "Population Estimates (Jinkou Suikei)" of the Statistics Bureau of Japan, Ministry of Internal Affairs and Communications, Government of Japan, except that data from the "Population Census (Kousei Chousa)" of the same agency were used for yerars in which censuses were conducted (years ending in 0 or 5). In the case of the census data, population of unknown age was allocated proportionately among all age groups. All of these data can be downloaded from http://www.e-stat.go.jp/stat-search/files/page=1&toukei=00200524&tstat=000000090001