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AGING, SAVING, AND FISCAL POLICY*

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Abstract

In this paper, I analyze the impact of population aging on the household, private, government, and national saving rates and obtain the following findings: population aging will lead to declines in household, private, government, and national saving rates, but to the extent that population aging is accompanied by absolute declines in population, investment rates will also decline, and moreover, countries always have the option of borrowing from abroad. Thus, the decline in saving caused by population aging will not necessarily spell disaster.

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1. Introduction

The world's population and Asia's population are aging at an unprecedented rate, and this paper considers the impact of this population aging on household saving, private saving, government saving, and national saving.

Looking first at the definition of population aging, population aging refers to an increase in the proportion of the elderly in the total population (or, equivalently, to a situation in which the elderly population is growing faster than the total population) and is caused by fertility declines and mortality declines (or, equivalently, increases in life expectancy).

Population aging is a global trend, and the share of the elderly in the world's total population is projected to more than double in the next half century. The share of the elderly in the total population is highest in the developed countries, but it is increasingly more rapidly in the less developed countries.

Population aging will have a variety of effects on the world economy, but in this paper, I will focus on the impact of population aging on saving—on household saving, private saving, government saving, and national saving.

This paper is organized as follows. In section 2, I discuss the theoretical rationale for why the age structure of the population affects the household and private saving rates; in section 3, I discuss the empirical evidence concerning the impact of the

age structure of the population on the household and private saving rates; in section 4, I discuss the impact of population aging on government saving; and section 5 is a concluding section.

To summarize the main findings of this paper, population aging will lead to declines in household, private, government, and national saving rates, but to the extent that population aging is accompanied by absolute declines in population, investment rates will also decline, and moreover, countries always have the option of borrowing from abroad. Thus, the decline in saving caused by population aging will not necessarily spell disaster.

2. Theoretical Considerations

In this section, I discuss the theoretical rationale for why the age structure of the population affects the household and private saving rates.

The hypothesis that best explains the connection between the age structure of the population and the household and private saving rates is the life cycle hypothesis of Franco Modigliani and Richard Brumberg (Modigliani and Brumberg (1955)). According to this hypothesis, people work and save when they are young and retire and dissave their previously accumulated savings when they are old. Thus, the life cycle

hypothesis predicts that the overall saving rate will be higher, the lower is the ratio of the elderly population to the working-age population (defined as the elderly dependency ratio). Conversely, the life cycle hypothesis predicts that, as the population ages and the elderly dependency ratio increases, the saving rate should decline.

However, one would also expect a country's young dependency ratio, defined as the ratio of children to the working-age population, to exert downward pressure on its saving rate because children contribute to consumption without contributing to income. Moreover, the young dependency ratio typically declines as the population ages, exerting upward pressure on the saving rate, and this will at least partially offset the downward pressure on the saving rate caused by the increase in the elderly dependency ratio.

Thus, it is not possible to say *a priori* whether or not, and to what extent, population aging will lead to a decline in the saving rate. Generally, however, the downward pressure on the saving rate caused by the increase in the elderly dependency ratio will more than offset the upward pressure on the saving rate caused by the decline in the youth dependency ratio, as a result of which population aging will cause the saving rate to decline.

3. Empirical Evidence

There are at least three types of empirical evidence concerning the impact of the age structure of the population on the household and private saving rates; (1) cross-country evidence, (2) time-series evidence for individual countries, and (3) micro evidence from household surveys. I look at each of these types of empirical evidence in turn.

3.1. Cross-Country Evidence

Looking first at the cross-country evidence, many authors, including Modigliani (1970), Modigliani and Sterling (1983), Horioka (1989), Loayza, et al. (2000), Schrooten and Stephan (2005), and Bosworth and Chodorow-Reich (2006), have analyzed the impact of the age structure on the household, private, and national saving rates using cross-country data, and they generally find that the age structure of the population has a significant impact on household, private, and national saving rates.

For example, Bosworth and Chodorow-Reich (2006) find for their full sample that a one percentage point increase in the youth dependency ratio and the elderly dependency ratio lowers the national saving rate by 0.19 and 0.54 percentage points, respectively, and find for their sample of Asian countries that a one percentage point

increase in the youth dependency ratio and the elderly dependency ratio lowers the national saving rate by 0.45 percentage points and 1.20 percentage points, respectively. And Horioka (1989) finds that the low elderly dependency ratio was by far the most important cause of Japan's high private saving rate during the 1975-84 period.

3.2. Times-Series Evidence for Individual Countries

Turning to the time series analyses for individual countries, such analyses have also tended to find significant demographic effects (see, for example, Horioka (1991, 1992, 1997) for Japan and Modigliani and Cao (2004) for China).

For example, in Japan, the youth dependency ratio has shown a long-term downward trend, while the elderly dependency ratio has shown a long-term upward trend. However, the decline in the youth dependency ratio was more pronounced than the increase in the elderly dependency ratio until the early 1970s, and as a result, Japan's household saving rate showed an upward trend until the early 1970s.

By contrast, the increase in the elderly dependency ratio has been more pronounced than the decline in the young dependency ratio since the early 1970s, and as a result, Japan's household saving rate has shown a downward trend since the early 1970s. Moreover, the increase in the elderly dependency ratio is expected to continue

and even accelerate, and this can be expected to cause a further decline in Japan's household saving rate, perhaps to zero or negative by 2010 (see Figure 1 for data on trends over time in Japan's household saving rate and Figure 2 for data on trends over time in the age structure of Japan's population).

As another example, in China, the youth dependency ratio has shown a long-term downward trend (due in large part to the one-child policy and other population control measures), while the elderly dependency ratio has shown a long-term upward trend. However, the decline in the youth dependency ratio has been more pronounced than the increase in the elderly dependency ratio, and as a result, China's household saving rate has shown an upward trend until now.

By contrast, the increase in the elderly dependency ratio is expected to become more pronounced than the decline in the youth dependency ratio after about 2010, and as a result, China's household saving rate can be expected to show a downward trend after about 2010 (see Horioka and Wan (2007) for data on trends over time in China's household saving rate and in the age structure of China's population).

3.3 Micro Evidence from Household Surveys

Turning finally to micro evidence from household surveys, such evidence show

that the elderly (especially the retired elderly) dissave, as assumed by the life cycle hypothesis. For example, Horioka's (2006b, 2006c) analysis of Japanese data shows that the retired elderly have dissaved 15-30 percent of their incomes in recent years. This suggests that the life cycle hypothesis holds and that population aging will have a significant impact on the household and private saving rates.

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3.4. Summary re Household and Private Saving Rates

The main findings of this section are as follows:

- (1) Population aging can be expected to have a significant negative impact on the household and private saving rates.
- (2) However, the population aging process is proceeding at different speeds in different countries, and the decline in saving rates can be expected to begin at different times and proceed at different speeds in different countries. For example, countries like Japan and Korea are already showing declines in their saving rates, and China can be expected to show a decline in its saving rate after about 2010, but many of the Southeastern Asian countries can be expected to maintain relatively high saving rates for the foreseeable future as their working-age populations burgeon. Thus, there is no danger of a region-wide (or worldwide) collapse in saving rates in the

near future.

4. Government Saving

In this section, I analyze the impact of population aging on government saving.

4.1. Theoretical Considerations

I would like to look first at the impact of population aging on government saving from a theoretical viewpoint. Since most countries have pay-as-you-go public pension systems, a given pensioner's benefits are financed by the contributions of current workers. Thus, as the population ages and the ratio of pensioners to current workers increases, benefits will rise relative to contributions, and this will increase the deficits of the public pension system (unless benefits can be reduced and/or contributions can be increased sufficiently to maintain a balance between benefits and contributions). And deficits will also arise in the medical insurance and nursing (long-term care) insurance systems for the same reason if these systems are also operated on a pay-as-you-go basis.

If population aging is accompanied by a decline in the youth dependency ratio, the government's educational expenses and other youth-related expenditures will

decline, but this decrease will be more than offset by the increase in elderly-related expenditures, and thus government expenditures will increase on balance.

4.2. Possible Ways of Alleviating the Decline in Government Saving Caused by Population Aging

Looking next at possible ways of alleviating the decline in government saving caused by population aging, countries with pay-as-you-go public pension systems often try to prevent the deficits of the system from ballooning too drastically by lowering benefit levels, delaying the pensionable age, and/or raising contribution rates. These measures will indeed reduce the deficits of the public pension system, but they will also lead to intergenerational inequities, with cohorts who were born earlier making out better than cohorts who were born later.

A far better solution is to switch to a fully funded public pension system because (1) such a system will not show deficits, regardless of how much the population ages, and (2) because it achieves inter-generational equity. Unfortunately, however, it is difficult to switch from a pay-as-you-go public pension system to a fully funded system because a given generation has to bear as double burden.

Thus, in countries with pay-as-you-go public pension systems, which is most

countries, population aging will almost definitely lead to an increase in the deficits of the public pension system and in overall government deficits and to a decline in government saving.

4.3. Will the Decline in Government Saving Cause a Decline in National Saving?

Whether that decline in government saving translates into a decrease in national saving depends on whether Ricardian equivalence holds. If consumers are myopic and do not realize (or do not care) that government deficits will necessitate tax increases in the future, the decline in government saving will translate into a corresponding decline in national saving.

By contrast, if consumers are Ricardian and realize that government deficits will necessitate tax increases in the future and care about future generations, they will increase private saving so that they can leave larger bequests to later generations to compensate them for the higher taxes they bequeath to them. In this case, the decline in government saving will not necessarily translate into a decline in national saving.

The evidence on whether consumers are myopic (selfish) or Ricardian (altruistic) is not entirely conclusive, but in my opinion, the bulk of the evidence

suggests that consumers are more myopic (selfish) than Ricardian (altruistic) (see, for example, Horioka (1993b, 2002)), which means that the decline in government saving *will* translate into a decline in national saving.

5. Overall Conclusion

5.1. Summary of Findings

The main findings of this paper are as follows:

- (1) Population aging will lead to a decline in household and private saving rates.
- (2) Population aging will also lead to a decline in government saving because of the pay-as-you-go nature of the public pension system in most countries.
- (3) The decline in government saving will be partially or fully offset by an increase in private saving if consumers are Ricardian, but the bulk of the evidence suggests that consumers are myopic rather than Ricardian.
- (4) Thus, the decline in government saving caused by population aging will reinforce the decline in household and private saving rates caused by population aging, leading to an unambiguous decline in the national saving rate.

5.2. So What?

Is the decline in the national saving rate caused by population aging something to be worried about? Not necessarily, for two reasons.

First, population aging is projected to be accompanied by absolute declines in population, and if population declines, there will be less need to expand the productive capacity of the economy and hence less need for investment. Thus, not only saving but also investment will decline, and a saving shortage will not necessarily emerge, even if the saving rate declines.

Moreover, even if a domestic saving shortage emerges, the country always has the option of borrowing from abroad, and unless all countries show a simultaneous decline in saving, which is unlikely, there will presumably always be some country that has excess saving that it is willing to lend to other countries.

5.3. Final Conclusion

To summarize the main findings of this paper, population aging will lead to declines in household, private, government, and national saving rates, but to the extent that population aging is accompanied by absolute declines in population, investment rates will also decline, and moreover, countries always have the option of borrowing from abroad. Thus, the decline in saving caused by population aging will not

necessarily spell disaster.

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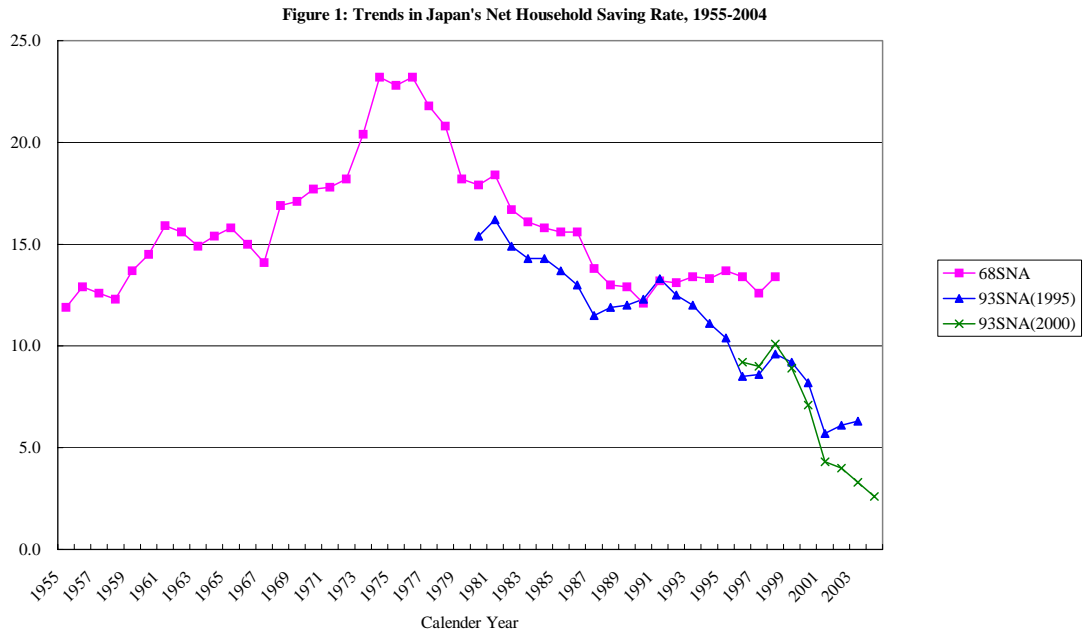
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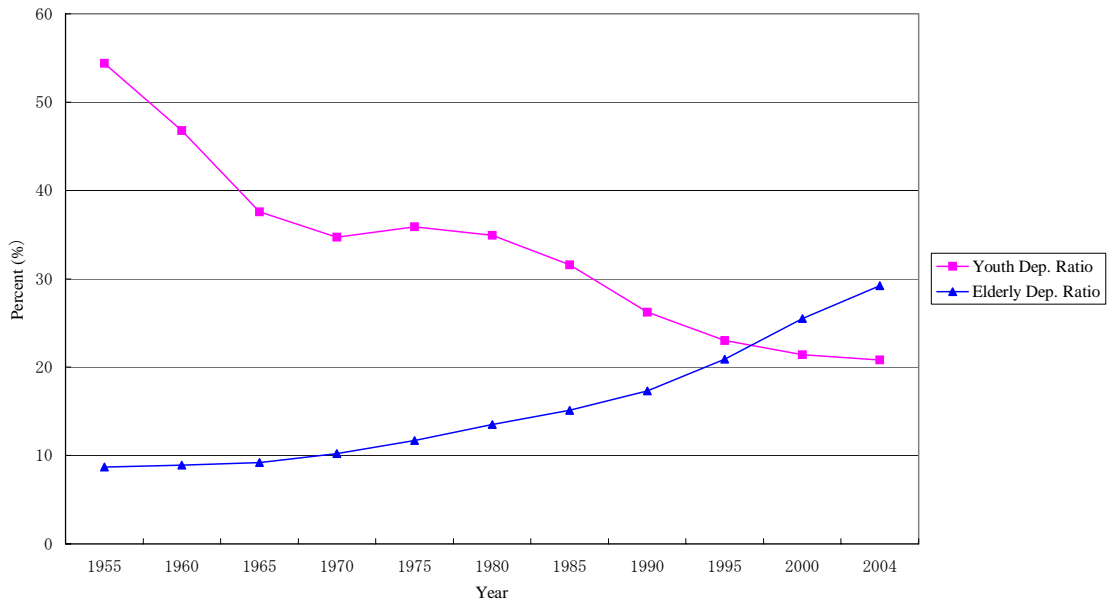
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Notes: The line marked “68SNA” shows data based on the 1968 United Nations System of National Accounts, the line marked “93SNA(1995)” shows data based on the 1993 United Nations System of National Accounts and the 1995 benchmark revision, and the line marked “93SNA(2000)” shows data based on the 1993 United Nations System of National Accounts and the 2000 benchmark revision. The 68SNA figures show the net household saving rate, while the 93SNA figures show the adjusted net household saving rate.

Source: Department of National Accounts, Economic and Social Research Institute, Cabinet Office, Government of Japan, ed., *Annual Report on National Accounts*, 2006 edition (Tokyo: Mediarando Kabushiki Kaisha, 2006), and the 2004 and 2005 editions of the same.

Figure 2: The Age Structure of Japan's Population, 1955-2004



Notes: The youth dependency ratio shows the population aged 0-19 as a percent of the population aged 20-64, while the elderly dependency ratio shows the population aged 65 and older as a percent of the population aged 20-64.

Sources: Statistics Bureau, Ministry of Internal Affairs and Communications, eds., *Kokusei Chousa (Population Census)*, various editions, and Statistics Bureau, Ministry of Internal Affairs and Communications, eds., *Jinkou Suikei Geppou (Monthly Bulletin of Population Estimates)*, various issues.