

# **Aging, Saving, and Fiscal Policy**

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# 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/or mortality declines ( = increases in life expectancy) .

# Trends in Population Aging

- 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.

# The Impact of Population Aging

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

# Theoretical Considerations (1)

- The life cycle hypothesis predicts that the age structure of the population will affect the household and private saving rates.
- According to this hypothesis, people work and save when they are young and retire and dissave their previously accumulated savings when they are old.

# Theoretical Considerations (2)

- 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 (called the elderly dependency ratio).

# Theoretical Considerations (3)

- Conversely, the life cycle hypothesis predicts that, as the population ages and the elderly dependency ratio increases, the saving rate will decline.

# Theoretical Considerations (4)

- However, one would also expect a country's youth dependency ratio, defined as the ratio of children to the working-age population, to exert downward pressure on its saving rate because, like the elderly, children contribute to consumption without contributing to income.

# Theoretical Considerations (5)

- Moreover, the youth 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.

# Theoretical Considerations (6)

- 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.

# **Empirical Evidence on the Impact of Population Aging on the Household and Private Saving Rates**

- (1) Cross-country evidence**
- (2) Time-series evidence for individual countries**
- (3) Micro evidence from household surveys**

# **Cross-country Evidence (1)**

**(1) Modigliani (1970)**

**(2) Horioka (1989)**

**(3) Loayza et al. (2000)**

**(4) Schrooten and Stephan (2005)**

**(5) Bosworth and Chodorow-Reich (2006)**

# Cross-country Evidence (2)

For example, Bosworth and Chodorow-Reich (2006) find for their sample of Asian countries that a one percentage point increase in the youth dependency ratio and the elderly dependency ratio lower the national saving rate by 0.45 percentage points and 1.20 percentage points, respectively (full sample: 0.19/0.54).

# Cross-country Evidence (3)

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.

# Time-series Evidence

Time series analyses for individual countries have also tended to find significant demographic effects (see, for example, Horioka (1997) for Japan and Modigliani and Cao (2004) for PRC).

# Case Study: Japan (1)

- 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.

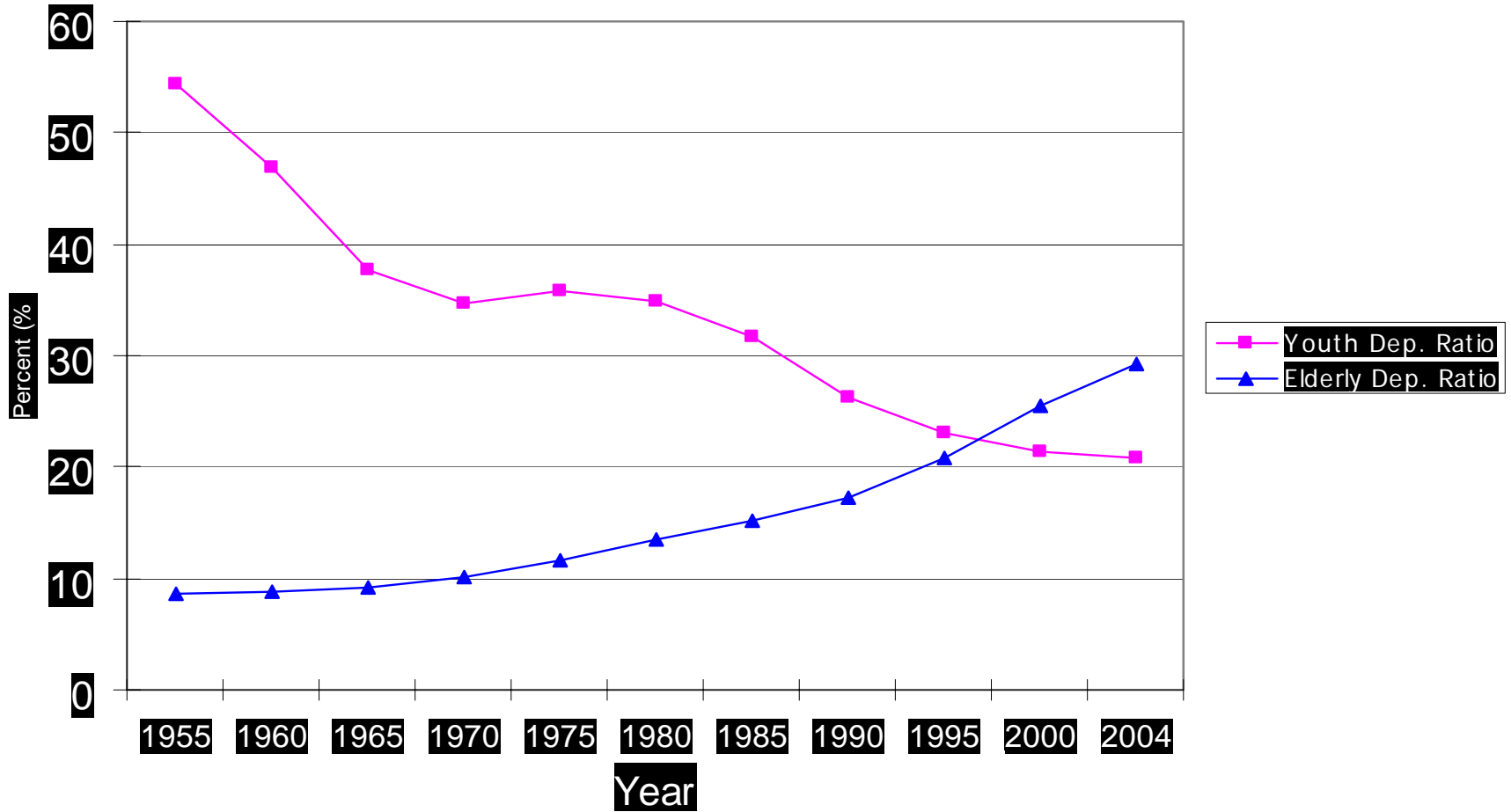
# Case Study: Japan (2)

- 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.

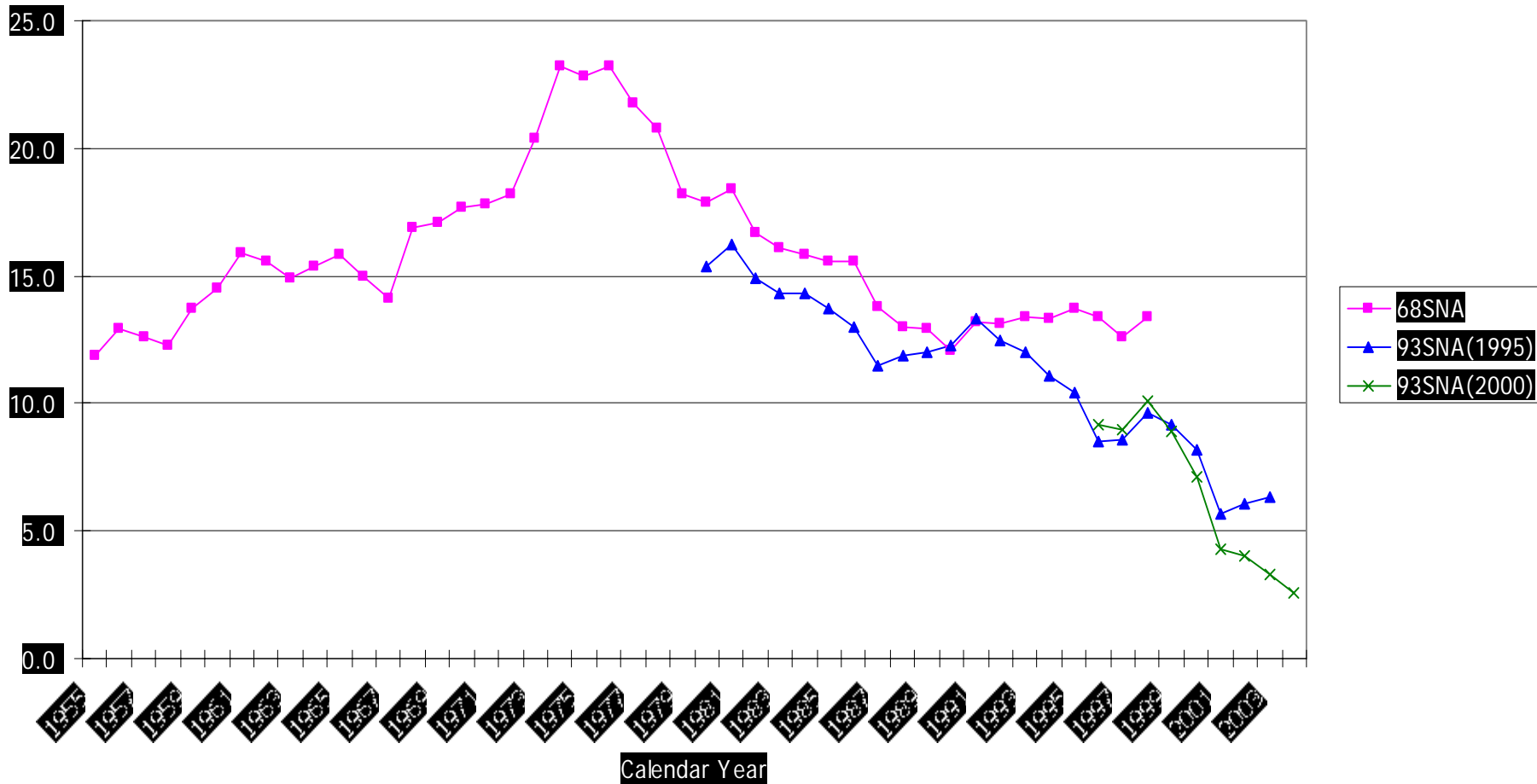
# Case Study: Japan (3)

- 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.

# The Age Structure of Japan's Population, 1955-2004



# Trends in Japan's Net Household Saving Rate, 1955-2004



# Case Study: Japan (4)

- 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.

# Case Study: People's Republic of China (1)

- In PRC, 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.

# Case Study: PRC (2)

- However, the decline in the youth dependency ratio has been more pronounced than the increase in the elderly dependency ratio, and as a result, PRC's household saving rate has shown an upward trend until now.

# Case Study: PRC (3)

- However, 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, PRC's household saving rate can be expected to show a downward trend after about 2010.

# Micro Evidence from Household Surveys (1)

- Micro evidence from household surveys show that the elderly (especially the retired elderly) dissave, as assumed by the life cycle hypothesis (see, for example, Horioka's (2006) analysis of Japanese data).

# Micro Evidence from Household Surveys (2)

- This suggests that the life cycle hypothesis holds and that population aging will have a significant impact on the household and private saving rates.

# Summary re Household and Private Saving Rates (1)

- Population aging can be expected to have a significant negative impact on the household and private saving rates.
- However, the population aging process is proceeding at different speeds in different countries, and thus the decline in the household and private saving rates can be expected to begin at different times and proceed at different speeds in different countries.

# Summary re Household and Private Saving Rates (2)

- Thus, there is no danger of a region-wide (or worldwide) collapse in saving rates in the near future.

# Government Saving (1)

- What impact will population aging have on government deficits (government saving)?
- Since most countries have pay-as-you-go public pension systems, a given pensioner's benefits are financed by the contributions of current workers.

# Government Saving (2)

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).

# Government Saving (3)

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 pay-as-you-go.

# Government Saving (4)

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 (government deficits) will increase on balance.

# Possible Solutions (1)

- Is there any way to prevent population aging from causing government deficits?
  - (1) 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.

# Possible Solutions (2)

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.

# Possible Solutions (3)

(2) A far better solution is to switch to a fully funded public pension system because (i) such a system will not show deficits, regardless of how much the population ages, and (ii) because it achieves inter-generational equity.

# Possible Solutions (4)

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 a double burden.

# Conclusion re Government Saving

Thus, in countries with pay-as-you-go public pension systems, etc., which is most countries, population aging will lead to an increase in the deficits of the public pension system and in overall government deficits and to a decline in government saving.

# **Will the Decline in Government Saving Cause a Decline in National Saving? (1)**

Whether the decline in government saving translates into a decline in national saving depends on whether Ricardian equivalence holds.

# **Will the Decline in Government Saving Cause a Decline in National Saving? (2)**

- (1) 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.

# Will the Decline in Government Saving Cause a Decline in National Saving? (3)

(2) By contrast, if consumers are Ricardian and realize that government deficits will necessitate tax increases in the future and they 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.

# Will the Decline in Government Saving Cause a Decline in National Saving? (4)

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), which means that the decline in government saving *will* translate into a decline in national saving.

# **Overall Conclusion (1)**

- (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.**

# **Overall Conclusion (2)**

**(3) And the decline in government saving will not be offset by an increase in private saving because the bulk of the evidence suggests that consumers are myopic rather than Ricardian.**

# **Overall Conclusion (3)**

**(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.**

# **Why Worry? (1)**

**Is the decline in national saving caused by population aging something to worry about?**

**Not necessarily, for two reasons.**

# Why Worry? (2)

(1) 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.

# Why Worry? (3)

(2) 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 savings which it is willing to lend to other countries.

# **Final Conclusion (1)**

**To summarize, 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.**

# **Final Conclusion (2)**

**Thus, the decline in household, private, government, and national saving caused by population aging will not necessarily spell disaster.**

**THE END**

**Thank you for your  
attention!**