



## Demographic change, social security systems, and savings<sup>☆</sup>

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### Abstract

In theory, improvements in healthy life expectancy should generate increases in the average age of retirement, with little effect on savings rates. In many countries, however, retirement incentives in social security programs prevent retirement ages from keeping pace with changes in life expectancy, leading to an increased need for life-cycle savings. Analyzing a cross-country panel of macroeconomic data, we find that increased longevity raises aggregate savings rates in countries with universal pension coverage and retirement incentives, though the effect disappears in countries with pay-as-you-go systems and high replacement rates.

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## 1. Introduction

Demographics can affect aggregate savings behavior. Most savings models that account for demographic factors focus on the fact that people at different ages save at different rates. In these models, demographic change affects aggregate savings through changes in the age structure of the population (e.g., Deaton and Paxson, 1997; Kelley and Schmidt, 1996; Higgins and Williamson, 1997; Higgins, 1998). However, we consider another fundamental demographic factor that may affect saving behavior: the length of life.

In a simple life-cycle model, a longer life span need not affect savings rates; the optimal response to a longer life span can be a corresponding proportional increase in working lifetime, with savings rates while working remaining fairly steady. However, there is empirical evidence at the microeconomic level (Hurd et al., 1998) and at the macroeconomic level (Bloom et al., 2003) that higher life expectancy increases savings rates. This raises the question of why people who expect to live longer should choose to save more rather than simply retire later.

We discuss four mechanisms through which life expectancy can affect savings: increased sickness in old age may prevent longer working lives; the influence of compound interest and wage growth over a longer working life may produce a wealth effect; imperfect annuity markets may reduce the effective returns to savings in high-mortality environments due to the chance of dying before spending one's wealth; and retirement incentives in social security systems may discourage or prevent longer worker lives.

The effects of longer life spans on saving are potentially large. Deaton and Paxson (2000) have shown that variations in age structure made only a modest contribution to the savings boom in Taiwan over the last 40 years, due to the fact that variations in savings rates by age are not very pronounced. Using a simulation model, Lee et al. (2000) argue that, given a fixed retirement age, increases in longevity in Taiwan can explain the rise in savings rates at every age, and its savings boom. We use theoretical and empirical analyses to argue for a link between longevity and savings based on the existence of social security programs that offer incentives to retire at a fixed age.

Gruber and Wise (1998) and Blondal and Scarpetta (1997) show that social security rules in OECD countries create powerful financial incentives to retire at a particular age and that many workers appear to respond to these incentives. This leads to a clustering of retirement at the ages at which retirement incentives are introduced in each country.

Similar social security arrangements also exist in many countries outside the OECD. For example, Social Security Administration (2002) reports data on social security in Taiwan. When covered workers reach 60 years of age, they are eligible upon retirement to receive a lump sum payment based on their contributions to the system. A worker receives a sum equal to his or her monthly salary for each of the first 15 years of social security contributions. This increases to 2 months' salary for the next 15 years of contributions. This lump sum is capped at 45 months of salary, though an extra 5 months worth of salary can be added to the lump sum by continuing to work to age 65. Thus, if one has worked to age 65, benefits no longer increase over time, although contributions continue.

Two additional factors may also influence the decision to retire at younger ages. Because productivity declines with advancing age, the average wage on which the lump sum is based may decrease over time,<sup>1</sup> and expected benefits may decrease. In addition, as one

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<sup>1</sup>This is more likely to be true for manual laborers than for skilled laborers insofar as experience is an important element of productivity for the latter group.

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