Longevity Risk, Pooled Annuities & Tontines

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Longevity Risk

Risk of outliving your retirement savings

• 65-year-old American man: 50% chance of living to 82; 20% chance of living to 89
• 65-year-old American woman: 50% chance of living to 85; 20% chance of living to 92
• 65-year-old American couple: 50% chance that at least one will live to age 88; 30% chance that at least one will live to 92

Retirements can last for 30 years or more
Annuities & Pooled Annuities

Unlike mutual fund accounts, **annuities** use **mortality gains** to increase lifetime income for the survivors.

- The share of each investor, at death, is enjoyed by the survivors.
- With **pooled annuities**, investors bear all the risks.
  - There is no insurance company guarantee.
- Pooled annuities are a lot like **tontines**.
A Simple Tontine

Suppose ten 65-year-old men invest in a fund

\[ 10 \times \$1000 = \$10,000 \]
Pooling Longevity Risk with a Tontine

A few years later, one man dies.

The 9 survivors are each eligible for . . .

\[
$1111 = 10 \times $1000 \div 9
\]

Meanwhile, the dead man forfeits his $1000.

- But he doesn’t care; he’s dead!
Pooling Risk with a Tontine

A few years later, another one bites the dust.

The 8 survivors split the $10,000, and each gets $1250 = $10,000 ÷ 8

- Of course, the survivors would get even more if the fund earned interest.
Imagine 1000 65-year-old men each contribute $1000 to a fund that buys a $1 million, 10-year, zero-coupon bond, paying 5% interest.

- In 10 years, the fund would get ~ $1.6 million, & each investor (or her heirs) would get ~ $1600. A tontine would also divide that $1.6 million—*but only among the survivors.*

- If 800 men survived the 10 years (to age 75), each would get ~ $2000 = $1.6 million ÷ 800.

- That’s ~ $400 more (~ 7% interest)!
Tontines Could Be Run by Mutual Funds

Tontines could be designed to

• Provide lifetime income
  • E.g., *tontine annuities* & *tontine pensions*

• Accept investors of different genders and ages, and who have different levels of investment

Tontines could be run by low-fee mutual funds

• No money for insurance agent commissions or for insurance company reserves or profits

• Minimal fiduciary duties