Supporting the Oldest Old: The Role of Social Insurance, Pensions, and Financial Products

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for
Living to 100
Orlando, Florida
January 8-10, 2014
Overview

• My paper focuses on the oldest old (90+)
  – On longevity risk— the risk of outliving your savings
• Demographics of the oldest old
• Mechanisms to support the oldest old
• Enhancing the income of the oldest old
Table 1. Life Expectancy by Age, 1909-1911, 1949-1951, and 2008

<table>
<thead>
<tr>
<th>Age</th>
<th>Average number of years of life remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1909-1911</td>
</tr>
<tr>
<td>0</td>
<td>51.49</td>
</tr>
<tr>
<td>65</td>
<td>11.60</td>
</tr>
<tr>
<td>70</td>
<td>9.11</td>
</tr>
<tr>
<td>80</td>
<td>5.25</td>
</tr>
<tr>
<td>90</td>
<td>3.03</td>
</tr>
<tr>
<td>100</td>
<td>1.85</td>
</tr>
</tbody>
</table>
Life Expectancy, cont.

• A 65-year-old
  – Man has a 30% chance of living to 90
  – Woman has a 40% chance of living to 90

• A 65-year-old couple has a
  – 50% chance that at least one 65-year-old spouse will live to age 91
  – 25% chance that at least one will live to 95.
90+ demographics

- 90+ population increased from 720,000 in 1980 to 1.9 million in 2010 and is projected to quadruple by 2050, to more than 8.7 million
- 2.8% of the older population (65+) in 1980, 4.7% of the older population in 2010, and they are projected to account for 9.9% of the older population in 2050
90+ demographics, cont.

• Overwhelmingly white (88.1%) and female (74.1%) in 2006-2008
• Most are married (15.8%) or widowed (75.1%)
• Most are high school graduates or beyond (61.3%)
• Had a median annual income of $14,760
  – men $20,133, women $13,580
90+ demographics, cont.

- 14.5% (198,090) of the oldest old were poor in 2006-2008
  - 9.6% of men, 16.5% of women
- the vast majority (84.7%) have at least one disability-type limitation (e.g., hearing, seeing, remembering, climbing stairs)
- 22.7% were institutionalized in facilities such as nursing homes
  - 14.5% of men, 25.5% of women
Figure 1. Income Sources of Population Aged 90 and Over: 2006-2008

- Social Security: 47.9%
- Other income: 29.8%
- Retirement: 18.3%
- Supplemental Security Income: 1.9%
- Earnings: 2.2%
Mechanisms to Support the Oldest Old

• Social Security, SSI, Medicare, Medicaid & Supplemental Nutrition Assistance Program (SNAP)
• Pensions
• Other financial products
  – Lifetime annuities
  – Deferred Annuities
  – Guaranteed Lifetime Withdrawal Benefits
Figure 2. How Benefits Compare to Earnings (2013 dollars & percentage of final wages)

Retired worker age 65, 2013

- Past wages
- Benefits

<table>
<thead>
<tr>
<th>Level</th>
<th>Past Wages</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;low&quot;</td>
<td>$19,670</td>
<td>$43,720</td>
</tr>
<tr>
<td>&quot;medium&quot;</td>
<td>$11,070</td>
<td>$18,230</td>
</tr>
<tr>
<td>&quot;high&quot;</td>
<td>$24,200</td>
<td>$69,950</td>
</tr>
<tr>
<td>&quot;maximum&quot;</td>
<td>$29,020</td>
<td>$110,100</td>
</tr>
</tbody>
</table>

Percentage:
- "low" 56%
- "medium" 42%
- "high" 35%
- "maximum" 26%
Pension Coverage and Retirement Income Adequacy

• At any point in time, only about 1 out of 2 American workers have pension plans
• Will current and future generations of retirees will have adequate retirement incomes?
  – 44% of Baby-Boomer and Gen-Xer households are at risk of running short of money in retirement, and 1 in 5 are projected to have less than 80% of what they will need
Lifetime Retirement Income Products

- Systematic withdrawals
- Lifetime annuities
- Longevity insurance
- Guaranteed lifetime withdrawal benefits
Systematic Withdrawals

• e.g., the **4 percent rule**
  – Set spending at 4% of savings
  – Invest in a 50/50 stock/bond portfolio
  – Each year, increase spending to keep up with inflation, e.g., $1,000,000 nest egg
    • $40,000 in the 1\textsuperscript{st} year
    • $41,200 in the 2\textsuperscript{nd} year (~ 3% inflation), etc.
  – Some possibility of running out of money
    • Historically, 6% over 30 year
Lifetime Annuities

• An insurance contract that converts a lump sum into a stream of income for life

• Depending on the retiree’s age, can provide cash flows of 7% of funds invested
  – e.g., a 65-year-old man who purchased a $100,000 immediate, level-payment annuity in 2012 – $6,336/year (6.34%)
  – 65-year-old woman – $5,880/year (5.88%)
Inflation-adjusted Annuities

• Annual payouts start lower but can end up higher
  – Level payment annuity
    • $6,336/year for a 65-year-old man
  – Annuity with a 3-percent escalator
    • $4,548 in the 1st year
    • More in later years
Longevity Insurance (e.g., Deferred Annuities)

• E.g., a 65-year-old man could invest $100,000 in a deferred annuity & beginning at age 85, he would get $25,451/year

• Instead, start at age:
  – 80, get $17,069/year
  – 75, get $11,650/year
  – 70, get $8,134/year
Guaranteed Lifetime Withdrawal Benefits (GLWB)

• Variable annuity invested in a portfolio of stocks/bonds/etc.
  – Portfolio grows (or shrinks)

• Retirement: Guaranteed withdrawals
  – Payouts come from the invested funds
  – If funds are ever depleted due to long life and/or poor investment returns, the guaranteed minimum kicks in
  – If funds do well, payouts can increase
GLWB continued

• The guaranteed withdrawal rate is determined at the time of the sale
  – It might be set at between 4% & 6%, depending upon the age when withdrawals are set to begin

• Disadvantages
  – Complicated
  – Can have annual costs that exceed 3%
  – Rarely have an inflation adjustment
Decline of Annuitization

• People rarely choose to buy annuities voluntarily
• The Annuity Puzzle
  – Financial literacy is low
  – Bequest motive
  – Adverse selection
  – Social Security
  – Little savings
Mechanisms for Enhancing the Income of the Oldest Old

• Guarantee minimum incomes
  – e.g., increase Social Security & the welfare benefits under SSI and SNAP

• Encourage workers to save more & invest better
  – a mandatory universal pension system
  – autoenrollment and better defaults

• Encourage workers to work longer
  – e.g., raise the early and normal retirement ages
Table 2. Increase in Average Annuity Income from Working Longer (percent)

<table>
<thead>
<tr>
<th>Lifetime Earnings Quintile</th>
<th>Increase from Working One More Year</th>
<th>Increase from Working Five More Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>16</td>
<td>98</td>
</tr>
<tr>
<td>Second</td>
<td>12</td>
<td>71</td>
</tr>
<tr>
<td>Middle</td>
<td>10</td>
<td>61</td>
</tr>
<tr>
<td>Fourth</td>
<td>8</td>
<td>52</td>
</tr>
<tr>
<td>Top</td>
<td>7</td>
<td>42</td>
</tr>
<tr>
<td>All</td>
<td>9</td>
<td>56</td>
</tr>
</tbody>
</table>
Mechanisms for Enhancing the Income of the Oldest Old, cont.

• Encourage workers to annuitize their wealth
• Increase Social Security benefits for the oldest beneficiaries
  – Increase benefits across-the-board
  – Provide longevity insurance by increasing benefits for the oldest beneficiaries
  – Increase survivor benefits
    • e.g., from two-thirds to 75% of the couple’s income before the other spouse’s death
Mechanisms for Enhancing the Income of the Oldest Old, cont.

• More Social Security Benefit Enhancements
  – increasing minimum benefits
  – reducing the work requirements for eligibility
  – supplementing benefits for low-income single workers
  – earnings sharing
  – reducing marriage duration for spousal benefits from 10 years to, say, 7 years
  – providing caregiver credits.
Mechanisms for Enhancing the Income of the Oldest Old, cont.

- Increase pension benefits for the oldest old
  - Relax the minimum distribution rules
  - Improve spousal protections in retirement accounts (QJSAs & QDROs)
- Have the government issue or guarantee annuities, retirement bonds (R bonds) & longevity bonds
Pooled Annuities and Tontines

• Government could sell *pooled annuities*
• The Social Security Administration (SSA) has death information
  – to ensure that it does not pay benefits to deceased individuals
  – & to establish survivor benefits
• With that information, SSA could make annuity payments only to the surviving members of each birth cohort
  – e.g., those born 90 years ago in 1924
Tontines

- Investment vehicles that combine features of an annuity and a lottery
- Investors pool their money
  - Each year they are alive, members receive investment income
  - As members die, their shares are forfeited to the surviving members, who benefit from the “mortality gains”
- Unless the fund is divided earlier, the entire fund goes to the last survivor
Tontine Example 1

- On the television show, “Mash,” Colonel Potter, as the last survivor of his World War I unit, got to open the bottle of French cognac they bought.
Tontine Example 2

- Imagine 1,000 65-year-old retirees
  - Each contributes $1,000 to an investment fund that purchases a $1,000,000 Treasury bond paying 4% interest ($40,000 interest per year)
  - Which will be split equally among the surviving members

- Assuming all the members live through the 1st year, each will receive a $40 dividend from the fund ($40 = $40,000 ÷ 1,000)
Tontine Example 2, cont.

- If only 800 original members are alive a decade later (when they are all 75), then each will receive a $50 dividend ($50 = $40,000 ÷ 800)

- If only 100 are alive two decades after that (when they are 95), then each will receive a $400 dividend ($400 = $40,000 ÷ 100)
Tontine Example 2, cont.

- Later, when only 40 remain, each will receive a $1,000 dividend ($1,000 = $40,000 ÷ 40)
- If the terms of the tontine call for liquidation at that point, each of the 40 survivors would also receive a liquidating distribution of $25,000 ($25,000 = $1,000,000 ÷ 40)
- Alternatively, the tontine could be designed so that the last survivor gets the $1,000,000
Example 3: A Fair Tontine Fund

• Imagine a fund with 4 investors
  – They can be different ages
  – Male or Female
  – And can have differing contribution levels

• If a member dies, her funds will be divided among the rest

• See, e.g., Michael J. Sabin, *Fair Tontine Annuity* (ssrn, 2010)
Example 3: A Fair Tontine Fund, cont.

- At every point in time, each member has a definite age, life expectancy & death probability
  - e.g., under the SSA 2009 life table, a 65-year-old man had a life expectancy of 17.51 years a death probability of 0.016182

- Then, we can design a fair transfer plan
  - Each time a member dies, her contribution is distributed to the survivors according to that fair transfer plan
Example 3: A Fair Tontine Fund, cont.

• Assume that 4 people each contribute $1,000 to a tontine fund
  – & for simplicity, no interest is earned

• The actual amount survivors get depends on who dies next

• Fair transfer plan (FTP) distributions are based on death probabilities
Table 3. A Fair Tontine Fund

<table>
<thead>
<tr>
<th>Person</th>
<th>Age</th>
<th>Life expectancy</th>
<th>Death probability</th>
<th>Force of Mortality Probability</th>
<th>Fair Transfer Plan Weight ($w_i$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>65</td>
<td>18.88</td>
<td>0.013181</td>
<td>0.013269</td>
<td>0.053815</td>
</tr>
<tr>
<td>2</td>
<td>70</td>
<td>15.22</td>
<td>0.020314</td>
<td>0.020523</td>
<td>0.086183</td>
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<td>3</td>
<td>75</td>
<td>11.89</td>
<td>0.032111</td>
<td>0.032638</td>
<td>0.146795</td>
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<tr>
<td>4</td>
<td>80</td>
<td>8.95</td>
<td>0.051906</td>
<td>0.053302</td>
<td>0.713207</td>
</tr>
</tbody>
</table>
Example 3: A Fair Tontine Fund, cont.

• If member $j$ dies, each surviving member $i$ would receive a portion of $j$’s contribution equal to $w_i/(1 - w_j)$, for $i \neq j$.

• E.g., if member 4 dies, her $1,000 balance would be distributed as follows:
  – Member 1 would get $187.64
  – Member 2 would get $300.51
  – Member 3 would get $511.85
  – & Member 4 would forfeit her $1,000
Example 4: A Fair Tontine Fund with lots of participants

• Tontine funds could be perpetual, with new investors coming in all the time
• Imagine a tontine fund with lots of participants
• Here are some hypothetical monthly statements
  – For two participants that each starts the month with $250,000 in their accounts
  – One lives through the month; the other dies
Sample Monthly Tontine Fund Statement for a Living Member

<table>
<thead>
<tr>
<th>Date</th>
<th>Amount</th>
<th>Balance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>03/31</td>
<td></td>
<td>250,000.00</td>
<td></td>
</tr>
<tr>
<td>04/02</td>
<td>67.17</td>
<td>250,067.17</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/03</td>
<td>25.21</td>
<td>250,092.38</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/05</td>
<td>55.14</td>
<td>250,147.52</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/07</td>
<td>135.41</td>
<td>250,282.93</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/07</td>
<td>48.91</td>
<td>250,331.84</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/12</td>
<td>52.29</td>
<td>250,384.13</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/15</td>
<td>102.54</td>
<td>250,486.67</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/20</td>
<td>159.46</td>
<td>250,649.13</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/21</td>
<td>139.68</td>
<td>250,785.82</td>
<td>Proceeds from FTP</td>
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<td>17.82</td>
<td>250,803.63</td>
<td>Proceeds from FTP</td>
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<tr>
<td>04/25</td>
<td>124.81</td>
<td>250,928.44</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/28</td>
<td>55.32</td>
<td>250,983.76</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/30</td>
<td>57.91</td>
<td>251,041.67</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/30</td>
<td>(1,041.67)</td>
<td>250,000.00</td>
<td>Payout of FTP proceeds</td>
</tr>
</tbody>
</table>
## Sample Monthly Tontine Fund Statement for a Member Who Dies During the Month

<table>
<thead>
<tr>
<th>Date</th>
<th>Amount</th>
<th>Balance</th>
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<tbody>
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<td>04/07</td>
<td>48.91</td>
<td>250,331.84</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/12</td>
<td>(250,331.84)</td>
<td>0</td>
<td>Forfeited to FTP</td>
</tr>
</tbody>
</table>
From a Fair Tontine Fund to a Fair Tontine Annuity

• Most retirees would prefer level benefits throughout their lives, rather than benefits that increase sharply at the end of life.

• Accordingly, we can, and we should design tontine products with benefits that increase gradually throughout retirement:
  – like an inflation-adjusted life annuity
  – but w/o insurance company profits and reserves
How to Get More Level Payments: Self Payback

• Each month, reduce a living member’s account balance by paying her a portion of her initial contribution

• Called a self payback

• Self paybacks can be computed like IRS required minimum distributions
## Sample Monthly Tontine Annuity Statement for a Living Member

<table>
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<td>57.91</td>
<td>251,041.67</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/30</td>
<td>(1,041.67)</td>
<td>250,000.00</td>
<td>Payout of FTP proceeds</td>
</tr>
<tr>
<td>04/30</td>
<td>(452.18)</td>
<td>249,547.82</td>
<td>Self payback</td>
</tr>
</tbody>
</table>
Tontine Funds Are a Noisy Version of an Actuarially Fair Annuity

Payments received by a typical long-lived male, normalized to $1 contribution.
About 5000 members, wide range of ages, genders, and contributions.
But Tontine Annuities Would Pay Better than Insurer-provided Annuities
Final Thoughts on Tontines

• Tontines would be popular
  – E.g., a tontine for a team of firefighters will be perceived as fairer than the typical annuity that they could buy from an insurance company
  – With an annuity, an early death seems to benefit the insurance company, but with a tontine, an early death benefits fellow firefighters

• Tontines could be regulated & protected by fiduciary rules
About the Author

• **Jonathan Barry Forman** (“Jon”) is the Alfred P. Murrah Professor of Law at the University of Oklahoma College of Law and the author of *Making America Work* (Urban Institute Press, 2006).

• A draft of this paper is available Jon’s web site at [http://jay.law.ou.edu/faculty/jforman/Articles/2013FormanSupporting%20theOldestOld.pdf](http://jay.law.ou.edu/faculty/jforman/Articles/2013FormanSupporting%20theOldestOld.pdf).


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