3B: Societal Changes and Adaptations as a Result of Longer Life Spans

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Living to 100
Discussion

January 2014
Orlando, FL
Robert L. Brown, PhD
FCIA, FSA, ACAS

Anna Rappaport

• Retirement Age had Fallen Significantly
• But now rising slowly
• Same is happening in Canada
Based on CPP Assumptions

**CPP: Proportion of Beneficiaries Working**

**Female**

<table>
<thead>
<tr>
<th>Age</th>
<th>2001</th>
<th>2005</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-64</td>
<td>14.4%</td>
<td>19.7%</td>
<td>26.4%</td>
</tr>
<tr>
<td>65-69</td>
<td>10.1%</td>
<td>12.5%</td>
<td>16.8%</td>
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<tr>
<td>70-74</td>
<td>5.0%</td>
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<td>7.4%</td>
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<tr>
<td>75+</td>
<td>2.0%</td>
<td>2.1%</td>
<td>2.5%</td>
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<tr>
<td>Overall</td>
<td>6.6%</td>
<td>8.1%</td>
<td>10.9%</td>
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</table>

**Male**

<table>
<thead>
<tr>
<th>Age</th>
<th>2001</th>
<th>2005</th>
<th>2009</th>
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</thead>
<tbody>
<tr>
<td>60-64</td>
<td>24.1%</td>
<td>31.9%</td>
<td>37.2%</td>
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<tr>
<td>65-69</td>
<td>17.6%</td>
<td>21.1%</td>
<td>26.1%</td>
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<tr>
<td>70-74</td>
<td>9.5%</td>
<td>10.9%</td>
<td>13.6%</td>
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<tr>
<td>75+</td>
<td>4.4%</td>
<td>4.6%</td>
<td>5.5%</td>
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<tr>
<td>Overall</td>
<td>11.8%</td>
<td>14.2%</td>
<td>17.6%</td>
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</table>
Anna Rappaport

- OASDI NRA Raised from 65 to 67 (With Delay)
- Same is happening in Canada with OAS/GIS starting in 2023
- No real Economic Basis
- Misses the Majority of Baby Boom
- Could be Viewed as Regressive

Anna Rappaport

- Move from DB to DC Shifts Longevity Risk to Worker
- Could have Kept DB with Shift in Retirement Age
- By Not Raising NRA, Benefit Value Rises with Life Expectancy
- In Amended Plans NRA is Going Up
- But Years in Retirement Still Up
Ratio of Active Life to Retirement

<table>
<thead>
<tr>
<th>Year</th>
<th>Active Life (Years)</th>
<th>Retirement (Years)</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1980</td>
<td>42.8</td>
<td>16.7</td>
<td>2.6</td>
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<tr>
<td>1990</td>
<td>41.7</td>
<td>19.4</td>
<td>2.2</td>
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<tr>
<td>2005</td>
<td>41.9</td>
<td>21.7</td>
<td>1.9</td>
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<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>42.5</td>
<td>21.9</td>
<td>1.9</td>
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<tr>
<td>1990</td>
<td>41.2</td>
<td>24.3</td>
<td>1.7</td>
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<tr>
<td>2005</td>
<td>40.7</td>
<td>26.0</td>
<td>1.6</td>
</tr>
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</table>

Anna Rappaport

- OASDI Earnings Test Liberalized
- In CPP, as Amended, You Can work and Collect CPP Benefits at the same Time
- But, You Also Contribute to the CPP
- And Reap Enhanced Benefits (Actuarially Equivalent)
Anna Rappaport

- A DB Plan with an ABM for Life Expectancy Better than DC
- But Need to be Sure There are Jobs for the Older Workers
- “Unintended Consequence” of Financial Easing is Low “i”
- This is really Tough on Savings and Pensions

Doug Andrews’ Recommendations

- Have a Demogrant Benefit
  --Could Claw Back from the Wealthy
  --Income or Income and Assets?
  --Would Ease OASDI Split Personality
  --Should Canada Expand OAS?
Doug Andrews’ Recommendations

• Have LTC Insurance
  --Should be Social Insurance, not Private
  --Mandated LTC (e.g., Germany) Would Work
  --Should Provide Universal Coverage
  --Less Chance Today of Family “Provision”

Doug Andrews’ Recommendations

• Last-Survivor Pension Should be 70%
  --Social Security is 55% in Germany/Sweden
  --60% in Canada
  --1.4 Factor Used (almost universally) for Two Vs One Person Family Works out to 71.4%
J. Forman’s Recommendations

• Guaranteed Minimum Income
  --Could Do Through Negative Income Tax
  --But Those 90+ Already have the Highest Income and Education

J. Forman’s Recommendations

• Encourage Workers to Save More and Invest Better
  --Have Better Default Options
  --Make Saving Mandatory (Like DC Social Security—Australia/Chile)
  --At the Least Make Enrolment Automatic
  --Regulate MERs
The impact of investment fee ratios on pension adequacy

<table>
<thead>
<tr>
<th>Management expense ratio (basis points)</th>
<th>0</th>
<th>40</th>
<th>150</th>
<th>300</th>
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</thead>
<tbody>
<tr>
<td>Accumulated value ($ after 40yrs)</td>
<td>777,000</td>
<td>707,000</td>
<td>551,000</td>
<td>400,000</td>
</tr>
<tr>
<td>Payout ($/yr)</td>
<td>45,000</td>
<td>41,000</td>
<td>32,000</td>
<td>23,000</td>
</tr>
<tr>
<td>Replacement ratio (%)</td>
<td>90</td>
<td>82</td>
<td>64</td>
<td>46</td>
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</tbody>
</table>

Assumes annual contributions of $10,000 over a worker’s 40 yr career with average annual income of $50,000

Source: Ontario Expert Commission on Pension Reform

The cost of investment fees in pension funds (by fund size) and individual savings accounts

<table>
<thead>
<tr>
<th></th>
<th>Average management expense ratio (basis points)</th>
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<tr>
<td>Large cap equities</td>
<td></td>
</tr>
<tr>
<td>$10 million</td>
<td>60</td>
</tr>
<tr>
<td>$1 billion</td>
<td>42</td>
</tr>
<tr>
<td>$10 billion</td>
<td>28 to 35</td>
</tr>
<tr>
<td>Individual account</td>
<td>250 to 300</td>
</tr>
</tbody>
</table>

Source: Ontario Expert Commission on Pension Reform
J. Forman’s Recommendations

• Is a Collective Approach Un-American?

J. Forman’s Recommendations

• Encourage Workers to Work Longer
  --Has a Double Impact
  --Encourage Later Take-down of OASDI
  --Raise the NRA and Earliest Age of Eligibility
  --Could be Viewed as Regressive
J. Forman’s Recommendations

- Encourage Workers to Annuitize
  --Force E’er’s to Provide an Annuity Option
  --Make Annuities the Default Option
  --Give Annuities Tax Preference
  --Promote Inflation-adjusted Annuities
  --Today’s Market: A Private Sector Failure?

J. Forman’s Recommendations

- Remove/Insure the Longevity Risk (e.g., Gov’t. Longevity Bonds)
- Use Deferred Annuities
- Not Costly (e.g., 16% of CAP if at Age 85)
- Allows DC CAP Plan a Known Draw Down Period
- Should be Widely Available Privately (Is Not Today)
- Could be a Supplement to Social Security
  --This has been Suggested in Quebec
- Many Benefit Model Options
- Could be Income Tested
How Well Have Retirement Systems Adapted to Longer Life

Presentation by Anna Rappaport
Living to 100 – January 2014

Agenda

- History of Retirement
- Retirement Ages
- Longevity Risk and Sustainability
- Conclusions
History of Retirement

- Growth of retirement
  - 1900: 25% of men over 65
  - 2000: 80%+

- Capability and retirement
  - Early years: retired = no longer able to work
  - 2000: period of leisure, fulfillment and discovery

- Earliest large scale pension
  - Union Army Pension
  - Payable at age 65 starting in 1890

- Paper offers more history

Signals: Retirement Age

- Retirement 20/20 pointed to importance of signals
- Social Security
  - 62 = early retirement age
  - 65-67 = normal retirement age
  - 70 = age at which increases stop
- ADEA – signals what ages protected
- Private plans
  - ERISA = 65: normal retirement age
  - 55 and up – most common early retirement ages
- Except for Social Security, no system of systematic adjustment
Big Changes in Periods of Retirement

Findings from expert commission in Quebec

- 1970: Expected work life = 46 years
  - Expected retirement = 13 years
- 2009: Expected work life = 39 years
  - Expected retirement = 23 years
- Why: 5 year increase in life expectancy
  - 5 year decrease in expected retirement age

Similar changes in many countries!

Labor Force Participation Rates (%)

<table>
<thead>
<tr>
<th></th>
<th>25-54</th>
<th>55-64</th>
<th>65 and over</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1950</td>
<td>96.5</td>
<td>86.9</td>
<td>45.8</td>
</tr>
<tr>
<td>1980</td>
<td>94.2</td>
<td>72.1</td>
<td>19.0</td>
</tr>
<tr>
<td>2000</td>
<td>91.6</td>
<td>67.3</td>
<td>17.5</td>
</tr>
<tr>
<td>2008</td>
<td>90.5</td>
<td>70.4</td>
<td>21.5</td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1950</td>
<td>36.8</td>
<td>27.0</td>
<td>9.7</td>
</tr>
<tr>
<td>1980</td>
<td>64.0</td>
<td>41.3</td>
<td>8.1</td>
</tr>
<tr>
<td>2000</td>
<td>76.8</td>
<td>53.0</td>
<td>9.7</td>
</tr>
<tr>
<td>2008</td>
<td>75.8</td>
<td>59.1</td>
<td>13.3</td>
</tr>
</tbody>
</table>
Retirement Age Trends

- Average Labor Market Exit Age in OECD Countries, 1965-2007

**Men**

Highest countries

OECD average

Lowest countries

Five-year moving average: end of year


Retirement Systems Adaptation to Longer Life

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Retirement Age Trends

- Average Labor Market Exit Age in OECD Countries, 1965-2007

**Women**

Highest countries

OECD average

Lowest countries

Five-year moving average: end of year


Retirement Systems Adaptation to Longer Life
Is Later Retirement Feasible?

- Depends on individual
- Depends on public policy
- Would need to be accompanied by change in disability provisions
- Would need employer support
- International experience: demonstrates variation

Longevity Risk and Sustainability

- Plan sponsors concerned about longevity risk
- Contributor to plan terminations, freezing of DB plans
- Strategies to manage longevity risk
  - Buy annuities
  - Financial market solutions
  - Buyout participants
- DC plans shift risk to participants – but leave them vulnerable

Solution not usually discussed – index or adjust retirement ages
**Retirement Ages and Sustainability**

- My view: longevity risk contributes to “unsustainability” when retirement ages are fixed
- Much more manageable if retirement ages are adjusted
- Plans that pool mortality risk and adjust retirement ages are a good alternative to DC plans
- Adjustable retirement ages could be a part of new “shared risk plans”

**Work as Part of Retirement**

- 35% of pre-retirees say they don’t expect to retire
- Retirees retired at a median age of 58, whereas pre-retirees expect to retire at 65.
- Pre-retiree expectations and retiree experience are different.
- In 2011, 44% of pre-retirees expect to stop working all at once, whereas 18% expect to gradually use hours, 31% to continue working part-time, and 3% to continue working full-time during retirement

Note: These are findings from the 2011 and 2013 SOA Survey of Post Retirement Risks and the Process of Retirement
Gaps in Knowledge about Working Longer

- Many people underestimate impact of working longer

**Perceptions of the Impact of Retiring Later**

*“Retiring Three Years Later Would Make Retirement…”*

<table>
<thead>
<tr>
<th></th>
<th>Retirees</th>
<th>Pre-retirees</th>
</tr>
</thead>
<tbody>
<tr>
<td>A lot more secure</td>
<td>14%</td>
<td>10%</td>
</tr>
<tr>
<td>A little more secure</td>
<td>35</td>
<td>49</td>
</tr>
<tr>
<td>No more secure</td>
<td>46</td>
<td>37</td>
</tr>
</tbody>
</table>

Source: SOA: 2011 Risks and Process of Retirement Survey Report, “Key Findings and Issues: Working in Retirement” (Data from the 2009 survey because question was not repeated in 2011)

Work Options for Later Work

- Flexibility of schedule, place, duties
- Many people may want to work part-time
- Phasing into retirement or working after retirement
- Organizing jobs at later ages
  - Same or redefined duties
  - Regular schedule or irregular work
  - Special projects
  - Mentoring
  - Entirely different responsibilities
  - Retiree pools
  - Snowbird arrangements
Conclusions

- Time to rethink retirement ages
  - Age 65 retirement age part of earliest plans in late 1800s
  - Huge increases in life span since then
- Failure to rethink: contributes to conclusion that system is not sustainable
- But challenges to longer work must be considered
  - Difficulty of finding work
  - Involuntary and “pushed” retirement
  - Some people not able to work
- Shift to DC is method of dealing with challenge
  - But adjusting retirement ages would be better
Mapping the Adequacy of Care and Support for the Elderly in Developed Countries

January 2014

Doug Andrews, FSA, FCIA, FIA

This Paper Discusses Adequacy

- What is the study group
- The fuzzy set methodology
- How is adequacy defined
- Findings
- Policy recommendations
Countries & Programs

Countries
- Canada
- England
- France
- Germany
- Sweden
- United States of America

Programs
- Social security (retirement)
- Health care
- Long-term care

Family Composition One
- Couple both aged between 65 and 70
- Male retired on state pension
- Had career earnings at average national wage
- No other earnings or savings
- Annual drug expenses of $2,000 (before state plan)
- General living expenses: 53% of average national wage
Family Composition Two

- Single female age 85 or older
- Receiving state survivor pension
- Based on male who had career earnings at average national wage
- No other earnings or savings
- Annual drug expenses of $1,200 (before state plan)
- General living expenses: 38% of average national wage

Four Family Situations Considered

<table>
<thead>
<tr>
<th>Family Composition → Care Status ↓</th>
<th>One - Couple</th>
<th>Two – Surviving Female age 85 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>No institutional care required</td>
<td>rent not own CN</td>
<td>rent not own SN</td>
</tr>
<tr>
<td>One member requires institutional care</td>
<td>rent not own CY</td>
<td>Institutionalized SY</td>
</tr>
</tbody>
</table>
State Pension Compared to General Living & Total Expenses for Each of CN, CY, SN, SY

<table>
<thead>
<tr>
<th>Label (Social protection)</th>
<th>Comparison</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely out of set</td>
<td>sp &lt; 50% gle</td>
<td>0</td>
</tr>
<tr>
<td>Somewhat inadequate</td>
<td>50% gle ≤ sp &lt; 100% gle</td>
<td>0.33</td>
</tr>
<tr>
<td>Somewhat adequate</td>
<td>100% gle ≤ sp &lt; 100% te</td>
<td>0.67</td>
</tr>
<tr>
<td>Completely adequate</td>
<td>100% te ≤ sp</td>
<td>1</td>
</tr>
</tbody>
</table>

- sp state pension
- gle general living expenses excluding care and drug expenses
- te total expenses

Average Score By Country and Label

<table>
<thead>
<tr>
<th>Score</th>
<th>At Least One Raw Score of 1</th>
<th>Label</th>
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<tbody>
<tr>
<td>0</td>
<td>No</td>
<td>Completely inadequate</td>
</tr>
<tr>
<td>0.2 &gt; score &gt; 0</td>
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<td>Mainly inadequate</td>
</tr>
<tr>
<td>0.4 &gt; score &gt; 0.2</td>
<td>No</td>
<td>Often inadequate</td>
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<td>0.4 &gt; score &gt; 0.2</td>
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<td>More inadequate than not</td>
</tr>
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<td>0.6 &gt; score &gt; 0.4</td>
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<td>More adequate than not</td>
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<td>0.8 &gt; score &gt; 0.6</td>
<td>Yes</td>
<td>Often adequate</td>
</tr>
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<td>1 &gt; score &gt; 0.8</td>
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<td>Mainly adequate</td>
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<tr>
<td>1</td>
<td>Yes</td>
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</table>
Results & Assessment

<table>
<thead>
<tr>
<th>ID</th>
<th>CN</th>
<th>CY</th>
<th>SN</th>
<th>SY</th>
<th>Score</th>
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<th>Mainly adequate</th>
<th>Mainly adequate</th>
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<td>Mainly adequate</td>
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<td>SN</td>
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<td>1</td>
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<td>Not adequate or inadequate</td>
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<td>Often inadequate</td>
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<tr>
<td>Score</td>
<td>0.5</td>
<td>0.33</td>
<td>0.84</td>
<td>0.84</td>
<td>0.84</td>
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<td>Mainly adequate</td>
<td>Mainly adequate</td>
<td>Mainly adequate</td>
<td>Often inadequate</td>
</tr>
</tbody>
</table>

Policy Recommendation 1

- Consider introducing a demogrant
- It can fill gaps left by earnings-related state pensions
Policy Recommendation 2

- Some form of comprehensive universal LTC insurance needs to be in place
- LTC is an insurance risk
- Different ways can be used to provide insurance coverage
  - Canada - government provided with co-payments and means testing
  - Germany - mandatory insurance

Policy Recommendation 3

- State survivor pensions need to be improved
- Based on the change in general living expenses a state survivor pension of 70% of the primary pension would be more adequate
Adequacy & Sustainability

- Canada
- England
- France
- Germany
- Sweden
- USA

- Adequacy
- Current S
- Potential S
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%
- Retirement: 18.3%
- Earnings: 2.2%
- Other income: 29.8%
- Supplemental Security Income: 1.9%
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

- "low" earnings: $19,670, 56%
- "medium" earnings: $43,720, 42%
- "high" earnings: $69,950, 35%
- "maximum" earnings: $110,100, 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 1st year
    • $41,200 in the 2nd 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

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 0.16182
- 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)</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>
</tr>
<tr>
<td>3</td>
<td>75</td>
<td>11.89</td>
<td>0.032111</td>
<td>0.032638</td>
<td>0.146795</td>
</tr>
<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>04/07</td>
<td>52.29</td>
<td>250,384.13</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/07</td>
<td>102.54</td>
<td>250,486.67</td>
<td>Proceeds from FTP</td>
</tr>
<tr>
<td>04/21</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>
</tr>
<tr>
<td>04/22</td>
<td>17.82</td>
<td>250,803.63</td>
<td>Proceeds from FTP</td>
</tr>
<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>
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<tr>
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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
  - See Michael J. Sabin, Fair Tontine Annuity (ssrn, 2010)
- Self paybacks can be computed like IRS required minimum distributions
## Sample Monthly Tontine Annuity Statement for a Living Member

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<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).
- Jon can be reached at jforman@ou.edu, 405-325-4779, [www.law.ou.edu/faculty/forman.shtml](http://www.law.ou.edu/faculty/forman.shtml).