Products, Tools and Strategies that Address Retirement Risks

Session 7F
October 28, 2020
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- Do leave a meeting where any anticompetitive pricing or market allocation discussion occurs.
- Do alert SOA staff and/or legal counsel to any concerning discussions
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Call for essays

• The original call for essays in the Fall of 2019 can be found here ...

• Article on these essays by Andrea Sellars and John Cutler, as well as a
dozen that were honorable mentions, can be found in the
October2020 issue of the Retirement Section News at
https://www.soa.org/sections/retirement/retirement-newsletter/

• Further information on upcoming essay calls can be found at
https://www.soa.org/research/opportunities/call-for-papers-list/
Project Oversight Group

Special thanks to our POG:

John Cutler (co-chair), Andrea Sellars (co-chair) and

Anna Rappaport, Barb Hogg, Carol Bogosian, Cindy Levering, David Manuszak, David Rogofsky, Joel Sklar, Julie Stich, Kenn Tacchino, Robert Eaton, Sara Rix, Steve Newman, Suzanne Gelnett, Ted Goldman, Vickie Bajtelsmit
Speakers

• John Cutler – Moderator
• Arun Muralidhar – SeLFIES: A New(ity) Look at Retirement
• John Turner – New Approaches to Communicating to Workers about Retirement
• Evan Inglis – A Risk-Based Framework for Making Retirement Income Decisions
Other essay submissions

- “Collective Defined Contribution: Time to Take Action” by Elizabeth Bauer
- “Hedging Against Inflation Risk With Real Annuities” by Zvi Bodie and Dirk Cotton
- “Take Ownership of Your Retirement Process: Oversight Tool to Understand Risks” by Max J. Rudolph
- “Layered Liquidity Management in Retirement” by Gwen Yun Weng
- “AROMER: Solving the Catch-22 of the 401(k)” by Kalon McMahon
- “A Danish Perspective on Investment-Based Retirement Income: Innovative DC Retirement Income Solutions From Denmark” by Per U.K. Linnemann
Other essays (con’t)

- “Introducing the Total Benefit Account: A Single Source of Employer Funding for Employee Needs” by Doug Spencer and Greg Ward
- “Think Like an Actuary to Assess and Mitigate Retirement Risks” by Ken Steiner
- “Strategies for Addressing Retirement Risks” by Anil Suri and Nevenka Vrdoljak
- “Tontine Savings Accounts” by Jonathan Barry Forman and Richard K. Fullmer
- “The 100-Month Protection Plan: A Private Social Security Annuity” by John Cutler
SeLFIES: A New(ity) Look at Retirement

Arun Muralidhar, PhD

Coauthors:
Professor Robert C. Merton, PhD, Nobel Laureate
Financial Advisor Paula Hogan CFPR, CFA

Date: October 2020
Retirement Security: Challenges Are Global
Trend Has Been to Pass Responsibility to Individuals

DB Plans Closed/Not Offered to Individuals
Many Individuals Not Covered by Any Plan

Longevity Increasing. Families more Dispersed
Low Financial Literacy. Conflicted Service Models

Yet the Goal is: Be Able to Maintain Pre-Retirement Lifestyle until Death

Need an “Out-of-the-Box” Solution
Biggest Challenge
Mismatch between Investor Goals and Industry Response

❖ Investors Understand Their Goals
  ❖ Maintain standard of living with certainty
  ❖ Have access to products they understand

❖ Industry Response is Mismatched
  ❖ Uses end of period wealth as key metric
  ❖ Does not offer a “safety-first” approach for protecting base standard of living
  ❖ Solutions that require financial literacy

⇒ Need Solutions that Individuals Can Implement With No Additional Training
DC Pension Plans Have Multiple Challenges
Could Lead to Widespread Retirement Problems

- **Risk** transferred to Individuals (one lifetime)
- **Complex Decisions** transferred to individuals
  - How much to save?
  - How best to decumulate? What annuity to buy?
- **Financial Illiteracy** confounds decision-making
- **High Cost** from involvement of multiple parties

But Goal Unchanged: Seek Guaranteed Real Retirement Income


Simple Goal: Steady Cash Flow Till Death
Guaranteed and Real = Preserve Pre-Retirement Lifestyle

- Work 40 Years: No Cash Flows Needed
- Retired for 20 Years: Need Steady Cash Flows
- With Protection from pop-up expenses
- Longevity Risk Adds Complexity

Problem: No Asset has this Profile/Bridges Time Gap; Annuities Not Flexible
Industry Uses the Wrong “Safe” Asset
Current T-Bills, Bonds or TIPS are Not “Safe”

T-Bills/bonds protect principal (wealth), not retirement income

Highly Volatile: Annuity/income perspective

Current products (either Stock-Bond or Life-cycle Funds) are risky

Current “Safe” Assets Are Risky; Too Much Focus on Wealth vs Income

Even US TIPs Are Risky in Retirement Plans

Cash Flow Mismatch/Reinvestment Risk

US TIPs maturity = 30 years maximum
(slightly longer in some countries - S.Africa)

❖ Can only hedge 10 years pre-retirement
❖ Do not need coupons when working
❖ Do not need Principal repayment
❖ Would require 61 additional small transactions to convert to desired outcome

More Pertinent Risk is Standard-of-Living Risk
Annuity = Inflexible to Purchase during Working Life
Solution: SeLFIES - A New Retirement Bond

Government Issues a New Bond

- Key Features:
  - Payment begins at age 65
  - Coupons-only for 20+ years (Life Expectancy)
  - $5 real/year
  - Goal of $50K annual @ $5 real/year = 10,000 bonds
    - Easy to track: 6,000 bonds = 60% of Goal

- If Individual Dies Early: Heirs Inherit Bonds (Easy to Bequeath) And Can Collect Income or Sell Bonds

- Change Retirement Date/Target Income: Simple

A Better “Safe” Retirement Asset


SeLFIES Deliver What is Needed
Designed to Require No Additional Financial Training

- Bond Cash Flows = Matches Retirement Goal
  - No bullet repayment, only steady Cash Flow
- Payment based on real amounts, not coupon (%)
  - $5 real/year
- Nominal Index linked to Goal – Per Capita Consumption
  - Hedges real Standard-of-Living risk for retirees
- Forward-starting: No cash flows when not needed
- Designed for financially unsophisticated population
  - Embeds Inflation, Compounding and Decumulation

Individual Just Needs to Specify Retirement Date and Target Income

Merton, R.C. and A. Muralidhar. 2019. Taking a closer look at SeLFIES: Added thoughts, clarifications, Pensions and Investments, May 27, 2019
Global Design – Suggested for Many Countries
Countries Can Customize to Their Unique Situation
SeLFIES – Good for Individuals

❖ Designed to Work with What People Know
   ✔ Date of Retirement and Target Income
❖ Embeds Compounding, Inflation & Decumulation
   ✔ Addresses Financial Competence
❖ Effective for Uncovered Workers Too
   ✔ Creates an “Individual DB”; Don’t Need Plan
❖ Easy to Track Progress Towards Retirement Goal
   ✔ Simple Math and Easy Calculations

→ Can Be Used “Out-of-the-Box”
SeLFIES – Good for Governments

✔ Reduces Risk of Retirement Poverty/Bailouts
✔ Cash flows from bond = Infrastructure needs
✔ VAT Regime = Government Hedged
✔ Boosts National Debt Demand
✔ Provides Near-Term Budget Relief
✔ Could be Transformational in Emerging Markets

Multiple Benefits for Governments Too
SeLFIES – Good for Financial Service Industry

✔ Goal of Individuals: Sustainable Retirement Income
Buy SeLFIES but Still Have Longevity Risk

✔ Goal of Insurance Companies: Profit/Manage Risk
Diversify Longevity Risk by signing large number of people

✔ Well-Designed SeLFIES
For right Maturity, Insurance Cos. would be willing to exchange 1 SeLFIES for Life Annuity paying $5 real/year till Death.
Price of SeLFIES vs Price of Annuity provides information about Design of Product and Longevity Diversification of Insurance Cos

Supports Product Innovation

SeLFIES: A Win/Win/Win

✓ **Individuals**  
Retirement income product that meets actual goals and is easy to use

✓ **Financial Services Industry**  
Improved hedging operations and product innovation

✓ **Government**  
Lower financial pressures, better cash flow match and potentially fund infrastructure

Source: The Economist, May 2018

Appendix


Comparing Retirement Outcomes: Benefit of Locking In
Comparing 60 Stock/40 Bond, Life-Cycle Portfolio, and SeLFIES

- Simple Experiment: Invest $100,000 for 10 yrs (Use Historical Data)
  - 60% in Stocks (S&P500 Index)/40% in Bonds (Barclays Agg Index)
  - TDF: Start with 90% Equity; Sell Equity, Buy Bonds every Year
  - Buy BFFS/SeLFIES Every Month
- After 10 years, Purchase Annuity at Retirement
- Buy 20-year Income Stream
- Other Approaches Highly Volatile; SeLFIES “Safe”
- Current Period: Historic Secular Decline in Rates

Products, Tools and Strategies that Address Retirement Risks

John A. Turner, PhD

October 28, 2020
New Approaches to Communicating to Workers About Pensions

• The paper I will be presenting is joint work with Yael Hadass, Marion Labouré, and Sally Shen.

• We have an international research team, representing by birth and current residence, Israel, France, UK, China, Canada, and the US.

• Our paper is a survey of new approaches being used to communicate to workers about pensions.
Strategies to Increase Pension Participation

- Over the past five decades, five approaches have been used sequentially and cumulatively to attempt to increase pension participation in voluntary pension systems.
- 1. tax preferences
- 2. matching contributions
- 3. financial education
- 4. automatic enrollment, with opt out
- 5. new approaches to communicating with workers
Communication Problems

• When asked in a U.S. survey if their employer’s communications help them make confident decisions, 76% indicated either “not very well” or “not at all.”

• At least a partial explanation may be that despite the Employee Retirement Income Security Act requirement that summary plan descriptions (SPDs) be understandable, because of the lack of enforcement of that requirement, a primary purpose of the documents currently is to protect employers from legal liability,

• This results in SPDs often being difficult to understand for many workers
Worker Engagement through Fun

• While pensions are generally not the liveliest topic, some employers have used fun to engage their employees.

• One example, is the company that hired a taco truck for a company outdoor pension benefits meeting, that might even work in a pandemic.

• Let’s Taco-Bout-Retirement™ was created by Jason Chepenik of Chepenik Financial of Orlando, who partnered with a food truck vendor and outfitted the food truck with signage displaying program slogans.

• At these events, they had enrollment cards with fun sayings such as, “Lettuce freshen up your future” and “Sign up now. Or you’ll be living la vida broke-a.”
Gamification

• Gamification is another approach. It involves gaming principles such as competition, status, recognition, challenge and fun to motivate people to learn certain material and perform certain actions, such as contributing to pensions.

• A computer game format in connection with pension enrollment can communicate the effect of delaying the start of pension contributions and the effect of contributing different amounts.

• Gamification can be used to teach people the basics about investing in pensions—such as issues about diversification.
UK

• In the U.K., one bank introduced an online computer game called Pension Jungle for its employees to encourage them to actively choose the level of their pension contributions when they were enrolling.

• Participants pick an avatar and provide information about their finances. An avatar is a visual representation of the player in the game setting.

• They learn about the company’s pension plan as they navigate a river.

• To avoid the rocks and crocodiles, participants need to correctly answer questions about the company’s pension plan.
Artificial Intelligence

• Artificial intelligence (AI) combined with data on individuals can be used to personalize pension communications.

• By analyzing data on their employees, such as age, income, sick leave usage and family status, pension sponsors can provide more targeted communications to their employees.

• It could encourage them to participate.

• It could provide better advice as to their pension investments.

• It could encourage them to increase their contributions, if their contributions are too low.
Investment Communications During Market Downturns

• One robo adviser has studied ways to better target communications to its clients.

• It categorizes its clients as either actively engaged or not actively engaged.

• It contacts its actively engaged clients during market downturns to encourage them not to sell stocks.

• It does not contact clients who are not actively engaged because some do not pay attention to stock market fluctuations but might react if those fluctuations are brought to their attention.
Negative vs Positive Communication

• Pension communication has often included statements such as “we know that pensions are a difficult topic,” or “we understand that it is not easy to make time for retirement planning when you are busy with planning the here and now.”

• These statements emphasize the barriers many individuals perceive that prevent them from acquiring information.

• However, focusing on the benefits of a search for plan information is a better predictor of the actual search for financial information.
Conclusions

• In this presentation, I have discussed some new approaches for communicating with employees about pensions.
• One approach is to make pension benefit meetings more fun.
• Another approach that incorporates fun and competition is gamification.
• A third approach is to use artificial intelligence combined with data on employees to better target communications to different types of participants.
7F: A Risk-Based Framework for Retirement Income Decisions

Evan Inglis, FSA, CFA

October 28, 2020
Three Key Questions & Evan’s Answers

<table>
<thead>
<tr>
<th>Q’s</th>
<th>A’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much can I spend?</td>
<td>• Divide your age by 20</td>
</tr>
<tr>
<td></td>
<td>• Feel free to spend that % of your wealth</td>
</tr>
<tr>
<td>Do I need annuity income?</td>
<td>Yes, if you want to spend more than age / 20</td>
</tr>
<tr>
<td>How should I allocate my assets?</td>
<td>More aggressively than conventional wisdom</td>
</tr>
</tbody>
</table>
The Basic Process

1. Determine safe spending level
2. Buy annuity income if desired spending is less than safe spending
3. Allocate assets
   • include annuity income in allocation
   • Social Security & pensions are annuity income
Assumptions

• Single individual, retiring at age 65
• Social Security income of $25,000 starting at age 65
• Investment portfolio of $1 million
• Minimum desired spending of $75,000 (Social Security + $50,000)
• Safe spending level = 3.5% of portfolio per year
• Inflation = 2.0%
• Nominal interest rate = 3.0%
• Annuity factor for lifetime income purchase = 16.0
  • Income rate = 1/16 = 6.25%
How much can I spend?

<table>
<thead>
<tr>
<th>Safe Spending Rule</th>
<th>Savings at Retirement</th>
<th>Safe Spending from Savings</th>
<th>Social Security</th>
<th>Total Safe Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>4% Rule</td>
<td>$1,000,000</td>
<td>$40,000</td>
<td>$25,000</td>
<td>$65,000</td>
</tr>
<tr>
<td>3.0%</td>
<td>$1,000,000</td>
<td>$30,000</td>
<td>$25,000</td>
<td>$55,000</td>
</tr>
<tr>
<td>Divide Age by 20</td>
<td>$1,000,000</td>
<td>$32,500</td>
<td>$25,000</td>
<td>$57,500</td>
</tr>
<tr>
<td>3.5%</td>
<td>$1,000,000</td>
<td>$35,000</td>
<td>$25,000</td>
<td><strong>$60,000</strong></td>
</tr>
</tbody>
</table>

- Relationship of spending to expected *real return* is key
- Safe spending % goes up with age
- Most retirees are uncomfortable spending down their savings
  - Spend whole life building up account
  - ‘I am a person with $xxx dollars’
  - Want to leave a bequest
How much annuity income do I need?

(Desired spending $ – Safe spending $) 
Divided by 
(Annuity income % – Safe spending %) 

($75,000 - $60,000) / (6.25% - 3.5%) = $545,456

Remaining savings = $1,000,000 - $454,544
Desired spending reached “safely”

<table>
<thead>
<tr>
<th>Source</th>
<th>Calculation</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Security</td>
<td></td>
<td>$25,000</td>
</tr>
<tr>
<td>Purchased lifetime income</td>
<td></td>
<td>$34,091</td>
</tr>
<tr>
<td>Safe spending from portfolio</td>
<td>3.5% x $454,544</td>
<td>$15,909</td>
</tr>
<tr>
<td>Total safe spending</td>
<td></td>
<td>$75,000</td>
</tr>
</tbody>
</table>
How to allocate assets

• Focus on income & spending, not wealth
  • High quality bonds have little risk since interest rate changes have little impact

• Use % drop in safe spending due to equity downturn as risk metric

• Adjust for personal preferences with risk aversion parameter
## Total Portfolio Calculation

<table>
<thead>
<tr>
<th>Income Source</th>
<th>Annual Payment</th>
<th>PV Factor</th>
<th>PV of income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Security</td>
<td>$25,000</td>
<td>18.92</td>
<td>$473,000</td>
</tr>
<tr>
<td>Purchased lifetime income¹</td>
<td>$34,091</td>
<td>14.97</td>
<td>$510,342</td>
</tr>
<tr>
<td>Total present value of lifetime income</td>
<td></td>
<td></td>
<td>$983,342</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source</th>
<th>Value</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifetime income</td>
<td>$983,342</td>
<td>68%</td>
</tr>
<tr>
<td>Remaining savings</td>
<td>$454,544</td>
<td>32%</td>
</tr>
<tr>
<td>Total portfolio</td>
<td>$1,437,886</td>
<td></td>
</tr>
</tbody>
</table>

¹Cost of lifetime income assumed to be 6.8% higher than value to account for insurance loads
Risk Aversion Factor

- Lifetime income allows for more aggressive portfolio
- More aggressive portfolio provides inflation protection

- Higher risk aversion => more fixed income
- More lifetime income => less fixed income

Fixed income % = (1 – lifetime income %) x risk aversion factor
### Allocation to Fixed Income and Equity

**Source** | **Value**   | **Percent**
---|-------------|-------------
Lifetime income     | $983,342    | 68%         
Remaining savings   | $454,544    | 32%         
Total portfolio      | $1,437,886  |             

**Investment allocation**

<table>
<thead>
<tr>
<th>Risk aversion</th>
<th>Equity</th>
<th>Fixed income</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>84%</td>
<td>16%</td>
</tr>
<tr>
<td>0.75</td>
<td>76%</td>
<td>24%</td>
</tr>
<tr>
<td>1.0</td>
<td>68%</td>
<td>32%</td>
</tr>
</tbody>
</table>

**Overall allocation**

<table>
<thead>
<tr>
<th>Equity</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>27%</td>
<td>73%</td>
</tr>
<tr>
<td>24%</td>
<td>76%</td>
</tr>
<tr>
<td>22%</td>
<td>78%</td>
</tr>
</tbody>
</table>

**Fixed income % = (1 – lifetime income %) x risk aversion factor**
Impact on spending of -50% equity return

YEAR 1
-$15,909
-$34,091
-$25,000

YEAR 2
-$9,227
-$33,423
-$25,000

-9.8% drop in spending

1Purchased annuity amount adjusted for inflation
### Sample Allocations for Moderate Risk Aversion
(risk aversion = 0.5)

<table>
<thead>
<tr>
<th>Case</th>
<th>Annuity Payments</th>
<th>Portfolio Values</th>
<th>Investment Allocation</th>
<th>Overall Allocation</th>
<th>Safe Spending Decrease from Equity Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SS Benefit</td>
<td>Max Safe Spending Level</td>
<td>Present Value of SS + LI</td>
<td>Investment % of Overall Portfolio</td>
<td>Equity</td>
</tr>
<tr>
<td>1</td>
<td>20,000</td>
<td>27,000</td>
<td>200,000</td>
<td>378,310</td>
<td>35%</td>
</tr>
<tr>
<td>2</td>
<td>24,000</td>
<td>41,500</td>
<td>500,000</td>
<td>453,973</td>
<td>52%</td>
</tr>
<tr>
<td>3</td>
<td>28,000</td>
<td>45,500</td>
<td>500,000</td>
<td>529,635</td>
<td>49%</td>
</tr>
<tr>
<td>4</td>
<td>32,000</td>
<td>67,000</td>
<td>1,000,000</td>
<td>605,297</td>
<td>62%</td>
</tr>
<tr>
<td>5</td>
<td>20,000</td>
<td>47,000</td>
<td>200,000</td>
<td>677,692</td>
<td>23%</td>
</tr>
<tr>
<td>6</td>
<td>24,000</td>
<td>71,500</td>
<td>500,000</td>
<td>903,046</td>
<td>36%</td>
</tr>
<tr>
<td>7</td>
<td>28,000</td>
<td>113,000</td>
<td>1,000,000</td>
<td>1,278,090</td>
<td>44%</td>
</tr>
<tr>
<td>8</td>
<td>32,000</td>
<td>182,000</td>
<td>2,000,000</td>
<td>1,802,825</td>
<td>53%</td>
</tr>
</tbody>
</table>
Issues

• Couple v. individuals
• Difference between fixed and inflation-protected income
• Distinction between necessary and discretionary spending
• Income that starts after retirement

Spreadsheet available from author: revaninglis@gmail.com
Questions?