

 Aging and Retirement

Products, Tools, and Strategies that Address Retirement Risks - Essay Collection





Contents

- | | |
|--|---|
| 1 Introduction
Andrea Sellars and John Cutler | 36 Tontine Savings Accounts
Jonathan Barry Forman and Richard K. Fullmer |
| 4 FIRST PRIZE: A Risk-Based Framework for Making Retirement Income Decisions
R. Evan Inglis | 40 A Danish Perspective on Investment-Based Retirement Income: Innovative DC Retirement Income Solutions From Denmark
Per U.K. Linnemann |
| 11 SECOND PRIZE: SeLFIES: A-New(-ity) Look for Retirement
Robert Merton, Arun Muralidhar, Paula Hogan | 45 Aromer: Solving the Catch-22 of the 401(k)
Kalon McMahon |
| 16 THIRD PRIZE: New Approaches to Communicating to Workers About Pensions
Yael Hadass, Marion Laboure, Sally Shen, John Turner | 50 Take Ownership of Your Retirement Process: Oversight Tool to Understand Risks
Max J. Rudolph |
| 21 Collective Defined Contribution: Time to Take Action
Elizabeth Bauer | 57 Introducing the Total Benefit Account: A Single Source of Employer Funding for Employee Needs
Doug Spencer and Greg Ward |
| 25 Hedging Against Inflation Risk With Real Annuities
Zvi Bodie and Dirk Cotton | 60 Think Like an Actuary to Assess and Mitigate Retirement Risks
Ken Steiner |
| 32 The 100-Month Protection Plan: A Private Social Security Annuity
John Cutler | 66 Strategies for Addressing Retirement Risks
Anil Suri and Nevenka Vrdoljak |
| | 73 Layered Liquidity Management in Retirement
Gwen Yun Weng |

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Introduction

Andrea Sellars and John Cutler

The Society of Actuaries' (SOA) Committee on Post- Retirement Needs and Risks issued its fifth annual call for essays in September 2019. Previous essay collections addressed a variety of issues including diverse risks encountered in retirement; developments in financial wellness; perspectives and potential solutions to the problem of ensuring retirement preparedness and innovations for securing future retirements; and the role that family structure can have on financial and retirement security. The collections can be found on the SOA website at: <https://www.soa.org/research/topics/research-post-retirement-needs-and-risks/#other>.

This fifth call for essays aimed to gather perspectives, opinions and data on how to advance the state of effective retirement planning tools, products, and strategies to assist individuals, financial advisors, employers and other stakeholders. The goal was to meet two objectives: (1) identify retirement risks, and (2) how to better plan for and maintain a secure retirement. Fourteen essays were submitted. John Cutler and Andrea Sellars chaired the project oversight group that developed the topic for the essays and overall goal. A panel of judges did a blinded review of the essays for publication and awards. The judges selected three essays for awards with \$3,500 awarded per essay. Consideration was given to creativity, originality and the extent to which an idea could contribute to the further development of solutions. The winning essays will be published in upcoming issues of the *Retirement Section News*.

The winning essays are the following:

- R. Evan Inglis, *A Risk-Based Framework for Making Retirement Income Decisions*. This essay provides a framework for making retirement decisions as to how much one can spend in retirement, how much lifetime (annuity) income is needed, and how one should allocate their retirement assets. The approach described provides an integrated solution that includes the availability of a lifetime income in the decision about asset allocation, which often results in a more aggressive decumulation portfolio than other more conventional methods.
- Robert C. Merton, Arun S. Muralidhar, Paula H. Hogan, *SeLFIES: A-New(-ity) Look for Retirement*. This essay poses a retirement planning challenge that looks to finance science to suggest what the authors regard as an elegantly simple solution to help individuals prepare for a financially secure retirement. Their concept is the creation of a simple new financial instrument that is a win-win-win for individuals, governments and the financial services industry. The authors propose that governments globally issue new long-term bonds, nicknamed SeLFIES - "Standard of Living Indexed, Forward-starting, Income-only Securities" that are a series of government-issued bonds, designed to mimic pension payments, that can be purchased directly by individuals (to create a type of "individual DB") or institutions from their respective governments. The essay covers the mechanics, uses and advantages of such on instrument to the individual, financial institutions and the government.
- Yael Hadass, Marion Laboure, Sally Shen and John Turner, *New Approaches to Communicating to Workers About Pensions*. This essay presents the case that in a voluntary pension system, retirement communications need to address four components: 1) the information transmitted; 2) the way in which the information is presented; 3) the way the information is transmitted; and 4) the format in which the information is transmitted. The new approach would add elements of humor, gamification, artificial intelligence and personalization all designed to encourage action (e.g., such as participating in a plan).

Our congratulations go to those authors for their excellent, thought provoking submissions.

The eleven essays listed below also contain excellent ideas and other innovative solutions including:

- *Collective Defined Contribution: Time to Take Action* by Elizabeth Bauer describes plans which attempt to create a hybrid pension approach with characteristics of both Defined Benefit and Defined Contribution plans. Participants share risks collectively rather than bearing them individually as in DC plans; or having them protected by employers as in DB plans. It reviews the features of plans found in the Netherlands, Canada, and features found in Taft Hartley multiemployer plans as well as in Wisconsin Retirement System plans. It challenges the profession to use our skills to define and ultimately promote a new hybrid system.
- *Hedging Against Inflation Risk With Real Annuities* by Zvi Bodie and Dirk Cotton presents a case for insurers to offer - and annuitants to elect – a “real annuity” (often referred to as an inflation- indexed single-premium immediate annuity) that both insures against longevity risk and hedges against inflation by linking the benefit to the consumer price index. The essay presents pros and cons and financial illustrations of the cost/benefit of the approach versus a “nominal annuity” that ignores inflation.
- *The 100-Month Protection Plan: A Private Social Security Annuity* by John Cutler proposes adding a right to allow individuals to buy an additional annuity at age 62 through the Social Security system to enable the enrollee to defer his usual Social Security benefit until age 70 -- 8 years or roughly 100 months -- and thereby get more of an income stream for a delayed start. The essay covers details about how this annuity could be structured, and issues addressed by this approach.
- *Tontine Savings Accounts* by Jonathan Barry Forman and Richard K. Fullmer presents a case for using open-ended “Tontine Saving Accounts” that would add a feature to regular savings accounts by sharing in mortality pooling. The pools envisioned would allow individual selection of investments and payout options but would function like annuities by not allowing early withdrawals. The financial arrangement would require investors to mutually and irrevocably agree to receive payouts while living; and forfeit the remaining portion of their accounts upon death to the surviving investors. Financial illustrations are provided and suggest investors could receive a valuable source of lifetime income from such a product.
- *A Danish Perspective on Investment-Based Retirement Income: Innovative DC Retirement Income Solutions From Denmark* by Per U.K. Linnemann gives a thorough review of the Danish investment-based retirement income solutions (iTDFs) and smoothed income annuities (SIAs), their design elements, optional features, functions and advantages over traditional income payment options.
- *Aromer: Solving the Catch-22 of the 401(k)* by Kalon McMahon describes a new retirement strategy/product dubbed AROMER that is a fully funded retirement investment account option whereby a third-party financier offers to contribute to a retirement plan account on behalf of a plan participant. This creates an additional retirement plan participant and converts a non-saver into a saver without requiring them to take any action or make any lifestyle changes. This product does not create a loan but, in exchange for funding the participant’s retirement account, the financier is entitled to a majority split (60/40) of the retirement plan balance.
- *Take Ownership of Your Retirement Process: Oversight Tool to Understand Risks* by Max J. Rudolph shares a tool the author uses to build individual alternative retirement planning scenarios, allowing him to better understand which assumptions are the drivers of his own personal situation. He covers the tools assumptions, variables, and sample base and alternative scenarios and how they could be used by others.
- *Introducing the Total Benefit Account: A Single Source of Employer Funding for Employee Needs* by Doug Spencer and Greg Ward proposes that instead of employers sponsoring separate plans to pay separate benefits they allow employers to set up one “Total Benefit” account to pay all benefits on a pre-tax basis (excepting the employer retirement plan matching contributions). The essay discusses how this structure would benefit employees at different stages of life and under different circumstances; and employers in controlling and lowering costs.
- *Think Like an Actuary to Assess and Mitigate Retirement Risks* by Ken Steiner proposes that households should apply the traditional actuarial balance sheet approach and pension cost equations to personal financial planning. The author presents the balance sheet equation, the sources of income and expenditures to be considered, the elements of risks to be considered, and the characteristics of an effective tool that would incorporate the recommendation.
- *Strategies for Addressing Retirement Risks* by Anil Suri and Nevenka Vrdoljak presents steps people can take to help boost retirement finances by addressing key retirement risks. The essay describes four risks that retirees face: longevity, health care, sequence of returns and inflation. It examines strategies that may help mitigate these risks

and the financial implications of each: wisely deciding when to retire, carefully choosing when to claim Social Security, allocating assets to a lifetime income annuity, prudently drawing down assets from a balanced portfolio, and planning ahead for future possible long-term care needs.

- *Layered Liquidity Management in Retirement* by Gwen Yun Weng divides the liquidity needs in retirement into three layers based on the likelihood and predictability of the liquidity events and proposes a management framework and strategies to manage each layer. The essay proposes that a simple framework could help retirees understand and analyze their financial needs in a clear and systematic manner.

As in previous years, we hope the publication of these essays will further add to our knowledge base, stimulate discussion and promote future efforts in this area. Plans are underway for the next call for essays and thoughts for future topics are always welcome.

Finally, our appreciation and congratulations again go out to all of our authors who have contributed to another successful year, and our thanks go out to the members of the Project Oversight Group for their participation and contribution to this effort.

POG members are: John Cutler (Co-Chair), Andrea Sellars (Co-Chair), 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.

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A Risk-Based Framework for Making Retirement Income Decisions

R. Evan Inglis

Making financial decisions for retirement isn't easy! Unfortunately, conventional wisdom may not produce optimal outcomes because the interaction of risks related to longevity, spending and investments is hard to assess. There are three key financial questions that people ask:

- How much can I spend?
- How much lifetime (annuity) income do I need?
- How should I allocate my assets?

This essay provides a framework for making these decisions, and will focus on the last two, which get less attention. Each of the decisions has an impact on the other questions so using a holistic framework provides better, integrated solutions. The approach is targeted at helping experts create solutions. It's straightforward, but somewhat technical, and it provides new insight and some surprising answers. The framework is characterized by:

- A focus on income that meets the spending needs and desires of a retiree
- Use of lifetime income (annuities) to increase spending
- Asset allocation that takes explicit account of lifetime income, including Social Security

The goal is to secure a desired spending level with a high degree of confidence. It's assumed that wealthier retirees are willing to take more risk with their spending to potentially increase wealth. Two key parameters that impact the answers are:

- A safe spending level defined as a percent of total savings per year
- A risk-aversion parameter similar to those used in utility functions in economics

A simple risk metric based on potential drops in the safe spending level is used to assess portfolio allocations. The risk-aversion factor adjusts the allocation for personal preferences about potential decreases in the safe spending level. The recommended portfolio will typically sustain an acceptable level of safe spending even in a severe equity downturn.

An example will illustrate the process. The example is for a single person, who just retired and uses a fixed dollar annuity to increase safe spending. The adaptations for couples, pre-retirees and variable annuities are relatively straightforward and a spreadsheet tool to do these calculations is available from the author.

DATA FOR THE EXAMPLE

We'll assume the following for our example:

- 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 (\$50,000 in addition to Social Security)
- 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 = $1/16 = 6.25\%$

DECISION 1. HOW MUCH CAN I SPEND?

We won't go into detail on the question "How much can I spend?" but the following guidelines will provide an answer to illustrate the process for addressing the lifetime income and asset allocation questions.

- **The 4% rule.** This standard is old but still has relevance. It's old mostly because it was developed when expected asset returns were higher, but 4% is still a reasonable spending level for many retirees. A retiree using the 4% rule would spend 4% of their portfolio in the first year of retirement, but then also increase that spending with inflation every year during retirement.
- **3% spending.** This is a simpler and more conservative approach to spending than the 4% rule. It's more conservative because it's a lower level of spending but also because the level of spending will adjust with the portfolio value—if the level of savings drops, then the safe level of spending will also drop.

Together these approaches define a range for safe spending levels and we'll use a safe spending level of 3.5% in the following sample calculations. However, different levels may be more appropriate for different retirees and advisers may want to use their own favored approach. Now we can turn to the two decisions of interest—the right amount of lifetime income and an asset allocation for the retiree's investable assets.

DECISION 2. HOW MUCH LIFETIME INCOME DO I NEED?

When the desired level of spending exceeds the safe level of spending for a retiree, then annuity income can be purchased to increase the safe spending level. The formula for determining how much savings to allocate to lifetime income is:

$$(\text{Desired spending } \$ - \text{Safe spending } \$) / (\text{Annuity income rate} - \text{Safe spending } \%)$$

For our sample retiree, the calculation is:

$$\begin{aligned} \text{Lifetime income } \$ &= [(\$75,000 - \$25,000) - 3.5\% \times \$1,000,000] / (6.25\% - 3.5\%) \\ &= \$545,456 \text{ to buy an annuity payment of } \$34,091 \text{ } (\$545,455 \times 6.25\%). \end{aligned}$$

After the purchase of lifetime income, the remaining portfolio is equal to \$454,544, and the total safe spending is at the desired level, as shown in Table 1.

Table 1
Safe Spending Example

Source	Calculation	Amount
Social Security		\$25,000
Purchased lifetime income		\$34,091
Safe spending from portfolio	3.5% x \$454,544	\$15,909
Total safe spending		\$75,000

The tremendous value of income guaranteed for life is shown by the significant increase in safe spending that is achieved—from \$60,000 (\$25,000 + 3.5% x \$1,000,000) to \$75,000. The value of this guarantee, which may also come from defined benefit pensions, is also important when determining asset allocation as described

later. Any of the various options for securing lifetime income including fixed, variable or inflation-indexed annuities, can fill the role of guaranteed lifetime income that increases safe spending.¹

DECISION 3. HOW SHOULD I ALLOCATE MY ASSETS?

Asset allocation is often based on an efficient frontier using the capital asset pricing model. The objective is to maximize return for a given level of risk, with risk defined as volatility in the investment returns. The typical analysis misses:

- **The income objective of a retiree.** In this essay, we presume that the objective for a retiree is not returns and wealth, but income and the spending it can support.
- **The impact of guaranteed lifetime income.** In this essay, we explicitly include the guaranteed lifetime income because it provides steady payments like fixed income—in fact, it is even lower risk than bond investments based on the objective of providing retirement income.

Because the typical analysis ignores lifetime income, many retirees have portfolios that are too conservative. The problem with these portfolios is that too much is invested in bonds so the value will not grow with inflation to support spending needs that increase.

We will use a simple metric to assess portfolio allocations: the percentage decrease in safe spending due to an equity downturn. We view fixed income as posing no risk to the spending objective, as explained here. Lifetime income is fixed income, so we calculate the present value (PV) of lifetime income streams and include them in the analysis. The portfolio that includes the lifetime income is referred to as the “overall portfolio” and, without the lifetime income, we will refer to the “investment portfolio.” The process for determining asset allocation goes like this:

1. Calculate the present value of Social Security and any other lifetime income, as seen in Table 2.

Table 2
Total Present Value Calculation

Income Stream	Annual Payment	PV Factor	PV
Social Security	\$25,000	18.92	\$473,000
Purchased lifetime income	\$34,091	14.97	\$510,342
Total present value			\$983,342

Notes: PV factors based on RP-2014 mortality; Social Security PV factor based on 3.0% interest rate and 2.0% inflation; purchased lifetime income PV factor based on 3.0% interest; it was assumed that the purchase of lifetime income costs 6.8% more than the present value shown here, due to loads and profit for an insurance company.

2. Calculate the percentage of the overall portfolio made up of lifetime income, as seen in Table 3.

¹ Fully inflation-indexed annuities are low risk but expensive. Fixed annuities may be well suited to typical retiree spending patterns where inflation-adjusted spending decreases at older ages. Variable annuities create additional risk but usually provide for higher lifetime spending.

Table 3
Overall Portfolio Calculation

Source	Value	Percent
Lifetime income	\$983,342	68%
Investments	\$454,544	32%
Overall portfolio	\$1,437,886	100%

- Determine the fixed income and equity allocations for the investment portfolio.

We allocate the investments considering that there is little risk to **spending** from the lifetime income stream. The more lifetime income, the less we need to invest in bonds, a trade-off that is accomplished using this formula:

$$\text{Fixed income \%} = (1 - \text{lifetime income \%}) \times \text{risk-aversion factor},$$

$$\text{Fixed income \%} = (1 - 68\%) \times 0.5 = 16\% \text{ for our sample retiree.}$$

The investment portfolio for our sample retiree is appropriately invested with 84% in equities (or other riskier growth-oriented assets) and 16% in fixed income.² The investment allocation is aggressive because a large portion of wealth is in lifetime income. A retiree who thought the 84/16 allocation was too aggressive or that the risk to spending was too great, could use a higher risk-aversion factor, as high as 1.0. For example:

$$\text{Fixed income \%} = (1 - 68\%) \times 1.0 = 32\%.$$

This 68/32 portfolio is still aggressive by conventional standards, but that is appropriate because the amount of lifetime income is so substantial. Explicitly recognizing the value of Social Security and other lifetime income creates portfolios with acceptable levels of spending risk without sacrificing too much growth potential.

ASSESSING RISK

A simple, effective risk metric is the potential change in safe spending due to an equity market drawdown. No assumptions about volatility or asset class correlations are needed.

No risk is attributed to bonds because they secure income so effectively. When bonds lose value, the yield increases and they continue to provide the same investment income. The risk related to bonds in retirement is that they do not grow with inflation. While the process described here doesn't directly address the risk of inflation to spending power, it does result in relatively high allocations to equities which, over time, will provide growth related to inflation.

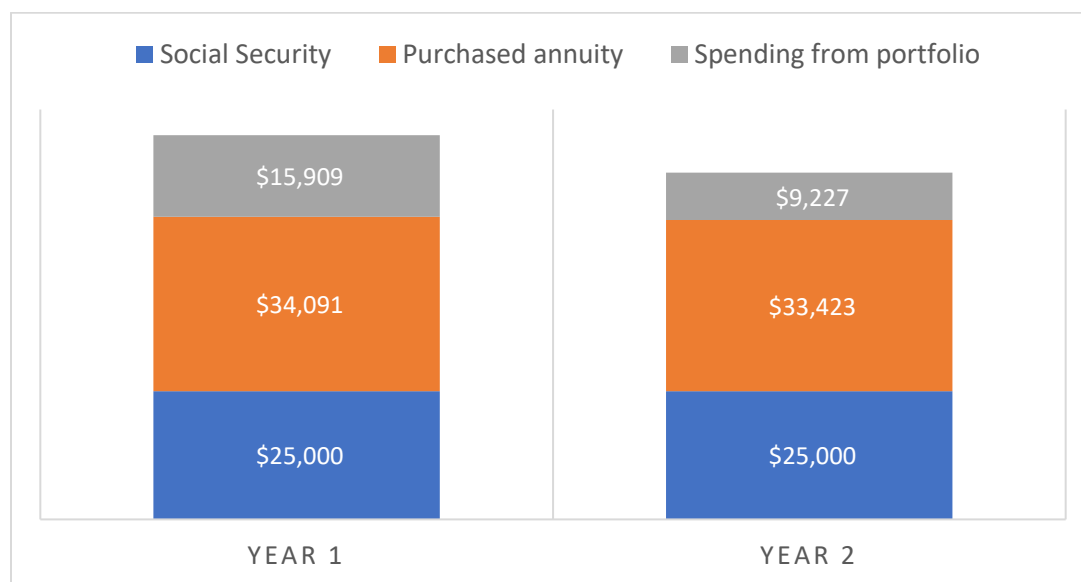
The potential drop in income with the aggressive 84/16 investment portfolio, even if the equity market drops 50%(!), is only 8.9% because so much of the income is already secured. This calculation is shown below.

$$\begin{aligned} \text{Potential spending drop} &= \text{potential equity drawdown} \times \text{equity allocation} \\ &\quad \times \text{safe spending from portfolio/desired total spending} \\ -8.9\% &= -50\% \times 84\% \times (3.5\% \times 454,544)/\$75,000. \end{aligned}$$

² Fixed income here refers to low-default risk investments such as Treasury securities or high quality corporate bonds. The duration of the fixed income investments is an important factor that is not covered here.

Figure 1 gives a visual sense of the impact of a large equity market downturn.

Figure 1
Impact on Spending of -50% Equity Return



Note: Spending and returns are shown in real terms assuming 2% inflation.

The loss in income for the risk-averse retiree who chose a 68/32 portfolio would be 7.3%. This change is likely manageable and will often be temporary as the market recovers. While conventional wisdom is to cover “necessary expenses” with low risk assets, in reality even necessary expenses are usually flexible. People are willing to cut back during big market downturns, partly because everyone else is also cutting back.

Note that decreasing the safe spending level reduces risk to the safe spending level. If we assumed that the retiree with the high risk aversion (parameter = 1.0) was willing to live with a lower level of safe spending at 3.0%, we would derive a slightly higher allocation to equities of 73%, but have a lower potential drop in the safe spending level of 5.6%.

RESULTS FOR A VARIETY OF SITUATIONS

Table 4 shows the asset allocation for various combinations of Social Security and other lifetime income payments and portfolio values. Allocations to equities are very high for some typical retirement situations, but the potential drop in income does not look onerous. The risk to spending is higher for higher levels of wealth and income, as appropriate.

Table 5 shows very conservative solutions for retirees with higher risk aversion and the willingness to adopt a lower safe spending level. These low risk solutions limit the potential drop in safe spending to less than 10% even in dramatic equity market downturns.

One important idea to be gleaned from the tables is that lower wealth individuals should have relatively aggressive portfolios because such a large portion of their spending comes from Social Security.

Table 4
Asset Allocation for Typical Retiree, Moderate Risk Aversion

Case	Annuity Payments		Max Safe Spending Level**	Portfolio Values		Investment % of Overall Portfolio	Investment Allocation		Overall Allocation		Safe Spending Decrease from Equity Decline		
	SS Benefit	Lifetime Income *		Investment Portfolio	Present Value of SS + LI		Equity	Bonds	Equity	Bonds + SS + LI	-50%	-25%	-10%
1	20,000	0	27,000	200,000	378,310	35%	83%	17%	29%	71%	-10.7%	-5.4%	-2.1%
2	24,000	0	41,500	500,000	453,973	52%	74%	26%	39%	61%	-15.6%	-7.8%	-3.1%
3	28,000	0	45,500	500,000	529,635	49%	76%	24%	37%	63%	-14.6%	-7.3%	-2.9%
4	32,000	0	67,000	1,000,000	605,297	62%	69%	31%	43%	57%	-18.0%	-9.0%	-3.6%
5	20,000	20,000	47,000	200,000	677,692	23%	89%	11%	20%	80%	-6.6%	-3.3%	-1.3%
6	24,000	30,000	71,500	500,000	903,046	36%	82%	18%	29%	71%	-10.1%	-5.0%	-2.0%
7	28,000	50,000	113,000	1,000,000	1,278,090	44%	78%	22%	34%	66%	-12.1%	-6.0%	-2.4%
8	32,000	80,000	182,000	2,000,000	1,802,825	53%	74%	26%	39%	61%	-14.2%	-7.1%	-2.8%

Notes: Retirement and Social Security start age = 65; risk-reduction parameter = 0.5; safe spending % = 3.5%

* Includes pensions, annuities or other sources

** Individuals may have lower desired levels of spending, allowing for higher equity allocations

Table 5

Asset Allocation for Risk-Averse Retiree, Low Safe Spending and High Risk Aversion

Case	Annuity Payments		Max Safe Spending Level**	Portfolio Values			Investment Allocation		Overall Allocation		Safe Spending Decrease from Equity Decline		
	SS Benefit	Lifetime Income*		Investment Portfolio	Present Value of SS + LI	Investment % of Overall Portfolio	Equity	Bonds	Equity	Bonds + SS + LI	-50%	-25%	-10%
1	20,000	0	26,000	200,000	378,310	35%	65%	35%	23%	77%	-7.5%	-3.8%	-1.5%
2	24,000	0	39,000	500,000	453,973	52%	48%	52%	25%	75%	-8.9%	-4.4%	-1.8%
3	28,000	0	43,000	500,000	529,635	49%	51%	49%	25%	75%	-9.2%	-4.6%	-1.8%
4	32,000	0	62,000	1,000,000	605,297	62%	38%	62%	22%	78%	-8.9%	-4.4%	-1.8%
5	20,000	20,000	46,000	200,000	677,692	23%	77%	23%	18%	82%	-5.0%	-2.5%	-1.0%
6	24,000	30,000	69,000	500,000	903,046	36%	64%	36%	23%	77%	-7.0%	-3.5%	-1.4%
7	28,000	50,000	108,000	1,000,000	1,278,090	44%	56%	44%	25%	75%	-7.8%	-3.9%	-1.6%
8	32,000	80,000	172,000	2,000,000	1,802,825	53%	47%	53%	25%	75%	-8.3%	-4.1%	-1.7%

Notes: Retirement and Social Security start age = 65; risk-reduction parameter = 1.0; safe spending % = 3.0%

* Includes pensions, annuities or other sources

** Individuals may have lower desired levels of spending, allowing for higher equity allocations

CONCLUSION

Standard approaches to determining safe spending, the need for lifetime income and developing portfolios for retirees have not been based on an income objective or been integrated with each other. The approach described here provides coordinated solutions to the key financial questions in retirement. It includes lifetime income in the decision about asset allocation, often resulting in a more aggressive portfolio than conventional methods. Advisers and others who are financially savvy may find this framework to be an improvement on conventional methods.

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SeLFIES: A-New(-ity) Look for Retirement

Robert C. Merton, Arun S. Muralidhar and Paula H. Hogan

Individual investors, policymakers and members of the financial services industry are struggling to figure out how best to help individuals prepare for a financially secure retirement, namely, allowing individuals to continue their pre-retirement standard of living post retirement. We propose that an incorrect specification of the problem to be solved is leading, not surprisingly, to suboptimal proposed solutions.¹ When the retirement planning challenge is posed correctly, finance science suggests an elegantly simple solution—the creation of a simple new financial instrument that is a win-win-win for individuals, governments and the financial services industry.²

Individual investors would like to be financially secure in retirement but are being moved from defined benefit (DB) plans, which provided such security courtesy of the plan sponsor, to defined contribution (DC) plans. In DC plans, individuals bear all the risk, must be self-reliant and are impeded by their lack of financial literacy. Moreover, current practice in DC plans focuses on accumulation through a diversified portfolio and decumulation either through a lump sum, some planned withdrawal strategy or the purchase of annuities at retirement. In crude expectation, investors will probably be fine with this approach, but they bear enormous market, interest rate and credit risk with these approaches, even in the long run. The probability that they will not achieve their retirement goals is increased further because current approaches are goal-agnostic (or focus on the wrong goal). In essence, the industry has come up short for the individual who seeks retirement security.

We propose instead a goal-based strategy where the goal of retirement is to achieve a target, guaranteed income to cover a base standard of living in retirement years, as opposed to accumulating to achieve a volatile target wealth number (that is hopefully sufficient for retirement-income needs). To achieve this revised specification of the retirement challenge (i.e., goal), we need an actionable solution and not just another complex investment strategy where the investor bears all the risk, often for high fees. Ideally, we need an investment vehicle from a reliable, unconflicted source (i.e., low risk). This vehicle should be easy to understand without financial education, liquid and fairly priced so that individuals can use it to create a floor of lifetime real income at the level they choose through either a series of small purchases over time (via their periodic contributions to the retirement plan throughout their working lives) or through larger lump-sum purchases. Current products like annuities or lifetime income replication portfolios do not meet these criteria.

Given current challenges, we propose that governments globally issue a new long-term bond, nicknamed SeLFIES: Standard-of-Living indexed, Forward-starting, Income-only Securities. SeLFIES have all these attractive properties and can make individuals self-reliant in retirement planning, while benefitting governments and the financial services industry.³

MECHANICS, USES, ADVANTAGES FOR INDIVIDUAL INVESTORS

SeLFIES are a series of government-issued bonds, designed to mimic pension payments, that can be purchased directly by individuals (to create a type of individual DB) or institutions from their respective governments. They would be issued through the same procedures adopted for current bonds ensuring transparency of price discovery,

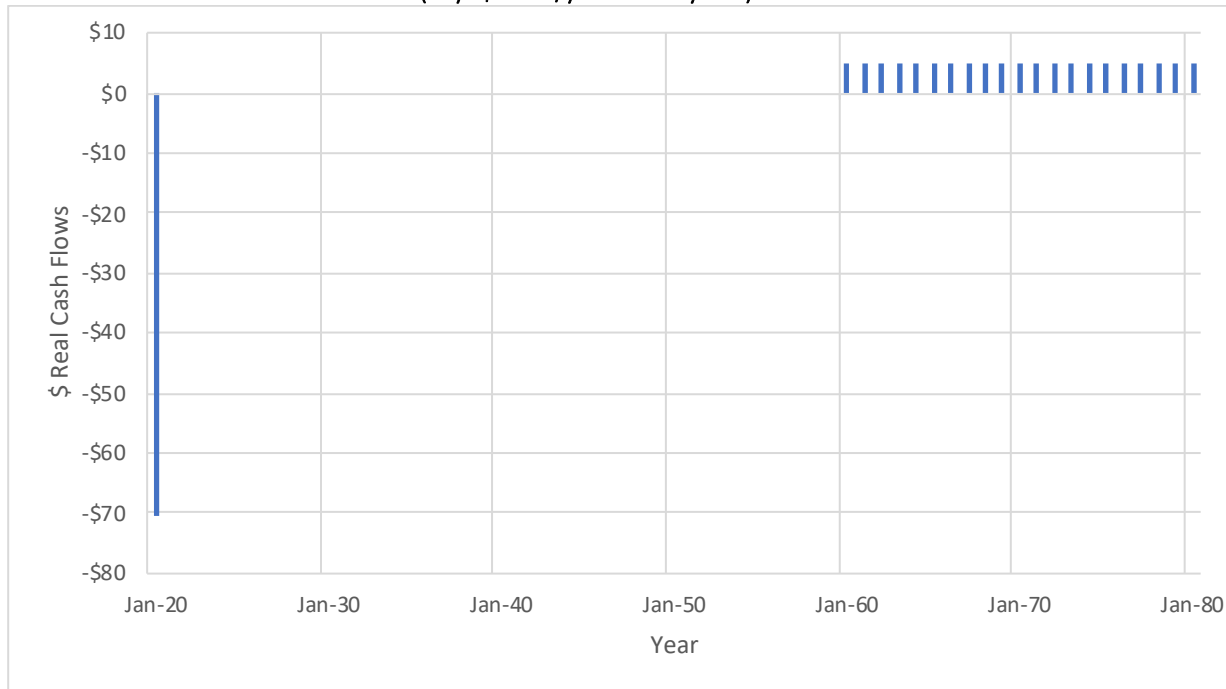
¹ Robert C. Merton, 2014, The Crisis in Retirement Planning, *Harvard Business Review* 92, no. 7/8.

² Arun Muralidhar, Kazuhiko Ohashi and Sung Hwan Shin, 2016, The Most Basic Missing Instrument in Financial Markets: The Case for Forward-Starting Bonds, *Journal of Investment Consulting* 16, no. 2:34–47; Robert C. Merton and Arun Muralidhar, 2019, Taking a Closer Look at SeLFIES: Added Thoughts and Clarifications, *Pensions & Investments*, May 27.

³ Robert C. Merton and Arun Muralidhar, 2020, SeLFIES: A New Pension Bond and Currency for Retirement, *Journal of Financial Transformation* 51, April.

liquidity and low cost. SeLFIES start paying investors upon retirement and only pay real coupons (e.g., \$5), indexed to aggregate per capita consumption, for a period linked to the average life expectancy at retirement (e.g., 22 years). Figure 1 shows a very simple cash flow chart of SeLFIES that start paying in 2060 for 22 years. The sharp negative bar in 2020 is the potential payment made today to acquire the desired retirement cash flow stream (i.e., the price of SeLFIES).

Figure 1
Real Cash Flows of 2060 SeLFIES Bond (Pays \$5 real/year for 22 years)



Current bonds index solely to inflation; SeLFIES cover both the risk of inflation and standard-of-living improvements. Standard-of-living risk is critical in retirement planning and often underappreciated in the pension reform debate. This indexation ensures that retirees preserve their standard of living, especially since retirement planning is potentially a 60-year process and technological progress over this long time period can dramatically alter the consumption basket. More importantly, the information needed by a SeLFIES user is already known to the buyer and there is no need for user education on compound interest, converting wealth into an estimate of retirement income, understanding inflation versus nominal bonds, etc. The design exemplifies how financial products should be designed but generally are not.

SeLFIES are designed to pay people *when* they need it and *how* they need it, and greatly simplify retirement investing. A 55-year-old in 2019 would buy the 2029 bond, which would start paying coupons at age 65, and keep paying, for say, 22 years, through 2051. A 64-year old in 2019 would buy the 2020 bond, so it caters to all individuals independent of retirement date. The following example highlights its simplicity: If individuals want to guarantee \$50,000 annually, risk free for 22 years in retirement, to maintain their current standard of living, they would need to buy 10,000 SeLFIES (\$50,000 divided by \$5) over their working life. This simple re-specification of the retirement goal to a target (real), steady income level drives the design of SeLFIES.

SeLFIES require only the most basic information and offer choices for buyers of any educational strata. The two required inputs are anticipated date of retirement (i.e., the SeLFIES payment start date) and target income goal for a good retirement, which determines the number of SeLFIES needed to reach this goal. If they change their retirement date, they could easily sell/buy the relevant SeLFIES with little effort and cost (unlike retirement income

replication products). The complex decisions of how much to save, how to invest and how to drawdown are simply folded into an easy calculation of how many bonds to buy. In addition to being simple, liquid, easily traded at very low cost and with low credit risk, SeLFIES can be bequeathed to heirs in case death occurs before the bond payments cease (unlike typical annuities) and heirs can either sell the bond or collect the income. Even the most financially illiterate individual can be self-reliant with respect to retirement planning with this unique design.

The buyer must simply set their goal at the level of income they currently live on, a number they already know and relate to in their everyday decisions. Since SeLFIES do not make payments until the retirement date, as shown in Figure 1, the buyer does not need to make any further transactions or decisions to reinvest coupon or principal payments during the entire accumulation period. One transaction, one time, for each SeLFIES bond purchased minimizes costs, decision effort and errors. Compare the cash flow from SeLFIES instead to either Treasury bills or long-term inflation-linked bonds in typical DC plan portfolios. For both current Treasury instruments, there is a mismatch between their cash flows and the cash flows required for retirement. Both pay coupons during working years when they are not needed and have a maturity shorter than the retirement planning window. These risks are borne by the individual with current DC products and practice.

CREATION OF BETTER INVESTMENT PRODUCTS

Products like target date funds (TDFs), on which the U.S. Department of Labor conferred “safe harbor” qualified default investment alternative (QDIA) protections, invest in current financial instruments and do not offer individuals any guarantee of target retirement wealth or income. Individuals defaulted into TDFs, especially with “auto” programs, could easily reach retirement with extremely inadequate retirement income (especially with low interest rates and uninformative statements focused on the level of assets or the current wealth accumulated). SeLFIES greatly enhance innovation by allowing for the creation of guaranteed retirement income products. Those seeking no-risk, low-cost, guaranteed retirement income can invest all their savings in SeLFIES. For more risk-taking retirement funding strategies, that cater to individuals who cannot/do not save enough to achieve their goal with risk-free investments and have the risk tolerance, a well-run asset management company can use a dynamic allocation strategy between risky assets and SeLFIES, with SeLFIES as the risk-free asset that locks-in guaranteed retirement income—a highly desirable result.⁴ Further, simple account statements, much like those from Social Security, illustrate the level of real, locked-in retirement standard of living, at current market prices, based on the number of bonds purchased (unlike current DC statements, which gives no indication of potential retirement standard of living).

SeLFIES do not directly provide an embedded annuity feature of payments for life but it does contribute to longevity risk protection for those who do eventually select full or partial annuitization at retirement, while providing decision flexibility to those who do not want to annuitize. The design calls for the number of years of payout to equal a period somewhat longer than the life expectancy for the cohort population at retirement. For example, if life expectancy at age 65 is 20 years (age 85), then the specified-payment period on the SeLFIES might be set at 22 years (age 87). A well-run insurance company should be willing to exchange a life annuity with the same \$5 indexed real payment for the specified term of \$5 real payments on the SeLFIES. If so, then the retiree can simply exchange their SeLFIES for a life annuity with no extra payment and no reduction of retirement income level. Those retirees in different circumstances can adjust accordingly and potentially enjoy the built-in de-accumulation payments in SeLFIES with no further transactions.

Why would a well-diversified insurance company be willing to exchange one SeLFIES bond for a life annuity that pays \$5 real/year till death (ignoring profit and cost considerations)? If the insurance company has insured a large group of diverse individuals in one cohort, then its net longevity realization should be close to the economy average of that

⁴ Adam Kobor and Arun Muralidhar, 2020, Targeting Retirement Security with a Dynamic Asset Allocation Strategy, *Financial Analysts Journal* forthcoming.

cohort, with relatively low risk. SeLFIES delivered in the exchange is the perfect hedging instrument for the insurance company's aggregate liabilities of this cohort. The somewhat longer payments on the SeLFIES than expected (22 versus 20 years) provide compensation to the insurance company for cost and profit. Furthermore, the SeLFIES bond received in exchange is the exact interest-rate risk hedging for the annuity liability created. It becomes more interesting if the insurance company is also diversified across multiple cohorts. Hence, SeLFIES with a maturity a touch above the economy average could facilitate a much more efficient annuity market to ensure individual longevity risk mitigation. SeLFIES benefits the insurance industry, since it allows them to offer new, low-cost annuities, with improved ability to hedge liabilities. Both insurance companies and pension funds would be natural institutional buyers of large denomination SeLFIES and create price discovery through Treasury auctions.

HOW SeLFIES COULD HELP GOVERNMENTS

SeLFIES are advantageous for governments too, making them not only beneficent, but also efficient, issuers. While SeLFIES could be issued by state governments, for convenience/brevity we focus solely on federal government issuance. Given the volume of current debt issuance, SeLFIES could replace some of the current bonds. First, when individuals retire poor (because they currently hold risky government debt in their DC plans relative to the correct retirement income goal), government will have to bail them out. If DC plan investments do not facilitate adequate, safe outcomes, gains are privatized and risks socialized. Since SeLFIES are attractive to investors from all parts of the life cycle, they potentially reduce those additional costs and risks to the government.

Second, SeLFIES give governments with value-added taxes (VAT) a natural hedge of revenues against the bonds, as revenues earned from VAT are essentially proportionate to consumption. This means less risk, more control and perhaps higher ratings for the governments to issue consumption-linked rather than inflation-linked bonds. Even for governments without VATs, indexing this bond to wages (as in Uruguay) is a good hedge against revenues.⁵

Third, as governments struggle to finance infrastructure, bonds with steady payments and forward-starting payment dates offer an effective funding mechanism to fulfill such needs. Cash flows from SeLFIES give governments an effective avenue to collect monies today for upfront capital expenditures, to fund infrastructure projects, then pay these back in the future, once the projects begin to generate revenues.

Fourth, for developing countries, SeLFIES could help "de-dollarize" debt and make them less susceptible to changes in global risk appetite. With SeLFIES, bond holders are all domestic; thus, a substantial part of long-term debt for government will be domestic debt whose obligations are in local currency, which is stabilizing for the government funding base.

This way, the government not only helps complete financial markets but also improves overall sovereign debt management operations (through better hedging of revenues and bond payments, and potentially extending duration) and lowers the risk of retirement security.

Federal and state tax exemptions could make issuance for retirement funding in personal taxable accounts. There are other alternative, albeit lower credit, issuers, but the overriding benefit of government issuance of SeLFIES is it mitigates credit risk and can be conducted with the size and regularity required for the global retirement challenge.

⁵ There are four possible variants for this indexation based on each country's particular situation: 1) nominal consumption/total population, 2) VAT revenues per capita/specified prevailing tax rate in force in that period, 3) consumer price inflation and 4) wage-income index.

SeLFIES ARE A WIN/WIN/WIN

SeLFIES are an elegantly simple solution for individual investors, the financial services industry and government. It is the proper, nonpartisan role of government to create the market that leads to price discovery which then makes it safe and possible for industry to create further and more appropriate investment products.

SeLFIES, while beneficial to many levels of society, don't have a natural forceful proponent:

- Individual investors don't speak with one voice.
- Policymakers have focused on safe harbor of existing products as opposed to what is best for individuals. SeLFIES would, however, surely qualify for QDIA status, once issued.
- The financial services industry has potential conflicts of interest and is embedded in an old retirement paradigm as well.

But imagine if it were routine for individual investors to buy SeLFIES up to their desired lifetime floor standard of living and then complement that floor with protections (cash reserves, insurance, Social Security, home equity) and upside potential (the long-term investment portfolio invested to the extent that they are able to accumulate and able and willing to put the long-term portfolio at risk).

The key point is that being financially safe properly implies establishing a floor of lifetime income designed to maintain one's core standard of living and then complementing that floor as one's individual situation demands.

SeLFIES are a win-win for all—they can greatly improve retirement funding security for citizens, provide a better cash-flow match and fund infrastructure for the government. They also allow individuals to achieve their respective retirement goals with minimal financial sophistication at potentially low cost, high liquidity and low risk. They allow financial institutions and insurance companies to improve their own hedging operations and product innovation. SeLFIES complete the market and need to be created. The time to act is NOW—the longer the delay, the higher the cost of ensuring retirement security for future generations and the higher the burden and cost to government. SeLFIES are the new and improved “a-new-ity.”

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New Approaches to Communicating to Workers About Pensions

Yael Hadass, Marion Labouré, Sally Shen and John A. Turner

“Communicating with employees is one of the most important aspects of any workplace retirement plan. A plan may be carefully designed to help participants achieve their retirement objectives, but if the plan sponsor does not effectively communicate the key information, the participants may not have the understanding they need to succeed in reaching their goals.”
—Earle W. Allen¹

Many people lack financial literacy, including an understanding of how to invest their pension accounts. Many are affected by behavioral biases, including inertia. Lack of knowledge and inertia may prevent some people from participating in a pension plan, resulting in insufficient retirement savings. Only 71% of U.S. workers who have access to a defined contribution plan participate. Among part-time workers, 52% participate. Among eligible workers in the lowest 10% of the wage distribution, 40% participate.²

Increasing pension participation in a voluntary pension system is a difficult problem.³ One reason may be that many workers take a passive approach when it comes to pension decisions.⁴ Policymakers and employers have used a number of approaches to increase pension participation rates. Over the past five decades, these approaches have occurred sequentially and cumulatively in five phases: first, tax preferences; second, employer matching contributions in defined contribution plans; third, financial education; and fourth, automatic enrollment. This paper discusses the fifth phase, which is new approaches for communicating with workers about pensions. This approach attempts to encourage active participation in pension decision-making. Eberhardt et al. show that many people avoid pension information that is readily available to them.⁵ Individuals who do this fail to discover whether they are saving adequately for retirement.

In a U.S. survey of more than 20,000 pension plan participants, only 17% felt they would be able to retire comfortably.⁶ When asked 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, resulting in SPDs often being difficult to understand for many workers.⁷

¹ Earle W. Allen, 2019, Effectively Communicating Your Retirement Plan Message to Employees, *HR Daily Adviser*, Feb. 6, <https://hrdailyadvisor.blr.com/2019/02/06/effectively-communicating-your-retirement-plan-message-to-employees/>.

² U.S. Bureau of Labor Statistics, 2019, Table 2. Retirement Benefits: Access, Participation and Take-up Rates, Civilian Workers, March 2018, <https://www.bls.gov/ncs/ebs/benefits/2018/ownership/civilian/table02a.pdf>.

³ I.D. Fabián, Y. Hadass, M. Labouré and J.A. Turner, 2020, New Ways to Increase Pension Participation and Contributions: Fintech, Communications Innovations and Consumption-Based Pension Products. Pension Policy Center Working Paper 2020-05.

⁴ Raj Chetty, John N. Friedman, Soren Leth-Petersen, Torben Nielsen and Tore Olsen, 2014, Active vs. Passive Decisions and Crowd-out in Retirement Savings Accounts: Evidence from Denmark, *Quarterly Journal of Economics* 129, no. 3:1141–219.

⁵ Wiebke Eberhardt, Elisabeth Brügggen, Thomas Post and Chantal Hoet, 2019, The Retirement Belief Model: Understanding the Search for Pension Information, March 1, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3205085.

⁶ Allen, Effectively Communicating.

⁷ Peter J. Wiedenbeck, 2019, Unbelievable: ERISA’s Broken Promise, Legal Studies Research Paper Series, no. 19-08-01, Washington University in St. Louis, School of Law, August, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3430686.

NEW APPROACHES TO PENSION COMMUNICATIONS

The European Insurance and Occupational Pensions Authority (EIOPA) believes that more needs to be done concerning communications to help people plan for retirement.⁸ The report says, “Just providing ‘sufficient’ legally and technically relevant information has proven not to be effective, and can even be counter-productive.”

To better understand pension communications, communication can be seen as interplays of four components: 1) the information transmitted (content)—this depends on the occasion and purpose; 2) the way in which the information is presented (presentation) (e.g., use of charts, visualization, layering); 3) the way the information is transmitted (channel) (e.g., online, paper, face-to-face); and 4) the format in which the information is transmitted (tool) (e.g., a letter, meeting).⁹

The information transmitted may affect both the channel and tool. A survey of U.S. pension participants indicates that the type of information being communicated should be a factor in selecting the communication channel.¹⁰ For example, participants favor receiving factual information, such as account balance, rate of return and fees, from print or online communication media. This is the type of information found in a participant’s quarterly statement.

Some people are switching from computers to smart phones as a way of digitally communicating. This means a switch from email to text messages.¹¹ Some pension information, such as reminders about enrollment, could be sent through text messages on smart phones. Participants could be able to check their account balance on their smart phone. Alternatively, while for some participants, receiving information about pensions via social media seems counterproductive, for younger workers, it may be the most effective method. Also, receiving information through podcasts may be effective for educating some participants.

Linking the information communicated to the plan members with tools helping them to understand it better, such as financial education, could boost the positive effect on individuals. Both the content of the information provided to plan members as well as its timing are key. Layering of information by providing online links to additional information may also prove helpful.

Another aspect of communication—framing—can be a powerful nudge to move individual behavior in a desired direction.¹² With framing, changes in wording can alter a person’s perception and response, while avoiding the cost of expensive awareness campaigns and programs.¹³ A choice can be framed in terms of what one gains when performing the action (e.g., expected positive future outcomes) or what one loses when not behaving in a certain way (e.g., expected negative future outcomes).¹⁴

One of the issues in framing is whether communicating negative effects of bad decisions is more effective than communicating positive effects of good decisions. Prospect theory posits that loss frames (negative messages) result

⁸ European Insurance and Occupational Pensions Authority (EIOPA), 2016, Report on Good Practices on Communications Tools and Channels of Communicating to Occupational Pension Scheme Members, https://www.eiopa.europa.eu/content/report-good-practices-communication-tools-and-channels-communicating-occupational-pension_en.

⁹ EIOPA, Report on Good Practice.

¹⁰ Allen, Effectively Communicating.

¹¹ Bruce Shutan, 2019, Is Technology Friend or Foe for Benefits Enrollment? *Employee Benefit News*, Oct. 9, https://www.benefitnews.com/news/is-technology-friend-or-foe-for-benefits-enrollment?position=editorial_1&campaignname=EBN_Daily_Views-10092019&utm_source=newsletter&utm_medium=email&utm_campaign=EBN_Daily_Views%2B%27-%27%2B10092019&bt_ee=vnRHBgjNNPf42bCathljskNh%2Fy3hkfC6QYRMYUF5k1sRtC7K5rtiswEGlOw86GKL&bt_ts=1570651614030.

¹² Gideon Keren, 2012, Framing and Communication: The Role of Frames in Theory and in Practice, Netspar Panel Paper 32; Gülden Ülkümen and Amar Cheema, 2011, Framing Goals to Influence Personal Savings: The Role of Specificity and Construal Level, *Journal of Marketing Research* 48:958–69.

¹³ Emmanuel Saez, 2009, Details Matter: The Impact of Presentation and Information on the Take-up of Financial Incentives for Retirement Saving, *American Economic Journal: Economic Policy* 1, no. 1:204–28.

¹⁴ Wiebke Eberhardt, Elisabeth Brügggen, Thomas Post and Chantal Hoet, 2017, Activating Pension Plan Participants: Investment and Assurance Frames, Design Paper 72, Netspar Industry Paper Series, <https://www.netspar.nl/assets/uploads/Netspar-Design-Paper-72-WEB.pdf>.

in stronger reactions than gain frames (positive messages) because losses have greater psychological effect than gains.¹⁵ In a 2017 paper, Eberhardt et al. find that loss frames are more effective in increasing participants' information search intentions.¹⁶ However, the source of the information may be important. When trust is low, such as in the financial services domain,¹⁷ loss frames can result in negative reactions.

NOVEL COMMUNICATIONS APPROACHES

Novel communication approaches can have major effects in improving pension outcomes. 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.¹⁸ Meals were served to employees of one company at its regional locations throughout the Southeast. Pension plan participation increased 78% from 2014 to 2018 with 95.5% participation. Contributions rose from 2.5% at the end of 2013 to 4.8% (7.9% including company match) in 2018. Employees became more engaged. "The atmosphere at this event is enjoyable, approachable and fun—and entirely different from that of traditional information sessions," said Chepenik. "It's really about a cultural shift, changing the way employees think about retirement savings plans, which ultimately yields results in increases in participation, rate of investment and overall satisfaction with the plan." 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." Thus, the message combines negative content with humor. It involves a combination of fun and food. It is an appeal to emotions rather than an appeal based on facts and figures.

This approach suggests that pension communications can have at least four dimensions: 1) negative versus positive, 2) serious versus humorous or fun, 3) factual versus emotional and 4) general versus personalized.

GAMIFICATION

Gamification provides another new approach for communicating with and educating workers. While it may not be suitable for some workers, for others it may lead to greater engagement. With worldwide sales (equipment and games) of more than \$135 billion in 2018, video games have become the world's leading cultural industry, ahead of cinema and recorded music. "Serious games"—video games for learning, training and awareness—are also growing, with a profit of more than \$3.5 billion worldwide.¹⁹

Gamification is a term coined by British programmer Nick Pelling in 2002 while designing a game-like user interface for commercial electronic devices (ATMs, vending machines, mobile phones).²⁰ Gamification can make otherwise complex material interactive and engaging.²¹ It involves gaming principles such as competition, status, recognition, challenge and fun to motivate people to perform certain actions such as contributing to pensions. Gamification does not necessarily involve a traditional game format. For example, many people who do not consider themselves "gamers" have encountered gamification techniques, from walking further to reach a Fitbit goal to moving up levels on retail or airline loyalty programs.

¹⁵ Amos Tversky and Daniel Kahneman, 1981, The Framing of Decisions and the Psychology of Choice, *Science* 211, no. 4481:453–58.

¹⁶ Eberhardt et al., Activating Pension Plan Participant.

¹⁷ Torben Hansen, 2012, Understanding Trust in Financial Services: The Influence of Financial Healthiness, Knowledge and Satisfaction, *Journal of Service Research* 15, no. 3:280–95.

¹⁸ The Secret to More Retirement Savings? ... Tacos! 2019, *Advisor Magazine*, May 13, <https://www.lifehealth.com/secret-retirement-savings-tacos/>.

¹⁹ Statista, 2019, Serious Games Market Revenue Worldwide 2018–2024. Accessed April 21, 2020, <https://www.statista.com/statistics/733616/game-based-learning-industry-revenue-world/>.

²⁰ Growth Engineering, 2019, The History of Gamification: From the Very Beginning to Right Now, Aug. 29, <https://www.growthengineering.co.uk/history-of-gamification/>.

²¹ Keir Macdonald, 2015, Is Gamification the Way Forward for Pensions? An Ugly Word for an Attractive Idea, *Professional Pensions*, Sept. 3, <https://www.professionalpensions.com/professional-pensions/feature/2424409/is-gamification-the-way-forward-for-pensions>.

A computer game format 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. However, because of the expense of creating games, gamification that focuses on the particular issues relating to a company’s pension plans, rather than on general education about pensions, will only be used by the largest pension plans. That issue could be dealt with for small plans by pension providers to those plans developing games that could easily be modified to fit the situation of a particular employer. Gamification can be effective in companies where workers are comfortable using computers at work. However, with the growth of the use of computers in schools and in jobs, that issue presumably includes most workers.

In the U.K., in 2011 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. 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. A genie acts as a guide for participants.²² In the United States, a benefits consulting firm has created pensions games for its clients.²³ One mutual fund company that manages pensions offers the game Boom or Bust to teach participants about pensions and saving for retirement.²⁴

ARTIFICIAL INTELLIGENCE AND MORE PERSONALIZED PENSION COMMUNICATIONS

Artificial intelligence (AI) combined with data on individuals can be used to personalize pension communications. One company uses artificial intelligence to assist investment advisers who are advising participants of 401(k) plans.²⁵ On its website, it explains how it assists investment advisers: “We provide deep insights and analytics about your clients as they interact with our site and the AI, allowing you to have a more meaningful interaction with your participants.”

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—and provide better advice as to their pension investments—and to increase their contributions if their contributions are too low.

Plans can use data to consider the best methods and timing of communications. Focused, personalized communications, based on information the plan and the employer have about the person, could be the norm, with the type of approach chosen by the employee. Understanding what information is important to people, and using technology and data to provide that information could improve pension outcomes.

One robo adviser has studied ways to better target communications to its clients. It contacts its actively engaged clients during market downturns to encourage them not to sell stocks. However, contacting clients who are not actively engaged may backfire because some do not pay attention to stock market fluctuations but might react if those fluctuations are brought to their attention.²⁶

Concerning negative versus positive communications, 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

²² Jann Lee, 2017, Can Gamification Engage Pension Members? *Benefits Canada*, March 21, <https://www.benefitscanada.com/pensions/other-pensions/can-gamification-engage-pension-plan-members-95181>.

²³ Laura Blows, 2014, The Pensions Game. *Pensions Age*, April, <https://www.pensionsage.com/pa/apr-the-pensions-game.php>.

²⁴ App Developers Tap Games to Drive More Savings, 2018, *Pensions & Investments*, Aug. 20, <https://www.pionline.com/article/20180820/ONLINE/180829978/app-developers-tap-games-to-drive-more-savings>.

²⁵ DreamForward, 2020, Our AI Works for You, accessed April 18, <http://dreamforward.io/foradvisors>.

²⁶ Dan Egan, 2017, Our Evidence-Based Approach to Improving Investor Behavior, Oct. 12, Betterment, <https://www.betterment.com/resources/investment-strategy/behavioral-finance-investing-strategy/behavioral-testing/>.

for plan information is a better predictor of the search for financial information. Thus, pension communications should focus more on emphasizing the benefits rather than the barriers to information search concerning pension participation.²⁷

CONCLUSION

Efforts to increase pension participation in voluntary pension systems have occurred in five phases: first, tax preferences; second, employer matching contributions; third, financial education; and fourth, automatic enrollment. This paper discusses the fifth phase, which is new approaches for communicating with workers to encourage them to participate in a pension and to increase their pension contributions. Pension communications can have at least four dimensions: negative versus positive, serious versus humorous or fun, factual versus emotional and general versus personalized. A variety of communication types are needed depending on the information content. However, at least in some circumstances, communications designed to encourage action, such as participating in a pension, may be more successful if they include some aspects that are positive, involve humor, are emotional and are personalized.

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²⁷ Eberhardt et al., The Retirement Belief Model.

Collective Defined Contribution: Time to Take Action

Elizabeth Bauer

The private sector defined benefit (DB) plan is, if not completely dead, then on its last legs: a mere 16% of Fortune 500 companies offer defined benefit plans to their newly hired employees.¹ Instead, employers provide for their employees' retirement by offering, and contributing to, defined contribution (DC) retirement savings accounts, which, as their name communicates, consist of a fixed employer contribution. This leaves employees to make investment and spend-down decisions themselves, and (absent the purchase of an annuity) necessitates that participants bear investment and longevity risk entirely on their own. In the early 2000s, cash balance hybrid plans were the next great thing, until they weren't. Now, experts propose, as the next-best alternative, solutions such as managed payout and longevity annuities.² What's really needed to bridge that DB-DC gap, however, is a collective defined contribution (CDC) plan, both as a legal framework and its implementation through appropriate providers.

What are collective defined contribution plans? This is one of multiple labels to denote plans, implemented or on the drawing board in a small number of countries, that attempt to create a hybrid with characteristics of defined benefit and defined contribution plans, in which participants share risks collectively rather than bearing them individually or having them protected by employers. I do not have a recommendation for a specific structure that should be adopted by plan sponsors or by the federal government via enabling legislation. What is important, however, is that retirement experts, in some fashion, whether as an official blue ribbon commission or a working group among actuaries, identify and actively promote the structure that is the best fit for retirement plans in the United States.

PLAN DETAILS

The "classic" CDC plan was pioneered in the Netherlands in the mid-2000s. Employers contribute fixed amounts to pension funds (or, more often, amounts that vary by age) which are managed on an industrywide basis; these amounts are designed to achieve a targeted level of retirement income at certain baseline assumptions. In the event that plans are deemed to be at risk of failing to meet this target, plans may freeze the cost-of-living adjustment (COLA) from year to year, or, as needed, reduce benefit payouts to retirees or benefit accruals to active employees.³ A 2013 white paper from pension consultancy Aon's U.K. location found that, in addition to protection against risks, employees in CDC plans would enjoy higher benefits than a comparable contribution to a traditional DC plan, based on modeling using economic conditions going as far back as 1955, and on the assumption that DC participants would otherwise be obliged to purchase an annuity outside the plan at retirement (the paper was written from a U.K. perspective, at a time when annuitization of DC balances was mandatory).⁴

These plans, however, have not been without their challenges. From the employer side, auditors have in some cases determined that employers are not as freed from defined benefit accounting as was expected because of the expectation that unions would negotiate higher contributions if needed in the future.⁵ From the employee side, the

¹ Elizabeth Bauer, 2019, In The News: To No One's Surprise, GE Freezes Its Pension, *Forbes*, Oct. 8,

<https://www.forbes.com/sites/ebauer/2019/10/08/in-the-news-to-no-ones-surprise-ge-freezes-its-pension/#4596a7e1461e>.

² For example, David C. John, 2019, An Automatic Way to Convert Retirement Savings into Income, Brookings' *Up Front* (blog), July 31, <https://www.brookings.edu/blog/up-front/2019/07/31/an-automatic-way-to-convert-retirement-savings-into-income/>.

³ For a one-page description, see Pension Rights Center, New Plan Design in the Netherlands, undated, <http://www.pensionrights.org/publications/new-plan-design-netherlands>, accessed April 23, 2020.

⁴ Aon Hewitt, 2013, Collective Defined Contribution Plans: A New Opportunity for UK Pensions? November,

https://www.aon.com/unitedkingdom/attachments/aon_hewitt/dc/Aon-Hewitt-Collective-DC-Whitepaper-Summary-Nov13.pdf.

⁵ Personal experience in international pension accounting consolidation.

“try our best” promises have been threatened by the exceedingly low bond rates bringing down funded ratios; this is a particular challenge because Dutch funding requirements are exceptionally strict.⁶

Canada has instituted its version of a CDC plan, the target benefit plan (TBP), with enabling legislation varying by province—New Brunswick, Alberta and British Columbia permit comprehensively and Quebec and Saskatchewan permit on a very limited basis, but in Ontario, the enabling legislation is still in development. Pension lawyer Jana Steele describes it:

Target benefit plans (TBPs) have fixed (or variable within a narrow pre-determined range) contributions, similar to defined contribution plans. However, TBPs provide for a targeted defined benefit (DB)-type pension based on a formula, similar to DB plans. Like DB plans, TBPs pool longevity and investment risk. The key factor that distinguishes target benefit plans from DB plans is that benefits under a TBP can be adjusted. That is, if, for example, a TBP underperforms expectations and fails certain funding tests, the targeted pension benefit may be reduced for all plan members.⁷

To achieve these goals,

All TBP regimes require a funding policy, which sets out the roadmap for the funding and benefits of the plan going forward. That is, the funding policy will specify contribution levels, the steps that must be taken if the applicable funding level is not attained and the steps that may be taken where the plan has excess funds.⁸

Specifically, in New Brunswick, stress testing is required to demonstrate a 97.5% probability that base benefits will not be reduced in a 20-year period, and that at least 75% of scheduled ancillary benefits will be provided.

IN THE UNITED STATES

There exists a type of plan in the U.S. that is, while not a true collective defined contribution, perhaps a close—or maybe distant—relative: the beleaguered Taft-Hartley multiemployer pension plan. Like a CDC, employers contribute fixed amounts that are treated as DC for accounting purposes. Like a CDC, the pension funds are managed and benefits are administered by a joint board on behalf of participating employers/unions. But a key ingredient is missing: There is no method to routinely adjust benefits when a plan is underfunded or when long-term projections indicate that funding is at risk; the only means of reducing benefits is through the Department of Treasury Multiemployer Pension Relief Act (MPRA) of 2014 process.

However, the National Coordinating Committee for Multiemployer Plans has proposed an alternate form of multiemployer plan that they call a “composite plan,” which would be characterized by true adjustable benefits.⁹ In such a plan, the targeted funded ratio would be set at 120%, and trustees would be required to undertake remedial action in any year the ratio fell short, with such actions as contribution increases, future accrual reductions, elimination of ancillary benefits such as early retirement subsidies or of recent benefit increases; or, if these changes are insufficient, reduction in COLA or, if still needed, reduction in accrued benefits for active or retired participants.

⁶ Toby Sterling, 2019, Going Dutch? Low Interest Rates Rattle “World’s Best” Pension System, *Reuters*, Oct. 18, <https://www.reuters.com/article/us-netherlands-pensions-analysis/going-dutch-low-interest-rates-rattle-worlds-best-pension-system-idUSKBN1WX0IU>.

⁷ Jana Steele, 2019, Target Benefit Plans—From New Brunswick to Ontario to the UK, *Osler Pensions and Benefits Law Blog*, April 12, <https://www.osler.com/en/blogs/pensions/april-2019/target-benefit-plans-from-new-brunswick-to-ontario-to-the-uk>.

⁸ Jana Steele, 2017, Target Benefit Plans in Canada, *Estates, Trust & Pensions Journal*, 36, June 29, <https://www.osler.com/osler/media/Osler/reports/pensions-benefits/Target-Benefit-Plans-in-Canada.pdf>.

⁹ The GROW Act (Giving Retirement Options to Workers): Section by Section Summary, National Coordinating Committee for Multiemployer Plans website, 2018, <https://nccmp.org/wp-content/uploads/2018/02/GROW-Act-Section-by-Section.pdf>.

Finally, one public pension system offers the closest the U.S. has to a risk-sharing model: the Wisconsin Retirement System. This plan, unique among American public pension plans, stays at a 99% funded status due not just to sound governance but to several key design characteristics:

A Wisconsin retiree's pension benefits can rise above the minimum level and also fall back down to that minimum if the plan's investments underperform or if the cost of the benefits comes in higher than anticipated—for instance if pensioners end up living longer than expected. This approach is called a “shared risk” model, referring to the way it avoids sticking taxpayers or retirees with all the potential losses from a financial crash.

These adjustments are made automatically—no politician has to take a difficult vote to approve them. To smooth out the effects of up and down markets, the state spreads the gains and losses across five-year periods.¹⁰

South Dakota's similarly well-funded public pension system has some, but not all of these tools, and to be sure, the Wisconsin plan is not a “pure” CDC; they do not set a fixed contribution rate and provide only such benefits as can be covered by that contribution, but other sources of cost increases (or decreases) are covered by contribution increases, rather than benefit reductions. Notably, these contributions are split evenly between employer and employee rather than the typical public plan case of fixed employee contributions. However, the overall structure has resulted in contribution levels and volatility far more moderate than elsewhere.¹¹

Some characteristics of such plans seem straightforward. A plan with a level lifetime accrual equivalent to a defined contribution plan seems far preferable to either the Dutch approach of contributions increasing as workers age or a traditional Taft-Hartley plan using level contributions to target a traditional defined benefit formula. A built-in COLA provides flexibility, by means of a below-consumer price index COLA or no COLA at all in any given year, with less unhappiness than a reduction in a fixed benefit.

CHALLENGES

At the same time, there are many challenges in plan/regulatory design.

Smoothing risk is fine in principle but assumes there is a known long-term discount rate or “true” return on assets or mortality improvement expectation to which variations will revert over time. How would a plan identify when asset losses must be reflected in benefit cuts, rather than deferred until later, without risking benefits for future retirees in the long-term order to preserve current retirees' benefits in the short term? Conversely, how much must a plan have built up in reserves before it can start spending that money? And what approach would a plan take to the crucial question of assumptions to use to convert an account balance into lifetime income for the spend-down phase?

Alternately, should a plan have a backstop like the Employee Retirement Security Act (ERISA) in the event of unforeseen circumstances? If so, to what extent should Congress mandate the minutiae of a plan's specific risk-sharing mechanisms to ensure it isn't left holding the bag?

Plans can more effectively share risk across generations when it has a wide range of participants demographically. Certainly, multiemployer plans in declining industries (mining, unionized trucking) are most endangered. How can a plan maintain this long-term demographic balance?

¹⁰ Jason Stein, 2016, Wisconsin's Fully Funded Pension System is One of a Kind, *Milwaukee Journal Sentinel*, Sept. 26, <https://projects.jsonline.com/news/2016/9/26/wisconsins-fully-funded-pension-system-is-one-of-a-kind.html>.

¹¹ Elizabeth Bauer, 2019, “Go North, Young Man,” to the Wisconsin Public Pension System, *Forbes*, March 8, <https://www.forbes.com/sites/ebauer/2019/03/08/go-north-young-man-to-the-wisconsin-public-pension-system/#2953bbf940d4>.

Should plans be sponsored by nonprofit entities? For-profit companies such as the same companies that manage retirement accounts? Should they be restricted to employer-sponsored plans, or open for individuals, IRA fashion?

CONCLUSION

I don't have the answer to any of these questions. But I believe that we, collectively, need to figure out the answers to the best of our ability. A retirement system that consists solely of retirement accounts is not in the best interests of American workers. The traditional defined benefit pension's phase out may be gradual but will have as its end result the demise of that guaranteed form of benefit. As a profession, we need to use our skills to define and ultimately promote a new hybrid system.

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Hedging Against Inflation Risk With Real Annuities

Zvi Bodie and Dirk Cotton

The only retirement contract that both insures against longevity risk and hedges against inflation is a life annuity linked to the consumer price index (CPI). It is denominated in the same units of account as Social Security benefits. We call it a “real annuity,” although it is also referred to as an inflation-indexed single-premium immediate annuity (SPIA). In computing a person’s replacement ratio of pre-retirement income, we can add Social Security benefits and the income produced by a real annuity to arrive at a meaningful number.

An annuity not linked to the CPI we call a “nominal annuity.” It is measured in units that are different from Social Security, so it would be a mistake to add the two in computing a replacement ratio. Despite those obvious facts, real annuities are largely ignored in practice and they comprise a tiny portion of the annuities market. The vast majority of income annuities sold are fixed in nominal dollars. From the perspective of rational economic decision-making, this is a puzzle. Let’s call it the “nominal annuity puzzle.” The purpose of this article is to explore the reasons behind this puzzle and to suggest ways to solve it.

NOMINAL ANNUITY PUZZLE

The lack of interest in real annuities can be explained by a lack of recognition that the purchase of a nominal annuity constitutes a speculative bet on future inflation rates and that the real annuity is the risk-free asset. Specifically, we disagree with advisers who suggest:

- Nominal annuities should be the starting point for an analysis of the cost of real annuities.
- The cost of a real annuity is represented by its lower initial payment compared to that of a nominal annuity.
- Insurers don’t offer real annuities because they don’t want to accept inflation risk.
- Graduated-payment annuities, which cost less than a real annuity, are an adequate inflation hedge.

Some advisers suggest that insurers don’t offer real annuities because they don’t want to accept inflation risk. However, an institution can hedge the risk of inflation by purchasing Treasury inflation-protected securities (TIPS)¹ or by means of inflation or “CPI swaps.”² The net result of combining a nominal annuity with an inflation hedge is a synthetic real annuity. Real annuities are not widely offered due to a lack of market demand, not because insurers can’t hedge inflation risk.

Hedging eliminates the risk of loss by giving up potential for gain. In contrast, when we insure, we pay a premium to eliminate the risk of loss but we retain the potential for gain. Real annuities hedge inflation risk; they do not insure it. This is an important distinction because hedging costs nothing (except for small transaction costs) while insurance can be quite expensive.

¹ TIPS provide protection against inflation. The principal of a TIPS increases with inflation and decreases with deflation, as measured by the CPI. For more information, see www.TreasuryDirect.gov.

² For a description of CPI swaps, see, for example, Michael J. Fleming and John Sporn, 2013, How Liquid is the Inflation Swap Market? Federal Reserve Bank of New York’s *Liberty Street Economics* (blog), April 1, <https://libtystreeteconomics.newyorkfed.org/2013/04/how-liquid-is-the-inflation-swap-market.html>.

COST-EFFECTIVENESS OF REAL ANNUITIES

An analysis of the cost-effectiveness of real annuities will be influenced heavily by the manner in which the argument is framed. A common way of framing this annuity comparison is to assume that nominal annuities are the appropriate baseline and then to consider the “additional” cost of hedging inflation risk. This is opposite the way economists generally consider investment risk. We typically begin with the risk-free rate of return and then consider the wisdom of increasing the expected return from an investment by taking on additional risk.

Framing the analysis based on nominal annuities poses two problems. First, as previously mentioned, most Americans are entitled to Social Security retirement benefits and these are indexed to inflation. They are essentially a real life annuity. As such, nominal annuity payouts cannot be added directly to Social Security benefits to determine the household’s expected income.

Second, framing the analysis with nominal annuities as the baseline implies that the difference between the initial payment of a nominal annuity and that of a similar real annuity can be interpreted as the cost of “inflation insurance.” We will demonstrate the flaws in that interpretation and explain that inflation risk is hedged and not insured.

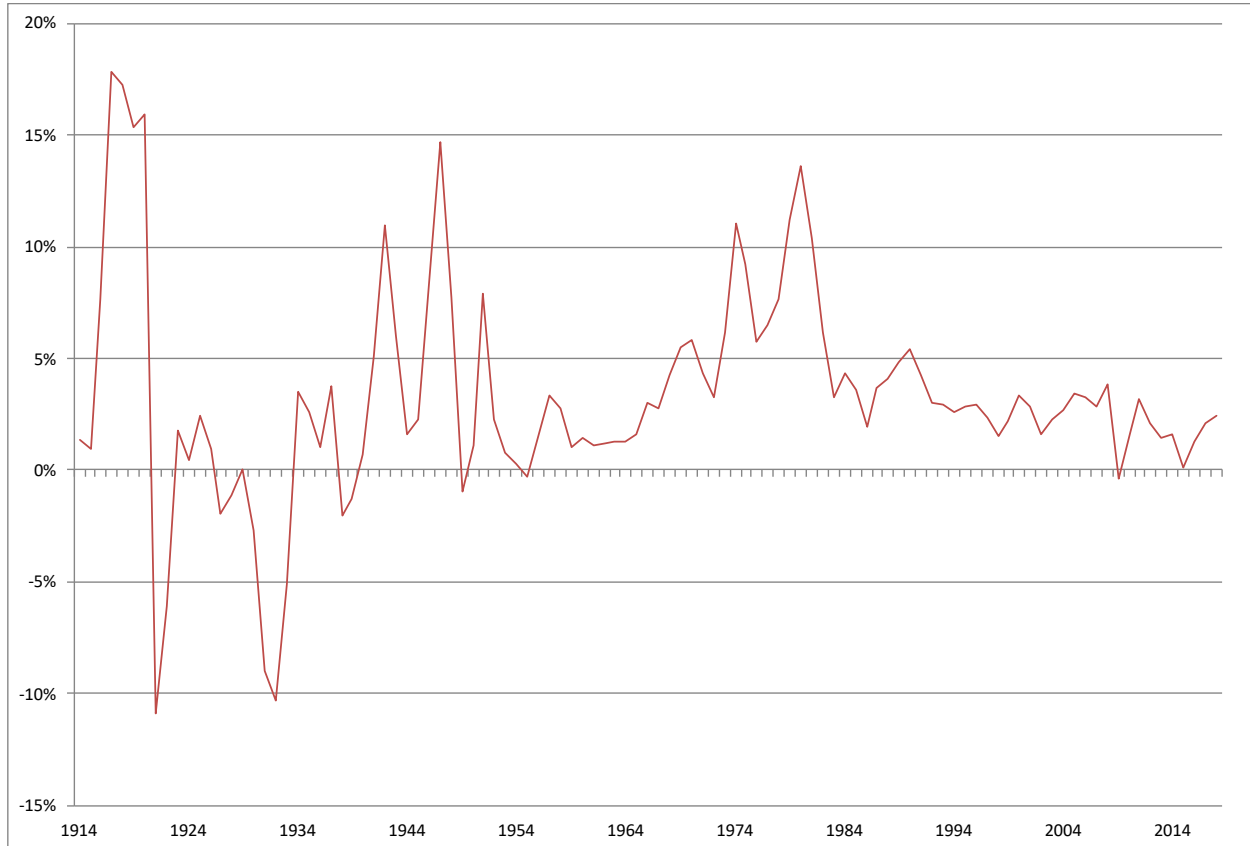
The correct framing of the comparison of real and nominal annuity payouts is to treat the real annuity as the risk-free asset and then consider the additional payout that is implied by exposing the annuitant to inflation risk.

Economic theory implies that, faced with a choice between two annuities (SPIAs) costing the same amount, one of which is fixed in nominal dollars and the other in real dollars, a rational individual should consider the real annuity to be risk-free and the nominal annuity to be risky.³ The reason is that individuals care about maintaining their levels of consumption, given that future inflation (CPI) is uncertain. A consumer can only purchase goods and services with real dollars.

The other consideration in choosing between the two annuities is the individual’s beliefs about future inflation, its mean, variance and tail risk (hyperinflation). Figure 1 shows U.S. annual inflation rates based on the U.S. Bureau of Labor Statistics CPI for All Urban Consumers (CPI-U) from 1914 to 2018.

³. We note that Dimensional Fund Advisors’ retirement product Target Date Retirement Income Funds, developed in collaboration with economist Robert Merton, gradually shifts to inflation-protected securities as the investor approaches retirement and hedges a real annuity. See <https://us.dimensional.com/target-date-retirement-income-funds>.

Figure 1
U.S. Average Annual Inflation Rate, 1914–2018



Source: Calculated from U.S. Bureau of Labor Statistics CPI-U, Historical CPI-U, Table 24, accessed Aug. 25, 2019, <https://www.bls.gov/cpi/tables/historical-cpi-u-201709.pdf>.

For simplicity, let’s assume a flat-term structure of real and nominal interest rates for which short-term bonds have approximately the same yield as long-term bonds so that we can talk unambiguously about the real and nominal rates of interest without specifying the maturity. When comparing two level-payment annuities of equal present value (i.e., cost), if the real rate of interest is lower than the nominal rate of interest, which is normally the case, the real annuity must have a lower starting value than the nominal annuity. The mathematics of compound interest and the time value of money guarantee this fact.

For example, let the present value of the annuities be \$100,000, the risk-free real rate 1% per year, the nominal risk-free rate of interest 3% per year and the number of years 20. The difference between the nominal and real risk-free rates is the forward rate of inflation, or the “breakeven” inflation rate. In this example, we set the future rate of inflation equal to the current breakeven rate of 2% per year over the next 20 years.⁴

The term cost-of-living adjustment is used by insurance companies to refer to one of two types of annual increases in the yearly payment:

- **Cost-of-living adjustments (COLA).** This is a constant percent increase. Most insurers offer graduated payment increases from 1% to 5% per year. We refer to this type of annuity as a “graduated-payment

⁴ The breakeven rate (forward rate) of inflation equals the expected rate plus an inflation risk premium of unknown size.

nominal annuity,” and it is fundamentally different from a real annuity. Payments are not linked to inflation, so this type of COLA is not an inflation hedge.

- **CPI-U index.** As of December 2019, no known insurers continue to offer CPI-adjusted annuities in the U.S. Prior to that time, at least one insurer offered a true BLS-derived CPI adjustment. This percentage was recalculated Jan. 1 of each year. Annuity income could either increase or decrease for that year based on the government’s reported change in the CPI.

Let’s consider how to compare these income streams. Nominal and real annuities are as different from each other as annuities denominated in different currencies. For example, think of an annuity denominated in U.S. versus Canadian dollars. If I live in the United States, I almost surely will not be interested in the Canadian annuity, unless I want to speculate on the U.S./Canadian dollar exchange rate. Now suppose that the interest rate in Canada is 1% per annum and in the United States it is 3%. A 20-year nominal annuity would offer a level payment of CA\$5,541.53 per year but the U.S. annuity would offer payments of US\$6,721.57 (see Table 1).

Table 1
Comparison of Canadian and U.S. Dollar SPIAs, N = 20 Years

Level Payment in Units of	Interest Rate	Annual Payment
U.S. dollars	3%	\$6,721.57
Canadian dollars	1%	\$5,541.53
Difference		\$1,180.04

Should we regard the difference of \$1,180.04 as the cost of choosing Canadian rather than U.S. dollars? Clearly, it is not a cost. The two annuities are in different currencies. Canadian retirees will choose a Canadian annuity and U.S. retirees will choose the U.S. dollar annuity. For a Canadian to buy a U.S. dollar annuity would be speculation on the future exchange rate between the two currencies. Retirees would avoid such speculation as imprudent if they understood its nature.

Similarly, real and nominal annuities are denominated in different “currencies.” The real annuity is measured in constant dollars—we can call them “CPI bundles.” In Table 2 as in Table 1, we can see that nominal and constant dollars are different “currencies” so that their difference does not represent a cost, either.

Table 2
Comparison of Nominal and Real SPIAs, N = 20 Years

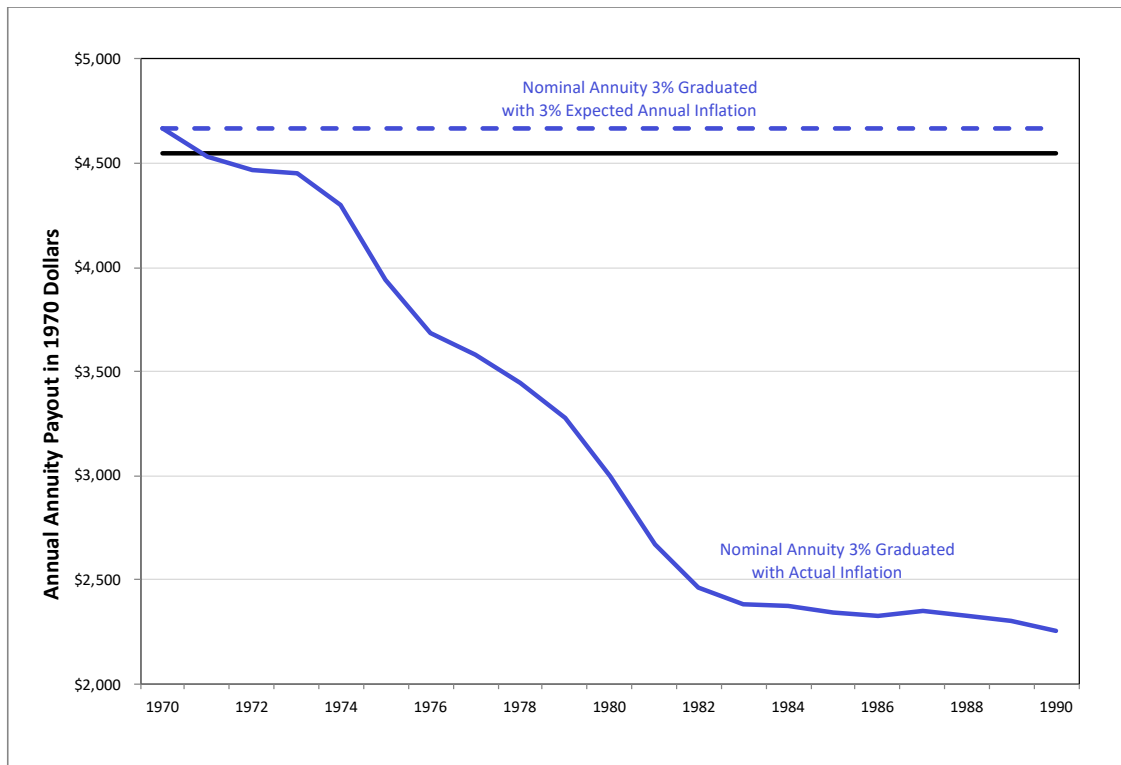
Level Payment in Units of	Interest Rate	Annual Payment
Nominal dollars	3%	\$6,721.57
Constant dollars	1%	\$5,541.53
Difference		\$1,180.04 or 21.3%

Choosing the nominal annuity amounts to speculating about the future value of the CPI, that is, on the rate of inflation. It might be tempting to do so if one believes that the actual rate of inflation will be less than the 2% spread between the nominal and real interest rates. But then the annuitant would be exposed deliberately to inflation risk and betting that future inflation rates will be lower than the market consensus at the time the annuity is purchased. Like foreign exchange-rate bets, this sort of speculation is imprudent for retirees.

STANDARD OF LIVING THROUGHOUT RETIREMENT

To see this, let's consider the actual history of the CPI. In Figure 2, we compare the 20-year history of a real level-payment annuity versus a graduated payment nominal annuity from 1970 to 1990 in terms of their "real values."⁵ The real value of the annuity is the inflation-adjusted purchasing power of the annuity's annual payments to the annuitant. Note that in the following examples, we use a 3% inflation rate assumption rather than the 2% assumption used in the previous exchange-rate example.⁶ Figure 2 shows the annual payments of a 3% graduated-payment nominal annuity (blue dashed line) assuming that future inflation (ex ante) indeed equals that 3% per year assumption along with the real value of these payments (solid blue line).⁷

Figure 2
Standard of Living Throughout Retirement, \$100,000 Annuity, 1970–90



Source: Inflation rates calculated from U.S. Bureau of Labor Statistics CPI-U, Historical CPI-U, Table 24, accessed April 21, 2020, <https://www.bls.gov/cpi/tables/historical-cpi-u-201709.pdf>; nominal annuities quote obtained for New York Life from ImmediateAnnuities.com, accessed Aug. 24, 2019, <https://www.immediateannuities.com/>; real annuities quote from Principal, accessed Aug. 24, 2019, <https://www.principal.com/individuals/save-invest-retire/annuities/income-annuities>.

Note: This is done for a 65-year-old single male; CPI-adjusted annuity payments ex ante equal CPI-adjusted annuity payments ex post and this is what we mean by risk free.

5. An annuity payout quote of \$4,670 per year for a 65-year-old single male was obtained online for New York Life at the end of May 2019 for a nominal annuity with a purchase price of \$100,000 and a graduated 3% COLA. An annuity payout quote of \$4,550 per year for a similar but CPI-adjusted "real" annuity was obtained online at the same time. (New York Life does not offer a real annuity so the second quote came from Principal, the only insurer that offered real annuities at that time.)

6. We use an expected inflation rate of 3% for the following examples rather than the 2% current breakeven rate of inflation used in the previous example simply because annuity quotes were more readily available for 3% graduated payment annuities.

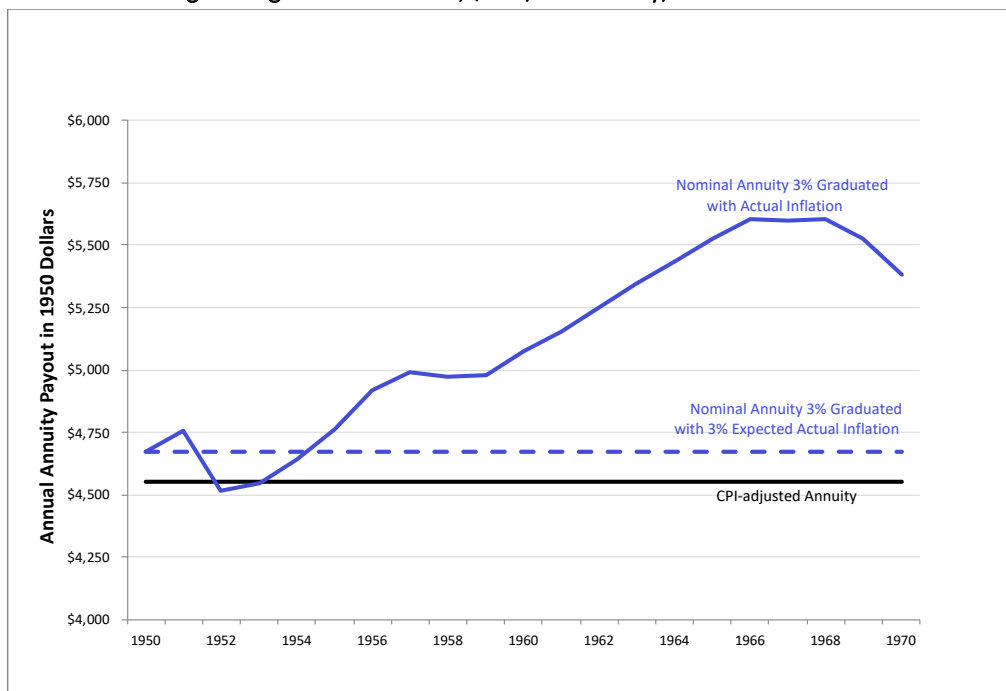
7. Nominal annuities front-load payments in real dollars given any positive rate of inflation. For this example, we assume the retiree desires constant real payments throughout retirement. However, a real annuity could be structured with the same present value that matches any spending slope desired by the retiree including declining real payments if the retiree expects spending to decline with age.

In times of high inflation, such as the United States experienced in the 1970s and early 1980s, a real annuity will quickly provide for more real dollars of consumption than a nominal annuity.

We note that inflation from 1970–90 averaged about 6.4% per year⁸ and that the 3% graduated-payment nominal annuity payments fell far behind the payments of the CPI-adjusted annuity in real dollars.

In periods of lower inflation, such as from 1950–70 as shown in Figure 3, the real value of the nominal annuity with graduated payments will exceed payments from the real annuity. Annualized inflation ran just above 2% per year during that period. Unlike the CPI-adjusted annuity whose ex post and ex ante payments are equal and risk free, ex post payments from the nominal annuity in real dollars will vary with future inflation rates and are, therefore, risky.

Figure 3
Standard of Living Throughout Retirement, \$100,000 Annuity, 1950–70



Source: Inflation rates calculated from U.S. Bureau of Labor Statistics CPI-U, Historical CPI-U, Table 24, accessed April 21, 2020, <https://www.bls.gov/cpi/tables/historical-cpi-u-201709.pdf>; nominal annuities quote obtained for New York Life from ImmediateAnnuities.com, accessed Aug. 24, 2019, <https://www.immediateannuities.com/>; real annuities quote from Principal, accessed Aug. 24, 2019, <https://www.principal.com/individuals/save-invest-retire/annuities/income-annuities>.

Note: This is done for a 65-year-old single male.

Some advisers and retirees consider the difference between the initial payment of a nominal annuity (\$6,440 from a recent quote) and the real annuity (\$4,550 in the example), or \$1,890, to be the cost of inflation protection with the real annuity. That is incorrect, in the same way that the direct comparison of U.S. and Canadian dollars was incorrect. The two annuity payments are in different “denominations” or units of measure. Figures 2 and 3 show that the constant-dollar difference in payments can vary substantially year-over-year depending on inflation.

⁸ Inflation rates calculated using BLS historical CPI-U data.

CONCLUSION

Purchasing a nominal rather than a real annuity is a decision to intentionally expose the annuitant to inflation risk. This inflation bet is similar to the example in which a Canadian retiree buys a U.S. dollar-denominated annuity and inadvertently speculates on the future foreign exchange rate. Neither is the kind of speculation a retiree should consider.

Nonetheless, all financial products have pros and cons and, given their full appreciation in the context of the remainder of the retirement plan, a retiree can make a rational decision to purchase nominal or real annuities, or neither. Annuitants should understand before choosing that nominal annuities include a speculative bet on future inflation rates and the potential for substantial losses of purchasing power should high rates of inflation return, while real annuities include neither.

The safer choice for a retiree is the real annuity, which avoids speculating on inflation rates, while hedging inflation and its tail risk. Payments from a real annuity are therefore also the correct baseline for comparison with alternative riskier income streams for retirees.

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The 100-Month Protection Plan: A Private Social Security Annuity

John Cutler

As we know, Social Security provides a great platform for protecting—projecting—wealth into retirement. By “wealth,” I mean disposable income and not just the accumulation of assets. We also should recognize that for many, it is insufficient for their needs. For those at the high end of the income spectrum, it might instead almost be called superfluous. But for the broad middle class, it is a critical support and one that never runs dry while you are alive.

That Social Security is a government program instead of a private insurer also means the benefit is from a trusted source. This proposal addresses one of the systemic problems—early withdrawal—by suggesting we could add a private sector annuity alongside Social Security.

PRIVATE SECTOR ANNUITY ... THROUGH SOCIAL SECURITY

We know the Social Security annuity increases approximately 8% a year for every year a person delays taking it from 62 to 70. We seem to barely get most people to wait until age 65 or 66 instead of taking an early retirement. But the wealth would be increased by delaying until 70, when the 8% increases cease.

What is envisioned here is the creation of a right to buy additional annuity protection through the Social Security system. This “protection” addresses the tendency enrollees have to tap into Social Security early by creating an eight-year annuity. Technically this would be 96 months (8 years x 12 months) but, for selling it to the public, it is important to make it snazzy—a word not often associated with Social Security. I call this the “100-month protection plan.”

Why eight years and not a shorter time span, for instance, covering enrollees between ages 66 or 67 and 70? As mentioned, the risk is probably greatest for lower-income individuals or even middle-income individuals who have lost a job or been downsized to part-time work close to their retirement age. So, while a shorter period could be envisioned, this is the risk period we are trying most to address. (And it is probably possible to simply allow an enrollee who does NOT want their annuity to start at age 62 to postpone the start date and get more of an income stream for a delayed start.)

Now someone will point out that people can already delay taking Social Security and cover that gap by tapping their savings.¹

This assumes one has assets one can tap and one is willing to do so. SOA research has shown that people are extremely hesitant to do this.² This research shows people will live within their means and not tap into retirement savings until they need to do so. While “need” is an elastic concept, I would argue that tapping those accounts to

¹ See, for instance, Wade Pfau, Joe Tomlinson and Steve Vernon, 2017, Optimizing Retirement Income by Integrating Retirement Plans, IRAs, and Home Equity, Society of Actuaries report, <https://www.soa.org/resources/research-reports/2017/2017-optimize-retire-income-plans-iras-equity/>, and Alicia Munnell, Gal Wettstein and Wenliang Hou, 2019, How Best to Annuitize Defined Contribution Assets, Center for Retirement Research working paper no. 2018-13, <https://crr.bc.edu/working-papers/how-best-to-annuitize-defined-contribution-assets/>.

² Greenwald & Associates, 2018, 2017 Risks and Process of Retirement Survey, Society of Actuaries report of findings, <https://www.soa.org/globalassets/assets/files/resources/research-report/2018/risk-process-retirement.pdf>, as well as Munnell, Wettstein and Hou, How Best to Annuitize.

delay Social Security claiming does not qualify as “needing to do so” as opposed to someone who has to tap into their savings to pay the rent or a mortgage.

More to the point of this essay, there have even been those who have proposed annuities as a way to fill the gap.³

This has not caught fire with the companies who would be selling these products to the public. And, indeed, most annuity products for retirement seem to be concentrated on single premium and/or immediate annuities, losing all the advantage of leveraging the value of paying in over a long stretch of time.

What is envisioned in this essay is a period-certain annuity: an immediate annuity term vehicle that pays monthly income for a specified period. Once that period has expired, no further value exists in the annuity.

For purposes of achieving a low-cost solution, what should be envisioned is an annuity that starts at age 30. Why age 30? It is past the early years of education and family building (to some extent). Most people are in the workforce by this point and while many are still stressed by expenses such as college debt, a mechanism that diverts a small amount along with their required Social Security withholding might just be painless enough to work.

DELIVERY

The big question isn't so much whether this is a good idea, but how to deliver it.

In the abstract, one could argue employers could provide this instead of, or in addition to, life insurance. But this assumes employers are looking for yet another product to throw in front of their employees. In fact, one could argue that we have reached a point where employers are hesitant to do more—even with what products they do put forward—due to risk management and liability issues.⁴

Since people aren't buying annuities on their own and it might be hard to do so through employers, what would be a good substitute? The model I would propose is through the Social Security Administration. These annuities would still be supplied by private annuity companies but it seems best to imbed the products within Social Security much like federal government employees get their life insurance through the Federal Employees Group Life Insurance (FEGLI) Program. In reality, they are part of a 100+ insurance company structure with MetLife as the administrator (and one of the insurers). A similar model would be the federal government's Thrift Savings Plan (TSP), also an independent entity investing the money for enrollees in a wide array of private sector financial vehicles.

Like those programs, the annuity proposal envisions that these annuity products would not be identified by carrier. More important, the rules for how the carriers price and reserve for the annuities would all be the same. There are certainly reasons why competition is good. But for this kind of product approach, it is better we treat this as a commodity product and reduce competition and differentiation to make it accessible and more desirable to the public.

One matter open for discussion is whether to make this an auto-enrollment option. I would suggest we do that here. But the amount we would want to tap becomes an issue. For lower income individuals, if the amount is too high, they will need to bow out of coverage just to meet current needs. To resolve this issue, withholdings should be on a sliding scale with larger salaries getting a larger percentage put aside and lower salaries having less put aside. Amazingly enough, this is what Social Security itself does, in that the withholding is income (salary) based. The idea

³ James Mahaney, 2017, Innovative Strategies to Help Maximize Social Security Benefits, Prudential, <https://www.prudential.com/corporate-insights/strategies-to-maximize-social-security-benefits>.

⁴ Interview with Cindy Hounsell, president of Women's Institute for Secure Retirement, Nov. 18, 2019.

would be to simply increase the withhold amount by a small percentage, say from 6.2% to 6.5%. (This is not necessarily where the withholding amount will end up but just to give a sense of magnitude.)

By the way, while there are no income distributional effects, this plays out differently for those in lower or higher income categories. Unfortunately, this sort of proposal means less “help” for the lower income individuals when they reach their 60s since the withholding is less. But they are probably the ones most at risk of tapping Social Security early so any amount set aside to delay that is desirable. On the flip side, since Social Security withholding is capped at \$132,900, higher income individuals won’t have as much taken out to help bridge Social Security.

Other issues include inflation protection. Most annuity arrangements have an inflation adjustor but life insurance, for example, term products, usually does not. Given we are talking only an eight-year span of time, it may be fine to just pay out a flat amount during these 100 months. If we had an inflation adjustment, it would have to come out of the saved (withheld) amounts; a person would get less at age 62 so they can get more at age 70 (via the inflation adjustor). The goal is to keep people from tapping Social Security early so it might make sense to front-load the benefit.

Another issue that often crops up in this sort of product, whether Social Security itself or private insurance, is the difference between the genders. There is a distribution issue, with women living longer (which conversely might incent men to tap early rather than “lose” the Social Security or insurance benefit). However, since this is not a pooled account with everyone contributing for everyone’s benefit, this is not an issue. Whatever an enrollee puts away comes back to them and them only. That, of course, raises the other gender issue: Women make less than men in general. This proposal does not address that except in the sense that delaying Social Security means higher lifetime distributions from Social Security, which does work to a woman’s advantage given increased life expectancy.

Yet another issue is whether the money can be taken as a lump sum. The answer here is no since the idea is a bridge across those early years. There is too great a risk that a lump-sum distribution would be squandered. However, a related issue is whether an enrollee could take Social Security early regardless of this bridge payment proposal. The answer is that even with the additional resources thrown into the mix, enrollees may have to tap Social Security early. If they do, this annuity amount at least augments the lower Social Security payments they will receive over their lifetime, if only for the first eight years.

To the question about whether there would be a death benefit if the person passes away before 62 (or 70 for that matter), the answer is yes. This is a retirement tool and not an insurance product in the sense that its intended purpose is to encourage people to delay Social Security. Potential enrollees would be unlikely to see the merit in a product that disappeared from their estate if they passed away. Also, presumably the distribution would be taxed if it is withheld tax-free. If it is taxed before withholding, then only the increase, not the principle, would be taxed.

We also have to decide if the goal is to completely replace what Social Security would pay each month or whether it is OK if it is less. This is critical because a scheme where full replacement is the goal may mean the withholding during working years is of too great a magnitude.

SUMMARY

Putting together the various items laid out, we have this:

- Working individuals have X% of their payroll deducted automatically as part of the Social Security withholding, starting at age 30.
- Workers can opt out at any time (and opt back in, as well).

- Withholding ends at age 62 if it has not ended earlier because the individual is no longer working (also if they move over to the SoCal Security Disability Insurance program).
- The annuity begins at a person's birthday age 62 and ends four months into age 70 (covering 100 months).
- Amounts are not indexed for inflation.

In terms of how much money is needed out of each monthly paycheck (though it comes out as a percentage), further work is needed. Since this is a thought exercise and not in-depth research, the next step would seem to be to flesh this out. To make this work, the amount taken alongside Social Security has to be low enough that individuals will stay in the program. But it should be enough to make a real difference when the enrollee gets to age 62. Because the funds are invested by the annuity company for as long as 30 years, the inside build up would be quite significant over time

One way to do some guesstimating is to build on work already done by Mahaney and Carlson that gives some sense of the range, at least as it related to what amounts to an immediate annuity:

Consider an example. A worker turning 62 in 2006 has a final salary of \$75,000, making her eligible for a \$1,320 a month in Social Security benefits if she began immediately. If she delays Social Security benefits until age 70, her benefit will grow to \$2,884, more than double what she would collect at age 62. ... Conversely, if she were to take the \$1,320 at age 62, her benefit would grow only to \$1,637 by age 70.⁵

For this worker, we would be trying to come up with something like \$1,300/month, which is what amounts to the replacement cost of the "lost" Social Security benefit if she does not start taking it at age 62. For an individual in a lower income quartile, the replace amount would be less.

As is often true with research, the most oft-repeated phrase is that "further research is needed." That is certainly true here.

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⁵ James Mahaney and Peter Carlson, 2008, Rethinking Social Security Claiming in a 401(k) World, in *Recalibrating Retirement Spending and Saving*, eds. John Ameriks and Olivia S. Mitchell, Oxford: Oxford University Press.

Tontine Savings Accounts¹

Jonathan Barry Forman and Richard K. Fullmer

A tontine savings account is an investment product similar to a regular savings account but with the added feature of mortality pooling through participation in an open-ended tontine or pooled annuity. As we envision them, tontine savings accounts would allow investors to select their investments and choose from a variety of alternative payout methods. These tontine savings accounts could be opened as individual retirement accounts (IRAs) or standard taxable accounts, and they would provide investors with high levels of retirement income at a relatively low price.

Unlike a regular savings account (or a typical variable annuity), an investor in a tontine savings account would never be allowed to withdraw her contributions (or investment earnings). The situation is identical to a commercial life annuity: Once the premium is paid, there is no refund. Instead, the investor in a tontine savings account would only receive payouts according to the payout method she originally elected.

For example, a typical investor in a tontine savings account might elect to receive relatively level monthly payments starting at her planned retirement age (if she is alive then) until her death. Alternatively, she might elect inflation-adjusted payouts that would start out lower but end up much higher. Either way, the payouts from a tontine savings account would be significantly higher than the payouts from a regular savings account—because the tontine savings account would shift assets from dead investors to surviving investors.

Payouts from a tontine savings account would also be significantly higher than payouts from a commercial annuity. Tontine savings account payouts would follow directly from: 1) the investment returns on the investment portfolio that the investor elects, 2) the mortality experience of her tontine pool and 3) the payout method that she elects.

Because the company sponsoring a tontine savings account would make no guarantees, it would only charge a trivial fee to invest the funds, keep track of when investors die and make the payouts; and no money would need to be set aside for insurance company reserves or risk-taking. All in all, tontine savings account payouts would mimic the high payouts that would come from being able to buy an actuarially fair variable life annuity, and we estimate those payouts could be 10 or 15% higher than what a typical commercial annuity would pay.²

THE MECHANICS OF A SIMPLE TONTINE SAVINGS ACCOUNT

A tontine is a financial arrangement in which investors mutually and irrevocably agree to receive payouts while living and share the proceeds of their accounts upon death.³ Specifically, an investor's account is forfeited at her death,

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² See, for example, Jonathan Barry Forman and Michael J. Sabin, 2015, Tontine Pensions, *University of Pennsylvania Law Review* 163, no. 3:757–831, at 796 footnote 148 and accompanying text (noting that commercial annuities typically provide benefits which are worth just 88% of an actuarially fair annuity).

³ See, for example, Richard K. Fullmer and Michael J. Sabin, 2019, Individual Tontine Accounts, *Journal of Accounting and Finance* 19, no. 8, <https://doi.org/10.33423/jaf.v19i8.2615>; Richard K. Fullmer, 2019, Tontines: A Practitioner's Guide to Mortality-Pooled Investments, CFA Institute Research Foundation Brief, <https://www.cfainstitute.org/-/media/documents/article/rf-brief/fullmer-tontines-rf-brief.ashx>; Forman and Sabin, Tontine Pensions.

with the proceeds fairly apportioned among the surviving investors as “mortality gains.” Payouts naturally vary depending on investment performance and on the mortality experience of the various investors in the tontine.

We envision tontine savings accounts as individually owned investment accounts offered through a common tontine pool. An individual investor would open a tontine savings account with an insurance company or other financial institution, and, over time, she would make contributions to that account. At the time the account is opened, the investor would decide how her contributions would be invested, and she would also decide when and how she would receive her payouts.

For a very simple example, consider what would happen to a hypothetical 35-year-old woman investor named Sally who contributes \$1,000 to a tontine savings account at ABC Insurance Co. Sally and ABC agree that: 1) her contribution will be invested in a Standard & Poor’s 500 stock index fund, 2) Sally will get an appropriate lump-sum payout at age 70 if she is alive then but 3) if she dies before reaching age 70, her contribution will be forfeited (for the benefit of the other investors in ABC’s tontine-savings-account portfolio).

ABC Insurance Co. would make no guarantee as to the amount Sally would get if she lives to age 70, and, when the investment is made, neither Sally nor ABC can be certain of exactly how large the lump-sum payout would be in 35 years. But ABC offers Sally a fair deal, and ABC can: 1) give her a pretty good estimate of what her probability of surviving to age 70 is and 2) give her a pretty good estimate of the size (and the probable range) of the lump-sum payout she would get if she lives until then.

For example, ABC might tell Sally: 1) it estimates a 35-year-old investor like her has an 80% chance of surviving to age 70 (from an appropriate life expectancy table) and 2) ABC projects that her investment in the S&P 500 index fund will earn an average annual rate of return of around 7% (from a capital markets forecast).⁴

As more fully explained below, given these two assumptions, ABC can honestly tell Sally that if she survives until age 70, she should expect to collect a lump-sum payout of around \$13,350 then, give or take.

Basically, for a trivial fee, ABC Insurance Co. will pool Sally’s investment with those of thousands of other tontine-savings-account investors, keep track of who lives and who dies, and make the appropriate tontine reallocations and payouts. ABC’s projected lump-sum payout for Sally of \$13,350 follows directly from its two assumptions, and here is the math. First, if the S&P 500 index fund grows at exactly 7% every year for the next 35 years, then the \$1,000 that Sally invests should grow to around \$10,700 in 35 years ($\$10,676.58 = \$1,000 \times 1.07^{35}$). Second, if exactly 20% of the 35-year-old investors in the tontine-savings-account pool die before reaching age 70, then: 1) if Sally survives to age 70, she should get around \$13,350 ($\$13,345.73 = \$10,676.58/0.80$), or 2) if she does not survive until then, she will have already forfeited her investment.

Another way to look at her investment choices is to see that if Sally invests \$1,000 in an S&P 500 index fund, she (or her heirs or estate) should get around \$10,700 in 35 years, but if she instead invests \$1,000 in a tontine savings account, she should get around \$13,350 if she survives until then; that is around \$2,670 more for her to live on then

⁴ See, for example, J.B. Maverick, 2020, What is the Average Annual Return for the S&P 500? Investopedia, Feb. 19, <https://www.investopedia.com/ask/answers/042415/what-average-annual-return-sp-500.asp> (noting that the average annual return from 1957 through 2018 was roughly 8%); BNY Mellon Wealth Management, 2020, 10-Year Capital Market Assumptions: Calendar Year 2020, March, at 10, <https://www.bnymellonwealth.com/assets/pdfs-strategy/10-year-capital-market-assumptions.-calendar-year-2020.pdf> (projecting a 6.2% annual return for the U.S. equity market over the 10 years from 2020 through 2029, with a 15.3% standard deviation).

(\$2,669.15 = \$13,345.73 – \$10,676.58). For that matter, depending on her bequest motives and other preferences, she could split her investment between the two accounts.

FAIR TONTINES

A fair tontine is one in which the expected value of the gain or loss each investor experiences as a result of mortality pooling is zero for each investor. That is, each investor receives a “fair” bet in the probabilistic sense. Satisfying this “fairness constraint” requires that the forfeited account balances of dying investors be transferred to the surviving investors in an actuarially fair (unbiased) way, taking into account each investor’s relative stake in the tontine pool and her probability of dying.⁵

Like regular savings accounts and traditional brokerage offerings, the opportunity to invest in tontine savings accounts would be perpetually open-ended; that is, new investors could open new accounts at any time, and current investors could make additional investments at any time. Thus, the individuals who make up any given financial institution’s tontine pool would change over time, and, eventually, newer generations of investors would completely replace older generations.

All fees for tontine savings accounts would be plainly and transparently disclosed, and the all-in costs to investors would be very low when low-cost investments are selected. For example, imagine a tontine savings account that is invested entirely in an S&P 500 index fund. We know many discount brokers offer an S&P 500 index fund with an expense ratio of 0.15% or less,⁶ and we believe the tontine-savings-account management and record-keeping functions could be performed for as little as 0.25% of investments. That means all-in fees could be as low as 0.40% of investments.

TONTINE SAVINGS ACCOUNTS IN THE REAL WORLD

As already mentioned, we envision tontine savings accounts as individually owned investment accounts offered through a common tontine pool. In addition to having these tontine savings accounts opened as IRAs or standard taxable accounts, we believe the accounts could also be offered as investments for 401(k) and other defined contribution plans. For example, an employer might decide to invest its matching contributions into tontine savings accounts for its employees—and to also allow its employees to direct some, or all, of their own contributions into those tontine savings accounts.⁷

In any event, when an investor makes a contribution to her tontine savings account, she would elect from a wide variety of payout options, including not only the lump-sum payout option described in the earlier example but also a

⁵ See, for example, Michael J. Sabin, 2010, Fair Tontine Annuity, Mar. 26, <https://ssrn.com/abstract=1579932>; Catherine Donnelly, Montserrat Guillén and Jens Perch Nielsen, 2014, Bringing Cost Transparency to the Life Annuity Market, *Insurance: Mathematics and Economics* 56:14–27; Michael J. Sabin and Jonathan Barry Forman, 2016, The Analytics of a Single-Period Tontine, Nov. 9, <https://ssrn.com/abstract=2874160>.

⁶ See, for example, Fidelity, Fidelity 500 Index Fund, accessed Nov. 2, 2019, <https://fundresearch.fidelity.com/mutual-funds/summary/315911750>.

⁷ Tontine investment opportunities could also be made available to defined benefit plans. See, for example, Forman and Sabin, Tontine Pensions, at 802–15.

variety of periodic and lifetime payout options. In particular, lifetime payout options could be designed to mimic immediate, level-payment annuities; immediate, inflation-adjusted annuities; deferred annuities (i.e., longevity insurance); and joint-and-survivor annuities.

Investors would also be able to elect from a wide variety of investment options. At its simplest, for example, imagine that the sponsoring financial institution has just two investment funds: a stock index fund and a bond index fund. With just those two funds, investors could easily be offered more than a dozen investment options, including, for example, a 100% equity option, a 50/50 option, a 100% bond option and a whole range of target-date strategies (e.g., with target dates from, say, 2030 to 2080). Investors could also be allowed to periodically change how their accounts are invested (i.e., make trades within their accounts).

CONCLUSION

We believe tontine savings accounts will initially be offered by insurance companies—as the example shown suggests. After all, insurance companies are the financial institutions that are already equipped to deal with mortality trends and to access data sources that indicate when investors have died; and state insurance commissioners already know how to regulate pooled annuities, if not tontines. In the long run, however, as the financial institutions offering tontine savings accounts would make no guarantees, we see no reason why mutual fund companies should not also be allowed to get into the business of offering tontine savings accounts. All in all, we believe tontine savings accounts would provide investors with a valuable source of lifetime income, and we look forward to their inception.

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A Danish Perspective on Investment-Based Retirement Income: Innovative DC Retirement Income Solutions From Denmark¹

Per U.K. Linnemann

It is well known that Denmark started down the defined contribution (DC) road for occupational pensions decades ago. It is perhaps less well known that two investment-based retirement income solutions—individualized target date funds (iTDFs) and smoothed income annuities (SIAs)—were developed in Denmark.

Variable income payout annuities were launched in 1952 in the U.S., an impressive achievement at that time.² Several decades later, in a new millennium, SIAs were launched in Denmark to overcome concerns over both fluctuations in payments from variable income payout annuities and the lack of transparency of participating and with-profits policies.

Moreover, iTDFs can be offered today, providing mass-customized and -personalized dynamic investment strategies and capital efficient smoothed retirement income solutions that can fulfil the needs of a diverse range of retirement savers and retirees.

There are many ways iTDFs and SIAs can be designed. They can, for example, deal with:

- **Low interest rate environment.** This time can be likened to “termites in the basement.”
- **Inflation risk.** This can erode any fixed pension income (by nearly a third with 2% per year compounded over 20 years).
- **Longevity risk.** Retirement will span beyond age 85 for more than half of 65-year-olds.
- **Market volatility risk.** Retirement income should not fluctuate with market conditions.

SMOOTHED INCOME ANNUITIES

SIAs fit into the category of “ideal” annuity products, which have the following features:³

- Protection against outliving pension capital
- Ability to capture higher investment returns during (part of) the decumulation phase
- Potential for increasing payments
- Stabilization of income payments
- Downside protection, for example, a guaranteed minimum retirement income
- A “money back” feature, for example, a guaranteed 20-year payment period
- Co-ordination between the different phases such as the transition from accumulation to decumulation and at the end of a guaranteed payment period

SIAs may be offered by life insurance companies or pension funds. They can provide upside investment potential and optional downside protection, such as lifelong guaranteed minimum retirement incomes. Low interest rates do not have to be locked in at retirement.

These products also offer an enhanced income-payment profile with “more money when you need it” based on realistic assumptions of future investment returns and longevity, avoiding conservative margins.

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² See William C. Greenough, 1990, *It's My Retirement Money—Take Good Care of It: The TIAA-CREF Story*, Homewood, Ill.: Irwin.

³ Actuarial Association of Europe (formerly the European Actuarial Consultative Group), 2009, *Avoiding Pitfalls in Retirement*, Press release, Nov. 10, https://actuary.eu/wp-content/uploads/2018/05/Press-release-DC_Avoiding_pitfalls_in_Retirement_101109.pdf.

SIAAs are based on an innovative formula-based approach to sharing investment risks between the individual customer and the provider. The investment risks and mortality risks (if there is any) are alleviated for the provider by equalizing across different contracts issued at different times.

On top of this innovative formula-based collective, smoothed income annuities may be designed especially for occupational DC pensions. Formula-based risk-sharing between the participants may create an attractive and capital efficient balance between costs and benefits. It would be possible to show to each participant exactly how much this form of solidarity would cost.

SIAAs includes, for example, the possibility of flexible and variable regular as well as single premium payments; early as well as extension of annuitization regardless of any stated (“maturity”) date in the policy; and phased retirement, combinations of joint, last-survivor, reversionary and deferred smoothed income annuities.

A presentation of SIAAs was included in a chapter in *Handbook of Insurance*⁴ and in a 2016 Organisation for Economic Co-operation and Development (OECD) publication.⁵ The new product category is supported by peer-reviewed scientific research in two *Annals of Actuarial Science* articles.⁶

THE OLD VARIABLE PAYMENT AND VARIABLE PERIOD PAYMENT STRATEGIES

Managing money in the decumulation (income) phase is a lot harder than in the accumulation (saving) phase. Retirement income professor Wade Pfau has expressed this in a mountain-climbing analogy for retirement: The ultimate goal of climbing a mountain is not just to make it to the top. It is also necessary to get back down. Going up is easier than coming down.⁷

Let us consider a few of the problems with traditional variable payment strategies (where payments fluctuate with the markets) and variable period payment strategies (where the length of the payment stream varies).

First, it can be problematic to withdraw a specific percentage from your portfolio from year to year (e.g., by using the annuitization method, where the distribution amount is determined by dividing the investment account balance by an annuity factor). Market volatility will cause your income to vary too much from year to year because payments are adjusted to underlying investment portfolio performance and this may create anxiety among retirees.

Second, if you practice the famous “four percent withdrawal rule” (by spending an amount equal to 4% of your savings adjusted upward each year for inflation), you’ll find that it lacks capital efficiency. You could either spend too much, and run out of money too soon, or not spend enough and deprive yourself of many of the pleasures of retirement.

It is problematic and a significant shortcoming when the investment strategy and the payment mechanism are disconnected and do not work well together.

There is another way: iTDFs. They deal with the complex decisions of how to invest and how to draw down so as to spend retirement savings over a predefined period. They combine the accumulation and decumulation phases of a pension, providing both a savings vehicle and a regular smoothed retirement income with or without longevity income management.

⁴ Nadine Gatzert and Hato Schmeiser, 2013, New Life Insurance Financial Products, in *Handbook of Insurance*, ed. Georges Dionne, New York: Springer.

⁵ Organisation for Economic Co-operation and Development (OECD), 2016, *Life Annuity Products and Their Guarantees*, <https://dx.doi.org/10.1787/9789264265318-en>.

⁶ Peter L. Jørgensen and Per Linnemann, 2012, A Comparison of Three Different Pension Savings Products with Special Emphasis on the Payout Phase, *Annals of Actuarial Science*, 6, no. 1:137–52; Per Linnemann, Kenneth Bruhn and Mogens Steffensen, 2015, A Comparison of Modern Investment-Linked Pension Savings Products, *Annals of Actuarial Science* 9, no. 1:72–84.

⁷ Wade Pfau, 2017, *How Much Can I Spend in Retirement? A Guide to Investment-Based Retirement Income Strategies*, McLean, Va.: Retirement Researcher Media.

A NEW APPROACH TO INVESTING AND SPENDING IN RETIREMENT: iTDFs

Traditional target date funds (TDFs) with predetermined glidepaths at the fund level are one size fits all, lack customization and are not designed to convert savings to income.

Contrary to the old TDFs, the new iTDF approach gives each investor a dynamically self-adjusting glide path where asset allocations are automatically adjusted between a risky (multiasset) investment fund and a riskless (multiasset) investment fund. Investment risk exposure is reduced as investors get older—avoiding excessive investment risk-taking at old age.

The iTDFs approach is to integrate and coordinate spending and asset-allocation decisions, making efficient use of capital (including decumulation) without the need for buffers and reserves (assets held in a side account to store gains or compensate for shortfalls). The full market-linked return is passed on to the investment account of the individual investor during both the accumulation and decumulation periods.

Although the investment account value may fluctuate significantly in the short term, the formulas dynamically determine an income that would not fluctuate with market conditions. The formulas also mitigate the risk that sudden market swings close to the retirement date might have on the beginning income.

Metaphorically speaking, intelligent shock absorbers and an automatic transmission are added to existing TDFs and life-cycle products.⁸ These new features are used to convey account owners seamlessly from the accumulation stage to the income stage and provide a smooth retirement journey managing point-in-time income risk. There is no boundary between pre- and post-retirement investment and iTDFs may overcome inefficiencies of disjointed products.

This new approach to TDFs are life-cycle products with personalized dynamic investment strategies and capital efficient smoothing of retirement incomes for each individual. The built-in drawdown and investment strategies work well together. They are interconnected and coordinated by mathematical formulas and constitute a unified whole in an innovative way.

NEW PERSPECTIVES ON RETIREMENT INCOME

The iTDFs approach is a managed account solution making decumulation and accumulation easy for investors. It is the desired or default degree of smoothing that determines the level of investment risk profile during accumulation and decumulation. This could open up a more meaningful dialogue with investors and pension plan members, where the focus is on stability in retirement incomes as guidance on investment risk tolerance.

These funds open up new perspectives on retirement income and retirees do not have to accept lower expected returns as the price for more stability in retirement incomes. On the contrary, the iTDFs' smoothing mechanism enables the combination of investment opportunities and expected higher returns with lower volatility in retirement incomes. Attractive member income outcomes are the priority and, after all, that is the purpose of pensions.

A choice between smoothed retirement income profiles can be offered. There is a trade-off between more income in the shorter term versus more income in the longer term. For instance, income could be weighted toward the first many years of retirement where retirees may prefer enhanced retirement incomes, when they tend to be more active. Or it could be weighted toward the latter years to offset the effect of inflation.

⁸ I described this concept in a recent guest column: Per U.K. Linnemann, 2017, iTDFs: "Self-Driving" Retirement Cars, *Retirement Income Journal* April 19, <https://retirementincomejournal.com/article/itdfs-self-driving-retirement-cars/>.

A targeted minimum pension benefit may potentially be obtained at retirement; the subsequent smoothed retirement income, non-decreasing over time with a high degree of certainty, can also be achieved. Low interest rates do not have to be locked in when converting retirement savings into retirement income.

OPTIONAL LONGEVITY INCOME MANAGEMENT

These new products may be designed to produce smooth income during retirement, either for a predefined period (for example, between ages 65 and 85) or, if combined with optional longevity pooling, for as long as the account owner lives—offering seamless transition between the two phases. This may provide survivor benefits when they have the biggest impact later in life—a compelling investment case.

The retirees may maintain flexibility and control of all of the savings during the liquidity period; they do not have to enter the life-contingent phase. They may opt out of a previously chosen longevity option at any time during the drawdown phase.

During the longevity pooling period, the participants share individual longevity risk and a return on survival (mortality credits) is added to the investment return as a result of the reallocation of wealth from those who die to those who live longer. The survivor benefits become more significant the older the retiree gets and the mortality gains for those alive will have more impact than asset returns at older ages.

The smoothing of the life-contingent retirement incomes is supported by an actuarial risk-sharing and equalization mechanism where experienced return on survival is distributed equitably between the participants—a compelling actuarial case.

These funds do not require expensive guarantees and the manufacturer does not have to assume investment and mortality risks. That said, for those who want guaranteed income in the later part of life, iTDFs may be combined with deferred or immediate income annuities.

FLEXIBILITY

Participants may be allowed the flexibility to adjust their contributions over time. The iTDFs may also offer the possibility for participants to personalize as well as the flexibility to change the expected retirement date, investment horizon, degree of smoothing and investment risk profile, retirement income payment profile and/or length of the liquidity period before any optional longevity pooling commences.

That said, flexibility should ideally be designed with some limited but relevant choices.

Moreover, iTDFs can be combined with an ongoing floor and ceiling approach on withdrawals—for example, for fulfilling minimum and/or maximum required distributions.

FINAL REMARKS

The iTDFs framework provides a platform for developing personalized dynamic investment strategies and capital efficient smoothed retirement income solutions. Different versions of iTDFs can be tailored to local market conditions and purposes and targeted at different customer and member groups—including low to medium earners. These funds could fill a vacuum in drawdown solutions not least in the underserved markets internationally.

Relying on a robust algorithmic framework, iTDFs will fit easily into an increasingly digitalized and mass-customized world. They can be delivered as fully automated solutions. The algorithm-based product design allows scalability, portability and low cost.

Finally, the iTDF framework can also provide investment strategies designed to enable the account holders to take (part of) their pensions as a “smoothed” lump-sum capital payment at retirement.

Further Reading

More information on SIAs and iTDFs as published in *Retirement Income Journal* and *Investment & Pensions Europe Magazine* are available from the author.

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Aromer: Solving the Catch-22 of the 401(k)

Kalon McMahon

The retirement crisis is very real. The median total household retirement savings for American workers is estimated at only \$50,000,¹ while over one in four Americans say they have no retirement savings or pension benefits whatsoever.² Improvements in health care means people are living longer, meaning they need to save even more. While auto-enrollment and auto-escalation have helped increase retirement plan participation, the value of these plan innovations is lost on the majority of Americans, who neglect their finances, leaving them on autopilot. The American retirement model has not been comprehensively addressed for decades and, without immediate intervention and policy change, this very solvable problem will escalate the retirement crisis into a retirement tragedy.

The good news is we can fix it, literally overnight, with one simple solution: sanctioning a third-party 401(k) contribution as a mutually beneficial investment vehicle. Financially stressed individuals could establish a risk-free relationship with external investors willing to fund a participant's retirement account in exchange for access to additional tax advantages and deferred compensation. Remora spelled backward, Aromer flips the power dynamic between Wall Street and Main Street and empowers cash-strapped individuals to effortlessly profit by allowing investors to fuel their road to retirement. Ultimately, Aromer could provide a safe and effective solution to help achieve 100% plan participation while simultaneously empowering the 99% with guaranteed long-term financial security.

Before we dissect this commonsense solution, let's explore how we found ourselves in a retirement crisis despite years of market highs and unemployment lows.

THE PROBLEM

The retirement crisis is the inadvertent collateral damage of a sound niche investment strategy suitable for some, being misappropriated and repackaged as a blanket long-term financial salvation theory for all. In the early 1970s, a group of high-earning individuals from Kodak approached Congress to allow a part of their salary to be invested in the stock market and thus be exempt from income taxes. This resulted in Section 401(k) being added to the tax code; it was intended to allow taxpayers a break on taxes on deferred income.

The key phrase in this story being high earning. The modern retirement model as we know it is the derivative of a specific investment strategy designed for employees with too much income seeking an additional tax shelter. That investor profile does not sound anything like the modern average American:

- Median American income in 2019 was \$63,000³
- The average American household with debt owes \$137,063⁴

¹ Catherine Collinson, Patti Rowe and Heidi Cho, 2019, Employers: The Retirement Security Challenge, 19th Annual Transamerica Retirement Survey, https://transamericacenter.org/docs/default-source/retirement-survey-of-employers/tcrs2019_sr_employer_survey_retirement_security_challenge.pdf.

² Board of Governors of the Federal Reserve System, 2019, Retirement, in *Report on the Economic Well-Being of U.S. Households in 2018*, <https://www.federalreserve.gov/publications/2019-economic-well-being-of-us-households-in-2018-retirement.htm>.

³ United States Census Bureau, 2018, Income, Poverty and Health Insurance Coverage in the United States: 2017, Press release no. CB18-144, <https://www.census.gov/newsroom/press-releases/2018/income-poverty.html>.

⁴ Board of Governors of the Federal Reserve System, 2019, Retirement, in *Report on the Economic Well-Being of U.S. Households in 2018*, <https://www.federalreserve.gov/publications/files/2018-report-economic-well-being-us-households-201905.pdf>.

- More than 25% of adults would need to borrow or sell something to pay for an unexpected expense of \$400⁵
- A quarter of adults have no retirement savings and skipped necessary medical care in 2018 because they were unable to afford the cost⁶
- More than 75% of Americans live paycheck to paycheck⁷ and simply can't afford to contribute to a 401(k)

For anyone with enough financial acumen to grasp the concept and enough financial surplus to fund it, the 401(k) plan made perfect sense. It reduced taxes, it increased wealth and, if the employer made matching contributions, it offered “free” money. Thirty-year projections promised employees retirement nest eggs big enough to fund the American dream. To reduce benefit disparity between higher- and lower-wage earners, nondiscrimination rules were adopted in 1984.⁸ As such, the tax-deferred benefits of a defined contribution retirement plan were quickly becoming available to the masses. The logic was sound: Invest a small percentage of your paycheck every month and you could be a millionaire by the time you retire. It was foolproof. Who couldn't afford to save a few hundred dollars every month?

But while society shifted from guaranteed retirement via defined benefit pension plans to possible retirement via do-it-yourself defined contribution plans, we forgot to educate people on one small detail—how to actually do it yourself. Consequently, it failed.

Fast forward to 2019. Employees who joined the workforce in the dawn of the defined contribution retirement plan era and theoretically should be enjoying their fully funded retirement, instead find themselves working beyond age 65 as Uber drivers, grocery store clerks and school teachers. As of February 2019, more than 20% of adults age 65 and older are either working or looking for work, compared to 10% in 1985.⁹ The U.S. Bureau of Labor Statistics expects the trend of older people working to continue, estimating that 13 million Americans age 65 and older will be in the labor force by 2024.¹⁰

HOW DO WE FIX IT?

The catch-22 of the modern retirement system is that it only works if you start saving when you are 22. The success of the model relies on the power of compound interest over time, but with so many workers living paycheck to paycheck, few can afford to save for retirement, especially in their 20s. Consider the following:

- Average student loan debt total per person: \$31,172¹¹
- Average monthly student loan payment: \$393¹²
- Time to pay off student debt: 10 to 30 years¹³

Take the example of a 25-year-old who invests \$300 a month in a Roth IRA for 40 years and earns on average 8% annually. When they retire at age 65, their investment will be worth just over \$1 million. If the same person were to

⁵ Ibid.

⁶ Ibid.

⁷ CareerBuilder, 2017, Living Paycheck to Paycheck is a Way of Life for Majority of U.S. Workers, According to New CareerBuilder Survey, Aug. 24, <http://press.careerbuilder.com/2017-08-24-Living-Paycheck-to-Paycheck-is-a-Way-of-Life-for-Majority-of-U-S-Workers-According-to-New-CareerBuilder-Survey>.

⁸ Employee Benefit Research Institute (EBRI), 2018, History of 401(k) Plans: An Update, *EBRI Fast Facts*, no. 318, <https://www.ebri.org/docs/default-source/fast-facts/ff-318-k-40year-5nov18.pdf>.

⁹ Lincoln Plews, 2019, Older Americans in the Workforce, Capital One/United Income white paper, April 22, <https://unitedincome.com/library/older-americans-in-the-workforce/>.

¹⁰ Mitra Toossi and Elka Torpey, 2017, Older Workers: Labor Force Trends and Career Options, U.S. Bureau of Labor Statistics *Career Outlooks*, May, <https://www.bls.gov/careeroutlook/2017/article/older-workers.htm>.

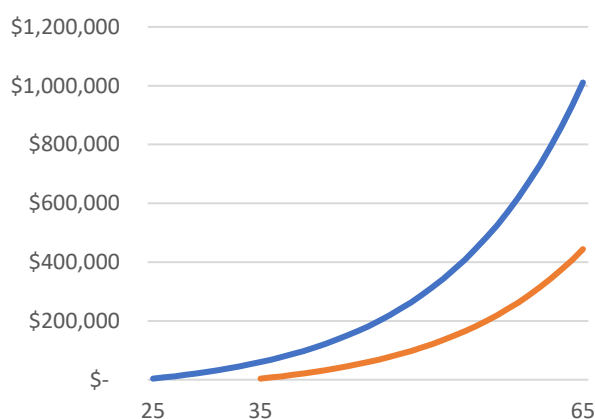
¹¹ Natalie Issa, 2019, U.S. Average Student Loan Debt Statistics in 2019, *Credit.com*, June 19, <https://www.credit.com/personal-finance/average-student-loan-debt/>.

¹² Ibid.

¹³ Ibid.

start investing \$300 a month at age 35, they'd only have around \$450,000 by the time they reached age 65. Those 10 years would cost over \$550,000. In other words, it's nearly impossible to catch up if you don't start saving in your 20s. This can be seen in Figure 1.

Figure 1
Cost of Starting Retirement Savings Too Late



Data source: Emmie Martin, 2019, Suze Orman: Why You Should Start Investing in Your 20s, CNBC Save and Invest, May 10, <https://www.cnbc.com/2019/05/10/suze-orman-why-you-should-start-investing-in-your-20s.html>.

Currently, one in six millennials say they have less than \$10,000 saved for retirement, and over half say they have nothing saved for retirement.¹⁴ What this suggests is that we are knowingly grooming an entire generation to fail all over again unless we afford some sort of alternative retirement strategy capable of exponentially closing the enormous retirement gap. But what if there were a zero-risk solution to immediately guarantee 100% plan participation with 100% of employees contributing enough to receive the full employer match starting their first day on the job?

THE SOLUTION

Introducing Aromer, the world's first fully funded retirement investment account option. By sanctioning a third-party retirement plan contribution as a mutually beneficial investment vehicle, we can empower employees to actually utilize and leverage the life-changing benefit already at their disposal—a benefit that would otherwise go untapped without connecting participants with willing investors seeking additional exposure to the employer matching and tax advantages unique to retirement plan participants.

How It Works

The idea works like this: a third-party financier offers to contribute to a retirement plan account on behalf of a plan participant, up to the annual contribution limit—at least enough to ensure receipt of the full employer match. In doing so, we create an additional retirement plan participant and convert a nonsaver into a saver without requiring them to take any action or make any lifestyle changes. Better than auto-enrollment and auto-escalation, 100% of employees would actually be—and stay—enrolled in the plan starting their first day on the job.

In exchange for funding the participant's retirement account, the financier is entitled to a majority split (60/40) of the retirement plan balance. To be clear, this is not a loan. There is no interest rate applied to the contributions. The participant can stop coverage at any time without penalty. For their part, the financier gains access to additional funds through the employer match while retaining all of the tax advantages afforded current retirement plan

¹⁴ Sean Dennison, 2019, 64% of Americans Aren't Prepared for Retirement—and 48% Don't Care, GO Banking Rates, *Plan Your Retirement* blog, Sept. 23, <https://www.gobankingrates.com/retirement/planning/why-americans-will-retire-broke/>.

participants. While a majority split may seem drastic, it's still 40% more than zero, which is what most Americans are on track to have saved for retirement without access to an Aromer account.

Let's look at an example. Imagine a 25-year-old college graduate making \$50,000 a year with \$30,000 in student loan debt who simply can't afford to make their student loan payments, pay rent and contribute to their retirement plan at work. The details are broken down in Table 1.

Table 1
Example for 25-Year-Old College Graduate

Results Summary	
Current retirement plan balance	\$0
Years to invest	40
Annual rate of return	6%
Annual salary	\$50,000
Expected annual salary increase	2%
Aromer contribution	\$19,000 per year
Employer match	50% up to 6% of salary
Total contributions (including catch-up)	\$850,000
Total employer contribution	\$90,603
Retirement plan balance @65	\$3,383,046
Share to retirement plan participant	\$1,353,218
Share to Aromer investor	\$2,029,828

If they allow an Aromer investor to fully fund the retirement account up to the annual contribution limit of \$19,000 (2019), at a 6% annual rate of return for 40 years, the participant would earn *\$1,353,218 without contributing a single dollar out of pocket*. In exchange for the principal investment of \$850,000 over 40 years, the Aromer investor would be entitled to the remaining majority share, totaling \$2,029,828.

WHAT NEEDS TO CHANGE?

Under the current system, retirement plan contributions can only be made by employers and employees. This model has remained relatively unchecked for nearly four decades. Given the impending retirement crisis, it's time to revisit this archaic and inadequate approach to retirement security for the millions of Americans who depend on it.

Let's take some cues from the fintech industry. Upromise¹⁵ paved the way by helping parents turn everyday purchases into college savings. In the same way, fintech solutions like EvoShare¹⁶ offer a financial platform that makes it possible for employees to turn everyday purchases into additional retirement plan contributions. What's interesting is that the opportunity to save is not limited to the participant. Imagine a world where family and friends can contribute to your retirement plan as a wedding gift or birthday present.

For their report *Securing Retirement for New Generations*, Politico asked thought leaders and policymakers to address the problems with the current U.S. retirement system and to identify potential solutions. The group put forth several straightforward ideas aimed at revamping the retirement model and helping Americans generate more wealth for retirement, including:

¹⁵ For more information on Upromise, visit <https://www.upromise.com/>.

¹⁶ For more information on EvoShare, visit <https://evoshare.com/AboutUs>.

An independent commission could help build political consensus. American retirement hasn't been comprehensively addressed for decades. One way to move forward would be for Congress to establish a high-profile independent commission. Though not a policy change in itself, a commission would bring needed attention to the issue, set an official baseline for the problem and launch the conversation on reforms, from small-scale adjustments to a wide-ranging revamp of the U.S. retirement system.

More Americans need access to retirement savings plans. The retirement system is still highly dependent on employers and far more dependent on the 401(k) than even its inventor envisioned. A simpler and portable account would give workers more consistent access to tax-advantaged savings and leave them less vulnerable to gaps caused by job changes and financial emergencies.¹⁷

Although a seemingly new concept, the strategy Aromer seeks to legitimize is not drastically different from other proven alternative investment strategies such as life settlement transactions whereby a policyholder transfers ownership of their policy to a third party in exchange for relief from future premium payments and an immediate cash payout for less than the mature value of the policy. Similarly, Aromer proposes a safe and effective strategy to help achieve 100% plan participation while simultaneously empowering the 99% with guaranteed long-term financial security. Ultimately, by sanctioning a third-party retirement plan contribution as a mutually beneficial investment vehicle, Aromer empowers plan participants to effortlessly profit by simply allowing investors to come along for the ride.

So, the question to the millions of Americans not contributing to their retirement plan becomes: Would you rather have 100% of \$0 or 40% of \$3 million?

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¹⁷ Politico, 2018, Securing Retirement for New Generations, *The Agenda: A Politico Working Group Report*, <https://static.politico.com/dd/46/de2db6744a41957c96c51f84f094/working-group-report.pdf>.

Take Ownership of Your Retirement Process: Oversight Tool to Understand Risks

Max J. Rudolph

What follows is educational and should not be considered as investment advice. Consult your financial or tax adviser, or own your decisions yourself.

In a previous Society of Actuaries' Financial Wellness essay,¹ I argued that having a personal risk manager is a great way to develop resiliency regarding retirement planning. In this essay, I share a tool I use to build individual retirement distribution scenarios, allowing me to better understand which assumptions are the drivers of my own personal situation. This allows me to analyze my own situation, or at least to compare rules of thumb generated by others for reasonableness. While the general concepts are universal, the application is specific to U.S. retirees.

I believe it is important to develop your own tools for retirement planning, skipping the free dinners offered by those selling a "solution." It may be the right one, but why not have a tool that can double check the work? There is no one-size-fits-all solution to retirement planning, and most products offered to retirees pay the person selling them at the point of sale, leaving you to accept the result, whether it is great or terrible.

BACKGROUND

I am nearly 60 years old, have traditionally practiced in the asset-liability management and enterprise risk management fields, and am drawn to books and articles that describe retirement planning. I have found that most advisory firms overgeneralize or provide complex stochastic simulations I have trouble relating to. My results will not be the average across 10,000 scenarios. I want to know what scenarios cause me to run out of money so I can mitigate that risk by working longer, saving more, buying longevity annuities or following some other path which allows me a higher likelihood of remaining financially independent. While the tool I share in this essay does not include this, in real life it should include a discussion around funding children's education, disability and long-term care insurance, and the risks associated with premature death, divorce or remarriage.

For retirement planning, I recommend that friends read books and articles written by Steve Vernon. He has participated in this series of essays in the past, and I encourage you to read anything he writes. A recent SOA report he co-authored does a nice job of looking at a wide spectrum of risks leading up to and including retirement.² The tool I will present is generally based on topics Vernon has written about, where quite a few retirement strategies were tested and one that works for many retirees was settled on.³

Similar to Vernon's preferred strategy, which is relatively simple to implement, the retiree defers Social Security until age 70 if possible, taking distributions from qualified accounts until then up to the total income chosen (net of any annuity payouts from defined benefit plans). After age 72, required minimum distributions (RMDs) must be taken from qualified accounts.⁴ If RMDs are greater than the chosen retirement income, then the excess is reinvested (after paying a 30% "income" tax) in a nonqualified account. If less, it must be topped off by distributions from the nonqualified accounts to create the desired total income. To keep the analysis simple, I won't consider strategies that include additional working years, or Social Security benefits based on a spouse's earnings or that

¹ Max Rudolph, 2017, Personal Risk Manager: Driver of Resilience, Society of Actuaries' Financial Wellness essay collection, <https://www.soa.org/resources/essays-monographs/2017-financial-wellness-essay-collection/>.

² Wade Pfau, Joe Tomlinson and Steve Vernon, 2019, Viability of the Spend Safely in Retirement Strategy, Society of Actuaries' Aging and Retirement report, <https://www.soa.org/resources/research-reports/2019/viability-spend-safely>.

³ Wade Pfau, Joe Tomlinson and Steve Vernon, 2017, Optimizing Retirement Income by Integrating Retirement Plans, IRAs, and Home Equity, Society of Actuaries report, <https://www.soa.org/resources/research-reports/2017/2017-optimize-retire-income-plans-iras-equity/>.

⁴ This was updated from 70% in the Setting Every Community Up for Retirement Enhancement (SECURE) Act of 2019.

begin prior to 70, although each could be fairly easily integrated by the reader in their own spreadsheet. The value of homes and other personal property is also ignored for simplicity, but each family's personal situation should be addressed.

The idea is to provide high level analysis that allows a retiree, or soon-to-be retiree, to consider various scenarios and develop strategies consistent with their unique risk appetite (also known as the "can you sleep at night?" test) and understand the ramifications.

THE TOOL

There are many strategies that generate retirement income, including payout annuities, military pensions, charitable gift annuities and reverse mortgages. I'll let others cover them and mean no disrespect by keeping it simple here. You can make a spreadsheet extremely complex, but keeping it simple is anything but stupid and makes it easier to both understand and explain.

For this CliffsNotes version of the model, I will consider defined benefit pension payouts, Social Security payouts, qualified accounts and nonqualified accounts for two soon-to-be retirees. Since Social Security benefits are adjusted for cost of living (inflation), all calculations will be done on a current year basis.⁵ This eliminates what I find to be very confusing, thinking about what a dollar today is worth in the future. Investments increase using a real total return rate (nominal total return rate – inflation rate). I use 2% real returns, but you might justify a different rate or build in additional conservatism. I ignore any inflation adjustment to defined benefit pensions (including Social Security) and assume all payouts are made annually at the start of the year. Both retirees (one is three years younger than the other) are assumed to live throughout the scenario and ignore adjustments to payout annuities with rights of survivorship. The retirees are assumed to have no debt.

THE VARIABLES

Some variables become columns in a spreadsheet (see Table 1), varying based on current age, withdrawals and earnings in prior years. The analysis starts by identifying accumulation values at a specific year end; initial ages are based on that date.

- A. Retiree #1 (R1; current age 62) payout annuities (includes any DB and Social Security payment)
 - \$20,000 annually from Social Security starting at age 70
- B. R1 qualified accounts accumulated value
 - \$500,000 (earning 2% real rate after net deposits and withdrawals)
- C. R1 nonqualified accounts accumulated value
 - \$250,000
- D. R1 income from qualified accounts (withdrawals, taxable as income)
- E. R1 income from nonqualified accounts (withdrawals, may be taxable as capital gain, dividend or interest; ongoing taxes of the nonqualified accounts are ignored)
- F. Retiree #2 (R2; current age 59) payout annuities (includes DB and Social Security payment)
 - \$12,000 annually at age 65 from a work-based DB pension plan and \$15,000 annually from Social Security beginning at age 70
- G. R2 qualified accounts accumulated value
 - \$500,000
- H. R2 nonqualified accounts accumulated value
 - \$250,000

⁵ Another way to think of this is to assume that inflation is always 0%.

- I. R2 income from qualified accounts
- J. R2 income from nonqualified accounts
- K. Total family income = $A + D + E + F + I + J$
 - Combine annuity payouts and all withdrawals for both retirees
- L. Before tax financial net worth = $B + C + G + H$
 - Combine qualified and nonqualified accounts for both retirees

Think of the income for each year as tiered into three levels. The goal each year is set in advance. In the base scenario, each retiree would like to have \$50,000 in annual (before tax) income, starting immediately. Tiers are only used if necessary to meet the annual income goal.

- **Tier 1.** Income from payout annuities (Social Security, DB plan)
- **Tier 2.** Income from qualified accounts; starting at age 72 required minimum distributions above the income goal are placed (after being taxed at 30%) in the nonqualified accounts
- **Tier 3.** Income from nonqualified accounts

Taxes are ignored except for excess qualified income (from RMDs) that is reinvested in the nonqualified account. Note that withdrawals from qualified accounts will be taxed as income, while nonqualified accounts are taxed on an ongoing basis at often lower investment and capital gains rates.

Qualified accounts are accessed first for several reasons related to taxation. By withdrawing prior to age 70, allowing deferral of Social Security benefits, total taxable income will be lower since there is no earned income from employment, and marginal rates are probably lower than when working. By reducing the amount invested, it also reduces the amounts that are taxable when RMDs are taken, so this is an especially valuable strategy if you have sizable qualified accounts.

This tiering strategy allows for stable income, depleting qualified accounts to zero before taking withdrawals from nonqualified accounts. This may have some advantages for estate planning as well since nonqualified assets receive a step-up in basis at death, while qualified accounts remain taxable as income to beneficiaries.

BASE SCENARIO

The base scenario has several defining characteristics, as seen in Table 1.

- The initial net worth of \$1.5 million is fully depleted by R1 age 92, followed by guaranteed combined annuity payouts of \$47,000 that provide resiliency.
- Any strategy that reduces withdrawals in the early years of retirement, either by deferring retirement or reducing income taken in the early years prior to the annuities kicking in, will extend the lifetime of the withdrawal strategy since those assets will be able to grow untouched until R1 age 92 if the adjustment is made by R2.
- Taking Social Security at 62 could be tested, showing an initial reduction in withdrawals but an increasing risk of assets running out in the longer run, and potentially higher marginal income tax rates when qualified accounts are depleted.

Table 1
Base Scenario Defining Characteristics

A	B	C	D	E	F	G	H	I	J	K	L	
Retiree #1			\$ 50,000	annual income	Retiree #2			\$ 50,000	annual income	Total	Total	R1
Payouts	Q Assets	NQ Assets	Q income	NQ income	Payouts	Q Assets	NQ Assets	Q income	NQ income	Income	Assets	age
	500,000	250,000	50,000			500,000	250,000	50,000		100,000	1,500,000	62
	459,000	255,000	50,000	-		459,000	255,000	50,000	-	100,000	1,428,000	63
	417,180	260,100	50,000	-		417,180	260,100	50,000	-	100,000	1,354,560	64
	374,524	265,302	50,000	-		374,524	265,302	50,000	-	100,000	1,279,651	65
	331,014	270,608	50,000	-		331,014	270,608	50,000	-	100,000	1,203,244	66
	286,634	276,020	50,000	-		286,634	276,020	50,000	-	100,000	1,125,309	67
	241,367	281,541	50,000	-	12,000	241,367	281,541	38,000	-	100,000	1,045,815	68
	195,194	287,171	50,000	-	12,000	207,434	287,171	38,000	-	100,000	976,972	69
20,000	148,098	292,915	30,000	-	12,000	172,823	292,915	38,000	-	100,000	906,751	70
20,000	120,460	298,773	30,000	-	12,000	137,520	298,773	38,000	-	100,000	855,526	71
20,000	92,269	304,749	30,000	-	12,000	101,510	304,749	38,000	-	100,000	803,277	72
20,000	63,515	310,844	30,000	-	27,000	64,780	310,844	23,000	-	100,000	749,982	73
20,000	34,185	317,060	30,000	-	27,000	42,616	317,060	23,000	-	100,000	710,922	74
20,000	4,269	323,402	4,269	25,731	27,000	20,008	323,402	20,008	2,992	100,000	671,080	75
20,000	-	303,624	-	30,000	27,000	-	326,818	-	23,000	100,000	630,442	76
20,000	-	279,096	-	30,000	27,000	-	309,894	-	23,000	100,000	588,991	77
20,000	-	254,078	-	30,000	27,000	-	292,632	-	23,000	100,000	546,710	78
20,000	-	228,560	-	30,000	27,000	-	275,025	-	23,000	100,000	503,585	79
20,000	-	202,531	-	30,000	27,000	-	257,065	-	23,000	100,000	459,596	80
20,000	-	175,982	-	30,000	27,000	-	238,747	-	23,000	100,000	414,728	81
20,000	-	148,901	-	30,000	27,000	-	220,062	-	23,000	100,000	368,963	82
20,000	-	121,279	-	30,000	27,000	-	201,003	-	23,000	100,000	322,282	83
20,000	-	93,105	-	30,000	27,000	-	181,563	-	23,000	100,000	274,668	84
20,000	-	64,367	-	30,000	27,000	-	161,734	-	23,000	100,000	226,101	85
20,000	-	35,054	-	30,000	27,000	-	141,509	-	23,000	100,000	176,563	86
20,000	-	5,155	-	5,155	27,000	-	120,879	-	23,000	75,155	126,034	87
20,000	-	-	-	-	27,000	-	99,836	-	23,000	70,000	99,836	88
20,000	-	-	-	-	27,000	-	78,373	-	23,000	70,000	78,373	89
20,000	-	-	-	-	27,000	-	56,481	-	23,000	70,000	56,481	90
20,000	-	-	-	-	27,000	-	34,150	-	23,000	70,000	34,150	91
20,000	-	-	-	-	27,000	-	11,373	-	11,373	58,373	11,373	92
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	93
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	94
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	95
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	96
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	97
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	98
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	99
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	100
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	101
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	102
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	103
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	104
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	105
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	106
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	107
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	108
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	109
20,000	-	-	-	-	27,000	-	-	-	-	47,000	0	110

ALTERNATIVE SCENARIOS

The benefit to building your own spreadsheet, with your personal and unique circumstances, is to do a variety of what-if analysis scenarios. For someone near retirement, looking at the amount to pull each year is extremely important. For someone younger who builds in an accumulation phase, the savings amount is likely more important to think about today. With that in mind, I will present two additional scenarios for the retirees, each using the same spreadsheet formulas but changing some assumptions.

Scenario 2

In the second scenario, the initial qualified account balance is increased to \$900,000 for retiree #1. Here are some characteristics of this scenario, shown in Table 2.

- For retiree #1, \$900,000 (combined with \$250,000 nonqualified account balance) is enough to last beyond R1 age 110.
- For retiree #1, investment income on qualified account assets are sufficient on their own to provide the desired income until R1 age 96.
- Although retiree #2 has funds run out at R1 age 92, the total income remains at \$77,000 until they are both well past age 100.
- These retirees could adjust their individual goal incomes if they desire to have total income last to a specific age, adjusting each year as investment results play out.

Table 2
Scenario 2 Defining Characteristics

A	B	C	D	E	F	G	H	I	J	K	L	
Retiree #1			\$ 50,000	annual income	Retiree #2			\$ 50,000	annual income	Total	Total	R1
Payouts	Q Assets	NQ Assets	Q income	NQ income	Payouts	Q Assets	NQ Assets	Q income	NQ income	Income	Assets	age
	900,000	250,000	50,000			500,000	250,000	50,000		100,000	1,900,000	62
	867,000	255,000	50,000	-		459,000	255,000	50,000	-	100,000	1,836,000	63
	833,340	260,100	50,000	-		417,180	260,100	50,000	-	100,000	1,770,720	64
	799,007	265,302	50,000	-		374,524	265,302	50,000	-	100,000	1,704,134	65
	763,987	270,608	50,000	-		331,014	270,608	50,000	-	100,000	1,636,217	66
	728,267	276,020	50,000	-		286,634	276,020	50,000	-	100,000	1,566,941	67
	691,832	281,541	50,000	-	12,000	241,367	281,541	38,000	-	100,000	1,496,280	68
	654,669	287,171	50,000	-	12,000	207,434	287,171	38,000	-	100,000	1,436,446	69
20,000	616,762	292,915	30,000	-	12,000	172,823	292,915	38,000	-	100,000	1,375,415	70
20,000	598,497	298,773	30,000	-	12,000	137,520	298,773	38,000	-	100,000	1,333,563	71
20,000	579,867	304,749	30,000	-	12,000	101,510	304,749	38,000	-	100,000	1,290,874	72
20,000	560,865	310,844	30,000	-	27,000	64,780	310,844	23,000	-	100,000	1,247,332	73
20,000	541,482	317,060	30,000	-	27,000	42,616	317,060	23,000	-	100,000	1,218,218	74
20,000	521,711	323,402	30,000	-	27,000	20,008	323,402	20,008	2,992	100,000	1,188,523	75
20,000	501,546	329,870	30,000	-	27,000	-	326,818	-	23,000	100,000	1,158,233	76
20,000	480,977	336,467	30,000	-	27,000	-	309,894	-	23,000	100,000	1,127,338	77
20,000	459,996	343,196	30,000	-	27,000	-	292,632	-	23,000	100,000	1,095,825	78
20,000	438,596	350,060	30,000	-	27,000	-	275,025	-	23,000	100,000	1,063,681	79
20,000	416,768	357,062	30,000	-	27,000	-	257,065	-	23,000	100,000	1,030,895	80
20,000	394,503	364,203	30,000	-	27,000	-	238,747	-	23,000	100,000	997,453	81
20,000	371,793	371,487	30,000	-	27,000	-	220,062	-	23,000	100,000	963,342	82
20,000	348,629	378,917	30,000	-	27,000	-	201,003	-	23,000	100,000	928,549	83
20,000	325,002	386,495	30,000	-	27,000	-	181,563	-	23,000	100,000	893,060	84
20,000	300,902	394,225	30,000	-	27,000	-	161,734	-	23,000	100,000	856,861	85
20,000	276,320	402,109	30,000	-	27,000	-	141,509	-	23,000	100,000	819,938	86
20,000	251,246	410,151	30,000	-	27,000	-	120,879	-	23,000	100,000	782,277	87
20,000	225,671	418,355	30,000	-	27,000	-	99,836	-	23,000	100,000	743,862	88
20,000	199,585	426,722	30,000	-	27,000	-	78,373	-	23,000	100,000	704,680	89
20,000	172,976	435,256	30,000	-	27,000	-	56,481	-	23,000	100,000	664,713	90
20,000	145,836	443,961	30,000	-	27,000	-	34,150	-	23,000	100,000	623,947	91
20,000	118,153	452,840	30,000	-	27,000	-	11,373	-	11,373	88,373	582,366	92
20,000	89,916	461,897	30,000	-	27,000	-	-	-	-	77,000	551,813	93
20,000	61,114	471,135	30,000	-	27,000	-	-	-	-	77,000	532,249	94
20,000	31,736	480,558	30,000	-	27,000	-	-	-	-	77,000	512,294	95
20,000	1,771	490,169	1,771	28,229	27,000	-	-	-	-	77,000	491,940	96
20,000	-	471,179	-	30,000	27,000	-	-	-	-	77,000	471,179	97
20,000	-	450,002	-	30,000	27,000	-	-	-	-	77,000	450,002	98
20,000	-	428,402	-	30,000	27,000	-	-	-	-	77,000	428,402	99
20,000	-	406,371	-	30,000	27,000	-	-	-	-	77,000	406,371	100
20,000	-	383,898	-	30,000	27,000	-	-	-	-	77,000	383,898	101
20,000	-	360,976	-	30,000	27,000	-	-	-	-	77,000	360,976	102
20,000	-	337,595	-	30,000	27,000	-	-	-	-	77,000	337,595	103
20,000	-	313,747	-	30,000	27,000	-	-	-	-	77,000	313,747	104
20,000	-	289,422	-	30,000	27,000	-	-	-	-	77,000	289,422	105
20,000	-	264,611	-	30,000	27,000	-	-	-	-	77,000	264,611	106
20,000	-	239,303	-	30,000	27,000	-	-	-	-	77,000	239,303	107
20,000	-	213,489	-	30,000	27,000	-	-	-	-	77,000	213,489	108
20,000	-	187,159	-	30,000	27,000	-	-	-	-	77,000	187,159	109
20,000	-	160,302	-	30,000	27,000	-	-	-	-	77,000	160,302	110

Scenario 3

Scenario 3 increases the amount retiree #2 collects annually to \$75,000, with no change in the asset balances from the base scenario. Here are some characteristics of this scenario, shown in Table 3.

- While the base scenario continued to produce the full desired income for retiree #1 until R1 age 86, taking additional payments right away reduces the expected final payout from assets accumulated for retiree #2 to R1 age 74.
- Qualified assets are depleted much more quickly in the years prior to age 70; alternatives like working part time for several years could be tested to see how long withdrawals could be extended.

Table 3
Scenario 3 Defining Characteristics

A		B		C		D		E		F		G		H		I		J		K		L	
Retiree #1						\$ 50,000		annual income		Retiree #2				\$ 75,000		annual income		Total		Total		R1	
Payouts		Q Assets	NQ Assets	Q income	NQ income	Payouts		Q Assets	NQ Assets	Q income	NQ income	Total	Total	Income		Assets		R1		age			
		500,000	250,000	50,000				500,000	250,000	75,000		125,000	1,500,000							62			
		459,000	255,000	50,000	-			433,500	255,000	75,000	-	125,000	1,402,500							63			
		417,180	260,100	50,000	-			365,670	260,100	75,000	-	125,000	1,303,050							64			
		374,524	265,302	50,000	-			296,483	265,302	75,000	-	125,000	1,201,611							65			
		331,014	270,608	50,000	-			225,913	270,608	75,000	-	125,000	1,098,143							66			
		286,634	276,020	50,000	-			153,931	276,020	75,000	-	125,000	992,606							67			
		241,367	281,541	50,000	-		12,000	80,510	281,541	63,000	-	125,000	884,958							68			
		195,194	287,171	50,000	-		12,000	17,860	287,171	17,860	45,140	125,000	787,397							69			
20,000		148,098	292,915	30,000	-		12,000	-	246,872	-	63,000	125,000	687,885							70			
20,000		120,460	298,773	30,000	-		12,000	-	187,550	-	63,000	125,000	606,783							71			
20,000		92,269	304,749	30,000	-		12,000	-	127,041	-	63,000	125,000	524,059							72			
20,000		63,515	310,844	30,000	-		27,000	-	65,321	-	48,000	125,000	439,680							73			
20,000		34,185	317,060	30,000	-		27,000	-	17,668	-	17,668	94,668	368,913							74			
20,000		4,269	323,402	4,269	25,731		27,000	-	-	-	-	77,000	327,670							75			
20,000		-	303,624	-	30,000		27,000	-	-	-	-	77,000	303,624							76			
20,000		-	279,096	-	30,000		27,000	-	-	-	-	77,000	279,096							77			
20,000		-	254,078	-	30,000		27,000	-	-	-	-	77,000	254,078							78			
20,000		-	228,560	-	30,000		27,000	-	-	-	-	77,000	228,560							79			
20,000		-	202,531	-	30,000		27,000	-	-	-	-	77,000	202,531							80			
20,000		-	175,982	-	30,000		27,000	-	-	-	-	77,000	175,982							81			
20,000		-	148,901	-	30,000		27,000	-	-	-	-	77,000	148,901							82			
20,000		-	121,279	-	30,000		27,000	-	-	-	-	77,000	121,279							83			
20,000		-	93,105	-	30,000		27,000	-	-	-	-	77,000	93,105							84			
20,000		-	64,367	-	30,000		27,000	-	-	-	-	77,000	64,367							85			
20,000		-	35,054	-	30,000		27,000	-	-	-	-	77,000	35,054							86			
20,000		-	5,155	-	5,155		27,000	-	-	-	-	52,155	5,155							87			

CONCLUSION

Planning for retirement should be considered long before a commitment to stop working is made. Think about scenarios relating to age to start Social Security, how much to target in total income, withdrawal strategies from qualified and nonqualified accounts... The options go on and on, and tax policy will likely change along the way. In this paper, three scenarios were developed showing the impact of changing the total desired income and the benefits of saving prior to retirement. The reader should also note the resiliency provided by payout annuities, especially those with a cost-of-living adjustment to compensate for inflation, like Social Security.

Each future retiree will be well served to access, or build, their own model that tests resiliency to assumptions like these, as well as what age to start Social Security benefits, long-term care insurance options and whether to add longevity annuities to protect against running out of income at the older ages.

Perhaps a future researcher or tax planner will address an issue that is more pertinent now that qualified funds can no longer be released over a beneficiary's lifetime. Is the person with abundant qualified funds better off letting them accumulate tax deferred until death or should you take additional withdrawals before 72, and pay the income tax, so heirs receive the funds in a nonqualified account receiving a step-up in basis?

By owning the retirement process, an individual can make better choices for their family and be less dependent on employers or advisory firms that have conflicts of interest. Only YOU are entirely aligned with your choices and the results they produce. Be accountable and enjoy greater independence or a larger bequest. Good luck and don't forget to save while you can. After all, Albert Einstein was right when he said that compound interest is the eighth wonder of the world!

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Introducing the Total Benefit Account: A Single Source of Employer Funding for Employee Needs

Doug Spencer and Greg Ward

On average, American businesses spend an estimated \$3 trillion a year in total benefit costs, not including wages and salaries. That translates to over 30% of total compensation for the average American worker.¹ While much of this goes into employee health care benefits, a good portion is allocated to retirement and savings, yet one in three employees still lacks confidence in a secure retirement.² Perhaps the problem is not the *amount* spent on retirement benefits but rather the *way* benefits are funded altogether.

Take for example recent proposals that would incentivize employers to help employees pay off their student loans.³ Such a benefit would be great for employees with student loan debt, but what about employees that don't have student loans? What if the same funds available for employees with student loans could be used by other employees to fund an emergency savings, retirement or health savings account?

No one likes to reinvent the wheel but, in the case of employee benefits, perhaps the American “wheel” could be a little more flexible. The tax code already offers employers a tax-preferred way to help employees save for things like health care and retirement, but what if employer contributions could be used for other things? What if employees could customize the way they use employer contributions? After all, financial needs change over time, so why can't an employer-funded benefit change with them?

Policymakers should consider legislation that would allow and incentivize employers to contribute funds to a “total benefit” account, whereby employees, and not the federal government or employer, get to decide how best to use these funds. Here's how it would work.

CREATE ACCOUNT FOR ALL BENEFITS BUT RETIREMENT

Instead of having different accounts for different benefits, allow employers to set up one total benefit account on a pretax basis. Policymakers can cap annual contributions under Section 415, but they may want to start with a figure such as \$18,000 per year. This would equate to what some employers pay currently for “Cadillac” health care plans, which include vision, dental and other plans, plus the proposed \$5,250 for student loan repayment. Employers will ultimately decide how much they contribute, up to annual limits, but those that want to compete for talent may need to contribute more based on competitive market forces. Once set, policymakers can index contribution limits for inflation.

(Since employer contributions to a retirement plan already go into an employee's retirement plan account, it is not necessary to allocate matching funds to this total benefit account.)

¹ U.S. Bureau of Labor Statistics, 2020, Employer Costs for Employee Compensation, news release, March 19, <https://www.bls.gov/news.release/pdf/ecec.pdf>.

² Employee Benefit Research Institute (EBRI) and Greenwald & Associates, 2019, 2019 Retirement Confidence Survey Summary Report, April 23, <https://www.ebri.org/docs/default-source/rcs/2019-rcs/2019-rcs-short-report.pdf>.

³ Kelly Anne Smith, 2019, House Bill Would Incentivize Employers to Help Pay Off Your Student Loans, Bankrate, Feb. 8, <https://www.bankrate.com/loans/student-loans/employer-incentives-repay-student-debt/>.

First Dollars Go to Basic Health Care

To ensure adequate health care coverage, employees could be required to use their first dollars to pay for at least basic, high deductible health insurance. They could only opt out if they provide proof of coverage from another source (e.g., a spouse, parent, second employer, private policy). They could even assign how much goes to pay for the health insurance premiums.

Any remaining amount can be used for other benefits, including: health care flexible spending accounts, health savings accounts, dental, vision, disability insurance, supplemental life insurance, commuter/parking, retirement plan, dependent care, tuition and student loan repayment. This way, the employee gets to choose the benefits that matter the most to them at that time.

Now is the right time to offer such a benefit. With the proliferation of financial wellness programs, employees are more likely to have access to tools and resources that can help them with these decisions.

HOW BENEFITS COULD CHANGE WITH YOU

The total benefits package can change as the employee's needs and life change.

Getting Started

Imagine how this might work for someone starting a new career. Let's say Susan is 22 years old and just started working for a Fortune 500 company. She is a typical college graduate with great health but tens of thousands of dollars in student loan debt. She could choose the lowest cost health plan and elect to put some money in her health savings account. With the rest of her funds, she could elect dental and disability insurance, commuter benefits and anything left could go toward her student loans.

Starting a Family

As Susan reaches her early 30s, she has been able to pay off her student loans thanks in large part to the extra money from the total benefit account, but now she is engaged and thinking of starting a family. What a great time to put more funds into the health savings account and/or to switch to a higher premium, lower deductible health plan. After the baby arrives, she can keep her focus on health care premiums while contributing to a flexible spending or health savings account, or she may wish to redirect some of the money to help pay for child care. As her kids get older, she may realize she needs additional life insurance, just in case.

Empty Nester

By the time Susan is an empty nester, she can now redirect a large sum of money to her own needs such as health care and retirement. If she is still healthy, she can use the high deductible plan and increase contributions to her health savings account. If, however, she has a lot of medical bills, she can easily afford a Cadillac plan and contribute to a health care flexible spending account and still put a few extra dollars away in her retirement plan.

In the end, Susan and her employer have a win-win relationship. Susan benefits from the flexibility to meet her needs on her timetable, while her employer benefits by keeping benefit costs under control. Susan remains a happier, healthier employee who is more likely to be on track for retirement and, in exchange, her employer benefits from talent retention and increased productivity.

Easier Benefits for Small Businesses

To make this plan equitable for businesses of any size, funds contributed to a total benefit account can be used on either a private or public exchange. This way small businesses that may not be able to set aside as much or have the same insurance rates can still help their employees without the hassle of administering benefits. For example, Mom and Pop's Widgets could contribute a more affordable amount to each employee's account, and each employee can go to an exchange and/or insurance company and use the money to meet their personal needs just like Susan did at the Fortune 500 company. This way, if Susan gets a great job offer from Mom and Pop's Widgets, she knows exactly what she would be giving up but still has the option to fund the benefits that matter most to her.

Starting Your Own Business

Lastly, let's say that Susan decides to go out on her own and start her own business. Under this plan, Susan could fund her own total benefit account up to the amount that she can afford and get the same tax treatment on her benefits as she did at the other jobs.

HELP FOR THOSE WHO NEED IT THE MOST

This could also be very easy to administer if companies wanted to help employees who are the most vulnerable. For example, if an employer wanted to provide an enhanced benefit for lower-income employees, they could do so based on a predetermined income threshold (e.g., 150% of the poverty level). This way employers can give their employees with limited financial means an extra boost toward their savings and debt reduction goals.

WHY IT MAKES SENSE

As outlined previously, the total benefit account has something for everyone. For employers, the total benefit account would help control for benefit costs while providing much needed tax relief. For employees, the total benefit account provides the flexibility to spend benefit dollars on things that matter most, at the time they are most needed. For policymakers, the total benefit account provides a mechanism for reducing student loan debt and building up short-term savings, which in turn will increase long-term participation in retirement plans and health savings accounts. By enabling more opportunities to save, the total benefit account is an important step toward reducing the risk of retirement unpreparedness.

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Think Like an Actuary to Assess and Mitigate Retirement Risks

Ken Steiner

In the current low-interest rate economic environment, with declining employer sponsorship of defined benefit plans, many individuals and couples (collectively referred to in this article as households) face significant risks accumulating sufficient assets prior to retirement to fund their desired level of expenses in retirement. Once retired, many households face additional risks managing (spending, protecting and investing) their assets in order to maintain their desired standard of living throughout retirement. This essay describes some of these risks and recommends the use of basic actuarial principles and processes to assess and mitigate them.

HOUSEHOLD BALANCE SHEET AND BASIC ACTUARIAL EQUATION

The household financial balance sheet is a proven tool for personal financial planning. When expressed in traditional account format, assets are entered on the left-hand side of the balance sheet and liabilities on the right-hand side. For retirees, household assets include accumulated pretax savings, amounts in after-tax accounts, the present value (PV) of future Social Security benefits, pension benefits, annuity payments, rental income, employment compensation and any asset (such as a home) that can be sold with net proceeds used to fund expenses in retirement. Household spending liabilities for retirees include all expenses that the household will incur during retirement, including the present values of future taxes, long-term care expenses and amounts left to heirs upon death. Household assets for pre-retirees also include the present value of future employment compensation and employer-sponsored retirement contributions or pension benefits.

Consistent with the household balance sheet and traditional actuarial balance sheet concepts, the basic actuarial equation for personal financial planning may be expressed as:

$$\begin{array}{ccccccc} \text{Accumulated} & & \text{PV income} & & \text{PV future} & & \text{PV future} & & \text{PV future} & & \text{Rainy day} \\ \text{savings} & + & \text{from other} & = & \text{expected} & + & \text{expected} & + & \text{unexpected} & + & \text{fund/PV} \\ & & \text{sources} & & \text{non-recurring} & & \text{recurring} & & \text{expenses} & & \text{amounts left} \\ & & & & \text{expenses} & & \text{expenses} & & & & \text{to heirs} \end{array}$$

This equation, which compares the total present value of a household's assets with the total present value of its spending liabilities, is similar in concept to the basic equations used by pension actuaries for pension plan funding requirements and by Social Security actuaries for determining Social Security's long-range actuarial balance. It tells us the total amount we can spend in retirement (the sum of the items on the right-hand side of the equation, including amounts left to heirs) is equal to the total assets we currently have in retirement, or will have accumulated at retirement (the left-hand side of the equation).

A quick glance at this basic equation highlights the importance of the basic actuarial principles of "time value of money" and "actuarial present values." These principles are the basic building blocks utilized by actuaries for management of risks for many financial security systems. They can also be successfully employed for personal financial systems.

RETIREMENT RISKS

This basic actuarial equation also helps us broadly classify the risks facing households attempting to determine whether they can afford to retire or how much they can safely spend in retirement into the following three general groups:

- **Overspending risks.** Involving unexpected reductions in assets and/or unexpected increases in expenses
- **Underspending risks.** Involving unexpected increases in assets and/or unexpected decreases in expenses
- **Spending strategy risks.** Involving not establishing a reasonable spending budget or using an inferior budgeting tool

Overspending Risks

If household assets are depleted, or significantly diminished prior to death, the household will generally not be able to fully fund desired levels of expenses. Since Social Security benefits are generally paid for life, the risk of fully depleting household assets in the U.S., however, is fairly minimal.

Asset Risks

In addition to the risk of accumulating insufficient assets to fund desired expenses at retirement, asset risks associated with potential overspending also include unexpected decreases in household assets during retirement resulting from:

- Unexpected expenses
- Uninsured or underinsured casualty losses
- Investment losses
- Spending more than the calculated spending budget
- Loss of expected income (reduction of Social Security, pensions, annuities including those losses that may result from the death of a spouse, from divorce or from other changes in family structure)
- Fraud, theft or bad advice
- Loss of employment

In some situations, generally involving household investment portfolios that include significant sources of deferred income, a household may also be subject to cash-flow risk associated with having relatively too much deferred income (such as deferred annuity contracts) not available to fund current expenses.

Expense Risks

Expense risks associated with the risk of overspending include increases in future household expenses resulting from:

- Longer than expected lifetimes
- Higher than expected expenses (from future inflation, etc.)

Underspending Risks

Paradoxically, retirement risks can also include underspending during retirement resulting from greater-than-expected assets, less-than-expected expenses or a combination of the two. Underspending can result in higher amounts than desired left to heirs upon death. Research has shown that retirees are generally more concerned with overspending risks and are, therefore, more likely to underspend than overspend in retirement.

Spending Strategy Risks

Not establishing a reasonable spending strategy (budget) or utilizing an inferior spending strategy tool to develop a spending budget can increase overspending or underspending risks.

CHARACTERISTICS OF A GOOD SPENDING STRATEGY TOOL

The following are the characteristics of a good spending strategy tool that would be consistent with the basic actuarial equation for personal financial planning:

- Permits inputting of all household assets and spending liabilities (including assets or expenses that are expected to commence or be incurred in future years)
- Uses reasonable (conservative) assumptions to develop present values and spending budgets for the current year; these assumptions may be stochastic, deterministic or a combination of the two (whichever option is expected to provide the most useful information to the household)
- Distinguishes between inputted non-recurring expected expenses and recurring expected expenses with an expectation that (if all assumptions are realized in the future) future budgets for recurring expenses will increase according to inputted expense inflation rates
- Allows the user to further categorize future expenses as either essential or discretionary
- Allows the input of different future inflation rates for different categories of expenses
- Provides for the input of an expected percentage reduction in expenses after the first death within a household
- Has a number of useful outputs, including:
 - Reasonable spending budgets for the current year for non-recurring expenses, recurring expenses and total expenses
 - Present values of household assets by source
 - Present values of expenses by category (non-recurring, recurring, essential, discretionary, etc.)

Static spending strategies, where spending is not adjusted to reflect actual experience as it emerges, are generally riskier than dynamic strategies that do periodically adjust to reflect actual experience. Consistent with basic actuarial principles, a good spending strategy should be dynamic in nature. A dynamic spending strategy is accomplished by performing periodic valuations of household assets and spending liabilities and making reasonable adjustments in spending budgets when necessary to keep household assets and spending liabilities approximately in balance.

As noted, a good spending strategy tool should employ conservative assumptions to calculate present values of assets and spending liabilities. I advocate using assumptions approximately consistent with assumptions currently used to price inflation-indexed annuities for several reasons, including:

- These assumptions are consistent with general financial economics theory.
- Most retirees are more concerned with overspending risks than underspending risks and would rather err on the conservative side with greater potential for future increasing spending budgets rather than future decreasing spending budgets.
- While investment in higher risk securities may be expected to yield higher returns, risk-adjusted returns should be unchanged.

- This approach was employed by the Society of Actuaries (SOA) as a reasonable way to think about how much real dollar lifetime income can be provided by a specific 401(k) balance in a 2017 article.¹

DEVELOPING SUSTAINABLE SPENDING, INVESTMENT STRATEGIES

By restructuring the items in the basic actuarial balance equation, making reasonable assumptions about the future and using basic actuarial processes, as discussed in more detail later, one can develop sustainable spending and investment strategies that can be used to mitigate many of the retirement risks mentioned and to help retirees maintain, and pre-retirees plan for, a more secure retirement.

Since household assets drive how much households can afford to spend in retirement, it is important to both protect and grow these assets. In addition to purchasing insurance (for example, home, health, life, automobile) to protect assets that may be used to fund future retirement expenses, this responsibility to protect and grow household assets may require making difficult (but very important) investment allocation decisions, especially in today's low-interest-rate environment. In choosing an investment strategy, the household (with possible assistance of a financial adviser), must decide how much investment risk to assume. In making this decision, those currently retired will need to determine how willing they are to risk reducing their current standard of living for the chance of having a higher standard of living in the future.

Financial advisers and academics have applied to personal finance the same liability-driven investment (LDI) concepts employed by actuaries. Applied to personal finance, the approach is frequently referred to by retirement experts as the safety-first approach, where a portfolio of low-risk or guaranteed low-risk assets (the floor portfolio) is intended to fund future essential expenses, with remaining assets, if any (the upside portfolio), invested in higher risk investments intended to fund future discretionary expenses.

While there are a number of investments that can reduce investment risk, there are just a few types of investments that can also reduce longevity risk by guaranteeing payment for life. I refer to these longevity risk-reducing strategies/investments as guaranteed low-risk investments. These investments include:

1. Delaying commencement of Social Security
2. Buying an immediate life annuity (single premium immediate annuity or SPIA)
3. Buying a deferred life annuity (or qualified longevity annuity contract, QLAC)
4. Electing the life annuity option under a defined benefit pension plan

In developing an investment strategy consistent with the safety-first approach, some households may wish to employ only guaranteed investments in their floor portfolio while some households may be comfortable employing other low-risk types of investments that do not mitigate longevity risks.

RECOMMENDED ACTUARIAL PLANNING PROCESSES

While it is important to utilize a good spending strategy tool and adopt a reasonable investment strategy, I believe it may be even more important to incorporate several time-tested actuarial processes into a household's retirement plan to better assess and mitigate retirement risks. Three of these processes are described here.

¹ Society of Actuaries, 2017, Big Question: When Should I Retire? Managing Retirement Decisions research project, <https://www.soa.org/resources/research-reports/2012/research-managing-retirement-decisions/>.

Process 1. Annual Valuation to Develop Data Points, Investment Strategy

1. Estimate your future recurring expenses in retirement
2. Estimate your future non-recurring expenses in retirement
3. (For retirees or near-retirees only) Categorize each expense in steps 1 and 2 as essential or discretionary
4. (For retirees and near-retirees only) Using results from a good spending strategy tool, determine the present values needed to fund your expected future essential expenses and your future discretionary expenses
5. Compare the total present value of your assets with present value of future expenses. If the total present value of your assets is greater than the total present value of your expenses,
 - Increase your current and future spending budgets
 - Increase your rainy-day fund
 - Or increase some combination of the twoIf the total present value of your assets is less than total present value of your expenses,
 - Increase your assets (for example, through part-time employment or continued employment if not retired)
 - Decrease your current and future spending budgets
 - Apply reasonable smoothing to your current spending budget
 - Or use some combination of these alternatives
6. (For retirees only) Compare the present value of your low-risk investments (floor portfolio) and your risky investments (upside portfolio) with present values of essential and discretionary expenses developed in step 4 to help develop an investment strategy consistent with the floor and upside portfolios anticipated under the safety-first approach
7. Repeat previous steps at least once a year

Process 2. Documentation of Annual Valuation

Actuaries generally document their work in an actuarial report. In addition to documenting the calculations involved in developing spending budgets, it can be helpful to maintain a historical record of spending budget calculations. This historical information will provide additional data points that can be used to refine future spending budget determinations

Process 3. Periodic Retirement Risk Assessment

While we must make assumptions about the future to develop a sustainable retirement plan, we also must be prepared when our assumptions turn out to be incorrect. In addition to the annual valuation process discussed, I recommend periodic stress testing of household financial plans with some what-if analysis for the purpose of determining the potential negative implications of being wrong about the assumptions used in the plan, and the actions to consider now or in the future to mitigate these potential negative implications. For example, if household assets are significantly invested in risky assets, it will make sense to model significant market reductions to measure the potential impact on future spending budgets. Or, if one of the members in the household has significantly more assets than the other, it will make sense to model the effect of death or divorce on the resulting spending budget of the household member with lower assets.

CONCLUSION

Protecting and accumulating household assets in order to afford retirement, or spending, protecting and investing assets in order to maintain a secure standard of living in retirement today is a risky proposition for many households. Actuarial science offers proven approaches and processes for assessing and mitigating financial risks. While calculating the present values required to implement these recommended approaches may be difficult for

some households, there are websites available to facilitate the required present value calculations, including my own: <http://howmuchcaniaffordtospendinretirement.blogspot.com/>.

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Strategies for Addressing Retirement Risks¹

Anil Suri and Nevenka Vrdoljak

Few Americans feel very secure about retirement. In 2007, 41% of retirees said they were “very confident” about having enough money to live comfortably throughout their retirement years. By 2017, that figure had fallen to a meager 17%.² This discouraging statistic suggests an important question: What can people do to create a more secure retirement? Fortunately, there are steps people can take to help boost retirement finances. Doing so involves addressing key retirement risks. The paper first describes four important risks that retirees face: longevity, health care, sequence of returns and inflation. It then examines strategies that can help mitigate these risks: wisely deciding when to retire, carefully choosing when to claim Social Security, allocating assets to a lifetime income annuity, prudently drawing down assets from a balanced portfolio and planning ahead for future possible long-term care needs. The final section summarizes the interrelationship of the risks and strategies presented.

KEY RETIREMENT RISKS

Research reveals a remarkable uniformity in the personal risks that people deem important as they approach retirement. Nearly three-quarters of pre-retirees express concern about health care costs in retirement, 70% are concerned about depleting their savings and most place a priority on maintaining a reasonable standard of living.³ Thus, the two salient personal risks in retirement relate to longevity and health care. Market risk, on the other hand, arises from exposure to financial markets. Retirees face two key types of market risk: sequence-of-returns risk and inflation risk.

Longevity Risk

Longevity risk is the risk of outliving wealth, possibly due to living longer than anticipated. Calculations based on data from the Society of Actuaries show that a 65-year-old couple has a 50% chance of one spouse living to 92 and a 10% chance of one spouse living to 100.⁴ Prudence suggests that they should not plan to averages; after all, living to 100 is a real possibility for many.

In thinking about retirement, many fail to appreciate just how long they might live. When asked to estimate how long the average person of their gender and age can expect to live, four in 10 underestimate by five years or more. Only one in eight similarly overestimates his or her life expectancy.⁵

¹ The views expressed here are those of the authors and not necessarily those of Merrill Wealth Management or any other entity within and including Bank of America.

² Employee Benefit Research Institute (EBRI) and Greenwald & Associates, 2018, 2018 Retirement Confidence Survey; EBRI and Matthew Greenwald & Associates Inc., 2007, 2007 Retirement Confidence Survey.

³ Society of Actuaries (SOA) and Matthew Greenwald & Associates Inc., 2018, 2017 Risks and Process of Retirement Survey.

⁴ Calculations based on Society of Actuaries, 2012 Individual Annuity Mortality Tables, Basic.

⁵ SOA and Greenwald & Associates, 2013, 2013 Risks and Process of Retirement Survey. Just as people tend to underestimate how long they can expect to live, so too they tend to overestimate how long they will be in the workforce. The 2015 EBRI Retirement Confidence Survey found that just 9% of workers say they plan to retire before age 60, compared with 36% of retirees who report they retired that early. The take-away for pre-retirees is that it's valuable to save while you can because retirement might last far longer than you expect. EBRI and Greenwald & Associates, 2015, 2015 Retirement Confidence Survey.

Health Care Risk

Half of affluent Americans say they are highly concerned about the rising costs of health care and their potential to deplete their retirement savings.⁶ The risk of the need for long-term care is of particular concern. According to the U.S. Department of Health and Human Services, at least 70% of people over 65 will need long-term care at some point.⁷

Sequence-of>Returns Risk

The performance of a retirement portfolio from which assets are regularly drawn depends critically not just on the average level of returns, but also the sequence in which they occur. Poor investment returns early in retirement can derail a retiree's plans. The practical implications of sequence-of-returns risk are readily apparent. Amid the financial crisis of 2007–09, many Americans were forced to postpone retirement because of a sharp, unexpected decline in the values of their portfolios.

Inflation Risk

Inflation threatens everyone, but especially retirees. Wages tend to rise with prices over time, helping to insulate most workers from inflation risk. Once they retire, people lose this crucial protection. Because retirees often rely on sources of income that do not grow with inflation, even a gradual increase in the cost of living can pose a challenge. At a 2.5% rate of inflation, for example, consumer prices end up doubling after 28 years. Moreover, health care costs, which disproportionately burden older Americans, have historically outpaced the overall rate of inflation.

ADDRESSING RETIREMENT RISKS

Although one cannot avoid longevity, health care, sequence-of-returns and inflation risks, one can address them. These five strategies can help.

Wisely Decide When to Retire

Deciding when to retire is a major decision. Affordability is a key component of this decision, and is critical in helping individuals define their options. Many people retire earlier than planned. Some of the common reasons include poor health, family caregiving needs, desires of a spouse or another family member and difficulties at work.

Later retirement often improves the economic situation because there are more years for assets to grow, more years to save, higher Social Security income and more years of employer-provided health coverage. Assets are also needed for a shorter time. For people with pensions, income from them may increase as well. Table 1 shows an example of a 16% and 35% increase in monthly income from delaying retirement by two and four years, respectively.

⁶ Merrill and Age Wave, 2017, *Finances in Retirement: New Challenges, New Solutions*, retirement study.

⁷ U.S. Department of Health & Human Services, 2017, *How Much Care Will You Need?*, last updated Oct. 10, 2017.

Table 1
Benefits of Delaying Retirement—Hypothetical Example

Retirement Age	401(k) Balance	Annuity Income per \$100,000	Monthly Annuity Income	Monthly Social Security	Total Monthly Income	Increase vs. 62
62	\$507,359	\$311.84	\$1,582	\$906	\$2,488	
64	\$570,073	\$323.67	\$1,845	\$1,038	\$2,883	16%
66	\$641,421	\$337.18	\$2,163	\$1,201	\$3,364	35%

Notes: This example uses the following assumptions:

- **401(k) balance.** Individual earned \$40,000 per year in real dollars beginning at age 22, and saved an average of 10% per year until age 62 and 15% per year on any earnings after age 62. The assumed real return on the 401(k) is 5% per year.
- **Monthly income.** The full 401(k) balance is used to provide monthly income.
- **Annuity factor.** This is based on estimated rates for an inflation-adjusted annuity as of Feb. 26, 2020. Annuity quotes provided by CANNEX.
- **Monthly Social Security.** This is based on Social Security Quick Calculator, www.socialsecurity.gov/OACT/quickcalc. Assumes \$40,000 in real annual earnings beginning at age 22 and monthly benefits start at the beginning of retirement.

The additional contribution of the 401(k) to retirement income from delaying retirement reflects: 1) growth from investment returns, 2) growth from additional contributions and 3) the fact that, because of the delay, the 401(k) will be spread over a shorter number of retirement years. The analysis is on a pretax basis.

Carefully Consider the Best Time to Claim Social Security

The choice of when to claim Social Security is among the most important financial decisions retirees will make. For many families, the lifetime expected value of Social Security benefits can exceed \$700,000. Research shows that waiting to claim Social Security can potentially boost the expected lifetime benefits for an individual by as much as \$55,000 to \$70,000. Couples stand to benefit more from waiting than single people.⁸

People routinely claim Social Security when they retire, but many stand to benefit from separating the decision of when to retire from that of when to claim Social Security. So even if one retires at age 62, it may make sense, if feasible, to wait until age 66 or beyond to claim benefits. Claiming at age 66 instead of age 62, for example, will raise monthly benefits by one-third (Figure 1).

Figure 1
How Monthly Benefits Vary Based on Claiming Age



Data from: Social Security Administration, Social Security Quick Calculator, accessed Feb. 7, 2020, www.socialsecurity.gov/OACT/quickcalc.

⁸ John B. Shoven and Sita Nataraj Slavov, 2012, When Does it Pay to Delay Social Security? The Impact of Mortality, Interest Rates and Program Rules, National Bureau of Economic Research (NBER) Working Paper no. 18210.

Here are some guidelines to consider in identifying the most financially opportune time to claim Social Security benefits:

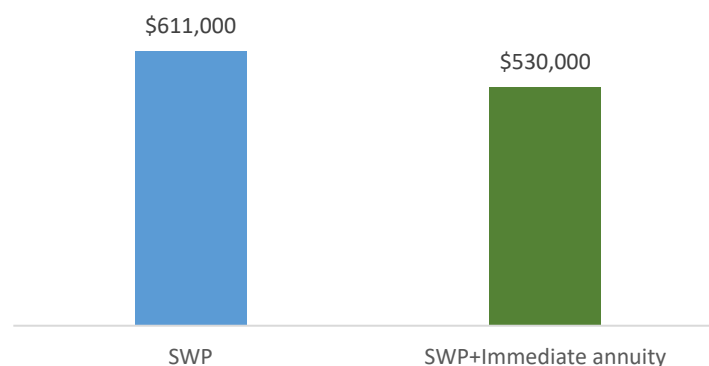
- Those who (due to poor health or other reasons) have very short life expectancies should consider claiming benefits at 62, the earliest possible age.
- Unmarried people whose life expectancy is average should consider waiting until age 69 or 70 to claim. Doing so boosts expected lifetime benefits by an estimated 14% to 18%.
- Many married couples stand to gain from coordinating when they claim benefits.
- For many married couples, it makes sense for the higher earner to delay claiming benefits.

Boost Retirement Income by Allocating Assets to a Lifetime Income Annuity

A key question to consider in preparing for retirement is whether guaranteed lifetime income from Social Security, a pension and annuities will cover essential living expenses. If not, it may be a good idea to consider buying a lifetime income annuity to help close the gap. Suppose, for example, a retiree will be receiving annual pension and Social Security income of \$40,000 but will need \$50,000 to cover essential expenses. One can purchase an annuity that will pay, in monthly installments, \$10,000 per year for the rest of one's life.

Figure 2 shows how adding an immediate annuity can be a more cost-effective way to fund retirement goals than a systematic withdrawal plan (SWP), which entails regularly drawing down a percentage of a portfolio's assets to provide income and rebalancing the remaining assets to a target allocation. Factoring in longevity projections that call for planning for a 30-year retirement, a goals-based wealth management analysis suggests that a traditional systematic withdrawal approach would require \$611,000 of assets (in addition to leveraging all Social Security income) to cover essential expenses over the 30-year period. However, adding an immediate annuity to augment guaranteed lifetime income would reduce the cost of funding the retirement goals to \$530,000.

Figure 2
Total Essential Funding Costs: SWP vs. SWP + Immediate Annuity



Data from: Anil Suri and Nevenka Vrdoljak, 2020, Goals-Based Wealth Management With Guaranteed Lifetime Income Through an Annuity, Bank of America, Chief Investment Office, Spring.

Notes: The following assumptions are used: Immediate annuity pricing of 5.28%; annual investment fees of 1.5% for stocks, 1.1% for bonds and 0.5% for cash; expected returns of 8.4% for stocks, 3.8% for bonds and 2.8% for cash; expected volatility of 18.2% for stocks, 5.2% for bonds and 1.7% for cash; analysis is based on a 95% probability for achieving essential goals and a 75% probability of achieving important goals. The source of the asset class assumptions is the Bank of America Chief Investment Office.

The example uses the following assumptions: The analysis considers a 65-year-old widow with a \$1 million investment portfolio. Her annual essential expenses (including housing, utilities, health care, food and transportation) total \$40,000 and her important expenses, such as travel and entertainment, are \$20,000 per year.

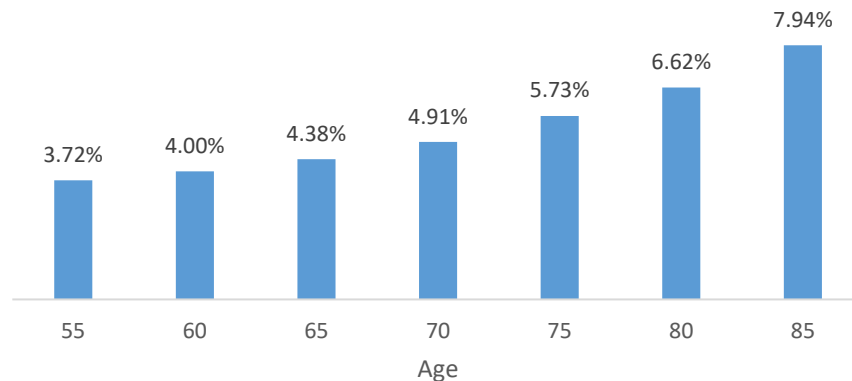
These expenses will grow at a 2.2% annual inflation rate.

Draw Down Assets From a Balanced Portfolio

If guaranteed sources of income cover essential expenses, one might consider following an SWP to generate additional income.

Our research indicates that it is overly simplistic to recommend, as some do, a single spending rate for all retirees. Sustainable spending rates depend critically on age and risk tolerance. Figure 3 shows our estimates of sustainable spending levels for retirees seeking a moderate level of confidence (90%) that they will not outlive their wealth. For a 65-year-old retiree, the sustainable spending rate is 4.22%. But a 75-year-old can safely spend at a 5.55% rate, and a 55-year-old—who may have many more years to live—should spend at a more modest 3.53% rate.

Figure 3
Rethinking the 4% Rule: Systematic Withdrawal Rates



Data from: Anil Suri, Nevenka Vrdoljak, Yong Liu and Run Zhang, 2020, Determining Sustainable Retiree Spending Rates, Bank of America, Chief Investment Office, January.

Notes: The systematic withdrawal rate is the maximum initial share of wealth that we believe a client can spend while attaining a 90% “probability of success.” The probability of success measures the likelihood that a retiree will be able to spend according to plan without exhausting her wealth. Spending is assumed to rise each year with inflation. The source of the capital market and planning horizon assumptions is the Bank of America Chief Investment Office.

Finally, let’s consider what asset allocation may minimize the risk of outliving one’s wealth. It’s important to note that retirees of all ages stand to benefit from having some equity exposure. Holding a portfolio comprised of only bonds and cash may feel safe, but it can actually elevate the risk of outliving one’s money. Our research finds that retirees between the ages of 55 and 85 seeking to maximize how much they can safely spend should allocate 37% of their portfolio to equities.

Plan Ahead for Future Possible Long-Term Care Needs

Many people harbor misconceptions about long-term care. Some say, “It won’t happen to me!” But as previously noted, approximately 70% of individuals over the age of 65 will need some form of long-term care in their lifetimes,

whether at home, at an assisted living facility or in a nursing home. The average stay in a nursing home is about 2.2 years for men and 3.7 years for women.⁹

Others hold the mistaken view that “the government will pay for it.” But the reality is that the government pays for long-term care only under special circumstances, typically when somebody has depleted their assets. Even in this unfortunate event, the long-term care provided through Medicaid offers limited choices.

The need for long-term care can cause more than financial strain. It can place a burden on loved ones. Investors with substantial assets may prefer to self-insure against this risk. But for many other investors nearing retirement, long-term care insurance can help address the risk and cost of care. Long-term care insurance is most available and affordable for people who are in their 50s or 60s and in relatively good health.

Options for funding long-term care include self-funding and traditional long-term care insurance. In addition to self-funding and long-term care insurance, recent innovations include hybrid life insurance with long-term care benefit riders and permanent life insurance with long-term care benefit riders. Hybrid and permanent life insurance policies can offer reassurance to clients because they provide either a death benefit or cash value if long-term care benefits are not used.

CONCLUSION

Many who are near or in retirement worry about covering their health care costs and outliving their wealth. Crucially, they want to avoid burdening loved ones. This paper sets out five strategies that can help to mitigate the key personal and market risks that retirees face.

Delaying retirement often improves the economic situation, potentially reducing the risk of outliving one’s wealth. By delaying retirement, there are more years for assets to grow, more years to save, higher Social Security income and more years of employer-provided health coverage. Assets are also needed for a shorter time.

Waiting to claim Social Security boosts guaranteed monthly income, again potentially reducing the risk of outliving one’s wealth. By waiting to claim Social Security, retirees increase their share of income from guaranteed sources, thus limiting their exposure to future market volatility. Social Security also provides an inflation hedge. This is because, under current law, the level of benefits rises each year to reflect increases in the cost of living.

Boosting retirement income by allocating assets to a lifetime income annuity or through a systematic withdrawal plan can likewise help to mitigate the risk of outliving wealth. Lifetime income annuities can also help to cushion a retiree’s portfolio from adverse movements in markets just after she retires.

An awareness of long-term care options can aid in alleviating a major source of uncertainty regarding health care costs in retirement. Options for financing long-term care include self-funding, traditional long-term care insurance and hybrid or permanent life insurance with a long-term-care benefit rider.

Taken together, these strategies can help address key personal and market risks. Table 2 contains a recap of the key risks and potential strategies.

⁹ U.S. Department of Health & Human Services, 2017, How Much Care Will You Need?, last updated Oct. 10, 2017.

Table 2
Summary of Strategies to Help Address Key Retirement Risks

Potential Strategy	Retirement Risks Addressed			
	Longevity	Health Care	Sequence of Returns	Inflation
Delaying retirement	✓		✓	✓
Waiting to claim Social Security	✓		✓	✓
Lifetime income through annuities	✓		✓	
Lifetime income through an SWP	✓			✓
Preparing for long-term care needed		✓		

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Layered Liquidity Management in Retirement

Gwen Yun Weng

Liquidity management is an important dimension of financial planning for retirement, yet it rarely gets the spotlight. This essay divides the liquidity needs in retirement into three layers based on the likelihood and predictability of liquidity events, and proposes strategies to manage them in each layer.

Many past studies¹ have found that typical retirees only focus on short-term cash-flow management based on simple projection of expenses and income sources. The lack of long-term planning and consideration for adverse situations could give rise to financial stress in retirement that one may or may not be able to recover from. Past studies² have also shown that retirees tend to adjust spending to cope with financial shocks. The goal of segregating layers of liquidity management is to help retirees better understand their needs and employ different strategies effectively. A systematic yet simple liquidity management framework could give retirees more control in their financial decision-making process throughout retirement.

THREE LAYERS OF LIQUIDITY MANAGEMENT

The framework proposed in this essay aims to capture the broad concepts of liquidity needs and strategies to meet these needs. Interested readers are encouraged to refer to more focused, country-specific studies on each type of liquidity requirement and management strategy.

The Basics

When making the decision to retire, near-retirees would often review their current level of spending and assess if the income in retirement is sufficient to cover the estimated expenses. Even if simplistic, this type of analysis is very necessary as it focuses mostly on highly likely, highly predictable, often recurring expenses such as basic housing, food, transportation and health care expenses. These expenses form the most basic and fundamental layer of liquidity needs.

Given the higher level of predictability and regularity of these expenses, they should be covered by lifetime guaranteed income streams, which can be a combination of:

- Pension income (note that in the case of defined contribution pension plans, only the portion that provides guaranteed income streams should be included here)
- Social security payments or publicly funded old age or retirement benefits
- Self-funded annuities include both payout annuities and variable annuities with guaranteed withdrawal guarantees

Compared to alternative strategies such as drawing down from available assets, lifetime guaranteed income streams can most effectively mitigate the longevity risk that is too often overlooked and difficult to manage by retirees. On

¹ See, for example, the Society of Actuaries' Committee on Post-Retirement Needs & Risks continuing work on managing finances, <https://www.soa.org/research/topics/research-post-retirement-needs-and-risks/#managing>.

² The SOA committee also has ongoing projects on retirement decisions, <https://www.soa.org/research/topics/research-post-retirement-needs-and-risks/#decisions>.

the flip side, it is not advisable to convert all assets to guaranteed income streams because retirees would lose access to liquidity to cover other less foreseen expenses.

The Probables

In the second layer of liquidity management, let's turn our focus to liquidity needs that are probable but less predictable in terms of timing and magnitude. This layer of liquidity needs is often overlooked by near-retirees and retirees in their retirement planning, and they can cause unnecessary financial stress in retirement and become difficult to cope with if not explicitly managed ahead of time. Examples of such probable liquidity needs could include, but are not limited to:

- Long-term care
- Critical illness
- Home maintenance and repair expenses
- Funeral expenses
- Estate taxes

Perhaps not coincidentally, these types of liquidity needs are often created by insurable events and insurance solutions would be the preferred choice to manage them. (Although there are no specific "tax insurance" products, life insurance policies are often used to manage estate taxes.) Even though one can opt to self-insure, a typical retiree would likely lack the discipline and knowledge to manage their own investments to successfully meet these needs. Insurance solutions may not be the cheapest option, but they provide the reliable guarantees and peace of mind desirable for most. Due to the relatively higher likelihood of occurrence, the first two layers of the liquidity needs should be covered before other considerations, such as capital preservation, come into play.

The Unpredictables

Conflicting financial priorities would emerge particularly after the first two layers of liquidity needs are sufficiently prepared for. These priorities often include:

- Preserving and growing the asset base for the estate
- Satisfying wants in life and achieving higher standards of living
- Managing unforeseen and unpredictable expenses

The first two considerations depend on the subjective desires of the retirees. One could choose to spend less and accumulate more in order to leave behind a more sizable inheritance, or spend as much as one could desire and enjoy the last stage of their life. There are no right or wrong decisions.

However, unforeseen expenses are often driven by objective needs and retirees have much less control over them. Events that could trigger such unpredictable liquidity needs include death of spouse, the need to care for family members and catastrophic health care expenses not covered by insurance. It is important that there is enough liquidity in the retiree's investment portfolio to meet these unique yet unpredictable liquidity needs.

To manage this last layer of liquidity needs, one straightforward way is to deliberately invest in less illiquid assets, such as real estate and alternative classes of investments, and leave enough liquidity in the asset portfolio. Many sophisticated financial optimizations look into the trade-off between risk (volatility of income) and return (income generation). Volatility in itself is not as important if there are no liquidity needs. If the needs in the first two layers are met, retirees would likely react less to the volatility, until unforeseen liquidity needs arise. Aside from the psychological cost, the trade-off between risk and return ultimately comes down to an explicit trade-off between liquidity and returns.

Alternatively, to prepare for the unpredictables, retirees could employ strategies to extract liquidity from illiquid assets. These strategies are often more effective if they are put in place ahead of severe liquidity events, which highlights the need for long-term planning. Common strategies include but are not limited to:

- Getting liquidity out of paid-for homes through home equity lines of credit or reverse mortgages
- Utilizing policy loan features of permanent insurance policies
- Securing lines of credit from traditional lenders

CONCLUSION

This essay proposes a straightforward management framework to identify different layers of liquidity needs based on predictability and suggests different strategies to manage them. To begin with, the basic living expenses in retirement should be covered by guaranteed incomes that effectively mitigate longevity risks. The second layer consists of probable liquidity needs that can be preferably managed by insurance solutions, which provide peace of mind. Beyond the first two layers, retirees also need to prepare for unpredictable liquidity needs, either through investment decisions that explicitly factor in liquidity considerations or through strategies that can extract liquidity from illiquid investments.

The simple framework could help retirees understand and analyze their financial needs in a clear and systematic manner. It will not be the case that all layers of liquidity needs can be managed sufficiently by all retirees. The goal of doing the analysis and planning is to raise awareness of any gaps so that near-retirees and retirees could become more prepared for the ups and downs in retirement.

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