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Expressions of Opinion
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Editor's Introduction

by Esther Peterson

Since the 1980s, employers have been shifting from defined benefit plans to defined contribution plans as the primary means for providing retirement benefits. Employees contribute pre- or post-tax dollars to the plans, often alongside employer contributions up to a certain percent of salary. So, how is it going? Do employees have the financial resources needed in retirement? Are defined contribution plans meeting the needs that defined benefit plans once met? If not, what is missing? How can participants use their resources more wisely, and how can plans be redesigned to meet these needs more effectively? The Society of Actuaries, in cooperation with other organizations across the United States and Canada, has dedicated extensive research and published reports to help address these questions.

Two of retirees' key needs for financial security in retirement are a reliable lifetime income stream and a guarantee that they will not run out of money. These are typically not sufficiently met in traditional defined contribution plans because each retiree must rely on their own expertise for developing a decumulation strategy in tandem with their longevity risk. Most individuals lack this expertise.

The three essays included in this *2024 Retirement Forum* highlight approaches to optimizing a decumulation strategy and creating new designs for defined contribution plans that address the challenges of longevity risk. Each essay is followed by comments and responses to those comments by the respective author(s).

In *"A Smart Way to Develop Retirement Income Strategies,"*[1] previously published in the *Securing Retirements Essay Collection* (SOA 2018), Steve Vernon develops a decumulation strategy that seeks to optimize retirement income from several possible sources, considering generally desirable and sometimes competing goals. His essay is based on results from a research initiative by the Stanford Center on Longevity in cooperation with the Society of Actuaries.

"Defined Contribution Plans, Emergency Funds and COVID-19,"[2] by Mary Stone is based on conversations about retirement risks with actuaries who work with defined contribution plans in the U.S. and Canada. In the context of employees bearing nearly all the risks, the emergence of COVID-19 has exposed the lack of access to sufficient emergency funds for the majority of the population.

"A Primer on Benefit at Risk in the Context of Lifetime Pension Pools" by Jean-François Bégin and Barbara Sanders highlights the results of the first of two research reports on lifetime pension pools commissioned by the Society of Actuaries Retirement Section Research Committee and the Canadian Institute of Actuaries.[3] The focus is on quantifying risk in lifetime pension pools as a means for communicating that risk with participants.

On behalf of the Society of Actuaries Retirement Section, I would like to thank the authors for their contributions. I would also like to thank Andrew Gillies, Lee Gold, Charles Millard, Michelle Richter, and Ruth Schau for sharing their expertise and pertinent comments on the publications. They represent

[1] Originally published in *Securing Future Retirements Essays Collection*, Society of Actuaries, 2018, *https://www.soa.org/resources/essays-monographs/2018-securing-future-retirements*.

[2] *Defined Contribution Plans, Emergency Funds and COVID-19: Challenges for Plan Sponsors and Participants*, Society of Actuaries, 2020, *https://www.soa.org/resources/research-reports/2020/dc-emergency-funds-covid-19/*.

[3] *Benefit at Risk for Lifetime Pension Pools*, Society of Actuaries, 2023, *https://www.soa.org/resources/research-reports/2023/benefit-risk-lifetime-pension*.

perspectives from highly accomplished actuaries and retirement professionals. They have worked in the public and private sectors as well as at universities and research institutions. Collectively, they have a broad range of experience in achieving financial security as well as identifying which risks have the most impact on that security. Their collaboration has added an important dimension to understanding the issues that are currently relevant.

We invite you to read the *2024 Retirement Forum*!

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A Smart Way to Develop Retirement Income Strategies

By Steve Vernon

How can actuaries apply their expertise and methods to help workers retire in a world where traditional defined benefit (DB) pension plans are mostly a thing of the past? I've been pondering this question throughout my encore career as a retirement educator and researcher, following a 30-year career as a consulting actuary working in the private sector.

I believe the techniques actuaries use to help large DB plans devise funding and investment strategies could also be used to develop viable retirement income strategies that could be implemented in individual retirement accounts and 401(k) plans. I've had the opportunity to test my belief on a previous collaboration between the Stanford Center on Longevity (SCL) and the Society of Actuaries (SOA). The research team included myself; another actuary, Joe Tomlinson, FSA; and retirement researcher Wade Pfau, Ph.D.

This project applied modern portfolio theory to the retirement, or decumulation, phase to help sort out the many retirement planning tradeoffs necessary to navigate the diverse landscape of retirement income solutions.

For details on how older workers and employers can use the strategy outlined in this essay, see these accompanying pieces:

- "*Smart Decisions Older Workers Can Make for Retirement*"
- "*Smart Steps Employers Can Take to Help Older Workers Transition into Retirement*"

The full report[1] contains details on the analyses and conclusions in the three essays written by me; other results, graphs and tables that present our analyses; and details on our assumptions and methods.

Let's first look at these tradeoffs and landscape, then we'll summarize our analyses and their results.

Retirement Planning Involves Tradeoffs

Choosing a specific solution that will help workers generate retirement income requires them to make informed tradeoffs between potentially competing goals:

- Maximizing lifetime income
- Providing access to savings (liquidity)
- Planning for bequests
- Minimizing implementation complexity and costs

[1] Wade Pfau, Joe Tomlinson and Steve Vernon, Optimizing Retirement Income by Integrating Retirement Plans, IRAs, and Home Equity: A Framework for Evaluating Retirement Income Decisions (Stanford, CA: Stanford Center on Longevity/Society of Actuaries, November 2017), *http://longevity.stanford.edu/2017/11/29/optimizing-retirement-income-by-integrating-retirement-plans-iras-and-home-equity-a-framework-for-evaluating-retirement-income-decisions/*.

- Minimizing income taxes
- Protecting against common risks, such as
  - Longevity
  - Inflation
  - Investment volatility
  - Death of their spouse
  - Cognitive decline and mistakes
  - Fraud
  - Political/regulatory issues (changes in laws or regulations on retirement plans or Social Security, or the taxation of these benefits)

It should surprise no one that the average American worker isn't adequately trained to make informed decisions regarding retirement income strategies that effectively balance these goals. And while there's no perfect retirement income generator (RIG) that meets all these goals, one comes close, as we'll see.

The Retirement Income Landscape

There are many viable retirement income generators, each with their own advantages and disadvantages:

- Social Security
- Pensions
- Investing savings and using a systematic withdrawal plan (SWP) to generate a retirement paycheck
- A guaranteed lifetime annuity from an insurance company (think of this as akin to a personal pension)
- Working
- Real estate rental income or income from a business
- A reverse mortgage

It's important to realize that each of these RIGs produces a different amount of retirement income. In addition, the advantages and disadvantages of some RIGs tend to complement others, which is one reason retirees should diversify their sources of retirement income to satisfy their unique goals and circumstances.

A Systematic Comparison of Retirement Income Strategies

Many analyses of retirement strategies contain significant limitations. For example, they might:

- Analyze only a few retirement income strategies, perhaps limiting the analysis to solutions their financial institution offers.
- Analyze solutions to deploy retirement savings in isolation, without considering how the solution interacts with valuable Social Security benefits.
- Not address the various goals that might be important to older workers and the tradeoffs these workers face.

To address these limitations, the SCL/SOA project examined 292 retirement income strategies, including various combinations of:

- Starting Social Security at age 65
- Starting Social Security at age 70
- Single premium immediate annuities (SPIA)
- Systematic withdrawal plans, including the IRS required minimum distribution (RMD)
- Guaranteed lifetime withdrawal benefits (GLWB)
- Fixed index annuities (FIA)
- SPIA/SWP combinations
- FIA/SWP combinations
- Tenure payment from a reverse mortgage

For three hypothetical retirees, we prepared the following analyses:

- Stochastic forecasts of income and accessible wealth (liquidity) throughout retirement for each retirement solution
- An efficient frontier that compares the tradeoff between expected amount of income and liquidity for the solutions we analyzed
- Patterns of income during the retirement period to determine if income is expected to keep up with inflation and to estimate the potential volatility

Stochastic forecasts and efficient frontiers are analytical techniques that many large pension plans use to devise funding and investment strategies.

Our economic assumptions reflect the low-interest environment prevalent in 2017. We compared high-performing and low-performing solutions to illustrate the impact of net investment performance and institutional vs. retail pricing on retirement outcomes. For the cost of annuities, we used actual annuity purchase rates prevalent at the beginning of 2017.

Figure 1[2] (*Retirement Income Frontier*) showed one example from our efficient frontier analyses for a hypothetical 65-year-old single female with $250,000 in retirement savings. Each symbol represents a retirement income strategy for our subject.

We used these efficient frontier analyses to narrow the number of solutions—from 292 to 21—that we examined in more detail, as discussed next.

The Retirement Income Dashboard

To help retirees and their advisers make informed tradeoffs regarding the potentially competing goals described previously, we developed eight metrics to help retirees and planners compare different retirement income solutions:

1. Average annual real retirement income expected during retirement;
2. Increase or decrease in real income expected during retirement (inflation protection);
3. Average accessible wealth expected throughout retirement (liquidity);

[2] See Figure 1, Retirement Income Frontier, in "A Smart Way to Develop Retirement Income Strategies" in *Securing Future Retirements Essays Collection*, Society of Actuaries, 2018, *https://www.soa.org/resources/essays-monographs/2018-securing-future-retirements*.

4. Rate that wealth is spent down;
5. Average bequest expected upon death;
6. Downside volatility (the estimated magnitude of potential future reductions in income);
7. Probability of shortfall relative to a specified minimum threshold of income;
8. Magnitude of shortfall.

We used these metrics to prepare detailed comparisons of the 21 retirement income solutions. For these solutions, we created a dashboard to compare the results of our analyses. Figure 2[3] (*Retirement Income Dashboard: No Deployment of Home Equity*) shows one dashboard example from our report for a married couple, each age 65, with $400,000 in retirement savings.

Social Security is Close to the Perfect Retirement Income Generator

Our analyses demonstrate that Social Security meets more retirement planning goals than any other RIG:

- It helps maximize the amount of expected retirement income through a more thoughtful optimization strategy.
- It helps minimize taxes by excluding part or all of income from taxation.
- It protects against most common risks, such as:
  - Longevity
  - Inflation
  - Investment volatility
  - Death of a spouse through the survivor's benefit Cognitive decline and mistakes
  - Fraud.
- It's simple to implement and there are no transaction costs.

As such, it makes sense for workers to maximize the value of this important benefit, usually by delaying the start of benefits for the primary wage-earner. The optimal strategy for a married couple often depends on their specific circumstances, so it may be desirable to use commonly available software or consult a financial adviser who specializes in Social Security optimization.

Many reputable researchers have confirmed the general advantages of a Social Security delay strategy.[4] These studies typically scrutinize Social Security benefits in isolation without considering income from other sources. By using a total retirement portfolio approach, including income generated by savings, our analyses amplify the importance of these researchers' findings.

Our analyses show that for many middle-income retirees (those with between $100,000 and $1 million in savings), Social Security benefits will represent one- half to two-thirds of total retirement income if workers start Social Security at age 65, and from three-fourths to more than 85% of total retirement income if they optimize Social Security by delaying until age 70.

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[3] See Figure 2, Retirement Income Dashboard: No Deployment of Home Equity, in "A Smart Way to Develop Retirement Income Strategies" in *Securing Future Retirements Essays Collection*, Society of Actuaries, 2018, *https://www.soa.org/resources/essays-monographs/2018-securing-future-retirements*.

[4] Wade Pfau, *When Should You Claim Social Security* (McLean, VA: Retirement Researcher, 2015); William F. Sharpe, *Retirement Income Scenario Matrices* (Stanford, CA: Stanford University, 2017), *https://web.stanford.edu/~wfsharpe/RISMAT/*; John Shoven and Sita Slavov, "The Decision to Delay Social Security Benefits: Theory and Evidence," National Bureau of Economic Research working paper no. 17866 (February 2012), *http://www.nber.org/papers/w17866*; James Mahaney, "Innovative Strategies to Help Maximize Social Security Benefits," Prudential research, updated 2017 edition, *http://research.prudential.com/documents/rp/InnovativeSocialSecurityNov2012.pdf?doc=innovativestrategies1112&bu=ret&ref=PDF&cid=MEP*; Laurence J. Kotlikoff, Phillip Moeller and Paul Selman, *Get What's Yours: The Secrets to Maxing Out Your Social Security* (New York, NY: Simon & Schuster, 2016).

As a result, for many middle-income retirees, the total retirement income portfolio reflects the desirable features of Social Security. In other words, if Social Security benefits represent 80% of the total retirement income portfolio, then at least 80% of the total portfolio will enjoy Social Security's advantages. In this case, *Social Security may be the only annuity income that many middle-income retirees will need*, given Social Security's dominance of their total retirement income portfolio.

Figure 3[5] (*Retirement Income Dashboard: Percent of Initial Retirement Income Provided by Social Security*) provides an example of our analyses showing the portion of total retirement income represented by Social Security for the 65-year-old married couple with $400,000 in savings for various retirement income solutions. For various retirement income solutions, Social Security (the nongray portion of each graph) delivers 60% to 86% of the total retirement income.

Pessimists might point out that Social Security is subject to political risk; our leaders can change the amount of benefits paid to current retirees or older workers, possibly making significant reductions. When deciding on a Social Security claiming strategy, older workers must weigh this risk against Social Security's other desirable features.

Introducing the Spend Safely in Retirement Strategy

Our analyses identified a straightforward strategy that produces a reasonable tradeoff among various goals for middle-income retirees. This strategy delays Social Security until age 70 for the primary wage-earner and uses the IRS required minimum distribution to calculate income from savings. We call this the "Spend Safely in Retirement Strategy."

The best way for an older worker to implement this strategy is to work just enough to pay for living expenses until age 70 to enable delaying Social Security benefits. To make this method work, retirees may also need to significantly reduce their living expenses.

If a worker isn't willing or able to delay retirement, the next best way to implement the Spend Safely in Retirement Strategy is to use a portion of savings to enable delaying Social Security benefits as long as possible but no later than age 70. They would then invest their remaining savings and use the RMD to calculate the lifetime retirement income generated by their savings. While analyzing this latter approach, we assumed the worker retires at age 65 but uses a portion of savings to enable delaying Social Security until age 70.

With remaining savings (after optimizing Social Security), we assumed retirees would use the RMD to calculate retirement income, starting at age 65. The IRS rules dictate the minimum withdrawal starting at age 70 1/2; at that age, the account balance in taxable retirement accounts (such as traditional IRAs and 401(k) accounts) is divided by the participant's life expectancy to determine the minimum required withdrawal amount for the coming year.[6] The RMD requires this amount be withdrawn from the account and included in taxable income for the year. Between ages 65 and 70, we assumed the retiree would withdraw 3.5% of the portfolio value at the beginning of each year.

[5] See Figure 3 (Retirement Income Dashboard: Percent of Initial Retirement Income Provided by Social Security) in "A Smart Way to Develop Retirement Income Strategies" in *Securing Future Retirements Essays Collection*, Society of Actuaries, 2018, *https://www.soa.org/resources/essays-monographs/2018-securing-future-retirements*.

[6] Note that starting in 2023, the age when minimum withdrawals must be made was increased to age 73.

The purpose of the RMD is for the federal government to capture taxable income from retirement accounts. It wasn't devised as a spend-down strategy, although our analyses show that it happens to meet common retirement planning goals. The RMD life expectancy tables can be translated into a series of withdrawal percentages, which are shown in the Appendix.

For married couples, the optimal strategy for claiming Social Security for the spouse who isn't the primary wage earner typically depends on individual circumstances. Often, the optimal strategy for this spouse calls for starting benefits somewhere between their full retirement age (FRA) and age 70. For our analyses of the 65-year-old married couple, we assumed the spouse who isn't the primary wage earner would start Social Security at age 66, their FRA.

The primary disadvantage of using savings to enable delaying Social Security benefits is that it can substantially reduce the amount of remaining assets and liquidity throughout retirement. This disadvantage must be weighed against the potential for permanently increased, guaranteed retirement income from a delay strategy.

Advantages of the Strategy

Our analyses show the Spend Safely in Retirement Strategy has many key advantages:

- It produces higher average total retirement income throughout retirement compared to most solutions we analyzed.
- The RMD portion automatically adjusts the withdrawal amounts to recognize investment gains or losses. Withdrawals are increased after years with favorable returns, and vice versa.
- It provides a lifetime income, no matter how long the participant lives. The RMD portion automatically adjusts the withdrawal each year for remaining life expectancy.
- It projects total income that increases moderately in real terms, while many other solutions aren't projected to keep up with inflation. The strategy produced projected real income increases of up to 10% during the retirement period.
- It produces a moderate level of accessible wealth for flexibility and the ability to make future changes as well as a higher accessible wealth compared to strategies that use annuities. It provides less accessible wealth than strategies that maximize flexibility, such as SWPs with low withdrawal rates and/or strategies that don't use savings to enable the delay of Social Security benefits.
- It provides a moderate level of bequests, for the same reasons.
- It produces low measures of downside volatility, with potential future annual reductions in spending typically well under 3%, which is hopefully a manageable amount.

The Spend Safely in Retirement Strategy has another significant advantage: It can be readily implemented from virtually any IRA or 401(k) plan without purchasing an annuity, something many retirees are reluctant to do and many 401(k) plans don't want to offer. Many administrators can calculate the RMD and automatically pay it according to the frequency elected by the retiree.

Several analysts have studied the RMD as a drawdown strategy and have concluded it's a viable way to produce a stream of lifetime retirement income.[7] These studies typically analyzed the RMD solution in isolation, without considering the value of Social Security benefits. Once again, by using a total retirement portfolio approach that includes Social Security income, our analyses amplify the importance of the analyses prepared by these researchers.

This project has given me a chance to apply my actuarial skills and expertise in new ways to help workers, employers and society at large.

[7] Joe Tomlinson, "Coping with Sequence Risk: How Variable Withdrawal and Annuitization Improve Retirement Outcomes," Advisor Perspectives, Sept. 25, 2017, *https://www.advisorperspectives.com/articles/2017/09/25/coping-with-sequence-risk-how-variable-withdrawal-and-annuitization-improve-retirement-outcomes*; Wade Pfau, "Retirement Spending and Required Minimum Distributions," Retirement Researcher, Nov. 22, 2016, *https://retirementresearcher.com/retirement-spending-required-minimum-distributions/*; Wei Sun and Anthony Webb, "Can Retirees Base Wealth Withdrawals on the IRS' Required Minimum Distribution," Center for Retirement Research at Boston College issue brief no. 12-19 (October 2012), *http://crr.bc.edu/wp-content/uploads/2012/10/IB_12-19-508.pdf*; David Blanchett, Maciej Kowara and Peng Chen, "Optimal Withdrawal Strategy for Retirement Income Portfolios," Morningstar Investment Management research paper, May 22, 2012, *https://corporate.morningstar.com/US/documents/ResearchPapers/OptimalWithdrawalStrategyRetirementIncomePortfolios.pdf*.

Appendix: Withdrawal Percentages Under the IRS Required Minimum Distribution

AGE	DISTRIBUTION PERIOD IN YEARS	MINIMUM PAYOUT RATE
70	27.4	3.65%
71	26.5	3.77%
72	25.6	3.91%
73	24.7	4.05%
74	23.8	4.20%
75	22.9	4.37%
76	22.0	4.55%
77	21.2	4.72%
78	20.3	4.93%
79	19.5	5.13%
80	18.7	5.35%
81	17.9	5.59%
82	17.1	5.85%
83	16.3	6.13%
84	15.5	6.45%
85	14.8	6.76%
86	14.1	7.09%
87	13.4	7.46%
88	12.7	7.87%
89	12.0	8.33%
90	11.4	8.77%

Notes:

- The RMD table continues beyond age 90.
- Use the account holder's age on their birthday during the calendar year.
- If the account holder is married and their spouse is more than 10 years younger, a different table with payout rates that are lower than these rates applies.
- RMD percentages changed beginning for 2022 and thereafter. The Appendix may not be up to date. Please see *https://restoflife.com/wp-content/uploads/2020/12/Table-3.1-Dec11-20.pdf*.

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Comments on

"A Smart Way to Develop Retirement Income Strategies"

by Lee D. Gold

For the past 15-plus years, like Steve Vernon, I have had a passion for modeling different approaches for income creation in retirement. Because of that passion, I thoroughly enjoyed reading Steve Vernon's article "A Smart Way to Develop Retirement Income Strategies," and I agree with many of the conclusions. Retirement income strategies do involve numerous tradeoffs, and finding the right balance is a complex challenge and mathematical problem.

Cognitive decline was not a major focus of this essay, but it was mentioned. I have witnessed this decline firsthand. Removing complex decision-making from retirees becomes increasingly important during retirement, and the spend safely in retirement (SSR) strategy accomplishes that key goal.

Keeping Pace with Inflation

The modeling performed looked at real income during retirement, and a specific metric was tracked to measure this. A possible enhancement to the model would be to track a retirement spending pattern that would include some element of inflation but also some reductions in overall spending that occur as retirees become less active. Studies have shown that older retirees tend to spend less than younger retirees.[1] The actual reasons for this likely include a variety of factors such as less activity, less travel, concern over future health expenses, concern with leaving a bequest, fear of running out of money. Said simply, the optimal spending pattern in retirement may not be a fixed amount of real (inflation-adjusted) income. It might be a slowly decreasing amount of real income.

Updated Economic Inputs

This essay was written using prevailing assumptions in 2017, including low interest rates. During the past three years, we've seen a dramatic increase in interest rates. It would be interesting to see whether any of the conclusions change when different economic inputs are used, including higher interest rates and higher inflation.

Observations from Recent SOA Study

The recent study published by the Society of Actuaries entitled *"What Retirement Plan Features Do Employees Really Want?"*[2] provides some additional insights related to the SSR strategy outlined in Vernon's essay.

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[1] Employee Benefit Research Institute. 2019. "Do Retirees Spend a Fixed Amount Throughout Their Retirement?" EBRI Fast Facts. Nov. 14, 2019. *https://www.ebri.org/publications/research-publications/fast-facts/8*. VanDerhei, J. K., Hahn, K, Roy. 2021. "In Data There Is Truth: Understanding How Households Actually Support Spending in Retirement." EBRI Issue Brief. June 24, 2021. *https://www.ebri.org/content/in-data-there-is-truth-understanding-how-households-actually-support-spending-in-retirement*.

[2] "What Retirement Plan Features Do Employees Really Want?" SOA Research Institute, March 2023, *https://www.soa.org/4963c4/globalassets/assets/files/resources/research-report/2023/ret-plan-features-emp-want.pdf*.

INVESTMENT DECISIONS

Employees prefer to have an expert making decisions about their investments. However, they also want the ability to override any recommendations made. Under the SSR, as outlined, retirees will still want/need assistance with investing their remaining assets.

LEAVING A BEQUEST

The ability to leave a bequest is important, ranking #5 of the 15 attributes studied. In designing retirement income strategies, this desire may need more weight than what an income optimization strategy would suggest. Survey findings suggest that optimizing personal income in retirement may not be a primary objective for retirees.

There is also a strong fear of "losing out" when it comes to forfeiting the ability to leave a bequest in exchange for lifetime income. Respondents in the study preferred a 20-year certain-only payment strategy over a lifetime income strategy. However, the most preferred payment pattern was a 20-year certain and life payment approach. These findings provide additional confirmation that a nonannuitized approach (like the SSR strategy) will appeal to retirees because of the ability to leave a bequest in the event of early death of the retiree (and spouse).

VARIABLE VERSUS FIXED INCOME

Looking at variable versus fixed income in retirement, consider the following two packages:[3]

	PACKAGE A	PACKAGE B
Access to your retirement money after retirement	Monthly benefits	Monthly benefits
Fixed versus variable benefits during retirement	100% Variable	**100% Fixed**
Benefits for your surviving spouse or partner after your death	100%	100%
Benefits to bequeath to family members, friends, charities, etc.	0%	0%
Limitation on the number of retirement payments you receive during retirement	20-year certain and life	20-year certain and life
Investment return before you retire	A fiduciary picks initial investments, but they can be changed.	**Benefits are not dependent on investment returns.**

Package A will be preferred by 28% of respondents, and Package B would be preferred by 72% of respondents.

[3] The simulator tool that was produced in conjunction with the written results of the study was used to generate these comparison results.

However, if we compare Package B to Package C, we get some interesting results:

	PACKAGE B	PACKAGE C
Access to retirement money after retirement	Monthly benefits	**50% any pattern, 50% monthly benefits**
Fixed versus variable benefits during retirement	100% Fixed	**50% Fixed, 50% variable**
Benefits for surviving spouse or partner after retiree's death	100%	100%
Benefits to bequeath to family members, friends, charities, etc.	0%	50%
Limitation on the number of retirement payments retiree receives during retirement	20-year certain and life	20-year certain and life
Investment return before individual retires	Benefits are not dependent on investment returns.	**A fiduciary picks initial investments, but they can be changed.**

With these changes, Package C is now preferred to Package B 74% to 26%, respectively. If Package C is compared to Package A, Package C is preferred 87% to 13%, respectively.

The point of all this? One hundred percent fixed income is not critical to an income stream in retirement. Flexibility and the ability to leave a bequest are important to individuals. A mixture of income streams, liquidity and bequest capabilities are likely to be preferred when compared to other single-payment-type options.

I applaud Vernon's essay and join him in the pursuit of income in retirement. The number of variables, tradeoffs, and retiree preferences ensures that no single solution will be best for everyone. Providing retirees with more tools—and simple tools—for generating retirement income will help them address the retirement income puzzle.

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Comments on

"A Smart Way to Develop Retirement Income Strategies"

By Charles E.F. Millard

In "A Smart Way to Develop Retirement Income Strategies," Steve Vernon's excellent essay, Vernon makes some very important points, some of which continue to stand the test of time:

- The tools that make defined benefit (DB) plans work can be applied to the defined contribution (DC) world.
- There are numerous tradeoffs involved in adopting a plan for lifetime income in the DC system.

However, Vernon's essay was written before the passage of the Setting Every Community Up for Retirement (SECURE) Act in late 2019. This bill has changed the nature of some of the tradeoffs required. For example, Vernon cites the following tradeoffs, among others:

- maximizing lifetime income
- liquidity
- bequests
- minimizing complexity and costs
- minimizing income taxes
- protecting against longevity risk
- protecting against investment volatility

The SECURE Act has changed the calculus for many, if not all, of these considerations.

Let's take complexity and costs. Vernon made the excellent point that "the average American worker isn't adequately trained to make informed decisions regarding retirement income strategies that effectively balance these goals." However, the SECURE Act now permits plan sponsors to include lifetime income solutions inside the DC plan. Before the SECURE Act, a plan sponsor was already able to choose a target-date fund (TDF) and default participants into it. The participant may, of course, leave that TDF but is not forced to make individual decisions about asset allocation. Similarly, after the SECURE Act, an employer can avoid foisting complexity on the participant by including an annuity or other lifetime income solution inside the TDF itself. This institutional, rather than individual, "distribution" reduces complexity and commissions and other costs substantially.

Analysis around liquidity is also different. Traditionally, lifetime income products required the complete sacrifice of liquidity or substantial withdrawal penalties. After the SECURE Act, multiple solutions have been offered that include various degrees of liquidity. Not all include full liquidity (especially when they are in pay status—and query whether plan sponsors will default participants into a solution that is not fully liquid), but some actually allow complete liquidity as long as there is money in the account.

If we combine two tradeoffs—"maximizing lifetime income" and "protecting against longevity risk"—we find that Vernon sees these as tradeoffs, whereas newer solutions combine to address both together. But newer solutions can provide guarantees of 5% and even 6% of the total account value. This arguably addresses maximizing lifetime income and protecting against longevity risk.

Finally, even sequence of returns risk is addressed by some of the post-SECURE Act solutions. These offerings strike repeated high-water marks, sometimes starting over 10 years before retirement age, and pay retirement income on a percentage of that high-water mark. Participants may not know the expression "sequence of returns risk," but if they retired in 2008 or 2021, they surely experienced it. These high-water-mark income protections are innovative tools in post-SECURE Act offerings.

The academic rigor in Vernon's underlying research is not in question. It would serve the actuarial community well if he or others were to do a similarly exhaustive study of the numerous post-SECURE Act offerings now on the market.

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Author's Response to Comments on "A Smart Way to Develop Retirement Income Strategies"

By Steve Vernon

I want to note that three important developments have occurred since "A Smart Way to Develop Retirement Income Strategies" was first published and the research was conducted.

The first development is that nominal interest rates rose substantially during 2022 and 2023. However, the most important assumption is the real interest rate, and it remains to be seen whether there will be significant long-term changes in real interest rates. If the levels of interest rates in 2023 continue into the future, the case for delaying Social Security benefits remains strong but possibly not quite as compelling as during the low interest rate environment prevalent in the years leading up to 2022.

The second development is passage of the Secure Retirement Act and the Secure 2.0 Act of 2022. Both laws have a goal to encourage retirement plan sponsors to offer annuities as a payout option in their defined contribution (DC) plans. Indeed, if plan sponsors implement annuities in their DC plans, that has the potential to help DC participants secure guaranteed streams of retirement income with institutional pricing.

The third development is the evolution of annuity design to accommodate delivering streams of guaranteed retirement income while at the same time offering some form of liquidity in case plan participants want or need to withdraw their remaining principal. This evolution may address some concerns that participants may have about committing savings to an annuity.

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Defined Contribution Plans, Emergency Funds and COVID-19: Challenges for Plan Sponsors and Participants

By Mary Stone

Introduction

As part of its ongoing effort to provide useful information on COVID-19, the Society of Actuaries (SOA) launched a series of reports exploring the impact of COVID-19 on retirement risks. The first report in this series, *Impact of COVID-19 on Retirement Risks*, released in April 2020, was informed, in part, by online conversations of the listserv the SOA maintains for its Committee on Post-Retirement Needs and Risks and the Aging and Retirement Strategic Research Program. The listserv is comprised of professionals involved in retirement security issues from a wide variety of disciplines and perspectives, including actuaries, economists, attorneys, financial advisers, benefit plan sponsors, demographers, academics, and policy researchers, among others. Other reports in this series may be found at: *SOA COVID-19 Research*.

This report is based on a follow-up conversation among actuaries from the SOA Retirement Section Council and the Retirement Section Defined Contribution Initiative Project Oversight Group. The actuaries that participated are working with plan sponsors of defined contribution plans in the United States and Canada. This report summarizes observations raised during the conversation about the current issues being discussed with clients to deal with immediate concerns as well as broader considerations about defined contribution plans, emergency funds and financial wellness. Its primary purpose is to assist retirement actuaries and plan sponsors and to stimulate further thinking and inform readers on how COVID-19 may reshape retirement in the future.

The context for this report series is not only to address the impact that the emergence of COVID-19 has on retirement risks, but also to reflect the environment that existed before COVID-19. Some key points about that environment include the aging population and the trend away from employers bearing nearly all of the risk for employee benefit plans. There has been a major move away from traditional defined benefit pension plans in the private sector, so that most active employee benefit retirement programs are defined contribution plans. In spite of this trend, many employees are not covered by an employer sponsored retirement program. Although defined contribution plans can potentially provide employees the means for retirement security, many employees are not well equipped to manage the risks associated with defined contribution plans, especially the longevity risk.

In addition, many individuals have only limited emergency funds, or they lack having an emergency fund altogether. The situation is especially acute for lower-income workers. An April 2020 study by the Pew Research Center[1] found that only about one-in-four (23%) of lower-income workers say they have rainy day funds set aside that would cover their expenses for three months in case of an emergency such

[1] "*About Half of Lower-Income Americans Report Household Job or Wage Loss Due to COVID-19*," Pew Research Center, April 2020. Lower-income adults are defined as those surveyed individuals with incomes less than 2/3 of the median income of adults surveyed.

as job loss, sickness or an economic downturn. Previous SOA research[2] conducted before the COVID-19 pandemic also showed that only about 34% of Millennials can afford to cover an unexpected expense of $1,000 from general savings.

This report is divided by the major topics that were raised and provides a synthesis of the discussion.

The authors would like to thank the discussants and reviewers for their participation and guidance. The discussants and reviewers were Joel Albers, Craig Blumenfeld, Grace Barbieri, Julie Curtis, Lee Gold, Drew Luchies, Anna Rappaport, Rob Reiskytl, Julian Robinson, Ruth Schau, Mark Shemtob, Sue Simon, Todd Tauzer, Lisa Ullman, and Zorast Wadia.

Background on COVID-19 and U.S. and Canadian Defined Contribution Plans

The recent market downturns have caused most defined contribution plan account balances to decline despite market rebounds since March 2020. Participants who remain actively employed and have many years before retirement may be able to adjust future contributions or planned retirement age, accordingly. The impact of investment performance may be compounded as some plan sponsors may lower contributions in the current economic environment, including reducing or suspending matching contributions or other non-matching contributions to improve corporate cash flow. In addition, if employees delay retirement, employers will need to manage workforce changes.

People vary greatly in their financial position—some have no savings or emergency fund and are more "financially fragile." Others with ample savings may have more flexibility in dealing with changes in their circumstances. For people with little savings but some defined contribution account balances, the defined contribution account balance may be viewed as a source of funds to use in an emergency. To generate enough cash to pay bills, these people may be forced to realize recent market losses on funds withdrawn from their defined contribution account. While access to retirement funds may seem attractive, it also increases the risk of insufficient retirement funds when a participant is ready to retire.

On March 27, 2020, the Coronavirus Aid, Relief, and Economic Security (CARES) Act was signed into law. The CARES Act represents an over $2 trillion economic relief package to provide aid from the public health and economic impacts of COVID-19. A feature of the CARES Act is to enable larger distributions and loans for those impacted by COVID-19, thereby granting access to 401(k) savings to deal with a financial emergency. Much of the SOA discussion included thoughts about how the CARES Act and the economic environment will factor into defined contribution plan modifications that would be adopted in either the short-term or long-term.

Canada also issued a large aid package in response to COVID-19, but little was done on the defined contribution side to allow access to funds. The main change by the regulators was to allow for full suspension of contributions to defined contribution Registered Pension Plans. Certain savings and retirement products are already easily accessed (TFSA, Registered Retirement Savings Plans with tax consequences), others can be accessed in financial hardship (e.g. Locked-in Retirement Accounts) and others cannot be accessed (e.g. defined contribution Registered Pension Plans).

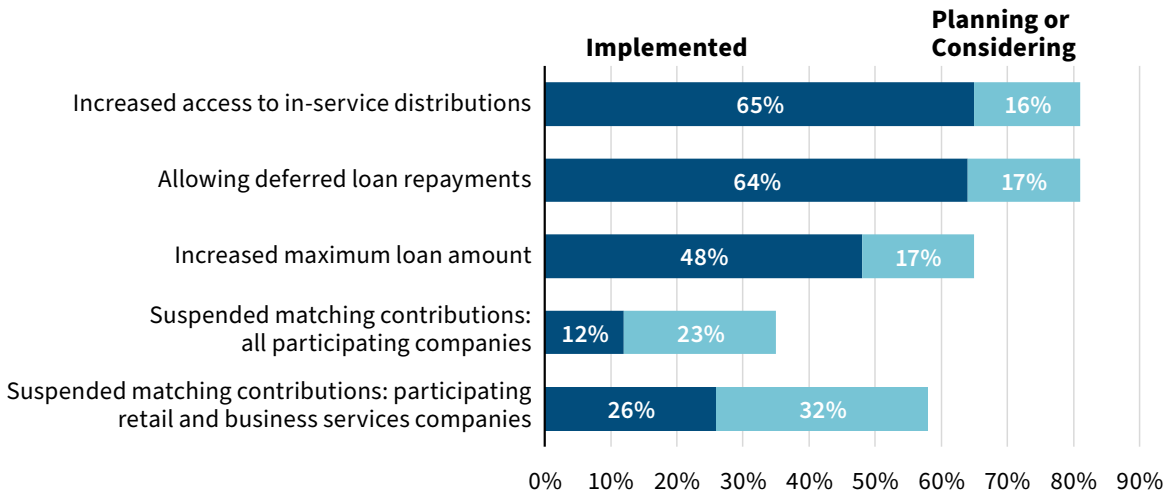
Willis Towers Watson conducted a pulse survey of employers during the week of April 20, 2020, about changes related to COVID-19 and their 401(k) plans. More than 800 employers with a total of

[2] "*Financial Perspectives on Aging and Retirement Across the Generations*," October 2018.

12 million employees participated. In general, more employers have eased restrictions to accessing 401(k) funds than have suspended or are considering suspending matching contributions. However, a markedly greater proportion of retail and business services companies, which have especially suffered during COVID-19, have implemented or are considering suspending matching contributions.[3]

FIGURE 1

Percentage of Employers Making 401(k) plan changes



Data source: Willis Towers Watson

The near-term concerns for actuaries working with defined contribution plan sponsors can be summarized by several immediate questions:

- Which changes in distribution options permitted by the CARES Act should be adopted?
- How will employer contributions to the plan need to change?
- Should a new approach be adopted to support emergency funds?
- Do participants have a reasonable range of investment options and tools to make decisions in volatile markets?

There are longer term issues such as benefit adequacy and retirement readiness, but generally those issues will not be revisited in the short term.

CARES Act Distributions

The CARES Act permits COVID-19 related withdrawals up to $100,000 or 100% of the participant's vested account balance during 2020 for participants who meet the criteria for establishing hardship due to the coronavirus. In addition, plan loans taken between March 23, 2020, and September 22, 2020, up to $100,000 or 100% of the vested account balance are also permitted for individuals who meet the criteria for coronavirus hardship. Payments on existing loans are also permitted to be deferred one-year through

[3] Willis Towers Watson. (2020, May 4). "Amid COVID-19, More Employers are Easing Access to 401(k) Assets than Cutting Matching Contributions." Press Release. *https://www.willistowerswatson.com/en-US/News/2020/05/amid-COVID-19-more-employers-are-easing-access-to-401k-assets-than-cutting-matching-contributions*.

a one-year extension of the loan repayment period. Adoption of these changes is at the plan sponsor's discretion. Plan sponsors may accept the employee's self-certification that they meet the requirements for a coronavirus hardship distribution (withdrawal or loan).

Hardship withdrawals would ordinarily trigger a 10% excise tax penalty if taken before age 59 ½. The CARES Act waives the tax penalty for those meeting the coronavirus distribution requirements. In addition, participants are permitted to spread the taxable income related to the distribution over three years or pay the amount back and avoid taxation.

Plan loans do not trigger taxation or tax penalties when initiated or during repayment. Participants will have to carefully evaluate the loan versus withdrawal option. Plan loans instill a discipline for repayment of the loan to the account. However, upon termination of employment, many employees default on their defined contribution plan loans, and loan defaults are treated as a distribution, triggering taxation and the tax penalty if under age 59 ½.

Adoption of the CARES Act distribution provisions varies, although some recordkeepers are reporting up to 70% of clients offering these options to their participants. This may reflect a philosophy that the client should not determine whether their employees need the money; allowing those with a true need to access the funds. The increased access to funds may ultimately lead plan sponsors to explore different plan structures in the future which segregate employer-funded account balances from the employee funded account balance, and perhaps allowing access to the employee-funded portion but not the employer-funded for loans and distributions.

Some aspects of the CARES Act distribution provisions are less clear leading to different interpretations. One area where there was a lack of clarity is the availability of coronavirus-related distributions when a spouse experiences a job loss. Based on additional guidance from the IRS in Notice 2020-50, eligibility was expanded to include financial hardship as a result of the individual's spouse.

Retirees who need to take distributions from their retirement account balance to fulfill federal required minimum distribution (RMD) requirements may be forced to recognize recent market losses. To address this, the CARES Act allows plans to waive RMDs for 2020.

Employer Contributions

The business hardships experienced with the COVID-19 pandemic are leading many U.S. employers to implement or consider suspension or reductions in employer contributions. It's unclear whether these changes will be short term or permanent. Recordkeepers that the discussion participants work with report 10-15% of employers have suspended contributions with 15-30% considering doing so. A recent survey by the Plan Sponsor Council of America[4] reported that nearly 90% of plan sponsors are making no changes to employer contributions at this time. Five percent have suspended matching contributions, and fewer than one percent have suspended non-matching (profit-sharing) contributions. Three percent of plan sponsors are considering options but have not made a decision at this time.

Similar steps have been taken or are being considered in Canada. The tax authorities have facilitated suspensions by changing certain tax laws.

[4] "CARES Act and COVID-19 Impact on Retirement Plans," Snapshot Survey—June follow-up, Plan Sponsor Council of America, *https://www.psca.org/research/cares_snapshot2*.

Plan design varies by industry and among employers for both nonelective and/or matching contributions. Some plans provide employer discretion over the contributions, while others do not. The speed and ease of implementing contribution changes will thus vary by plan design. Funding flexibility is available for plan sponsors of defined benefit pension plans. Perhaps the current crisis will foster discussion of further flexibility in plan sponsor contributions for defined contribution plans.

Changes in employer contributions can be complex for safe harbor plans as a loss of safe harbor status could lead to challenges in passing nondiscrimination testing requirements that would not apply for a safe harbor plan. IRS Notice 2020-52 provides welcome COVID-19 related relief for midyear changes adopted during March 13, 2020, through August 31, 2020.

Temporary pay cuts implemented by some employers will also trigger lower employer contribution amounts as the percentage of pay employer contribution is applied to a lower amount of pay.

Emergency Funds

The need for the special distribution rules under the CARES Act highlights the lack of financial preparedness among many employees. Increased focus on support for emergency funds is expected, especially offering a tax-favored option for employee contributions to an emergency fund.

More employers are requesting guidance from financial wellness advisors on how to best address the need for emergency funds among their workforce. Some employers are offering educational content either as a standalone topic or as part of a broader financial wellness series. More progressive employers often are either actively enrolling employees in direct deposit to savings accounts through either a bank or credit union as part of a bank-at-work program or to a sidecar account associated with the retirement plan (these arrangements are less common). Since a lack of emergency savings has increased the potential of early distributions from retirement plans, there is greater importance because of financial strains from COVID-19 to have foundational cash reserves as a fundamental resource of any financially well household.

A more holistic view of employee financial wellness could ultimately lead to a flexible plan design that includes employee emergency funds, employee retirement funds, and employer retirement funds. Employer matching contributions could apply to both emergency fund and retirement fund employee contributions but remain in an employer-funded retirement account. Any emergency funds not drawn upon before retirement could be consolidated with the employee retirement funds upon retirement. A maximum dollar amount of employee contributions to the emergency fund on a tax-favored status could help gain acceptance for this among policymakers.

In Canada, Registered Retirement Savings Plans may be accessed for emergency funds with potential limitations if the employer sponsors the arrangement. Also, in the case of financial hardship, Locked-in Retirement Accounts may be accessed. In both cases, funds that are withdrawn will be included as income in the year of receipt.

Canada has a Tax-Free Savings Account (TFSA) that allows individuals to save and invest after tax money to be distributed tax free. Contributions (up to $6,000 in 2020) to a TFSA are not deductible for income tax purposes. Generally, interest, dividends, or capital gains earned on investments in a TFSA are not taxable—either while held in the account or when withdrawn. Other countries also have programs that offer more flexible accounts for emergency needs.

Implications for Investment Options

Many plan participants have called recordkeepers, primarily due to concern with declines in asset values rather than requesting access to funds. Sometimes, participants can react out of fear and make rash decisions. The call center personnel may help ease these fears, helping participants take a long-term view.

Target date funds (TDFs) are a common Qualified Default Investment Alternative (QDIA). In general, target date funds have an asset allocation glidepath that reduces the equity/growth asset exposure over time while increasing the bond/fixed income allocation. There are many variations between TDF series. In particular, some TDF glidepaths reduce the equity/growth allocation **to** retirement (the target date) and then keep it constant. Other TDF glidepaths continue reducing the equity/growth path **through** retirement, some as long as 30 years post retirement. Through retirement TDFs typically have a higher equity/growth allocation at retirement. It's possible that plan sponsors will revisit their plan's TDF series following the crisis.

With the passage of the SECURE Act in December 2019 and the subsequent market turmoil brought on by the COVID-19 pandemic, it is possible that there will be greater interest in lifetime income options within retirement plans. Newer TDFs which incorporate lifetime income options are gaining market share.

Short- and Long-term Ramifications on Retirement Readiness

The overall impact of COVID-19 on retirement readiness will depend upon how retirement account balances recover from depressed asset values, reduced employee and employer contributions, as well as the distributions through withdrawals or loans and associated loan defaults that may occur. Individuals who experience a prolonged job loss and self-employed individuals who experience a decline in their business will face greater challenges.

A recent paper from Aon[5] illustrates how the market downturn related to COVID-19 may impact representative employees at various ages, showing how a representative older worker may be more negatively impacted than a representative younger worker. If the negative market returns of the first quarter of 2020 hold for the rest of the year, and asset returns go back to expected levels in future years, a representative 60-year-old participant may experience decreased retirement readiness of about 1.3 times their projected final pay at age 67. If the assumptions in this paper hold true, participants such as this representative employee have three primary strategies to adjust for the additional shortfall:

- Save an additional 5% of pay every year until age 67 retirement; or
- Defer retirement by one year (to age 68); or
- Reduce their standard of living in retirement by an additional 9%

Behavioral economics principles also demonstrate that participants do not always act in their own best financial interests. It's possible that future plan designs will help better protect participants during retirement by encouraging the use of lifetime income options.

[5] "Retirement Readiness During Times of Instability, Insights from Aon's *The Real Deal* Research, June 2020." *https://retirement-investment-insights.aon.com/defined-benefit/aon-retirement-readiness-during-times-of-instability-article*.

Prolonged periods of unemployment will not only cause retirement savings to suffer, but clearly will increase the financial fragility of many. The Pew study cited earlier found that about four-in-ten Americans frequently worry about paying their bills or saving for retirement. These worries may not necessarily be connected to the coronavirus outbreak. U.S. adults actually show *less* concern now about the amount of debt they have, their health care costs, paying their bills and being able to save enough for retirement than they did when asked some of the same questions in a *September 2019 survey*[6], well before the start of the pandemic. Previous SOA research[7] conducted before the COVID-19 pandemic also showed that Millennials are the most financially fragile generation with 26% having high financial fragility, 35% moderate, and 39% low fragility.

In addition to the risk that retirement savings will not be adequate at retirement, many challenges remain for retirees to manage the distribution of their savings over the retirement period. Very little focus has historically been provided to this challenge. Although the SECURE Act provisions providing fiduciary protection for plan sponsors that offer lifetime income options within the employer retirement savings plan may provide better options in the future, potentially as defaults, more needs to be done.

Conclusion

COVID-19 will almost certainly have long lasting ramifications for retirement plans and financial security for individuals. The prevalence of defined contribution plans as primary retirement vehicles, especially in the private sector, has transferred many of the risks of retirement security on individual employees. The pandemic has caused massive unemployment including permanent job losses in many cases, asset losses, and declines in contributions that jeopardize retirement security for all individuals. Financial fragility has also been highlighted with the lack of emergency funds leading to increases in debt and the likelihood of individual bankruptcies. Recovery is anticipated to take a long time for many individuals.

It is too early to predict with certainty the changes that will likely follow. Open questions include:

- Is defined contribution a satisfactory design for a primary retirement vehicle? What changes are needed to make it better?
- What new or different risk sharing designs might achieve a better balance of risk between plan sponsor and participant while providing more risk pooling for the participant?
- Have the default options traditionally offered worked out well? How might they change? Will default options be added for the payout or decumulation phase?
- Will target date funds change and what new investment options might emerge?
- How should a defined contribution plan sponsor think about benefit adequacy? Will the focus turn from savings for wealth accumulation to income replacement?
- Will tax-favored or employer sponsored emergency fund plan options become more prevalent?
- Will coverage for employees not eligible for a defined contribution plan, many working for small employers, expand due to state sponsored programs or the SECURE Act provisions for pooled employer plans?

[6] Most Americans Say the Current Economy Is Helping the Rich, Hurting the Poor and Middle Class, Pew Research Center, September 2019.

[7] "*Financial Fragility Across the Generations*," February 2019. The SOA research provides insights into financial fragility and who is most likely to be fragile. The researchers developed an index based on a combination of each individual's feelings about financial management and their responses to some financial questions. They then divided the population into three groups with regard to fragility.

This report on which the essay was based provided perspectives current to June 2020 and raised many issues to contemplate in the face of COVID-19 as the situation evolves. It has also signaled the importance of reevaluating the best ways to plan for and manage retirement risks in the future. With the COVID-19 situation rapidly evolving, the SOA is monitoring it closely and continuing to provide research communications that further explore the impact of this pandemic.

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Comments on

"Defined Contribution Plans, Emergency Funds and COVID-19: Challenges for Plan Sponsors and Participants"

By Ruth Schau

The COVID-19 topic has become a little tired for many of us, because we don't want to return to 2020 again in our lifetimes. However, this research contains important issues that span well beyond COVID-19.

Not all individuals have a career like an actuary. Professions like actuarial science, medicine, law, etc., have more stability even with the occasional job or career switch that occurs throughout a normal career. Also consider that many auto mechanics, electricians, and plumbers have similar job stability without college degrees, so job and income stability are not just for college graduates. In general, job stability is a core requirement to create funds necessary for life.

Individuals without job stability don't have the same consistency of income, and when there are breaks in employment, these individuals look for other sources of funds. This might include emergency savings, or as my mother referred to it, "mad money." No matter what you call it and whether it exists in cookie jars, envelopes tucked away, or a savings account, emergency savings are essential.

Employers have options to support and encourage the creation of emergency savings funds. Two options are now available in the Secure 2.0 Act of 2022 for defined contribution (DC) retirement plans:

1. Penalty-free withdrawals for emergency expenses: No early withdrawal penalty is paid for financial needs relating to necessary or personal family emergency expenses if the distribution is no more than $1,000 and is limited to one occurrence per calendar year.
2. Pension-linked emergency savings accounts: Non-highly compensated employees may contribute to an emergency savings account linked to the individual's DC retirement plan, subject to rules including auto-enrollment up to 3% of pay with an account limit of $2,500, which is indexed for inflation.

Other options that are available include diverting a portion of pay to a savings account through automatic deposit options or other similar funds outside of retirement plans.

Emergency funds are not named well because access to money is needed throughout life for a variety of reasons. It could be due to a health-related emergency, but it could also be to pay for routine car or appliance repairs. I don't view these as emergencies as much as normal life occurrences that create a greater-than-normal need for money.

There's a lot of focus on low pay, but a lifelong lesson for me after my first year of work after college was that a friend of mine, earning only about half my salary, had saved more than I had by the end of the year. That was an eye-opener and motivated me to focus on saving more. The example of her diligence made me realize that many individuals can set some money aside during the year, even if only a small amount. It's financial education and understanding that are needed.

A more difficult problem is the need to create funds for periods of unemployment. This is likely not solved through emergency funds. The longer unemployment lasts, the larger the amount of funds needed, so $1,000 or even $2,500 may not be enough.

A related problem is when an individual experiences unemployment. Not only are all sources of funds being used, but there's a risk of depleting all, or most, of their retirement savings.

While a period of unemployment is a challenge and the use of retirement funds is totally understandable, there is something to consider. Should there be limits on the source of funds so that employer funds are not depleted until retirement? If we limit access to employee savings only, funds will remain for the individual for retirement, instead of depleting them altogether. Employer-paid retirement is more effective in providing retirement benefits. If this provision is enacted, the DC plan becomes more like the once-common defined benefit pension plan.

In summary, saving for retirement takes a lifetime of work, and the depletion of savings during employment for emergency needs shouldn't be taken lightly. Expecting the unexpected may be beneficial because all of us need access to funds on a regular basis for car repairs, appliance repairs, and medical bills. A change of behavior and attitudes about providing for emergencies could help individuals save more, making them better prepared to face the challenges that lie ahead for all of us.

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Author's Response to Ruth Schau Comments on "Defined Contribution Plans, Emergency Funds and COVID-19: Challenges for Plan Sponsors and Participants"

By Mary Stone

Thank you to Ruth Schau for her thoughtful comments. The need for emergency funds was a key consideration at the beginning of the COVID-19 pandemic as many employees lost jobs. Although government assistance enacted during the pandemic helped lessen the financial burdens, the need for funds to cover unplanned expenses was a critical issue during the pandemic and remains important.

As Schau points out, the provisions added by the Secure Act 2.0 of 2022 to improve access to funds in the event of an emergency provide options for plan sponsors to support these needs. Establishing dedicated emergency savings accounts linked to defined contribution (DC) retirement plans for non-highly compensated employees helps emphasize the importance of having funds set aside for unexpected expenses.

Like Schau, my personal experience early in my career necessitated spending less and developing frugal habits that have stayed with me through the years. Without an understanding of managing finances, even for seemingly ordinary items like owning and maintaining a car, individuals can misjudge how much money they can afford to spend. Credit card debt has continued to rise and appears commonplace to many. Providing financial education is an important way for plan sponsors to help employees develop better life skills and prepare for retirement.

As Schau points out, job stability is key to creating funds necessary for life while working and into retirement. When an individual experiences a period of unemployment, this can trigger a serious drain on all available financial resources and lead to increased debt. Most state unemployment benefits last only for a limited period and for a limited dollar amount per week. Although many employee savings plans currently permit access to funds for emergencies, emergency savings accounts are likely smaller than needed to withstand unemployment. As the pandemic continued, unemployment was reduced, but inflation reached high levels not seen in many years. Both unemployment and inflation create challenges for managing recurring and periodic expenses.

I agree with Schau that restructuring plans to limit emergency access to employee funds would be beneficial. Restricting employer funds to apply solely for retirement helps ensure funds are available in retirement, although I am skeptical that this alone is as effective in providing retirement income as a defined benefit pension plan. Utilizing funds effectively during retirement remains a challenge for most retirees and represents another important opportunity for financial education and continued plan design evolution to provide greater security through lifetime income.

Saving for retirement and managing the usage of funds during retirement is critical with defined contribution retirement programs, because they are often the only source for retirement benefits beyond Social Security. Employer support for financial education and emergency savings accounts will be essential in ensuring employees develop good skills to manage short- and longer-term financial challenges.

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A Primer on Benefit at Risk in the Context of Lifetime Pension Pools

By Jean-François Bégin and Barbara Sanders

As the prevalence of guaranteed pension arrangements decreases worldwide, flexible noninsured payout schemes are expected to become more popular. In response to this trend, the Retirement Section Research Committee of the Society of Actuaries Research Institute and the Canadian Institute of Actuaries recently commissioned two research reports on lifetime pension pools, their design elements, and how to communicate and disclose benefit risk to members of such pools. The first report, *Benefit at Risk in Lifetime Pension Pools,* by Jean-François Bégin and Barbara Sanders, was published in February 2023. This *Retirement Forum* essay summarizes some of the report's findings on member communication and disclosure for pension practitioners. It also sets the stage for the second report on lifetime pension pool design elements (see Bégin and Sanders, 2023b).

Introduction and Scope

Lifetime pension pools allow retiring individuals to convert a lump sum into income for life. These pools do not guarantee a specific income level; instead, the pension payable varies with the group's investment and mortality experience. By pooling individual participants' mortality risks, lifetime pension pools can generate higher sustainable income while alive than an individual's systematic withdrawal from the plan. These pools are also expected to outperform retail annuities because there is no requirement for risk capital to support guarantees.

Various arrangements and products fit the broad description of lifetime pension pools in the literature: group self-annuitization plans, pooled annuity funds, annuity overlay funds, retirement tontines, assurance funds, variable payout annuities, variable annuities, and variable payment life annuities. There are also some working examples of these pools, which include the College Retirement Equities Fund operated by the Teachers Insurance and Annuity Association of America in the U.S. since 1952, the Variable Payment Life Annuities run by the Faculty Pension Plan of the University of British Columbia since 1967, and the Lifetime Pension introduced to the Australian market by QSuper in 2021.

We expect to see more of these lifetime pension pools in the years to come. In Canada, recent changes to income tax regulations that accompanied the Budget Implementation Act of 2021 will facilitate this trend. In the U.S., there is some interest among pension practitioners in pursuing an expansion of the Employee Retirement Income Security Act of 1974 to allow the creation of lifetime pension pools at a broader scale (see, e.g., Shemtob, 2021, 2022).

Given that the income provided through a lifetime pension pool is expected to vary, it would be helpful to characterize the associated benefit risk in these noninsured pension payout arrangements. The focal point of this essay is, therefore, member communication and disclosure. We wish to create meaningful measures for members of the pool to understand the benefit risk they are bearing.

Following the rich literature on risk measures in risk management and actuarial science, one way to do so is through a percentile-related measure—very similar in nature to the value at risk (VaR)—which identifies the benefit shortfall in extreme scenarios with a given confidence level and over a specified time horizon. This measure, identified as the benefit at risk (BaR) in the Society of Actuaries Research

Institute and Canadian Institute of Actuaries' original *request for proposals*, is investigated at length in the published report, *Benefit at Risk in Lifetime Pension Pools* (Bégin and Sanders, 2023a).

Instead of investigating profits and losses like VaR, BaR focuses on benefits or the possible loss thereof. The notion of benefits is broad; one member could be interested in benefits received at a specific point in time, whereas other members could focus on the minimum benefit or the average benefit over a given period.

Another main difference of BaR when compared to the classic VaR measure is that we contrast the members' benefits to some other quantity or basis of comparison called the *comparator*. The comparator could be the current level of benefits, the future expected benefits, the total lifetime benefits, or the benefits from an alternative retirement option.

Because the focus of the report *Benefit at Risk in Lifetime Pension Pools* is member communication and disclosure, we propose two distinct BaR measures to help with budgeting and decision-making. These measures highlight two crucial dimensions for members:

- **BaR as a budgeting tool:** This is for existing participants who must plan for (and possibly adjust) consumption based on the income the pool will provide.
- **BaR as a decision-making tool:** This is for prospective participants who must weigh the risks and rewards of voluntarily allocating retirement assets to the pool compared to other available decumulation options.

The first tool is used to help current members understand how risky their benefits are in the short term. For this purpose, we propose to use a measure based on the minimum benefit likely to be realized over a relatively short period; this specific measure is called the *minimum BaR*. Using the minimum allows members to be confident that they will likely be able to pay for all their budgeted expenses, even when benefits are low.

The second tool serves as a comparative tool for prospective members to contrast the pros and cons of different arrangements; it gives them information about benefit risk in the medium to long term. It is based on the average benefit likely to be realized over a long period; for this reason, it is called the *average BaR*.

Before introducing these two measures in detail, we will first describe lifetime pension pools.

How Do Lifetime Pension Pools Work?

In this essay, we select a straightforward structure in which benefits are adjusted annually based on asset returns and realized mortality experience to illustrate the operation of lifetime pension pools. The stylized operation of the pool is similar to those explained in Piggott, Valdez, and Detzel (2005), Valdez, Piggott, and Wang (2006), Qiao and Sherris (2013), and Hanewald, Piggott, and Sherris (2013). It is also reminiscent of the benefit update rule used by the College Retirement Equities Funds (CREF, 2022). For illustration, we assume benefits are revised once a year with no lag between the end of the year and the payment of the adjusted benefit.

Assume that a pool of annuitants decides on the amount it wishes to invest in a (closed) pool; $A(0)$ denotes the investment made by a member. This amount gets converted into an annual benefit using a hurdle rate (i.e., an assumed rate of return) and a mortality assumption (typically a life table representing

the pool's systematic mortality). Specifically, for each member, the current annual benefit of $B(0)$ is obtained from the following equation:

$$B(0) = \frac{A(0)}{\ddot{a}_x},$$

where $\ddot{a}_x$ is the price of an annuity due for a member aged x. The annuity price is based on the hurdle rate assumption and the abovementioned mortality table.

Then, a year after the benefit is paid, the benefit is updated to account for the experience of the pool. Specifically, we adjust the member's benefit by multiplying it by two experience adjustment factors:

1. **The mortality experience adjustment factor (MEA):** This adjustment factor accounts for pool survivors and decedents. It captures benefit adjustments related to the money left in the pool by decedents and how this money is split among survivors. In broad terms, this adjustment factor will be larger than one—implying increases in the benefit level—if members are dying sooner than expected by the mortality table. Conversely, it will be lower than one if members die later than anticipated, implying benefit cuts for survivors to ensure the survivors are still provided with lifetime benefits.[1]
2. **The investment experience adjustment factor (IEA):** This adjustment factor accounts for deviations in the investment returns when compared to the hurdle rate used to compute the annuity price. Specifically, the adjustment factor will be larger than one if the realized investment return is higher than assumed and lower than one if the realized investment return is lower than the hurdle rate.

The same will also be true at all times after time 1. We, thus, have the following recursive update rule for benefits:

$$B(t) = B(t-1) \times \text{MEA}_t \times \text{IEA}_t,$$

where MEA_t and IEA_t are the time-t mortality and investment experience adjustment factors, respectively.

The interested reader can peruse Section 3.2 of the *report* for a numerical example explaining how the benefits are updated from one year to another.

Benefit at Risk in Lifetime Pension Pools

Before discussing the minimum and average BaR measures, we first define the BaR in all generality; this definition is broader than the lifetime pension pool context we consider in this essay and the *Benefit at Risk in Lifetime Pension Pools* report. Indeed, the benefit at risk could be used by actuaries to communicate risk in virtually any arrangement where benefits are uncertain (e.g., collective defined contribution plans).

[1] The description above holds under the simple model used in the report. When the model is more realistic (e.g., when members bring different amounts to the pool or when there are multiple cohorts), the mortality experience adjustment will depend not only on *how many* survivors there are relative to expected but also *which* members survive.

Like VaR, BaR has a probability level and a horizon, denoted by p and τ, respectively. However, instead of investigating profits and losses, the focus is on benefits. The notion of benefits is very broad, as mentioned above; one could be interested in benefits received at a specific point in time, whereas others could focus on the average benefit or the minimum benefit over a given period. The BaR end user makes this choice. We call this input the *benefit statistic*, and we denote the corresponding random variable by $\beta(\tau)$.

Another key input to the BaR is the comparator, denoted here by C, which acts as a benchmark for the benefit statistic $\beta(\tau)$. The comparator, for instance, could be the current level of benefits at the time the BaR is being calculated, the expected future level of benefits, or the total lifetime benefits.

The expression $C - \beta(\tau)$ represents the (random) amount by which the benefit statistic $\beta(\tau)$ falls short of the comparator C. It measures the member's risk of benefit loss relative to the comparator. In all generality, the BaR at probability level p and horizon τ for benefit statistic $\beta(\tau)$ and comparator C is defined as the p^{th} percentile of the distribution of the shortfall $C - \beta(\tau)$.

For instance, if the benefit statistic is chosen to be the benefit received one year hence and the comparator—say, the current benefit—is $1,000, then saying that *the 95% BaR is $100* means that next year's shortfall will be no more than $100 with a 95% probability.

Minimum BaR as a Budgeting Tool

As members budget for their expenditures, they need to understand the extent to which benefits might be reduced. Because individual circumstances can change rapidly in retirement, budgeting is best constrained to the short term (maximum five years), with necessary adjustments made as events unfold. Specifically, as they plan for the next five years, members may wish to line up their expenditures with projected income in an adverse (rather than neutral or best-estimate) scenario. This rationale allows them to pay for all their expenses, even when benefits dip lower than expected. To reflect this, the benefit statistic in the minimum BaR measure is set to the minimum benefit observed over a given horizon of $\tau = 5$ years. Mathematically, we define the minimum benefit over a horizon of five years by

$$\underline{B}(5) = \min_{t \in \{1,\ldots,5\}} B(t),$$

which is the minimum benefit received between years 1 and 5.

The next step in creating a BaR measure is choosing a comparator. We assume that members would compare potential future benefits to their current benefit level $B(0)$ in the minimum BaR.[2] The resulting worst shortfall over a five-year horizon under a single scenario is then $B(0) - \underline{B}(\tau)$.

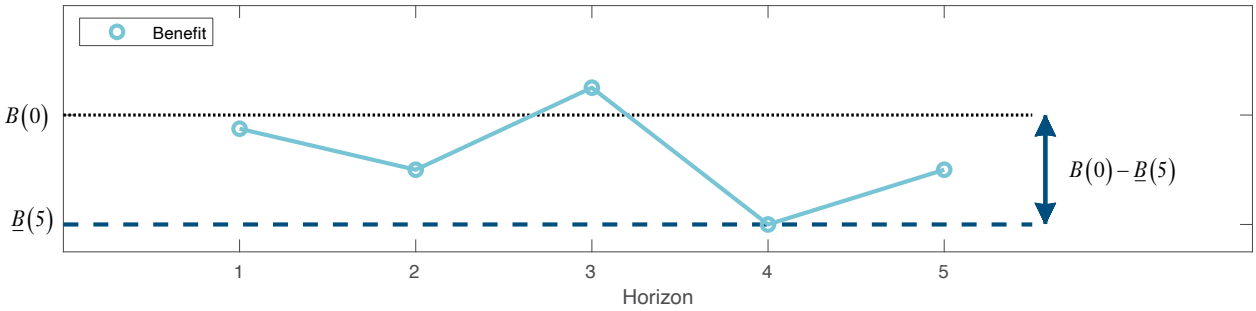
Figure 1 shows a hypothetical benefit path over a five-year period (light blue circles). The benefit departs from its current value, $B(0)$, and changes over time. For this specific path, the minimum (or worst) benefit in the next five years is observed in year 4 (dashed dark blue line). The difference between the current benefit (dotted black line) and this minimum represents the member's greatest benefit shortfall relative to the comparator over the next five years under this particular scenario.

[2] This choice is justified from a habit formation perspective: in the short term and for budgeting purposes, members care most about shortfalls relative to the current level (see Pollak, 1970; MacDonald et al., 2013).

Note that while the value of the comparator is known *ex ante*, $\underline{B}(5)$ is a random quantity whose value becomes known only *ex post* (i.e., at the end of the horizon). Different hypothetical benefit paths give rise to different shortfalls: Figure 1 only shows one possible realization of the shortfall. Many scenarios need to be generated to have a good idea of the shortfall distribution, especially in the tails (i.e., in extreme circumstances).

FIGURE 1

Hypothetical benefit path and its minimum



This figure shows a hypothetical benefit path over a five-year period (light blue circles) along with the current benefit $B(0)$ (dotted black line) and the minimum benefit over the period $\underline{B}(5)$ (dashed blue line). The difference between the current benefit and the minimum benefit over a five-year horizon is the amount by which the minimum benefit $\underline{B}(5)$ falls short of the comparator $B(0)$.

Once these shortfalls are generated, we can select a percentile of the simulated distribution to obtain our minimum BaR measure. For this purpose, a probability level of 97.5% is chosen to be conservative but not overly cautious.[3,4] The minimum BaR is therefore obtained as the 97.5th percentile of the shortfall distribution.

Simply put, this BaR measure captures the most significant shortfall observed over the next five years relative to the current benefit in an adverse scenario representing a 1-in-40-year event.

Average BaR as a Decision-Making Tool

Another use of BaR, from the members' perspective, is as a decision-making tool. Members could be interested in comparing different arrangements before entering any of them, and this comparison could include an assessment of the potential for benefit shortfalls under each arrangement.

The relevant horizon for decision-making purposes is longer than the budgeting horizon considered above. We employ a horizon of 20 years, which is close to the average life expectancy at retirement. If needed, one could select a slightly longer horizon, especially in light of the longevity improvements

[3] There is obviously a relationship between the probability level and the horizon considered. Indeed, a longer horizon should be coupled with a lower level and a shorter horizon with a high level. As explained in Dhaene et al. (2008), a good approximation rule for the risk measure probability level suitable for a horizon τ is $p = p_{\text{annual}}^{\tau}$, where p_{annual} is the annual probability level. Note that assuming that p_{annual} = 99.5% (i.e., the level used for solvency capital requirements under Solvency II) yields an approximate five-year level of about 97.5%—the level selected for the minimum BaR.

[4] Even though this level fits the Solvency II framework, we recognize that end users might want to apply different probability levels that fit their purpose and needs. We encourage practitioners to find probability levels that are consistent with their communication and disclosure goals.

observed over the last decades; we expect that changing the horizon from 20 years to 25 or 30 years will not materially impact the measure.

Over a longer horizon, there are two main reasons the benefits may change. First, the arrangement may target a nonlevel (i.e., either increasing or decreasing) expected benefit pattern.[5] Second, there is statistical uncertainty around this target: actual outcomes will differ from expected, regardless of whether the expected benefits have an increasing, level or decreasing pattern. To construct a shortfall measure that considers both of these aspects, we focus on the average benefit level over the entire horizon and compare the *actual average* benefit against the *expected average* benefit. In other words, the average observed benefit over our horizon becomes the benefit statistic, and the expected average benefit becomes the comparator.

Finally, for the probability level, we use 90%, which represents a 1-in-10 event.[6] This level is conservative but not overly cautious. In practice, it is up to the end users to find the level that fits their purpose and needs as well as that of their members.

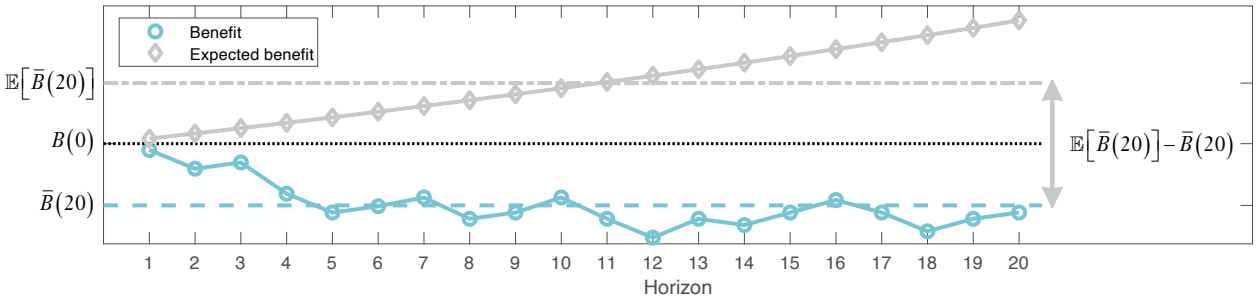
Mathematically, the average benefit—the benefit statistic—over a horizon of 20 years is given by the following expression:

$$\bar{B}(20) = \frac{1}{20}\sum_{t=1}^{20} B(t),$$

and the expected average benefit—the comparator—is its expected value denoted by $\mathbb{E}\left[\bar{B}(20)\right]$.

FIGURE 2

Hypothetical benefit path and its average



This figure shows a hypothetical benefit path over a 20-year period (light blue circles) along with the current benefit $B(0)$ (dotted black line), the expected benefit path (gray diamonds), the expected average benefit over the next 20 years $\mathbb{E}\left[\bar{B}(20)\right]$ (dot-dashed gray line), and the average benefit over the period $\bar{B}(20)$ (dashed light blue line). The difference between the expected average benefit and the average benefit over a 20-year horizon is the amount by which the average benefit $\bar{B}(20)$ falls short of the comparator $\mathbb{E}\left[\bar{B}(20)\right]$.

Figure 2 mirrors Figure 1 but for the average instead of the minimum; it shows a hypothetical benefit path over a 20-year horizon (light blue circles). From this realization, we can obtain the *average* observed benefit over these 20 years, denoted by $\bar{B}(20)$ (dashed light gray line). The (theoretical) expected benefit is reported with gray diamonds in Figure 2, and its *average* level over the next 20 years is indicated by the

[5] For example, in the context of lifetime pension pools, an increasing expected benefit pattern could arise if the hurdle rate is selected to be significantly lower than the expected portfolio returns. A decreasing expected benefit pattern could arise if the hurdle rate is higher than the expected portfolio returns.

[6] This is consistent with an annual probability level of 99.5%, as prescribed by Solvency II, since $0.995^{20} \approx 0.9$.

dashed gray line. This latter quantity is then compared to the average observed benefit, with the difference between the two representing the amount lost by the member when compared to what she was supposed to obtain (on an expected value basis) over the long term. This difference is the shortfall—the comparator minus the benefit statistic.

Once again, the shortfall $\mathbb{E}\left[\bar{B}(20)\right] - \bar{B}(20)$ is a random quantity that varies from scenario to scenario, and we therefore need to generate multiple scenarios to capture the size of this shortfall in adverse cases. The average BaR measure is calculated as the 90th percentile of the shortfall distribution.

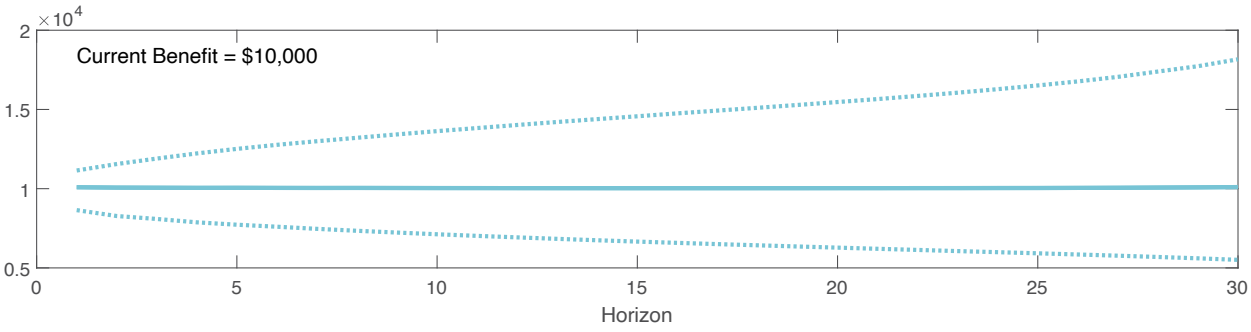
For members, the average BaR measure represents the shortfall in an adverse 20-year scenario that is likely to materialize one time out of 10. In other words, in 10% of the possible future scenarios, we expect a shortfall equal to the calculated measure or more.

Illustration of the BaR

In this section, we illustrate the use of both the minimum and average BaR measures by applying them to a stylized lifetime pension pool. We assume a closed membership group with 100 members aged 65 years joining at inception. We assume that each lifetime pension pool member deposits $143,410 in the fund. The price of the initial annuity is $\ddot{a}_{65}$ = 14.3410 using the female Canadian Pensioners' Mortality (CPM) 2014 table without generational adjustments, resulting in a current benefit of $10,000.

FIGURE 3

Annual benefit funnel of doubt



We show the median (solid line) as well as the 5th and 95th percentiles (dotted lines). Half of the portfolio is invested in the risky asset, and the other half is in the risk-free asset. We assume that the retiree joins the pool at 65 with $143,410, so the current benefit is set to $10,000. The current pool size is set to 100 members.

The pool invests half of its assets in the risky asset—proxied by a stock index—and the other half in a risk-free asset.

1. The risky asset provides a random return generated by the block bootstrap approach (see Appendix C of the *report* for more details). Specifically, the method relies on past returns from the S&P/TSX Composite Index between 1990 and 2021; these returns display an average return of 7% and a volatility of 15%.
2. The risk-free asset provides a fixed return of 2% per annum.

We set the hurdle rate to the average return on the portfolio—that is, 4.5% per annum in this illustration.

For simplicity, we consider only idiosyncratic mortality risk in this illustration. Mortality is assumed to follow the female CPM 2014 table without generational adjustments, and deaths are modeled using Bernoulli distributions (see Section 4.5 of the *report* for more details).[7]

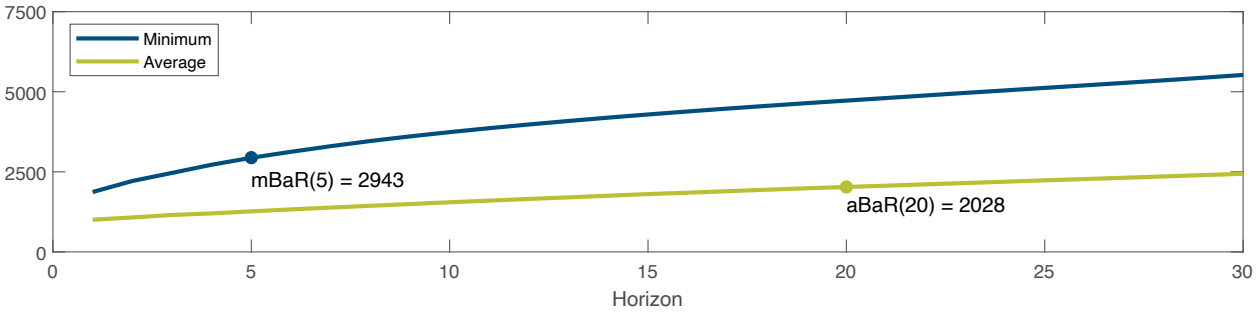
Figure 3 reports the funnel of doubt of the annual benefits (i.e., median as well as 5th and 95th percentiles of the benefit distribution). Overall, the benefits tend to be more uncertain as longer horizons are considered. Two reasons explain this:

1. The year-to-year change in benefits gets compounded over longer horizons.
2. The mortality experience adjustment becomes more prominent as the group ages because death probabilities generally increase with age.

The median benefits are stable—a byproduct of using the expected average return on the portfolio as the hurdle rate.

FIGURE 4

Minimum and average benefit at risk measures



This figure reports the minimum (blue line) and average BaR (green line) as a function of the horizon. The minimum BaR level is set to 97.5%, the average BaR level to 90%, and the hurdle rate to the expected portfolio return. Half of the portfolio is invested in the risky asset, and the other half is invested in the risk-free asset.

Figure 4 shows the minimum and average BaR for different horizons based on a current benefit of $10,000. The five-year minimum BaR estimate is $2,943, meaning the following for members:

> *In one out of 40 future scenarios, your benefit could fall from its current value over the next five years by $2,943 or more. In 39 out of 40 scenarios, your benefit shortfall is projected to be less severe.*

As per Figure 4, the 20-year average BaR is $2,028. This number can be communicated to a member in the following way:

> *Your plan is targeting a level benefit of $10,000 each year, but actual future benefits are uncertain. In 1 out of 10 future scenarios, your actual benefit might fall short of the target by $2,028 in each of the next 20 years.*

[7] Systematic mortality risk is also relevant but out of the scope of the report. To account for this risk, users must rely on deterministic generational life tables or stochastic mortality models allowing for longevity improvements (see Lee and Carter, 1992; Cairns et al., 2006, for examples of such mortality models).

To be precise, it is the *average* benefit over the next 20 years that is likely to fall short of the target by this amount. However, it may be difficult for members to understand a sentence that contains both an average and a 1-in-10 probability. Here, we chose accessibility over precision.

This description might still not be accessible for some members; we advise actuaries and financial advisors to work with members to ensure these stakeholders understand the meaning of these BaR measures and the accompanying statements. Moreover, illustrations and explanations of BaR measures should be included in annual member statements.

Limitations of BaR

The new class of measures introduced in this essay and in our report can be helpful for communication and disclosure to members. Nonetheless, these have some limitations that end users should be aware of.

First, the BaR suffers from limitations similar to those of the VaR:

- **It provides a false sense of security and has a narrow focus.** The actual benefit loss can be higher than BaR. Unfortunately, many end users could think of BaR as the most a member could lose. In reality, this number can be far from the worst benefit loss a member can come across.
- **It is only as good as the assumptions used to compute the measure.** The BaR measure depends on some subjective inputs—the probability level, horizon, benefit statistic, and comparator—as well as the assumptions used in calculating the benefits, especially the variability of investment returns. A change in these assumptions and inputs will change the end result.
- **It should not be used as an objective in an optimization exercise because it can produce suboptimal decisions.** It is well-known that using the VaR—and, by extension, the BaR—in a risk minimization problem yields counterintuitive results: By not bringing in the magnitude of the shortfalls that exceed the cutoff probability, the "optimal" choice might expose members to very low benefits. We, therefore, have some reservations about the use of BaR by actuaries in the context of lifetime pension pool design.

Further to the last limitation noted, one should be very careful when using BaR in the context of design because it does not tell the whole story.

- Some designs might produce a lower (and therefore more desirable) BaR but do so at the expense of some other feature of the benefit distribution. For instance, a lifetime pension pool with a low hurdle rate creates a pattern of increasing benefits, which lowers the BaR. However, such an arrangement would also produce a considerably lower current benefit, all other things being equal. In these cases, considering only the BaR without also considering the expected level of benefits might be misleading.
- The BaR does not comment on the variability of the benefits from one year to the next. Indeed, BaR considers only the distribution of benefits across all possible scenarios at specific times and not how benefits might evolve as a function of time along a single scenario.

Despite these limitations, we believe that BaR is a great device when used appropriately: as a budgeting and decision-making tool for members, for instance.

Concluding Remarks and Further Developments

Daykin noted in 2004 that "the future probably lies in the development of different forms of risk-sharing between pensioners and annuity providers." Simply put, future annuity products and arrangements will likely transfer more flexibility and risk to members than has traditionally been the case. Over the last two decades, we witnessed numerous pushes in this direction, with the introduction of new legislation permitting lifetime pension pools, their launch in the marketplace, and the publication of several research papers on the topic.

As these new pools become a reality, actuaries and plan sponsors need to understand the risks within these pools. They also need to communicate risk to members in a meaningful way so that members can make appropriate decisions about their retirement income. This is very challenging in practice because (1) members tend to be financially illiterate (see, e.g., Lusardi and Mitchell, 2011), and (2) actuaries sometimes struggle with communication when dealing with nonexpert audiences (see, e.g., Society of Actuaries, 2002).

The report and this essay address part of this issue by proposing a new collection of measures for member communication and disclosure. Specifically, we suggest two meaningful applications of the BaR concept: the minimum BaR for budgeting purposes and the average BaR for decision-making purposes. The report is a first attempt at communicating risk-related information to members; there is still much work to be done to make these pools accessible to the general public and ensure its success.

We noted above some limitations of the proposed measures. Notably, using BaR in contexts other than communication and disclosure might be misguided because it does not tell the whole story. Specifically, when the objective is to identify optimal pool design features, the BaR should be used in concert with other measures that capture other dimensions of risk and reward relevant to members. Our second report on lifetime pension pools, commissioned by the Society of Actuaries' Retirement Section Research Committee and the Canadian Institute of Actuaries, uses the BaR concept and other measures to explore the following design elements:

- **Closed versus open pools:** In the first report, we considered closed membership groups only where no new members join the cohort after inception. Yet, it is unclear if these are optimal or if open pools would perform better.
- **Hurdle rate policy:** In the first report, we considered a constant hurdle rate. It would be possible to consider a variable hurdle rate in practice, which could be linked to either nominal or real return expectations. On the one hand, hurdle rate adjustments may introduce additional year-to-year volatility in benefits. On the other hand, not adjusting the hurdle rate when return expectations change may diminish fairness.
- **Delayed recognition of gains and losses:** Delayed recognition could give participants a longer time to adjust their consumption to changes in pension income. However, it can also introduce value transfers among members if done poorly. Some relevant methods for delayed recognition are, for instance, the staggering of benefit changes over consecutive years and the creation of an adjustment corridor within which the benefits are not changed.

We leave these exciting questions for our second report, *Exploration of Lifetime Pension Pool Design Elements*, which is now available (see Bégin and Sanders, 2023b).

Acknowledgments

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Comments on

"A Primer on Benefit at Risk in the Context of Lifetime Pension Pools"

By Andrew E. Gillies

The minimum benefit at risk (mBaR) statistic is already being used to provide invaluable information to retirees. I am the plan actuary of a multiple employer collective defined contribution pension plan. One of the advantages of this plan's design over conventional money purchase defined contribution pension plans in Canada is that it incorporates the decumulation of member accounts within its plan design and allows for members to receive income in retirement. As part of the decumulation income options available to its retirees, this plan's design provides lifetime and spousal survivor payouts through a variable payment life annuity (VPLA).

The plan's VPLA is designed to provide expected increases each year using a conservative hurdle rate, when compared to the long-term investment returns expected to be received on the pool of assets backing the VPLA.

Further, the plan's VPLA utilizes a smoothing methodology to make yearly adjustments to pensions in pay. Experience gains or losses compared to the hurdle rate and the hurdle mortality assumption are recognized over a five-year period. The change in a member's VPLA pension each year is determined with reference to the pool's experience of the prior year and the immediately preceding four years as well. This allows the plan administrator to communicate in advance to its retirees the partial change in pension anticipated next year, because 80% of the investment and mortality experience that will be reflected in next year's pension adjustment is already known at the beginning of this year.

As with any VPLA, actual benefits paid may decline based on actual investment and mortality experience. Investment or mortality losses compared to the hurdle rate and hurdle mortality assumptions could result in losses that are realized over a particular five-year period. The mBaR(5) statistic proposed in the Society of Actuaries' "A Primer on Benefit at Risk in the Context of Lifetime Pension Pools" is an essential tool that we use to quantify the risk real retirees are exposed to when utilizing the VPLA. It allows us to provide a formulaic, robust response to the question from our potential and current retirees "What is the likelihood that my pension will decrease over the next five years?"—or more succinctly, "How safe is my pension?"

In practice, we use the mBaR(5) to determine the likelihood of a decrease in a retiree's VPLA pension over the next five years. As noted in the paper, the mBAR tool was adopted because the benefit statistic can be used by future and current retirees to determine appropriate "safe" budgets over the next five years. We are fully cognizant of the need for reliable income for retirees from a VPLA.

To determine the mBaR(5) statistic, a robust investment projection model is necessary to simulate returns on the assets within the VPLA asset pool over the next five years. This is completed with reference to the VPLA's current and target asset allocation. Using each generated investment return scenario, we determine the VPLA's projected annual pension adjustments for each of the next five years by applying a smoothing algorithm, which incorporates the prior four years of investment returns and the generated future investment returns. Future mortality experience is anticipated to be equal to that

assumed under the hurdle mortality assumption. For our purposes, we prepare 2,000 future investment return scenarios.

From these, the mBaR(5) statistic is determined. The comparator chosen is the pension currently in pay. This exercise is completed annually, with results published publicly for our members and any interested individuals to review.

This primer and the full report do great jobs of building the necessary foundation for actuaries to support members of VPLAs or other lifetime pension pools. I hope further expansion of the work will include:

- Analysis of the mBaR with the comparator selected as the pension amount available from fully insured annuities purchased with the same funds used to purchase a VPLA pension, which will provide robust statistics on the anecdotal assertion that lifetime income pools or VPLAs can provide greater benefits to retirees with little to no added risk of pension decline; and
- Use of the average BaR statistic to evaluate VPLA plan designs similar to the five-year smoothing methodology.

I appreciate the work done by the authors, Jean-François Bégin and Barbara Sanders, to promote the development of tools necessary to properly evaluate the safety of pensions paid from lifetime pension pools, including VPLAs.

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Comments on

"A Primer on Benefit at Risk in the Context of Lifetime Pension Pools"

By Michelle Gordon-Richter

Much has been written, yet relatively little has been implemented in the lifetime pension pool domain. Some jurisdictions currently allow issuance of pooled products; others are less clear. The reason interest in these solution types has been recently stoked is at least partly a function of an unpredictable market environment combined with rising interest rates (which reduce the value of already purchased bonds), making safe income derived from more traditional retirement solutions more challenging than usual for today's retirees to accomplish.

I feel strongly that solutions including lifetime pension pools are critical to the future of the field of wealth management. They may not have had popularity to date because, as a society, we have not yet accurately distinguished the field of asset management—an institutional, left-side-of-balance sheet worldview—from wealth management, a human (assets-liabilities) worldview. This conflation between word meanings in turn can lead to suboptimization in suggested retirement income strategies, for reasons I will describe later in my comments.

The Society of Actuaries' "Benefit at Risk in Lifetime Pension Pools" by Jean-François Bégin and Barbara Sanders provides material advancement toward an inclusive vision for the retirement income advisor identity within the wealth management field for at least the reasons that follow, which are outlined in this paper:

1. Longevity risk pools provide a lean form of nonguaranteed retirement income that can, on average, materially improve income outcomes relative either to making systematic withdrawals from an uninsured portfolio or to purchasing a guaranteed income stream from an insurance company.
2. Benefits at risk (BaR) and minimum benefits at risk (MBaR) level the playing field between an investment-maximizing viewpoint (current world) and the income-optimizing worldview that I believe would be the more merited advisor compensation view in the U.S. space.
    a. Investment advisors and managers rely upon value at risk (VaR) metrics when making securities selection recommendations toward the objective of maximal ultimate asset accumulation for an investor's given level of risk tolerance. One should similarly expect that BaR would be relied upon by retirement income advisors if longevity risk pools were readily available and if advisory fees could be earned by advising upon risks associated with the assets in these pools.
    b. MBaR, as the authors point out, can help retirees and their advisors determine budgeting for several years as well as how to allocate assets both in and outside the pool given the risk characteristics of the pool, which will comprise a portion of the advised portfolio. Inspired by techniques taught in the financial planning field, retirees and clients of retirement income advisors who participate in a lifetime pension pool could rely on MBaR metrics to understand the amount to contribute to a pool that would cause MBaR to match their basic expenses and could then invest more aggressively those assets that are used to support discretionary expenses.

The global trend toward defined contribution (DC) plans and away from defined benefit (DB) pensions has a material impact not only on plan participants but also on the actuarial field. For those actuaries

who have historically provided actuarial services directly to DB plan sponsors, the global shrinking of DB limits the number of potential clients for biometric asset/liability matching services.

Absent the future for the type of work that the authors have described, there may be a different role for life/annuity actuaries in the future. I have invested 100% of my own human capital into my belief that longevity risk pooled vehicles, including but not limited to annuities, should be available in/via the DC space. But I am also very aware that there are current constraints to that becoming more widespread.

I believe that wealth occurs when assets owned by a person grow in excess of that person's liabilities. If most consumers projected their own balance sheets, retirement income needs would be recognized on those balance sheets as an impending liability. In the U.S., the role of an investment advisor is to prudently maximize the left side of a balance sheet. An investment advisor is not required to consider liabilities in performing their role of serving assets. The role of an actuary, however, is to help deliver products and services that either (or both):

1. Minimize the right side of the insured's balance sheet; or
2. Smooth/guarantee retirement income (which is reflected on the income statement, not the balance sheet).

For DC plans, there is a viewpoint that a fiduciary must manage costs to drive asset bases higher. This viewpoint could limit the role for an actuary. What if in the future, instead of assets under management billed by an investment advisor as the only available advisement frame for plan advising and wealth management, there were also an available billing frame for income/benefits under advisement in the tax-qualified space? Not only would such a framework create an important role for actuarial services in the DC and retail retirement wealth management spaces, but it would also align advisor incentives with the objectives of prudently maximizing income drawn from these accounts during a lifetime. The U.S. and Canadian governments provide tax incentives for qualified retirement savings because those savings are designed to provide income, not because those savings are designed to provide an inheritance for heirs.

In this paper, the authors lay what I believe to be the necessary groundwork for both measurement metrics as well as derivative product solutions that will enable actuaries to continue to hold the rightful role that they have historically played behind the scenes in securing many American and Canadian retirements.

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Authors' Response to Comments on "A Primer on Benefit at Risk in the Context of Lifetime Pension Pools"

By Jean-François Bégin and Barbara Sanders

We extend our gratitude to Andrew Gillies and Michelle Richter-Gordon for their insights on our essay and for continuing the important discussion on lifetime pension pools. We have a few additional thoughts based on their observations.

Gillies explains that the Ideal Canadian Pension Plan (ICPP) already uses the benefit at risk (BaR) measure to provide invaluable information to retirees—and we applaud the initiative. As mentioned in our essay, clear communication with pool members is an important challenge when managing lifetime pension pools. We are delighted to see pool operators using our tools.

One exciting feature of the measure we introduced in our essay is its flexibility—its definition can be altered to create tailor-made measures that focus on aspects that are relevant to pool members. As suggested by Gillies, the minimum benefit at risk (mBaR) could be adapted to allow for comparison with fixed insured annuities. It could also be used to compare some drawdown strategies, for instance. Therefore, we encourage actuaries to customize the definition of our BaR measure in ways that align with their objectives and serve the interests of their members.

We recognize that introducing BaR is only the initial step in ensuring members understand the risk borne in lifetime pension pools. Gillies correctly points out that members must know "the likelihood that their pensions will decrease over the next five years," and the mBaR addresses this clearly. More generally, retirees would like to know how safe their pensions are, and a combination of additional *new* measures (including BaR) would help get a complete picture of the risk and reward trade-offs inherent in these pools.

These additional tools could be very useful, but some members may find them challenging to interpret, particularly those who lack financial literacy. In such cases, it may be beneficial for these individuals to receive assistance from others. We agree with Richter-Gordon that there is an urgent need for a new type of advisor who could play a crucial role in bridging this knowledge gap by providing members with fiduciary guidance regarding options for generating retirement income. Indeed, such retirement income advisors might be the main end users of measures like BaR. We hope that our new collection of measures will be helpful in this respect and in providing a framework for retirement income advisors to assess risk and reward more holistically (i.e., not just by focusing on maximizing assets).

While most of the comments from Gillies and Richter-Gordon were centred on the mBaR, the essay and report introduced another measure—the average BaR—for decision-making purposes. The latter measure is suitable for comparing different options because it captures both elements of risk and reward and adjusts for changes in the expected benefit pattern. We therefore fully agree with Gillies regarding the use of the average BaR in the context of evaluating and comparing lifetime pension pool designs. In fact, our second report employs the average BaR and several other measures to compare different lifetime pension pool design elements. Among others, we investigate in this new report a design that spreads the adjustment over time—similar to the design of the ICPP.

Many thanks again to both Gillies and Richter-Gordon for their excellent contributions to this important conversation.

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