SOCIETY OF ACTUARIES

PENSION SECTION

ISSUE 89 MAY 2016

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Issue Number 89 • May 2016

Chairperson's Corner

By Julie Curtis

I am a baby boomer, born at the heart of the largest homegrown population explosion in North America's history. Even as a young student, I wondered how things would work out economically for our generation. There were so many of us. Growing up in a multigenerational family, I saw firsthand how many resources—financial, personal, and medical—were required to maintain a good quality of life for the older generation. How would our generation get jobs when we flooded the market? How would we manage when we became the "sandwich" generation? And unless we also had many children to support us as we aged, who would care for us, and where would our financial resources come from?

Every generation asks these questions, and every generation faces its own challenges. We just need to look at the challenging job market facing the millennial generation a few years ago to see that every cohort has problems.

It was the sheer number of boomers that marked our generation, and like many of us, I realized that continued prosperity due to prolonged population growth was probably not sustainable. At some point, we would age, caring for the generations before and after us and having to save for our own future all at once.

Becoming a pension actuary was a natural fit for a young person who thought about, perhaps obsessed over, the long-term economic prognosis for our generation and the generations to follow. I heard stories of the difficulties my grandparents and great-grandparents faced, saw the improved overall economic status of my parents' generation, and wondered how we could sustain those gains and maybe even improve the situation for future generations.

As I moved through adulthood, I also noticed that people were living longer, and for the first time, large numbers of us were enjoying an extended middle age. Our parents' productive years overlapped with ours for two, three and even four decades. Many of us have enjoyed a time when we, our parents and our children were all functional adults at the same time, sometimes for many years. Eventually, though, all of us who survive to old age come to a point where we are no longer economically productive or self-sufficient, and we must draw on external resources.

When I started my career as a pension actuary, defined benefit (DB) plans—combined with the existing social programs and tax-advantaged retirement savings plans—provided a solid approach to acquiring those resources. Then I started to see the size of plan sponsors' defined benefit obligations grow sharply. The increasing number of pensioners, increasingly large benefits created by higher pay and longer service, and low inflation/lower asset returns combined to make the size of obligations untenable in many cases. Media reports of pension obligations dwarfing a company's assets became all too common. Not surprisingly, we had to reassess the traditional pension system. One of the most thoughtful looks at the future of retirement plans emerged from the SOA's *Retirement 20/20*. (*http://retirement2020.soa.org/background.aspx*)

Although the initiative was completed five years ago, many of its observations still apply. It reminds us that continued innovation in retirement plans is possible and necessary, that achieving a balance between DB/defined contribution (DC)/social programs is not easy, but it is an important goal. The project explored key concepts of our existing system and suggested future actions that plan sponsors might consider. To paraphrase Emily Kessler during her 2009 testimony to the ERISA advisory council, retirement features that create the best outcomes for the most participants include:

- Some insurance and risk-sharing elements
- Ways for employers to offer their employees plans (DB and/or DC) that might not be sponsored by the employer
- Wise use of markets, including education, strong, unbiased advice and standardized products
- Communications and messaging to encourage individuals to consider longer careers, annuitization at retirement, and long-term planning throughout their working lives.

The Pension Section continues to explore the current state of DB and DC plans and ways to improve and innovate these plans to keep North America's retirement system robust. If you are interested in exploring how to improve the system, please let us know. The Pension Council and its communications, research and continuing education teams welcome volunteers and suggestions. You can reach us at *https:///www.soa.org/about/volunteer/default.aspx*. ■

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A View from the SOA's Staff Fellow for Retirement

By Andrew Peterson

It is no secret to pension actuaries that we are working in a time when traditional defined benefit (DB) plans are experiencing extreme challenges. The multiple factors—including low interest rates, volatile investment markets, increasing longevity, maturing plans, and so on—have created a very challenging operating environment for DB plans. As a result, we are witnessing a paradigm shift in the North American retirement landscape where individuals are increasingly being asked to take direct responsibility for their own retirement security; this requires that they directly bear investment, longevity and inflation (among other) risks. This is happening both through explicit plan design changes and the "de-risking" exercises being executed by many plan sponsors with traditional pension plans.

While this paradigm shift is perhaps most prominent (and advanced) for single-employer pension plans in the private sector, the financial challenges and pressures are also being experienced by multiemployer and public sector pension plans, in both the United States and Canada. Certainly the trend away from DB plans has not happened in public pension plans to the degree it has in the private sector, yet even as I write this, I have just read two different press articles about politicians proposing lump sum payout options in public pension systems as a way to relieve the financial stress on these plans. (Note that it wasn't clear to me how this "relief" was actually going to be realized unless they "underpay" participants.)

Unfortunately, plan sponsors often see retirement plan options as an either/or choice—either DB or defined contribution (DC). As pension actuaries, we know that plan design is actually a spectrum of options with many possible variations and choices. In fact, that was the real genesis for the Pension Section's sponsorship of the *Retirement 20/20* initiative that was initiated about a decade ago. In her chairperson column in this issue, Julie Curtis writes a bit more about *Retirement 20/20*, but a core goal of that initiative was to think about new plan designs outside the DB/DC silos, starting from a clean slate perspective. The active work of that specific initiative ended about five years ago,[1] but the spirit of the work continues in other SOA-sponsored projects.

One example is a recently completed research project the SOA sponsored on target benefit plans titled *Analysis of Target Benefit Plan Design Options*. The work was authored by Barbara Sanders of Simon Fraser University (British Columbia). As such, it is set in the Canadian context, where there seems be a much more specific application of risk-sharing plans than has happened yet in the United States. Despite its Canadian context, the paper's application transcends geographic borders as much of the work is not specific to a particular regulatory framework. The focus of the research is how different target benefit plan designs (i.e., risk-sharing mechanisms) and funding strategies impact benefit security and stability over both short- and long-term periods. The analysis and results are developed through a stochastic model and not merely a deterministic approach.

One aspect of this project that is unique and particularly helpful is that in addition to the full report, Ms. Sanders has written two issue briefs that highlight the key concepts and conclusions of the full paper. The issue briefs are each about six to seven pages, making them easily accessible and a quick read for busy pension actuaries. I believe the work of this project should be of particular use to any actuary thinking about different risk-sharing designs and how different design choices and funding strategies will impact the ultimate variability and level of benefit provision. I encourage you to read the briefs and seek to apply them when you engage in plan design projects to encourage plan sponsors to consider more options on the DB to DC plan design spectrum.

If you have specific feedback on this project or other project ideas that you think the SOA Pension Section should pursue, please feel free to contact me. ■

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ENDNOTE

[1] The SOA Pension Section Council has recently started a project to revisit the work of *Retirement 20/20* to evaluate what additional work should/could be done at this time and/or whether there were key lessons learned that should be discussed further.

Perspectives from Anna: Some Insights into the Work of the Committee on Post-Retirement Needs and Risks

By Anna M. Rappaport

I chair the Society of Actuaries' Committee on Post-Retirement Needs and Risks (CPRNR). The committee, which started its work nearly 20 years ago, was founded on the premise that more focus was needed on how retirement resources are used and risks managed during retirement. As its work proceeded, I had several major insights that I want to share. We have also had several interesting projects in the last two years, and I will share some highlights from those as well.

SOME INSIGHTS

The importance of housing wealth: For many middle-income American families nearing retirement, their home is their major asset. The CPRNR conducted two studies on segmenting the middle market and found that housing wealth far exceeded financial assets for many families. This finding has always made me want to include some consideration about housing as we discuss planning strategies. (Note that these studies did not include the value of Social Security or defined benefit [DB] plans.)

What decisions are most important: A large part of retirement planning is about investing well, but that only matters if you have assets to invest. For families with housing wealth and very little or no other financial assets, the big decisions are when to claim Social Security and when to retire. Figuring out how to work longer can be especially important for them. For software and advisory services to be useful, they need to focus on the issues that are of importance to the user.

Many voluntary retirees feel "pushed": In 2013, the CPRNR conducted focus groups with people who indicated they had retired voluntarily and were financially resource constrained. This was followed up by the risk survey. Previously we knew that there were many involuntary retirements. We learned in 2013 that many voluntary retirements were also "pushed." Reasons included unpleasant working conditions, family needs and health challenges.

More people expect to work in retirement than actually do: Working in retirement can be difficult, but either retiring later or working in retirement are important ways for people with limited resources to improve their retirement security. The chances of being successful with work in retirement are greatly enhanced if people maintain skills and contacts, are willing to accept reduced roles and responsibilities, and have a strategy to stay employable. Phased retirement is of interest to employees but not often used by most employers. Part-time jobs are more widely available, but it is hard for older persons to get jobs. This is an area that needs work. For some people, this issue is just as, or more important than, learning about investments.

Retirement planning means different things to different people: As an actuary, when I think of retirement planning, it seems automatic to think about long-term, rest-of-life risk and contingencies and the time value of money. There are differences among actuaries about which risks are important and how to measure them, but generally they embrace these ideas. I was surprised to learn that for some people (probably without quantitative backgrounds), planning is very different. In three different sets of focus groups, the CPRNR heard from individuals for whom planning meant a cash flow forecast that focused on their "regular bills" and "income." If they could pay their regular bills, that was their goal. For some of them, it was short term and not long term. For others, when the issue of risk and uncertainty was raised, the response was, "I will deal with it when it happens." The gaps in planning are bigger than I imagined, and this goes hand in hand with the goal of not spending down assets.

Many people do not want a plan to spend down and use assets: The CPRNR has been very focused on the question of how one might systematically use assets over the retirement period and

not use them up too fast. The committee has discussed lifetime income and other spend-down strategies. Most recently, it has sponsored a project looking at the application of efficient frontier theory to retirement income. But, in focus groups, some of the participants have indicated that they want to hold on to assets. They do not embrace any spend-down plan, and they are withdrawing the required minimum distribution from their tax-protected retirement funds only because they are required to do so. In addition, some do not consider these withdrawals, when spent, a spend down of assets since the withdrawal is required.

Shocks and unexpected expenses include a wide variety of different items: The 2015 focus groups and risk survey focused on financial shocks and unexpected expenses. The most common concerns mentioned in the focus groups were unexpected home repairs and dental expenses. I supposed that if people could anticipate that they would have these expenses, then they could set up reserves for them. But some people view items that are not part of their regular monthly payments as unexpected expenses.

Working with the CPRNR has been a path of discovery and insight for me. It has been interesting, and I have learned a lot. Unfortunately, solutions for middle-income retirees remain difficult.

UPDATE ON COMMITTEE WORK

New topics chosen for exploration in 2016 are:

- Research on people late in life (85 and over)
- Concepts of retirement adequacy
- Financial wellness issues pre-retirement (as it impacts security in retirement).

I also want to share with you an update on some of the recent projects of the CPRNR.

Focus on advice: About two years ago, the CPRNR started to focus on how advice fit within employee benefit programs. It had become clear that there are major gaps in planning and that the employer can provide the best opportunity for the average individual to gain access to advice. An article in the last *Pension Section News* provided insight into activities related to advice.

Focus on lifetime income: The CPRNR has conducted several projects related to lifetime income in partnership with the Stanford Center on Longevity. An article in the last *Pension Section News* also provided insight into these activities.

2015 risk survey and focus groups: Complete reports containing these results are now available. During 2016, the CPRNR will be working on special topic reports from the 2015 risk survey. There will be a new risk survey in 2017.

Diverse risks call for essays: This project attempted to move forward the CPRNR focus on solutions. It is discussed elsewhere in this issue, and the prize-winning essays are included.

Retirement literacy and longevity: A project on retirement literacy is currently underway, as is one on communicating longevity concepts.

All of the work of the Committee of Post-Retirement Needs and Risks is available at *https://www.soa.org/research/research-projects/pension/research-post-retirement-needs-and-risks.aspx*. ■

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Risk Strategies Pertaining to the Many and Diverse Risks Found in Retirement

By John Cutler

The Society of Actuaries' (SOA's) Committee on Post-Retirement Needs and Risks (CPRNR) has been researching and seeking solutions for managing post-retirement risks for nearly 20 years. While a great deal of information is available about the challenges caused by these risks, corresponding solutions are often not readily available. Furthermore, in many areas, there is no clear consensus on the best solutions.

In the fall of 2015, the CPRNR issued a call for essays focused on three different areas: (1) defined contribution plan risk management strategies; (2) decumulation strategies for retirement; and (3) long-term care financing.

In the first area, an increasing number of employers use defined contribution (DC) plans as their primary retirement benefit plan. While these plans enable employees to accumulate substantial retirement resources, there may be gaps for those using DC plans as their primary retirement vehicle. Risk protection available with defined benefit (DB) plans is lost in several areas.

The second topic, decumulation, revolves around the issue that households have their retirement resources in a variety of funds. Those with multiple sources of funds have choices with respect to which funds to draw down first. Everyone needs to make decisions about what type of drawdown arrangement to implement. The question here is what methods are recommended for drawing on these various resources in retirement.

The third topic, long-term care financing and retirement, continues a theme from the CPRNR's 2013 call for papers. The SOA was especially interested in essays that integrated retirement planning and financing for long-term care (public or private).

The SOA received 20 papers (essays) and selected 18 to be published in a compendium that is now available on SOA.org. After careful review and consideration, the committee announced in January that the following essays were selected for awards:

FIRST PRIZE

- Evan Inglis, "The 'Feel Free' Retirement Spending Strategy." This essay provides a rule of thumb for decumulation with a range attached to it. The author keeps it fairly simple and provides some analysis as to why this rule is reasonable.

SECOND PRIZE

- Krzysztof Ostaszewski, "Retirement: Choosing between Bismarck and Copernicus." This essay suggests an entirely different view of retirement—as in retirement is when you can't work anymore.

THIRD PRIZE

- Anna Rappaport, "Thinking about the Future of Retirement." This is a "big picture" approach, focusing on retirement ages as well as a range of issues related to DC plans.
- John Turner, "Longevity Insurance Benefits for Social Security." This essay on longevity insurance proposes a change to Social Security to better achieve this goal and then focuses on how that will link to decumulation.
- Steve Vernon, "Designing and Communicating Retirement Plans for Humans" and "A Portfolio Approach to Retirement Income Security." Steve Vernon had two winning papers. One was on designing a better retirement plan. For this, he revisits behavioral finance issues and uses them to make recommendations about structuring employee (DC) benefit plans to offer good support for decumulation. The other presented a portfolio approach to retirement income security that built on research sponsored by the SOA with the Stanford Longevity Center.

We wanted to highlight the long-term care arena, and the essay "News Flash: Retirement Takes Over Long-Term Care" focuses on a wide range of policy ideas. Importantly, it posits that long-term care linked to retirement vehicles will be how public policy will address this risk/need.

We are pleased that these essays can be included in this issue of *Pension Section News*, along with a short interview with each author. Many of the others will be published here in later issues. ■

John Cutler served as chairperson for the Project Oversight Group for the Diverse Risks' call for essays. He has been an active member of the Committee on Post-Retirement Needs and Risks for several years. He retired from the Office of Personal Management in 2015 and is now a Senior Fellow for the National Academy of Social Insurance as well as special advisor to the Women's Institute for a Secure Retirement (WISER). At OPM, he was actively involved with health and long-term care issues, and he is the architect of the Federal Long Term Care Insurance Program for federal employees.

INTERVIEW WITH
R. Evan Inglis

R. Evan Inglis, FSA, CFA

TELL US A LITTLE ABOUT YOURSELF.

E.I: I'm an actuary with experience thinking about investments for pension plans and retirement. I've done a lot of thinking about retirement spending and investing at work and at home in the past few years. I've ended up helping a couple of friends and my parents with their retirement planning. People want to know, "Do I have enough money?" I considered retiring myself a few years ago (although I now expect to be working happily for many years), and I put a lot of hours into developing a pretty sophisticated model for planning retirement spending. Embarrassingly, my happiest hours on earth are spent developing models in Excel, but I also love to exercise and follow the Seattle Seahawks.

WHY IS THE IDEA IN YOUR ESSAY IMPORTANT?

E.I: People need simple guidelines in retirement so they can live their lives without stopping to do a lot of financial analysis. Some of us like to do that, but most people don't have the aptitude or interest for meaningful analysis. The SOA's focus groups and surveys have told us that over and over.

Our current economic environment and, most importantly, the level of interest rates indicate that future returns on stocks and bonds are likely to be much lower than we have gotten used to over the past few decades. It's appropriate to expect equity returns in the 5 to 7 percent range and bond returns in the 3 to 4 percent range, and existing retirement spending guidelines like the "4 percent rule" are inappropriate for those levels of return.

I believe the "feel free" (FF) strategy is superior to the 4 percent rule, which has been the default benchmark for retirement spending. The 4 percent rule was a valuable concept, but it is outdated now. The FF approach is simpler, safer, better aligned with today's economic environment and more consistent with retirees' actual behavior.

WHAT ATTRACTED YOU TO THE ESSAY CONTEST?

E.I: I have a strong belief that the FF spending approach can be a powerful aid to lots of people, and I was looking for a way to publish a description of the idea. The contest was perfect and came along just at the right time. Writing up the essay pushed me to develop some supporting numerical analyses but also allowed me to present the approach in a relatively informal way that is very consistent with the overall nature of the approach. Feel free spending is meant to be fairly intuitive, and rigorous analysis is not needed to understand how useful it can be.

WHAT STEPS, IF ANY, WOULD HELP MAKE THE IDEAS IN YOUR ESSAY A REALITY?

E.I: I think the FF spending strategy can be an important aid to millions of retirees. I will work with my employer and/or the SOA to get this message out.

WHAT ELSE WOULD YOU LIKE TO TELL US?

E.I: "Feel free" to describe this strategy to friends and relatives. That is the point: you can "feel free" to use and recommend this approach because it is safe—*not* foolproof, but very safe. Read the essay for some key considerations, but they are generally common sense (for example, consider whether you have long-term care insurance or not).

Finally, I cannot emphasize enough that in our work and in planning our personal financial futures that it is vital to use reasonable expectations about future investment returns that are not based on our experience of the past few decades. ■

The "Feel Free" Retirement Spending Strategy

R. Evan Inglis

I end up talking with people about retirement income a lot these days. My friends, my parents and new people that I meet all seem to be interested in whether they have enough money saved up. Retirement income strategies and the level of spending that is "safe" or appropriate is something I've done a lot of work on and thinking about. I've developed an elaborate model to help me analyze my own situation that I also use to help others. There are many issues to consider—for example, the impact of income taxes and large one-time expenses.

Even though there are lots of things to think about, for the vast majority of people, very simple guidelines will be most useful. My simple answer to the questions "How much can I spend?" or "Do we have money enough saved?" is that if someone plans to spend less than **3 percent of their assets** in a year (over and above any Social Security or other pension, annuity or employment income), then they have enough money saved and they aren't spending too much. This is a fairly conservative estimate, but people tell me they want to be conservative with their retirement spending. They would rather feel safe than spend a lot of money, and I think that is very appropriate in our current economic environment.

Three percent could be viewed as a more conservative and simpler version of the well-known "4 percent rule." The 4 percent rule fixes a level of spending at the time of retirement and increases it with inflation—there is no adjustment for the level of your portfolio at any point in time. The 3 percent rule that I have recommended recognizes the lower level of returns we are likely to experience in coming years due to low interest rates and other factors such as demographic trends. It is also safer because it adjusts downward when portfolio values drop. That means spending will vary, but it reduces the risk (in fact, it virtually eliminates the risk) of running out money. This approach presumes one has 40 percent to 70 percent of their portfolio in equities and the rest in fixed income. (See Appendix, Section 1.)

In advising my parents (who are in their mid-70s), I realized they could spend a bit more than someone who was just retiring in their 60s. That's a shame since most people want to and do spend more when they are in their early retirement years.[1] However, it makes sense because as you grow older and have a shorter remaining lifespan, the potential to run out of money decreases. The objective of this rule is to ensure that money lasts a lifetime—not to enable the highest level of spending. With that in mind, I developed the "feel free" spending rule described below.

FEEL FREE!

To determine a safe percentage of savings to spend, just **divide your age by 20** (for couples, use the younger spouse's age). For someone who is 70 years old, it's safe to spend 3.5 percent (70/20 = 3.5) of their savings. That is the amount one can spend over and above the amount of Social Security, pension, employment or other annuity-type income. I call this the "feel free" spending level because one can feel free to spend at this level with little worry about significantly depleting one's savings. My belief is that most people would rather spend their money at a safe level than they would spend their time on analyzing their situation in order to be confident in spending a bit more. This perspective is supported by reports from focus groups organized by the Society of Actuaries which show that retirees spend much less time thinking about their finances than pre-retirees do and that most retirees do little planning but a lot of adapting to circumstances.[2] In an economic catastrophe like 2008, one's feel-free level of spending might drop by 20 percent to 30 percent in a year, but people adjust their spending naturally in times of economic crisis anyway. (See Appendix, Section 2.)

If the economic and financial market environment reverts to something similar to what we've experienced in the past, a retiree who follows this rule will have more than enough money and their portfolio will grow, providing for additional spending as time goes on. If we experience a lower return environment as many experts predict,[3] this level of spending is still highly likely to last a lifetime, without depleting one's portfolio in any significant way. (See Appendix, Section 1.)

So, one should feel free to spend a percentage of savings equal to their age divided by 20.

NO MORE!

At the other end of the spectrum, **divide your age by 10** to get what I call the "no more" level of spending. If one regularly spends a percentage of their savings that is close to their age divided by 10 (e.g., at age 70, 70/10 = 7.0 percent) then their available spending will almost certainly drop significantly over the years, especially after inflation is considered. Except for special circumstances like a large medical expense or one-time help for the kids, one should not plan to spend at that level. Purchasing an annuity may allow spending at close to the "no more" level, but no more than that. Anyone who wants to spend more than the feel-free spending level (divide-age-by-20 rule), may want to consider buying an annuity to provide some of their income.[4] Without an annuity, one should do careful analysis and regular updates to a spending plan to safely spend at higher levels. The amount of annuity income that makes sense will depend greatly on one's preferences,

including the desire for a bequest. For those who want to feel free to spend at a certain level, it will make sense to purchase annuity income that will allow their remaining spending to be close to the feel-free level of spending for their age at the time of the annuity purchase. Someone who wants to spend close to the no-more level should probably annuitize a substantial portion of their wealth. (See Appendix, Section 3.)

OTHER CONSIDERATIONS

There are all kinds of things that could and should be considered when thinking about retirement spending. Common sense needs to be applied to each person's circumstances. Here are some of the questions to ask when applying this rule (or other similar rules):

- Do you have long-term care insurance? If you do, you can spend a little more. If you don't and you don't plan to have your kids take care of you, you may want to reduce your spending a bit.
- Will you lose a significant amount of annuity income when your spouse dies? Obviously your spending capacity will change at that point.
- Will you pay significant income taxes? You should consider income taxes as part of your spending. Keep in mind that some states have special exclusions for certain kinds of retirement income.[5]
- What if interest rates go up? First of all, you can't expect that they will. You can probably spend a little more if they do, but if rates go up by 200 basis points, you can't increase your feel-free rate by 2 percent of your savings. The best advice is to stick to the divide-by-20 rule for the foreseeable future.
- Do you want to pass on a certain amount to your kids or charity? If you have particular wishes about how much to pass on, then you can adjust your spending accordingly.

Another potential complication is when someone retires and expects some kind of annuity income that starts in the future. For example, someone who retires at 55 may plan to start taking Social Security at age 70 or be expecting a pension to start at age 65. A similar situation arises if a large expense, like a mortgage payment, will go away at some point in the future. If one is waiting for an annuity payment to start, it may be fine to spend down savings to some extent. Here are some things to consider:

Keep in mind that it will be difficult to achieve level spending if the annuity is large relative to the amount of savings. Consider someone who retires at age 55, with $600,000 in savings and $60,000 in annuity income beginning around age 65. There is no way to fully adjust the pre-annuity spending to be consistent with the post-annuity capacity without spending down one's assets significantly.

CONCLUSION

The feel-free spending level is an easy-to-determine and -remember guideline for those who do not have the time, expertise or inclination to do a lot of analysis and who don't want to hire an adviser for help. Hopefully, this simple rule is useful, even for those who do lots of planning around their retirement. It's simple and it's safe. One needs to use common sense about their circumstances, but dividing one's age by 20 should provide a useful spending guideline for most retirees.

APPENDIX

1. Real Rates of Return

Tables 1A–D show simple calculations of potential real returns for different portfolios in different types of future financial markets. These are intended to help validate the feel-free levels of spending that are unlikely to spend down savings balances no matter how long someone lives. Each table represents a combination of a portfolio approach and a financial market scenario. Compare these real rates of return to feel-free spending levels. If the rate of return is above the spending level, savings will grow. If the rate of return is below the spending level, savings will decrease. Keep in mind that real world market volatility lowers the effective return and that the impact of volatility will be greater for the aggressive portfolios.

Table 1 Real Rates of Return

A. Aggressive, Pessimistic		
	Allocation	Return Above Inflation
Equity	70%	4.00%
Fixed income	30%	1.00%
Total	100%	3.10%

B. Conservative, Pessimistic		
	Allocation	Return Above Inflation
Equity	40%	4.00%
Fixed income	60%	1.00%
Total	100%	2.20%

C. Aggressive, Optimistic		
	Allocation	Return Above Inflation
Equity	70%	7.00%
Fixed income	30%	2.50%
Total	100%	5.65%

D. Conservative, Optimistic		
	Allocation	Return Above Inflation
Equity	40%	7.00%
Fixed income	60%	2.50%
Total	100%	4.30%

2. Comparison of Spending Rule to Life Expectancy

Table 2 shows how long the spending level determined at a particular age would last if it was fixed after the initial calculation. Initial spending is assumed to grow with inflation, with no other adjustments. Investment earnings are assumed to equal inflation. This helps to establish the level of conservatism in the rule and to validate how the spending level increases with age.

3. Combining Guaranteed Annuity Income with the Spending Rule

These scenarios illustrate how the feel-free spending rule can help determine a percentage of wealth to be used to purchase an annuity. Each scenario envisions a single individual planning for an annuity purchase with interest rates and mortality assumptions appropriate for mid-2015. See Table 3. ■

Table 2 Comparison of Spending Rule to Life Expectancy

Planning Age	Spending Level	Years Until Savings Depleted	Age at Which Savings Depleted	Life Expectancy, Male*	Life Expectancy, Female*
65	3.25%	30	95	86.6	88.8
75	3.75%	26	101	88.6	90.3
85	4.25%	23	108	92.2	93.4

* Society of Actuaries, "RP-2014 Mortality Tables" (November 2014).

Table 3 Combining Guaranteed Annuity Income With the Spending Rule

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Wealth (savings)	1,000,000	750,000	1,000,000	500,000	750,000
Age	60	65	65	70	65
Social Security Benefit	25,000	20,000	20,000	20,000	22,000
Annuity price ($ cost per annuity income $)	15.0	13.5	13.5	12.0	13.5
Desired spending	55,000	50,000	70,000	50,000	75,000
Desired spending above S.S. as % of wealth	3.00%	4.00%	5.00%	6.00%	7.07%
No-more-spending benchmark	6.00%	6.50%	6.50%	7.00%	6.50%
Recommended annuity purchase	–	140,000	425,000	260,000	690,000
Annuity purchase as % of wealth	0%	19%	43%	52%	92%
Annuity income purchased	–	10,370	31,481	21,667	51,111
Remaining savings	1,000,000	610,000	575,000	240,000	60,000
Desired spending above annuity income	30,000	19,630	18,519	8,333	1,889
Desired spending above annuity income as % of remaining savings	3.00%	3.22%	3.22%	3.47%	3.15%
Feel-free spending benchmark	3.00%	3.25%	3.25%	3.50%	3.25%

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ENDNOTES

1 See Ty Bernicke, "Reality Retirement Planning: A New Paradigm for an Old Science," *Journal of Financial Planning* 18, no. 6 (2005).

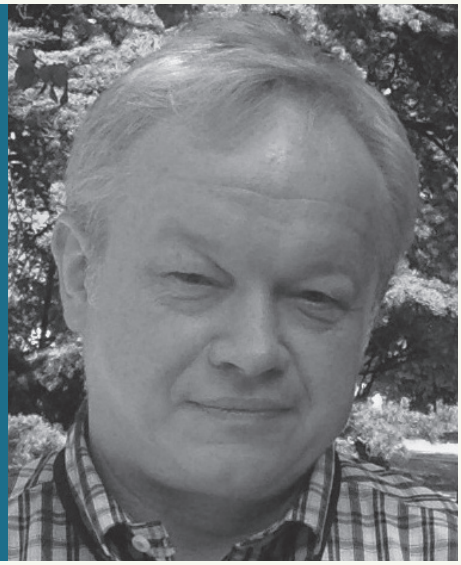
2 Mathew Greenwald & Associates, "2013 Risks and Process of Retirement Survey," Society of Actuaries–sponsored report (2013); Mathew Greenwald & Associates, "2005 Risks and Process of Retirement Survey," Society of Actuaries–sponsored report (2005).

3 Up-to-date return forecasts for different asset classes are published at ResearchAffiliates.com and GMO.com.

4 As of mid-2015, when 10-year Treasury rates are at about 2.20 percent, a fixed annuity might allow spending of about 6 to 7 percent of the single premium and an inflation-adjusted annuity would provide income of almost 5 percent of the savings spent on such a policy. An investment-only variable annuity can provide higher levels of income but with less certainty about the amount.

5 "State-by-State Guide to Taxes on Retirees," last modified October 2015, Kiplinger.

INTERVIEW WITH
Krzysztof Ostaszewski



Krzysztof Ostaszewski, FSA, CERA, MAAA, FSAS, CFA, Ph.D.

TELL US A LITTLE ABOUT YOURSELF.

I am a native of Lodz, Poland. I received a master's degree in mathematics from the University of Lodz in 1980 and a Ph.D. in mathematics from the University of Washington in Seattle in 1985. I am a 1991 chartered financial analyst, a 1994 member of the American Academy of Actuaries, a 1999 fellow of the Society of Actuaries, a 2009 chartered enterprise risk analyst and a 2010 fellow of the Singapore Actuarial Society. I was a 1995 Fulbright research fellow in Poland, studying actuarial aspects of free market reforms, and a Fulbright specialist in 2003–2004. I am also a current Fulbright specialist (since 2013).

I am now a professor of mathematics and the actuarial program director at Illinois State University. That program is one of the Centers of Actuarial Excellence and was among the first nine so designated in the United States in December 2009; it is the first one in the state of Illinois.

I am also currently serving on the SOA's Social Insurance and Public Finance Section Council and on the SOA's Inclusion and Diversity Committee.

My research in actuarial science has been published in two SOA monographs and in many leading journals, including the *Journal of Risk and Insurance*, the *Geneva Papers on Risk and Insurance—Issues and Practice*, the *North American Actuarial Journal*, *Insurance: Mathematics and Economics* and the *Journal of Insurance Regulation*. For my actuarial research, I was recognized with the 2005 Robert I. Mehr Award from the American Risk and Insurance Association and the 2003 Donald Hardigree Award from the Western Risk and Insurance Association. I am one of the coauthors and signatories of the Actuarial Standard of Practice No. 32 concerning social insurance.

WHAT ATTRACTED YOU TO THE ESSAY CONTEST?

This was a unique opportunity for me to be able to address the biggest weakness of retirement policies worldwide—centralized decision making and lobbying replacing market processes. The result is that we have a global "shortage" of retirement income, and governments are scrambling to find ways to pay promised benefits, so instead of growing our way out of this problem, we argue who will pay for what. How can we grow our way out of this? By paying great attention to one asset that we are throwing away: human capital.

It is time the insurance industry finally understands that it is not in the "protection" business but in the business of convincing people and businesses to take on more risk—rationally and profitably. Our mission is to convince people to do more crazy stuff. It is a noble mission. I can't say this enough.

WHAT STEPS, IF ANY, WOULD HELP MAKE THE IDEAS IN YOUR ESSAY A REALITY?

Every time people want to improve their lot by working, we should let them. Our job is to accommodate that noble desire, not control it for the purposes of centralized decision making.

WHAT GROUPS WOULD NEED TO BE INVOLVED?

I would like to see insurance products designed from the perspective of the question "How can we help our customers use their human capital most efficiently?" This is what I ask of our industry.

I would like governments to let people take care of themselves and stop saying that too many people are too ignorant to be able to take care of themselves. More service, less so-called leadership. This is what I ask of political decision makers.

WHAT ELSE WOULD YOU LIKE TO TELL US?

It is time for the insurance industry to stop acting ashamed of its mission. We have a noble, valuable mission that contributes greatly to the well-being of society. We help people take on more risk. Can there be any better social purpose? I do not think so. We are a noble profession in a noble industry. ■

Retirement: Choosing Between Bismarck and Copernicus

By Krzysztof Ostaszewski

OTTO AND NICOLAUS: AN INTRODUCTION

Otto Eduard Leopold, Prince of Bismarck, Duke of Lauenburg, commonly referred to as Otto von Bismarck, was a Prussian, and later German, statesman who dominated German and European political affairs from the 1860s until 1890. He was the driving force behind implementation of the world's first welfare state in the 1880s in the German Empire, through these three laws:

- Sickness Insurance Law of 1883
- Accident Insurance Law of 1884
- Old Age and Disability Insurance Law of 1889

The last law created an old age pension program, equally financed by employers and workers, and designed to provide a pension annuity for workers who reached the age of 70. It also created a disability insurance program intended to be used by those permanently disabled. It was the world's first social insurance scheme, with its key characteristics:

- Public administration
- Premiums and benefits determined by law
- Pay-as-you-go financing

The system provided a uniform design for retirement for all citizens alike. It became in many ways a model for the world, still followed today. Interestingly, it is commonly referred to as **insurance**. The system created by the last law, although in a vastly transformed form, still effectively survives in modern Germany. And many social insurance systems around the world, including Social Security in the United States are, to some degree, modeled on it.

Legend has it that on May 24, 1543, Nicolaus Copernicus, lying on his death bed, was presented with the final printed pages of his life's work, *De Revolutionibus Orbium Coelestium*, allowing him to do the last check of a book that transformed the world, not just because it changed our perspective on the motion of planets and the structure of the solar system but mainly because, through the later work of Galileo, Kepler and Newton, it inspired the creation of calculus and the science of physics, i.e., the intellectual backbone of what fuels our modern standard of living. As the story goes, Copernicus woke from a stroke-induced coma, looked at his book and then died peacefully. He worked till his last breath. Frankly, that's how I want to go. I do not think I can pass away working on a document as historic as *De Revolutionibus Orbium Coelestium*, but maybe while solving some actuarial exams problems?

RETIREMENT INSURANCE?

The name commonly used for the system created by Bismarck is, mysteriously, **insurance**. Is it insurance? Does it make sense to lump retirement planning with insurance? What is it insurance against? After all, if you are wealthy enough, you can retire. So save a lot, invest wisely and one day you will be wealthy enough and enjoy retirement. Why the need for any insurance?

Actuaries commonly say: A life annuity is a form of insurance—it is insurance against living too long. Then again, why would living too long be a bug, and not a feature? As long as I am alive, I can still solve old actuarial exam problems and hopefully get paid for this (I know this new generation of actuarial students want all content for free, the way they get their music, but that's why I have a YouTube channel for my work). I can always work and earn money by meeting the needs of my fellow men and women. Why would I need insurance against being able to work too long? Of course, if I became infirm, or worse yet, severely disabled, I may not be able to work. For that I may need insurance. But that is disability insurance, not retirement insurance.

Why do we need retirement insurance? Or do we?

To address this question, let us ask a more fundamental one: What is insurance? The most common answer is that insurance is a contract providing protection from certain financial losses defined in the contract. This sounds reasonable, but let us rephrase the question: What is the social role of insurance? Individually, insurance provides protection from certain financial risks. But is there any social benefit to insurance? After all, the protection is provided by redistribution of money from customers to customers, and on top of that, not all money received from customers is redistributed back—the insurance company keeps a large cut to itself, to pay for its expenses, profits and for one especially large and important expense: salaries of actuaries. For customers, this is a negative sum game. Is there a benefit to society at large?

Let me propose to answer this question with a question: Imagine a world with no automobile insurance—in such an alternative world, would people drive more or less than in our existing world with automobile insurance? The answer is clear: They would drive less. This means that the social purpose of automobile insurance is to get people to drive more. And, similarly, the social purpose of the insurance industry is to convince our customers to take on more risks. Let us face it: **The mission of our**

industry is to get people to do more crazy stuff! And let us be proud. It is a noble mission. Without risk taking, no innovation would ever take place, and most likely, no industry of any kind would ever take place. The statement: "Captain Kirk, there may be intelligent life on this planet!" is really equivalent to: "Captain Kirk, these creatures appear to be capable of risk taking!"

NOT SO CRAZY, PLEASE, SAID THE ACTUARY

Of course, actuaries immediately think of the phenomenon known as **moral hazard:** the tendency of people or firms insured to assume more risk than they were willing to assume in absence of insurance. But let us be, as actuaries should be, precise about this. The complaint about moral hazard is not about risk taking that was assumed in the pricing of the insurance contract. The complaint is only about the new, not predicted by actuaries, and often greatly unpredictable, change in the behavior of the insured people and firms after they obtain insurance protection. What do actuaries do about this problem? They adjust the pricing of the insurance product. If the additional risk taking results in additional incomes of the insureds, or at least additional happiness, higher premiums are paid with ease and a smile. But if the opposite happens, there is a lot of weeping and gnashing of teeth and, most importantly, complaining about the evil insurance companies.

Under normal market circumstances, however, the overall result of good actuarial pricing work is that additional risk taking is directed toward productive activities, and not risk for the sake of risk itself. In other words, while the mission of our industry is to get people to do more crazy stuff, we also prod people toward practicing risk under actuarial supervision, and this means that at times of important decisions actuaries tell us: **Not so crazy, please, and fasten that seat belt while driving.** Why do I mention the seat belt? Because the pricing response is not just about the level of premium itself, but equally, or even more importantly, about the structure of the contract: Both the price and the type of coverage affect the customer's pocketbook and, by doing so, customer's behavior.

Insurance is the most effective mechanism of risk management ever designed in human affairs because it is the only risk management mechanism that speaks directly to the human pocketbook. Actuaries are the speechwriters for that conversation.

BACK TO RETIREMENT

Otto von Bismarck told the subjects of the German Empire: When you turn 70 years old, leave the labor force. Work no more. Bismarck, an aristocratic Junker himself, offered the aristocratic lifestyle of leisure to the masses, albeit at a small scale and at advanced age.

Leaving the labor force can be a random event, or can be a conscious, willing choice. Whatever the reason, leaving the labor force is a risk. When a worker stays away from the labor force for an extended period of time, such a worker becomes less of a worker, as his/her skills may deteriorate, becoming less current and less marketable overall. If the extended stay away from the labor force is caused by unemployment or disability, and covered by a scheme insuring against one or both of these risks, this insurance scheme provides protection against the risk of ill-timed withdrawal from the labor force. And that is in fact the risk insured against in retirement schemes as well.

And that in turn implies that the social purpose (intended or unintended) of all these forms of insurance (unemployment, disability and retirement) is to encourage people to leave the labor force. While this encouragement makes perfect sense for people who can no longer work, it is at best a strange idea for those capable of working—because leaving the labor force is risky, as explained above, and the resulting loss of human capital is detrimental to the individual involved and to the society.

Otto von Bismarck was a powerful innovator in insurance and left a lasting impact on the way retirement systems are structured. His biggest footprint in history is that a retirement age, and in fact the entire process of transition to retirement, is set by the retirement system, not by the system participants individually. Yet the retirement system protects against individual risk, the risk of leaving the labor force prematurely, with the resulting individual loss of human capital.

Life insurance in general, in any of its forms, i.e., life insurance, life annuity, disability insurance and even health insurance, is, first and foremost, human capital insurance. The "protection" is effectively a mechanism to replace income provided by human capital when a random event named in the insurance contract, resulting in loss of human capital, happens. Retirement "insurance" is the only one where the event is not random, but rather deterministically prescribed by the retirement system. It is the only insurance system in which the system itself causes the insured event to happen.

And, let us remember, the social purpose of insurance is to get people to do more crazy stuff: in this case, to assume the aristocratic Junker lifestyle, even if at limited scale. All this to avoid the supposed threat that the last moments of Copernicus' life perfectly describe: waking up from a stroke-induced coma, looking at one's life's crowning achievement and dying while scribbling corrections on the margin—as if that were a grave threat no matter the individual circumstances.

The Bismarck and the Copernicus models of retirement offer two possible extremes of retirement system design:

- The Copernicus model maximizes the use of human capital, utilizing it till the very last nanosecond, while

- The Bismarck model deems large amounts of human capital of people beyond a prescribed retirement age unneeded and socially undesirable.

A retirement system, by its very nature (as insurance providing income replacement) encourages leaving the labor force, i.e., throwing our human capital away. Yet, in the final analysis, it is the human capital that is the source of our wealth and prosperity. Maximizing its value should be a natural objective of public policy—and of insurance firms serving their individual clients. This may sound challenging, but it is not impossible.

Nearly all retirement systems around the world are now suffering a price shock. The market price of assuming the aristocratic Junker lifestyle is appallingly high, especially, as actuaries point out in numerous analyses, in relation to what the public is willing to pay for them. This is, of course, a consequence of allowing **moral hazard** to roam freely, and of rejection of the actuarial analyses proposing market prices that would sharply reduce or eliminate that moral hazard. The market price system is not allowed to work, and instead price controls on the aristocratic Junker lifestyle have resulted in shortages and rationing of the aristocratic Junker lifestyle. But, as always in insurance, the main social consequence is getting people to do more crazy stuff. In this case, the crazy stuff is throwing their human capital away.

I humbly propose to remember that Nicolaus Copernicus used his human capital till the last drop, and we are all better off for that.

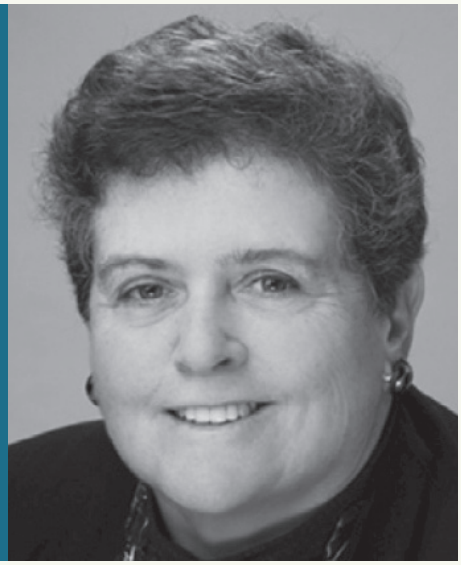
I also humbly propose that we should redirect the future of retirement systems design, in both public policy and private industry, toward the objective of maximizing our customers' human capital, and not toward assuming the aristocratic Junker lifestyle.

Lord Alfred Tennyson, unwittingly, wrote this on the Copernicus retirement model in the final words of his *Ulysses:*

> …(T)hat which we are, we are;
> One equal temper of heroic hearts,
> Made weak by time and fate, but strong in will
> To strive, to seek, to find, and not to yield. ■

Krzysztof Ostaszewski, FSA, CERA, MAAA, FSAS, CFA, Ph.D., is a professor of mathematics and the actuarial program director at Illinois State University. He can be reached at krzysio@ilstu.edu.

INTERVIEW WITH
Anna Rappaport



Anna Rappaport, FSA, MAAA

TELL US A LITTLE ABOUT YOURSELF.

I am a phased retiree and have thought about phased retirement as an advisor to employers and policymakers and for myself. This is an issue I have been thinking about for more than 20 years. I am age 75, still professionally engaged, and I hope to continue. I chair the Society of Actuaries' (SOA's) Committee on Post-Retirement Needs and Risks. I served as the president of the Society of Actuaries in 1997–1998 and completed 50 years as a fellow in 2013. I spent 28 years with Mercer and retired from there in 2004.

I am also an artist, and you can find my art work as well as a lot of my writings on *www.annarappaport.com.*

WHAT ATTRACTED YOU TO THE ESSAY CONTEST?

Since the shift to defined contribution (DC) plans, I have been very concerned that there is not adequate risk protection for employees who have only DC plans. I am also concerned that the retirement ages have not adapted as longevity has increased, leaving us with longer and longer periods of retirement. Together these two factors leave the public exposed to more and more risk. The essay contest presented an opportunity to look at these two issues together and to encourage more dialogue around them.

WHAT STEPS, IF ANY, WOULD HELP MAKE THE IDEAS IN YOUR ESSAY A REALITY?

My essay identifies a number of things that should happen to adapt the present system to my vision of a new retirement definition and timing and of better risk protection in DC plans. Some people think my ideas are impractical, but I think we need to dream big and encourage dialogue about the right ideas.

For these ideas to be adopted, various stakeholders involved with the retirement system would need to support the ideas and come together. First, it will be necessary for us to get recognition of the importance of these ideas. Actuaries as advisors to plan sponsors can play a major role in promoting discussion of these concepts and in implementing the ideas. Some of the ideas from the essay can be implemented by plan sponsors today without legislative or regulatory changes. Others require changes in law or regulation. The essay outlines several of those.

WHAT GROUPS WOULD NEED TO BE INVOLVED?

Interested parties include actuaries, employers sponsoring benefit plans, financial companies offering products, advisors and policymakers. Critical to making progress will be the ability of diverse groups to start working together and learning to compromise.

WHAT ELSE WOULD YOU LIKE TO TELL US?

I am very proud of the work being done by the Committee on Post-Retirement Needs and Risks and of the many volunteers who make this work possible. We focus on the individual. This essay and a great deal of what I do is informed by the research conducted by the committee. It is focused on the individual and how research works for him or her. ■

Thinking About the Future of Retirement

By Anna M. Rappaport

The United States has shifted to a primarily defined contribution (DC) environment for pensions. Many defined benefit (DB) plans are frozen and being phased out. This essay will focus on actions that can improve the future, assuming a DC world, and provide suggestions about how actuaries can assist. If we think about what would make a good system, then we can work together to move closer to it. Where we will arrive is the result of the actions and interactions of individuals, advisers, financial services organizations, employee benefit plan sponsors and policymakers.

This essay about the future of retirement will focus on retirement ages, how we retire and retirement risks.

RETIREMENT AGES AND HOW WE RETIRE

The shift to DC plans has meant that retirement plans no longer incorporate incentives to retire at specific ages. The United States and other nations have experienced major increases in life spans in the last 100 years. Social Security has a major role in setting expectations (or signals) about retirement and has defined a retirement age range of 62 to 70. While Social Security includes strong incentives to start benefits at later ages, the most popular benefit claiming age remains 62. When they were first introduced, formal retirement systems often started with retirement ages around 65; earlier retirement was introduced later. Over a long period, retirement ages gradually dropped, so that many people retired in their late 50s or early 60s. But in recent years, labor force participation at higher ages has increased, and work is being accepted as part of retirement. In the United States, mandatory retirement has generally been forbidden, but many people are still faced with retiring earlier than they expected, and often not by choice.

Society of Actuaries' Risks and Process of Retirement research tells us:

- Thirty-five percent of pre-retirees say they don't expect to retire.
- Retirees have retired at a much earlier age than pre-retirees expect to retire. In 2013, retirees had retired from their primary occupation at a median age of 58, while pre-retirees expected to retire at 65.
- The majority of retirees, including voluntary retirees, were pushed rather than pulled into retirement. The push came from loss of a job, unpleasant circumstances at work, illness or family members needing care.
- There appears to be a significant gap between expectations about working in retirement and what actually happens.

Work at later ages will depend on there being adequate opportunities for older workers. Without increases in actual retirement ages, increases in normal retirement age requirements may result in a reduction in monthly benefits paid at time of retirement. Without indexing of retirement ages, the value of monthly pension benefits starting at a fixed age increases as life spans increase. With indexing, their value would be much closer to remaining the same as life spans increase.

- There is a societal need to rethink retirement ages and think about retirement based on the period to the end of life. Actuaries can help move the conversation forward by focusing people on demographic realities.
- A gradual shift from work into retirement is better for many people and can also accommodate the needs of employers. There has been quite a lot of informal phased retirement, but very little formal phased retirement in the United States. Actuaries can help further the development of phased retirement.
- If we want to increase retirement ages without creating undue hardship, we need to recognize that some jobs are very physically demanding and look at better integration of retirement, disability and death benefit coverage. We should also note it is possible to shift to different jobs that may be less demanding physically. Shifting can include moving to different types of work and/or a different schedule. This will work for many people in demanding jobs, but not all.
- Actuaries can explore the issues surrounding signals and terminology with regard to termination about retirement ages. It would be desirable to replace the terms "early retirement age" and "normal retirement age."
- It would be very helpful if everyone did an evaluation of the impact of retiring at different ages before they choose a retirement age. Research shows big gaps in knowledge about the impact of retiring at different times. In a presentation at the 2015 Society of Actuaries Annual Meeting & Exhibit, Grace Lattyak pointed out that AonHewitt research shows that a one-year increase in retirement age reduces the shortfall in the amount of assets needed for a comfortable retirement by about one times pay. This results from an increase in resources from more savings and a reduction in what is needed since the retirement period will be one year shorter. See Table 1.
- I hope that new and better job options will open up to older workers, and that they enable choices for phasing into

retirement. These options should consider the value older workers bring to the table, their abilities and preferences and how they intersect with business needs. Actuaries can help to move this discussion forward.

Table 1: Adequacy of Retirement Resources for Average Career Workers; Resources Needed and Available for Average Worker at Retirement (Amounts Shown as Multiple of Pay)

Age at Retirement	Resources Needed for Adequate Retirement	Resources Available	Shortfall
60	14.5	6.8	7.7
65	11.0	8.4	3.4
70	7.6	10.0	−2.4
75	6.5	11.7	−5.2

Source: AonHewitt's "The Real Deal: 2015 Retirement Income Adequacy at Large Companies." Data is from Grace Lattyak's presentation at the 2015 Society of Actuaries Annual Meeting & Exhibit, and is for a full-career contributor. Amounts shown are in addition to Social Security. (Note that the resources available in this study are greater than the resources for most of the American workforce at average pay levels because this assumes a career worker with the same firm. In addition, the study focuses on large firms, and such firms often have better benefits than smaller firms.)

- If job options are to work out well, individuals who want to work in retirement need to be realistic about how they need to prepare and about what they expect. Often this may mean moving from a senior position to a lower position, and being flexible and willing to adapt to assuming a new role. This also means keeping computer and other skills up to date and being prepared to work with people of all generations. Often pay will be considerably lower than the pay one earned before retirement.

RETIREMENT RISKS

Traditional DB plans place most of the risk on the employer, and traditional DC plans place most of the risk on the employee. Newer benefit designs offer hybrid structures, sharing risk differently. This essay assumes the system is primarily DC.

Financial well-being in retirement depends on disability, death, length of employment, type of plan, health care needs, long-term care needs, method of withdrawing funds, amount of savings and investment results. Fraud can derail a program. Family needs can also divert funds that were to be used for retirement. We can think of risks in a DC environment as being "inside the plan" and "outside the plan." Employers help employees manage the risks by the way they structure the plan, including default options, and by offering education, guidance and advice. A great deal of attention has been paid to structuring investment default options and to auto-enrollment and increases, to get employees into the plan. Much less attention has been paid to how funds are withdrawn and used. These can be inside-the-plan or outside-the-plan risks. In addition, little attention has been paid to disability and long-term care risk, both of which are outside the plan but have a big affect on security in retirement.

In a DC environment, the most common methods of payout include lump sums and installment payouts of account balances. Annuities that guarantee income for life or for the life of the annuitant plus a survivor are used much less often. The individual is often left to figure out on their own, or with an adviser, what risks they face and how to deal with them. But SOA research shows that many people do not focus on the long term. Financial products that offer a path to risk protection include products offered within the employee benefit program, or products by an insurance company or mutual fund, but such products are often complex. Public understanding of many of them is poor with some individuals not focused on the risk or the product.

I have identified several changes I believe would improve retirement security within the context that retirement savings in the workplace is most often in a DC system.

- It would be desirable for plan sponsors to again become more active in helping employees identify, understand and manage risks that affect their financial security. It would also be very desirable for employees to understand the issues surrounding risk and options for providing risk protection. This, however, seems very unlikely. Actuaries can play a role in bring these important messages to both groups. Employers who implement financial wellness programs are taking important steps to help employees focus on risk. The first message is one that actuaries understand well—long-term thinking is very important.
- It would be desirable for disability coverage to be added to DC plans so that these plans have an embedded disability benefit so added savings in DC accounts is continued during periods of long-term disability. This would be accomplished through embedding disability insurance into the DC plan, probably as an investment option, or through providing such coverage next to the plan. Prior to disability, this coverage could be paid for by the employer or the employee, or the cost shared. Actuaries can play an important role in making this happen. The first step however is helping employers and employees recognize the seriousness of the disability risk.
- It would be very desirable for the payout options in DC plans to be expanded so that plan funds can be applied to provide lifetime income, to provide survivor benefits, to help pay for unexpected medical expenses during retirement, and to help finance long-term care. I would like to see the DC plan post-retirement thought of more like a lifetime financial security account. Actuaries can help to develop this idea, model alternatives and develop a range of options and solutions.

- The reality is that often financial products will be purchased by individuals, maybe linked to their employer and maybe on their own. Many products are complex and hard to compare. It would be desirable for financial products to be simplified, and terminology standardized. If this was done, hopefully products could be designed so that they can readily be compared and purchased in a competitive marketplace. Actuaries could play an important role in making products more comparable and understandable.
- Many middle income class Americans have not had access to unbiased and affordable advice. It would be very desirable for individuals to be able to choose automated and easy-to-use advice systems that will respond to the issues and concerns of the middle class including risk management and protection. I hope there will be widespread acceptance of such systems and they will be designed to integrate with in-person support and offer advice easily accessible to the middle income class. I also hope that many employers will support them and use them as part of their employee benefits communication or financial wellness programs.

POLICYMAKERS CAN HELP

Employee benefit legislation is often linked to taxation and federal revenue. The benefits part of the legislation can be subsidiary to the impact on taxes. It would be better if retirement saving was viewed realistically as a deferral of taxation to provide for the future security of our citizens. Currently, savings are too often viewed as today's tax expenditures.

Here are some suggestions for policy improvements:

- Change the Medicare secondary rules so that working individuals over age 65 who have signed up for Medicare have Medicare as their primary coverage. This will remove a disincentive to hiring such employees.
- Clarify the uncertainty with regard to bona fide termination of employment. This will make it easier to rehire retirees on a limited basis, with confidence that there is no regulatory problem.
- Make it easier for employers to implement phased retirement programs.
- Examine wage and hour and independent contractor rules in order to support phased retirement and seniors working on a limited basis.
- Encourage employers who offer DC benefits as their primary retirement vehicle to offer more payout options and better risk protection. Use safe harbors to make it easier for them to do so.
- Where a benefit or type of coverage is subject to regulation by multiple agencies or by state and federal agencies, try to unify and simplify the regulation.
- Modify the legal structure governing DC plans to enable them to offer a range of payout options.
- Create safe harbors to give employers a path forward with regard to more options for the payout period.
- Create safe harbors with regard to offering retirement advice.

POST SCRIPT

I realize the proposals discussed in this essay will require change on many fronts. Many stakeholders will need to participate in making that happen. I encourage you to focus on what you think will make a better future and hope that you will participate in making it happen. I hope that the actuarial profession will be leaders in this regard. ■

Anna M. Rappaport, FSA, MAAA, is an actuary, consultant, author and speaker, and is nationally and internationally recognized expert on the impact of change on retirement systems and workforce issues. She can be reached at anna.rappaport@gmail.com.

INTERVIEW WITH
John A. Turner

John A. Turner, Ph.D.

TELL US A LITTLE ABOUT YOURSELF.

I am the director of the Pension Policy Center, a small policy research center in Washington, D.C. I have worked on pension and retirement issues for a number of years, sometimes taking an international perspective on policy issues. I have consulted on pension issues in a number of countries, including Burundi, Tanzania, Albania, Macedonia, Tajikistan and Indonesia. I have also advised the governments of Norway, France and the United Kingdom. I have spoken at pension conferences in more than 30 countries and have written more than 100 papers and a dozen books on pension issues. One of my papers received an award as best paper of the year from the *Journal of Risk and Insurance*. Two of my books have been translated into Japanese. I have a Ph.D. in economics from the University of Chicago.

WHAT ATTRACTED YOU TO THE ESSAY CONTEST?

For several years, I have been writing papers about longevity insurance benefits. These are benefits that start payment at an advanced age, such as 82. These types of benefits can be purchased privately from insurance companies using personal savings or individual retirement accounts (IRAs). They can also be obtained through employer-sponsored plans, if the employer chooses to offer that benefit. Relatively few people purchase annuities of any type, including longevity insurance benefits. Obtaining these benefits through an employer-sponsored plan has the further problem that they must be purchased on a unisex basis, which is disadvantageous to males, and may be one reason why few plans offer them. Because of these problems, I have been advocating that Social Security provide longevity insurance benefits. I was attracted to the Essay Contest as a way of getting further recognition for the possible policy reform of having Social Security provide longevity insurance benefits at age 82 as a way of dealing with the decline in economic well-being that affects some people in advanced old age. In the future, when fewer retirees have a defined benefit (DB) plan, more of them will face the risk of using up all their savings at more advanced ages, especially if they live longer than they expect. A longevity insurance benefit as part of Social Security would help deal with that problem.

WHAT STEPS, IF ANY, WOULD HELP MAKE THE IDEAS IN YOUR ESSAY A REALITY?

A Social Security reform to restore solvency will mostly consist of unpopular changes, such as raising taxes and reducing benefits for future retirees. Longevity insurance benefits could be added as a low-cost benefit as part of a reform package. I am writing papers exploring various aspects of this type of benefit. For example, Ireland and China have longevity insurance benefits as part of their social security programs. I have written about those programs with Irish and Chinese coauthors.

WHAT GROUPS WOULD NEED TO BE INVOLVED?

AARP, actuaries and academics are three opinion leader groups that would be good to bring on board.

WHAT ELSE WOULD YOU LIKE TO TELL US?

A longevity insurance benefit in Social Security is a low-cost benefit that would help a lot of older women with low incomes. For some women, their economic resources decline at widowhood. This benefit would help deal with that problem. ■

Longevity Insurance Benefits for Social Security

By John A. Turner[1]

Preventing people from falling into poverty as they age is a key goal of Social Security. Longevity insurance is one way to address the income needs of those who have lived longer than they expected and have used up their retirement savings, with only their Social Security benefit remaining. While all annuities provide retirees a degree of longevity insurance, in recent years the term longevity insurance has been used to refer to a particular type of deferred annuity. Longevity insurance is a deferred annuity that starts at an advanced age, such as 82. Longevity insurance annuities provide insurance against outliving one's assets, but only when that risk becomes substantial at advanced ages.

With a longevity insurance benefit, the problem of asset decumulation with uncertain life expectancy is simplified. Instead of planning for an uncertain period, retirees can plan for the fixed period from the date of their retirement to the date at which they start receiving the longevity insurance benefit.

Longevity insurance as an addition to Social Security has been proposed recently in both the United States and Canada. In 2013, a fully funded longevity insurance benefit starting at age 75 was proposed for the Quebec Pension Plan, the social security plan in Quebec that corresponds to the Canada Pension Plan for the rest of Canada.[2] In addition, in 2013, President Obama in his initial proposals for his fiscal year 2014 budget included a type of longevity insurance benefit in Social Security. That benefit would offset at older ages some of the benefit reductions caused by introducing a chained consumer price index for adjusting Social Security benefits in payment. The benefit would start at age 76, would phase in for each recipient over a period of 10 years, and when phased in at age 85 would provide a benefit equal to about a 5 percent increase in Social Security benefits. This proposal was not included in the final budget because of lack of support for the idea of the use of the chained CPI.

This article proposes that longevity insurance should be added as a form of benefit provided by Social Security. This type of benefit would be particularly valuable as a part of a reform package that included benefit cuts to restore Social Security's solvency. A social safety net benefit would be needed to offset the effects of Social Security benefit cuts on older retirees.

This article is structured as follows. First, it discusses the role of longevity insurance in the early history of Social Security, and how that role has diminished over time. Second, it describes problems with the provision of longevity insurance by the private sector, and compares the provision of longevity insurance in the private sector to its provision in the public sector. Third, the paper discusses alternative ways that Social Security could provide longevity insurance benefits. Fourth, it offers concluding comments.

This paper builds on a previous literature analyzing various aspects of longevity insurance in the private sector and for Social Security.[3]

LONGEVITY INSURANCE IN THE HISTORICAL DEVELOPMENT OF SOCIAL SECURITY

In 1940, when Social Security benefits were first provided in the United States, the benefit eligibility age was 65. For males age 20 in 1900, their life expectancy was age 62.[4] Thus, less than half of men entering the workforce survived to receive benefits in the early years of Social Security.

Over time, three changes fundamentally altered the nature of the old-age benefits that Social Security provides. First, the benefit eligibility age has been lowered to age 62.4 Second, life expectancy has increased. Third, the average age at which workers enter the labor force has increased. With these three changes, the United States Social Security has transitioned from a longevity insurance program to a program providing old-age benefits for a substantial proportion of the population that entered the workforce in their youth. Now, 87.8 percent of those age 20 survive to age 62.

LONGEVITY INSURANCE IN THE PRIVATE SECTOR

This section considers issues relating to the provision of longevity insurance benefits in the private sector. To anticipate the findings, it is seen that the private sector faces disadvantages in providing longevity insurance benefits, presenting a case for the provision of these benefits through Social Security.

Annuities provided through employer-provided retirement plans in the United States must calculate benefits on a unisex basis. Thus, employer-sponsored pension plans are required to use the same mortality rates for men and women when calculating benefits, despite the fact that at typical retirement ages women on average live about three years longer than men.[5]

The gender difference in life expectancy is considerably greater at older ages than for people in their early 60s. The U.S. life tables for 2009 show that women age 62 are 35 percent more likely than men that age to survive to age 85.[6] At age 85, women's life expectancy is 17 percent longer than that of men. When priced using gender-based mortality rates, women's single life

longevity insurance annuities purchased at age 62 with payments beginning at age 85 would cost considerably more than those for men, perhaps as much as 50 percent more. Thus unisex longevity insurance annuities provided by pension plans in the private sector would be a bad deal for men.[7]

Problems with the provision of longevity insurance annuities in the private sector also include that adverse selection may be more of an issue in that longevity insurance annuities presumably would only be purchased by people with really long life expectancies. Further, potential purchasers may be concerned with the risk of life insurance company insolvency over a long time period, with government reinsurance not providing adequate protection, a concern that may in actuality be overstated.

Another reason longevity insurance annuities are not provided by pension plans relates to the administrative issues involved in providing them. Because a survivor's benefit is the default for annuities, employers need to obtain a notarized statement from the spouse waiving the survivor's benefit if that option is not chosen. Employer concern about issues relating to the verification of the waiver of survivor's benefits may be another reason employers generally do not provide annuities of any type through pension plans.

In the United States, longevity insurance annuities can be purchased privately (not through an employer-provided pension plan) on a gender basis, taking into account the longer life expectancy of women. New York Life[8] expressed the opinion that pure longevity insurance annuities would have limited appeal in the United States, but that those annuities combined with another benefit payment feature, in particular a death benefit, would be marketable. While such a benefit would reduce the income provided by the annuity, it would nonetheless provide some longevity insurance benefits.

LONGEVITY INSURANCE ANNUITIES PROVIDED BY GOVERNMENT

The government has several advantages over the private sector in providing longevity insurance annuities. First, the government has a hedge against increases in the liability due to unexpectedly large improvements in life expectancy to the extent that people work longer (and pay more taxes) due to improvements in health at older ages. Currently, no asset exists for the private sector to invest in that provides a full hedge against increased annuity costs arising due to unexpected improvements in life expectancy.

Second, the government does not have the problem of adverse selection because it provides the benefit to a preselected group. In the private sector, insurance companies would provide longevity insurance to people who self-select, in part based on their subjective expectation of long life expectancy.

POLICY PROPOSAL

This section provides an example of how a longevity insurance benefit in the United States might be structured as part of Social Security. This proposal could be part of a package that otherwise reduced the generosity of Social Security benefits and raised the payroll tax rate to restore solvency.

The target population for this Social Security reform proposal is people age 82 or older. Age 82 is chosen as approximately the life expectancy at age 62.[9] Women outnumber men by roughly two to one in this age group.[10] Thus, this proposal particularly would benefit women at advanced ages.

While longevity insurance benefits can be provided in different ways, as an example, we present a specific proposal. We propose that starting at age 82, everyone receiving a Social Security benefit would receive an additional $50 a month. That amount would be increased to $100 a month at age 87 and to $150 a month at age 92. These benefits would be price indexed.

These benefits would be the same for everyone within an age bracket. Because of the taxation of Social Security benefits for higher income persons, the after-tax benefit would be slightly progressive in absolute terms and, of course, would be progressive in terms of the percentage increase in benefits that people at different income levels received. The benefits would be financed out of the Social Security Old-Age and Survivors Insurance (OASI) Trust Fund, and thus benefit cuts or payroll tax rate increases at younger ages would be needed to finance them.

Recognizing this enhanced insurance protection, U.S. Social Security OASI could be renamed Old-Age, Survivors and Longevity Insurance (OASLI). The renaming would help inform people about the benefit. It would positively frame the benefit, rather than the benefit being thought of as antipoverty assistance.

CONCLUSIONS

With a longevity insurance benefit, the problem of asset decumulation with uncertain life expectancy is simplified. Instead of planning for an uncertain period, retirees can plan for the fixed period from the date of their retirement to the date at which they start receiving the longevity insurance benefit.

While adding longevity insurance as a new benefit when Social Security is already facing a financing deficit would be problematic, reintroduction of a longevity insurance benefit as part of Social Security in a reform package that involved benefit cuts could be an important policy innovation. Longevity insurance benefits are deferred annuities that begin payment at advanced older ages. This benefit is generally not provided by the private sector.

A longevity insurance benefit as a part of Social Security in a reform package that involved benefit cuts could be an important policy innovation.

The government has several advantages over the private sector in providing longevity insurance annuities. First, the government has a hedge against the liability to the extent that people work longer (and pay more taxes) due to improvements in health at older ages or due to raising the eligibility age for Social Security benefits. Currently, no assets exist for the private sector to invest in to provide a hedge against unexpected improvements in life expectancy. Second, the government does not face adverse selection because it provides the benefit to a preselected group. In the private sector, by comparison, insurance companies would face adverse selection because they provide longevity insurance to people who self-select, in part based on their subjective expectation of long life expectancy.

While longevity insurance benefits initially were a major aspect of Social Security in the United States, over time the role of those benefits has declined as benefit eligibility ages have been reduced and life expectancy has increased. This paper argues in favor of reintroducing those benefits into Social Security as part of a reform package. ■

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ENDNOTES

1 I received valuable comments from Thomas Prost and other participants at Netspar Pension Day in Utrecht, Netherlands; Michelle Maher and other participants at the Pension Policy Research Group conference in Dublin, Ireland; participants at the Nevin Economic Research Institute (NERI) Labour Market Conference in Belfast, Northern Ireland; participants in the 13th International Workshop on Pensions, Insurance and Savings in Paris, France; and participants at the Fourth International Conference on Social Security Systems in the Light of Economic, Demographic and Technological Challenges in Poznan, Poland. I have also benefited from collaboration on earlier papers with David Blake, Tianhong Chen, Gerard Hughes, Mark Iwry and David McCarthy.

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INTERVIEW WITH
Steve Vernon

Steve Vernon, FSA

TELL US A LITTLE ABOUT YOURSELF.

For the past ten years, I've used my actuarial expertise and experience to help people cope with the longevity revolution in a DC world. I conduct and coordinate research at the Stanford Center on Longevity, I've published five books on retirement planning, I write a biweekly column on retirement at CBS MoneyWatch, and I deliver several retirement planning workshops each year. In my prior life, I was a consulting actuary serving large retirement systems, working at Watson Wyatt and Mercer.

WHAT ATTRACTED YOU TO THE ESSAY CONTEST?

I saw it as a venue for promoting two of my favorite ideas. First, we need to finish the transition from DB to DC retirement plans. That can only happen when DC plans design, communicate and implement retirement income strategies that rank-and-file workers can use to convert their hard-earned account balances into reliable, lifetime income. Second, we need to apply portfolio thinking to the retirement income phase, diversifying retirees' sources of income among different retirement income generators that meet specified goals, expressed in terms of retirement income. Both of these ideas represent great areas of opportunity for actuaries.

WHAT STEPS, IF ANY, WOULD HELP MAKE THE IDEAS IN YOUR ESSAY A REALITY?

Collectively, we need to make retirement income security for workers a priority for plan sponsors, employers and their employees. Employers would design, administer and communicate robust retirement income programs in their DC plans, offering both investing and annuity solutions, and integrating with Social Security claiming strategies.

WHAT GROUPS WOULD NEED TO BE INVOLVED?

These steps will need plan sponsors, retirement plan design consultants, investment advisors, legal counsel and government regulators to become familiar with the various retirement income solutions that can be offered in DC plans and each solution's pros and cons.

WHAT ELSE WOULD YOU LIKE TO TELL US?

After studying the concept of retirement for over 40 years, I've concluded it doesn't make sense to retire full-time in your 60s for periods that can last up to 30 years or more. Not only does that require a lot of money, it leaves you vulnerable to financial meltdowns that will inevitably occur in your lifetime. There's provocative research that suggests remaining engaged in work and life, as well as trying new things, helps you stay healthy and keep your wits longer.

I'm currently in my early 60s, and I plan to work in some manner until at least age 70. After then, who knows? But for this phase of my life, I focus on work that is interesting and helps people, and I build in time for grandkids, travel, hiking, biking, yoga, organic farming and pursuing many other interests. ■

Designing and Communicating Retirement Plans for "Humans"

By Steve Vernon

> *[Retirement income planning] is a really hard problem. It's the hardest problem I've ever looked at.*
> —Bill Sharpe, Nobel laureate, Stanford University

> *For many people, being asked to solve their own retirement savings problems is like being asked to build their own cars.*
> —Richard Thaler, University of Chicago

Why did retirement plan sponsors and their advisers collectively decide it would be a good idea to require workers to be their own actuaries and investment managers? That's exactly what happened when they replaced defined benefit (DB) plans with defined contribution (DC) retirement plans. With DC plans, workers must not only decide how much to save for retirement and how to invest these savings, but also how to deploy these savings to generate reliable, lifetime retirement income. In retrospect, there's plenty of evidence that demonstrates this long-term trend has decreased retirement security and confidence among American workers.[1]

If Bill Sharpe, a Nobel Prize winner in economics, thinks retirement income planning is a really hard problem, what results can we expect from average workers?

Richard Thaler, a prominent behavioral economist, tells us that conventional economic thinking assumes all people are "Econs" who rationally weigh all relevant facts when making financial decisions, are unbiased and consistent, and are cold-blooded optimizers who calculate like computers and don't have self-control problems. But Thaler points out that most people are actually "Humans" who are limited in their ability to gather and analyze relevant facts, have biases and passions, and often make irrational, inconsistent decisions.

So why is it that most DC retirement plans are designed for Econs, not Humans? In an age of increased longevity, the consequences of making retirement income planning mistakes can be serious or even devastating. People might retire too soon before accumulating sufficient savings, or they may not know how to deploy these savings to generate reliable income for potentially lengthy retirements. Either way, there's a significant possibility that many retirees will live some of their remaining years with inadequate retirement income or even in poverty.

THE OPPORTUNITY

To better meet the needs of older workers approaching their retirement years, plan sponsors, their advisers and financial institutions need to evolve the design and communication of DC retirement plans. Fortunately, the intersection of two recent developments gives them an opportunity to improve DC plans to work effectively for the many Humans—and the few Econs—who participate in their retirement programs:

- Recent research on behavioral economics provides valuable insights into the various quirks, biases and emotions that influence how Humans make financial decisions.[2]
- Recent research sponsored by the Society of Actuaries (SOA) has led to the development of actuarial and economic engineering methods that can optimize retirement income solutions in DC plans.[3,4]

BEHAVIORAL ECONOMICS CAN HELP

Let's take a look at some of the behavioral economics principles that are relevant to retirement plan design and individuals' decision-making.

- **Bounded rationality** refers to the fact that many people lack the cognitive ability to solve complex problems. Even people who might have the intellectual capability to do so may not have the time or motivation to focus on all the complex challenges they face. That's why our society makes extensive use of specialization; consumers of all types benefit from the skills of specialists, such as engineers, doctors, architects, plumbers and so on. Retirement income planning is one of those complex challenges that deserves the attention of specialists such as actuaries and investment managers. In fact, studies have shown that many people would prefer to have a specialist do their retirement income planning for them.
- **Loss aversion** refers to the phenomenon that people feel the pain of losses more than they might feel the joy of gains. That's why people will go to great lengths to avoid losses, even if avoiding these losses means they forgo the possibility of reaping gains.
- **Framing** refers to how people express the relevant features of a decision they face, and the possibilities and consequences of a decision they choose to focus on.
- **Defaults** take advantage of inertia and social norms to guide participants to better outcomes. Defaults have been deployed successfully by many retirement plan sponsors to increase contributions during participants' working years. The next frontier is to design defaults that apply in the payout phase.

The SOA and other institutions have surveyed retirees to understand the strategies they use to spend their retirement savings. Few retirees have a formal strategy—10 percent to 25 percent, depending on the survey you read. Common responses to questions about how they spend their savings include "gut feel" and "the amount I need to meet my living expenses." Retirees tend to exhibit two distinct strategies: (1) spending their savings too rapidly, at a rate that most likely will cause them to outlive their savings, or (2) conserving savings for a rainy day, often withdrawing just the required minimum distribution (RMD) from IRAs and 401(k) accounts. Neither strategy seems optimal in a DC world.

ENGINEERING OPTIMAL RETIREMENT INCOME SOLUTIONS

The SOA's Committee on Post-Retirement Needs and Risks recently sponsored research by the Stanford Center on Longevity (SCL) to analyze optimal retirement solutions that can be offered in a DC retirement plann.[5,6] This research shows how to use a diversified portfolio approach to retirement income, where retirees optimize the income they receive from Social Security, pensions, invested assets and annuities to achieve stated goals.

Typical retirement income goals include:

- A desire for liquidity to meet emergencies
- Maximizing expected lifetime retirement income
- Income that doesn't decrease due to capital market volatility
- Income that retirees can't outlive

The research analyzed how various retirement income generators (RIGs) can meet these objectives. Here are a few key results:

- There's a distinct, quantifiable tradeoff between liquidity and maximizing income; increasing expected access to savings reduces the income retirees are expected to receive over their lifetime in predictable ways.
- For most retirees, using retirement savings to enable delaying Social Security benefits increases expected lifetime income.
- The SOA/SCL research shows that once a retiree achieves a basic level of guaranteed, lifetime retirement income from Social Security, pensions and/or an annuity, optimal solutions would invest remaining assets 100 percent in equities. In essence, sources of guaranteed lifetime income become the "bond" part of a retiree's income portfolio.
- For the portion of retirement income that's generated from invested assets, the required minimum distribution can be a reasonable solution that's easy for plan sponsors and retirees to implement. This solution works best if retirees have a basic level of guaranteed income from other sources. Of course, there are other methods to implement systematic withdrawals from invested assets, but they often involve periodic interventions from an informed retiree or financial professional.

A BETTER APPROACH: HOW DC PLAN SPONSORS CAN HELP

DC plan sponsors can combine behavioral economics principles with this recent actuarial and economic research to engineer retirement income solutions for Humans that enable retiring employees to convert their savings into reliable retirement income. A key part of this program is a retirement income menu with simple "check the box" options that retiring employees can elect; this menu would be integrated with the investment menu that's already familiar to workers while they're accumulating savings.

Many middle income retirees don't have access to financial professionals who are skilled in retirement income generation and who aren't conflicted by the way they're compensated. A retirement income program can provide these retirees with trustworthy methods to convert their hard-earned savings into reliable income.

The SOA/SCL research supports a retirement income menu design with at least three distinct RIG options:

- Systematic withdrawal program from invested assets in the plan
- Guaranteed, lifetime annuities offered by an insurance company
- A temporary payout from plan assets that enables delaying Social Security benefits

A retiree could allocate their savings among one or more RIGs to develop the retirement income portfolio that best meets their needs and circumstances.

The default retirement income solution should be designed carefully to meet the needs of the greatest number of retiring employees, while also protecting plan sponsors from fiduciary liability.[7] A carefully constructed default would send a message to plan participants that the plan sponsor has worked with experts to develop a retirement income solution that might work reasonably well for many people. Retiring employees can always opt out of the default if they've read the communications material and carefully considered their alternatives.

One possibility is to offer different defaults for employer and employee contributions. Employer contributions could be defaulted into guaranteed lifetime annuities. In this case, the stated objective of the plan design would be to provide lifetime retirement income. Employee contributions could be defaulted into flexible lifetime payout options such as systematic withdrawals from invested assets using the RMD. It's hard to imagine a plan sponsor incurring fiduciary liability if the default solution is something called "the IRS Required Minimum Distribution."

Today, the default many retirees elect is a lump sum rollover from their employer's plan into an IRA. This default potentially exposes retirees to reduced retirement incomes, compared to other solutions that could be offered within the employer's plan.

Using computer modeling offered by the plan sponsor or administrator, retirees could estimate how much retirement income they might receive with the default option or various combinations of the above RIGs. This is a critical retirement planning task—only Econs are capable of completing the necessary calculations on their own. An easy-to-use modeling capability helps Humans and their advisers decide if they have enough savings to retire, and to consider the necessary tradeoffs between the retirement income goals expressed above.

USING BEHAVIORAL ECONOMICS PRINCIPLES TO IMPROVE RETIREMENT PROGRAM DESIGN

A critical part of a retirement income program is communicating the features of the various RIGs offered in the retirement income menu to help retiring employees make effective decisions. As discussed above, plan sponsors can carefully design defaults to meet the needs of the majority of retiring employees. So let's discuss some additional ideas for deploying behavioral economics principles to help guide retiring employees to optimal solutions.

Many older workers strongly desire freedom from work and want to retire as soon as financially feasible. They frame the loss they want to avoid (loss aversion) as losing years of retirement freedom by retiring too late. If they don't understand the amount of retirement income their savings can generate, they may demonstrate the phenomenon of "unrealistic optimism" by assuming their savings are sufficient to retire. The modeling capability described above can offer a realistic picture of their retirement cash flow. If they realize they have inadequate retirement resources, a more effective life decision may be to redesign their work to make it more enjoyable, enabling them to continue working and delay drawing down financial resources until those resources are adequate.

Another factor that often influences a retirement decision is the possibility of dying early. They frame the loss they want to avoid as the regret they'd feel if they died too soon to enjoy their retirement years. This thinking helps them rationalize starting Social Security benefits as soon as possible, electing lump sums from DB or cash balance plans, and using invested assets to generate retirement income instead of taking advantage of the lifetime guarantee of annuities (which are often irrevocable with no liquidity). Research shows that such decisions may not be optimal from a pure financial perspective.

One way to address this concern is to point out the consequences of dying early vs. living a long time. If they die early, can they really know how much regret they might feel about their retirement decisions when they're dead? In addition, guaranteed sources of lifetime income such as annuities typically deliver higher income in the early years of retirement than formal systematic withdrawal programs with invested assets. So if they die early, they'll enjoy higher levels of income before their early demise if they've elected some annuity income.

On the other hand, advisers could frame a potential loss to avoid as the possibility that retirees will live a long time and run out of money. In this situation, it's possible for many people to imagine being old and poor (they might observe older friends and relatives in this situation). Framing the loss this way can help them rationalize delaying Social Security benefits, electing the monthly annuity from a DB plan, and deploying some assets into lifetime guaranteed annuities.

Loss aversion would also indicate that retirees should prefer some amount of guaranteed income that wouldn't decrease due to investment losses, over retirement income generated from invested assets with the potential for reductions in income resulting from investment losses. Social Security, DB plans and annuities all provide this type of guaranteed income.

There's evidence that the "planning" done by many middle income retirees is to determine if they can cover their monthly living expenses with their retirement income: Social Security, a pension (if they have one) and any other recurring income. If they can cover their current living expenses, they decide retirement is feasible. Down the road, they think they'll reduce their living expenses if necessary.

While this isn't the ideal way to plan for retirement income, it's the reality for many retirees. Plan sponsors can help by enabling their retirees to "pensionize" their DC accounts and convert them into recurring income.

Plan sponsors can enhance the planning process further by using behavioral techniques to engage and motivate retiring workers to spend more time planning their retirement security. For example, retirement readiness programs can help retiring workers envision a positive life in retirement. Another effective technique is to use virtual reality to show people what they might look like in 10 or 20 years to motivate them to take care of their future self.

ADVANTAGES TO RETIRING WORKERS AND EMPLOYERS

A retirement income program offers the following advantages to retiring employees:

- Institutional pricing has the potential to increase retirement incomes by 10 percent to 20 percent compared to retail solutions.[8]

- The employer's plan is a safe place to keep retirement savings, away from fraudsters who target seniors.
- Solutions are more likely to be implemented successfully if it's easy for retiring employees to implement their decisions.

A successful retirement income program will also help employers better manage an aging workforce. It demonstrates that employers care about key life issues facing their older workers, which improves their morale and productivity. If older workers are uncertain whether they have enough savings to retire, or how to deploy their savings in retirement, their default decision is to continue working. Eventually this decision will become undesirable for both the worker and employer.

FINISH THE JOB

Plan sponsors shouldn't wait for the perfect retirement income solution to be developed—that most likely won't happen, and it's not necessary. Good retirement income solutions exist today that are much better than the practice in most DC retirement plans, which is often to do nothing. Don't let "perfect" be the enemy of "good."

Plan sponsors will need to take the steps advocated in this essay to successfully finish the transition from DB to DC retirement plans. ■

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A Portfolio Approach to Retirement Income Security[1]

By Steve Vernon

With the decline of traditional pensions, many older workers and retirees urgently need to decide how to make their retirement generate income that lasts for the rest of their lives. With retirements that can last 20 to 30 years or more, this is indeed a daunting challenge for those fortunate enough to have significant savings by the time they retire.

To address this challenge, different thinking and new language is needed by individuals, retirement plan sponsors, advisers and financial institutions to transition from a mindset of **accumulating assets for retirement** to a mindset of **generating income in retirement.** One way to help with this mindset transition is to apply portfolio concepts that have been successfully used to accumulate assets to help retirees develop a portfolio of retirement income. The portfolio approach to retirement income is the subject of a recent collaboration between the Stanford Center on Longevity (SCL) and the Society of Actuaries (SOA).[2]

CLASSIC INVESTMENT PORTFOLIO THEORY, REVISITED

When workers are saving for retirement, classic investment portfolio theory advocates they allocate their savings among different types of assets (called "asset classes"), each having distinct characteristics and each expected to perform differently in up vs. down markets. This is called the "asset allocation decision." As a result of applying this theory to asset accumulation, many retirement portfolios have a mix of stocks, bonds and cash investments, and possibly real estate as well. This is the common definition of "portfolio diversification."

When workers are accumulating assets, investment risk is expressed as the possibility that the total value of their portfolio might depreciate or not keep up with inflation. The goal of asset allocation is to minimize the odds of these undesirable outcomes over the time horizon that applies to workers (typically until the age when they expect to retire).

But things get more complicated when workers retire and need to use their savings to generate income for the rest of their lives. To help retirees with these new goals, plan sponsors, financial institutions and advisers can apply portfolio thinking by diversifying retirees' sources of income among different types of retirement income generators (RIGs). Retirees would then allocate their retirement income among RIGs that not only perform differently in up vs. down markets, but also have different characteristics regarding how long their income might last, and may have other desirable features to meet different life circumstances. This is the "retirement income allocation decision."

Retirement income risk is then expressed as the possibility that the total amount of retirement income would decrease by an undesirable amount or not keep up with inflation. The goal of retirement income allocation is to minimize the odds of these undesirable outcomes for the rest of retirees' lives. The uncertainty about how long retirees will live is one of the key challenges of retirement income planning.

TYPICAL RETIREMENT INCOME GOALS

Here are common goals that retirees may have for constructing their retirement income portfolio:

- Generate a lifetime retirement income they can't outlive
- Maximize the amount of retirement income expected to be paid over their lifetime
- Minimize the odds that their total retirement income will fall below an undesirable level, usually due to stock market crashes
- Provide the potential for growth income to keep up with inflation
- Maintain access to savings in case of unforeseen expenses, such as medical or long-term care
- Preserve the ability to apply unused funds as a legacy
- Select solutions that are easy to use and don't need continual monitoring and adjustment, or that protect retirees against fraud and mistakes due to cognitive decline

Unfortunately, there's not one single RIG that delivers on all these goals, so retirees need to prioritize and make tradeoffs between these goals. This is a valid argument for diversifying retirement income sources, so the entire retirement income portfolio might address all the goals that are important to each retiree. Also, it's important to note that many retirees might have different priorities and circumstances than their friends and family, so each retiree will want to take their specific needs, goals and circumstances into account when determining their retirement income allocation.

COMMON RETIREMENT INCOME GENERATORS AND THEIR PROS AND CONS

Here are the common RIGs that have distinct characteristics regarding the above goals, each with different advantages and disadvantages:

Table 1 Type of Retirement Income Generator

Goal	Social Security	Invest SWP	Invest for Income	Annuity	Work	Reverse Mortgage	Rental Property
Can't outlive	Yes	No	Yes	Yes	No	Yes	Yes
Maximize income	Yes	No	No	Yes	Yes	No	No
Access to savings	No	Yes	Yes	No	No	No	No
Growth potential	Yes	Yes	Yes	No	Yes	Yes	Yes
Downside protection	Yes	No	No	Yes	No	Yes	No
Potential for legacy	No	Yes	Yes	No	No	Yes	Yes
Ease of use	Yes	No	No	Yes	Yes	No	No

- Drawing from Social Security
- Investing savings and using a systematic withdrawal plan (SWP) to generate a retirement paycheck
- Investing savings and living off the interest and dividend income
- Buying a guaranteed lifetime annuity from an insurance company (think of it as a personal pension)
- Working
- Generating money from real estate rental income
- Obtaining a reverse mortgage

Retirees should prioritize the goals that are most important to them, learn how each of the above RIGs might meet those goals, and then construct a portfolio of retirement income that increases the odds of successfully meeting their goals. Many retirees may want to find a qualified and unbiased retirement income planner who can help them with these decisions.

Table 1 shows how various RIGs meet common retirement income planning goals.

It's important to point out that there isn't one single RIG that has yes answers to every possible goal. Also, the yes and no answers for some RIGs tend to complement each other, which is one reason retirees should diversify their sources of retirement income to satisfy their unique goals and circumstances.

Note that Table 1 is intended to illustrate broad concepts about retirement income portfolios, and that the ratings are generalizations. There can be exceptions to the ratings, and some individuals might have reasons to disagree with some of the answers. For example:

- An SWP with a very conservative withdrawal rate might have a good chance of lasting for a retiree's life.
- An SWP invested entirely in government or corporate bonds (aka, a "bond ladder") offers downside protection.
- There are some annuities with the potential for growth in income.
- Work doesn't lend itself well to some of the goals in the above chart and may present the most exceptions and/or disagreements.
- Reverse mortgages have a potential for a legacy only to the extent that the value of the house exceeds the loan value.

Here are some additional comments on the rankings regarding maximizing expected retirement income:

- Social Security ranks yes to this goal because most retirees can significantly increase their expected lifetime payout by delaying the start of benefits.
- Annuities rank yes to this goal because retirees spend all of their principal over their lifetime. By contrast, with invested savings and rental property, there's typically principal remaining unused at death.
- Work ranks yes to this goal because it gives retirees extra spending money and may enable them to delay starting Social Security or drawing down on savings. But a no answer would be reasonable as well.

APPLYING PORTFOLIO ANALYTICAL TECHNIQUES TO THE RETIREMENT PHASE

The SOA/SCL study uses stochastic forecasts and efficient frontiers to show how retirees can quantify the tradeoff between the above retirement planning goals and commonly used RIGs. These analytical techniques have been used extensively to construct investment portfolios for the accumulation phase, and it's natural to extend use of these methods to the retirement income phase. Here are a few results from the SOA/SCL study:

- Retirees can increase the amount of their expected lifetime income by using savings to enable delaying the start of their Social Security benefits or buying an annuity, but in the process, they'll reduce the amount of savings they can access throughout their lives.
- Retirees can increase the amount of income they might expect over their lifetime by increasing the amount they

invest in stocks, but they're more vulnerable to stock market crashes. Investing more in bonds will provide downside protection but will reduce their expected lifetime income.
- With systematic withdrawal programs, there's a predicable tradeoff between the withdrawal rate, the expected lifetime income and the amount of accessible savings. Higher withdrawal rates produce higher expected lifetime income compared to lower withdrawal rates, but the higher rate has a greater chance of depleting assets, particularly for lengthy retirements.

PUTTING IT ALL TOGETHER

Here's one strategy that integrates these ideas using a portfolio approach:

- Cover basic living expenses with a floor of guaranteed lifetime income that retirees can't outlive and that won't decline when the stock market crashes. Such sources include Social Security, DB pensions and annuities.
- Cover discretionary living expenses from invested savings with a high allocation to stocks. Because basic living expenses are covered by guaranteed sources of income, retirees can better tolerate fluctuations due to stock market volatility in the portion of retirement income from invested assets, and they are less likely to panic and sell during down markets.
- Retirees can work just enough in their 60s and 70s to give them extra spending money, nurture social contacts and delay drawing down Social Security until age 70 and retirement savings as long as possible.
- People who have the time, skills and temperament might consider investing in real estate rental property to diversify their income. Alternatively, real estate investment trusts (REITs) can be an easier way to invest for income with real estate.
- People with low savings in 401(k) and IRAs but substantial home equity might explore reverse mortgages to boost their retirement income. Reverse mortgages can also be used to supplement income from SWPs in down markets, helping mitigate sequence of return risk.

In addition to the need to generate lifetime retirement income, retirees also face significant risks for medical and long-term care expenses. In theory, both of these risks can be addressed through insurance. In practice, most retirees are only insured for medical expenses through Medicare, Medigap and Medicare Advantage plans. In this case, retirees have turned a significant, unpredictable risk into a more manageable risk through the payment of monthly premiums. The amount of current and future medical insurance premiums needs to be considered when developing their retirement income strategy.

The threat of ruinous long-term care expenses represents the classic case for insurance: an event with the potential for significant financial costs that happens relatively infrequently. But most retirees don't buy long-term care insurance, preferring to self-insure for this risk. This can be one reason retirees express a preference for liquidity when deciding upon a retirement income strategy. The problem with this approach is that a significant long-term care event can overwhelm a retirement income strategy by quickly exhausting savings. In this case, there's no savings left to generate retirement income or pay for additional long-term care expenses. This can be one reason to leave home equity intact and not purchase a reverse mortgage to generate retirement income; home equity can serve as a financial resource to tap through a reverse mortgage or home equity loan if needed to pay for long-term care.

There's a lot to consider regarding the task of generating a reliable, retirement income that might need to last 20 to 30 years or more. Retirees, plan sponsors, financial institutions and advisers can use a diversified portfolio approach to generating retirement income that meets retirees' unique goals and circumstances, taking into consideration the features of various RIGs that are commonly available. This portfolio approach uses the same thinking and analytical techniques that have worked so well for the accumulation phase for the last few decades. ■

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ENDNOTES

1 Portions of this essay have been previously published by the author on CBS MoneyWatch in January 2016.

2 Steve Vernon, Wade Pfau and Joe Tomlinson, "Optimizing Retirement Income Solutions in DC Retirement Plans, Phases 1 and 2," Stanford Center on Longevity project (July 2015).

Researching Benefit Plans

An Interview with Julie Stich

Like the Society of Actuaries, the International Foundation of Employee Benefit Plans (International Foundation) is focused on education and research. The International Foundation's work relates to employee benefits, and their work is geared toward employers and plan sponsors—individuals who are involved in managing employee benefit plans in some way. The interests of the two organizations overlap, and the research done is largely different. The International Foundation conducts several surveys each year on different benefit topics. It also conducts a biennial survey on benefit plan prevalence and design *(Employee Benefits Survey)*. The foundation's work covers private sector plans, public sector plans and multiemployer (union) plans. As Director of Research, Julie Stich, CEBS, serves as project leader for all International Foundation research.

WHAT IS MOST IMPORTANT IN YOUR RESEARCH PROGRAM?

Our research efforts tie directly to our mission—to provide "the diverse employee benefits community with objective, solution-oriented education, research and information to ensure the health and financial security of plan beneficiaries worldwide." We strive to provide data that is original, accurate, unbiased and unique.

Our members have told us they need practical data to help them run their plans day to day and for benchmarking to make sure their current plans are as effective as possible and to help them strategize for the future. Our 33,000 members represent a variety of sectors and industries throughout the United States and Canada. We're fortunate to be able to tap their experience and knowledge through our survey work. In my opinion, our diverse membership is both key to our research and our strength. We're in a unique position to gain a keen understanding of how benefits are being handled and offered in all sectors. And, with members in both the United States and Canada, we're able to see similarities and differences between the countries.

The area of employee benefits offers many research topic possibilities. There is a lot of really good research already available. How do we decide what to focus on? When we choose topics for upcoming projects, we look at the research that exists and what's missing. We want to fill the gaps, to provide hard-to-find data that our members and others in the industry need. Our ideas come mainly from what we on staff hear from our members and from what we see happening in the industry.

ARE YOU SEEING ANY MAJOR TRENDS IN THE BIENNIAL SURVEY?

We're getting ready to conduct our *Employee Benefits Survey* again for 2016. We continue to ask about "traditional" benefits like retirement plans, life insurance, health benefits and disability insurance, but this year we'll be focusing on nontraditional, newer benefits and those being offered in flexible work environments. In the retirement area, we're focusing on financial and retirement readiness and effective defined contribution (DC) plan design.

We've been conducting this survey since 2007. Interestingly, we've seen great consistency in results each time. While some people may label this as "boring," as a researcher, it gives me both comfort and confidence in the data. Shifts in employee benefit plan prevalence and design tend to be gradual for the most part. Our survey results reveal changes we expect, like more movement toward high-deductible health plans and continuing shifts away from defined benefit (DB) pensions in the corporate sector.

ARE THERE MAJOR DIFFERENCES BETWEEN TYPES OF PLANS? WHAT ARE SOME HIGHLIGHTS OF THE DIFFERENCES?

Our multiemployer and public-sector members continue to offer DB pension plans, and roughly 60 percent of respondents from those sectors offered DC plans in 2014 too. In the multi-

> We want to fill the gaps, to provide hard-to-find data that our members and others in the industry need.

employer world, DC plans are largely seen as supplemental to DB plans. About one-third of our corporate respondents offered a DB pension in 2014.

Financial and retirement planning benefits were offered by more than 80 percent of corporate respondents in 2014, with slightly lower percentages among multiemployer and public employer respondents. Given the concerns expressed by both members and the media regarding retirement security, we're interested in seeing if those percentages will increase for 2016.

We're watching a couple of other areas too: automatic features in DC plans, and final distribution options for both DB and DC plans. We've seen consistency in the availability of options over the past several years; we'll be looking to see if there are shifts in these areas for 2016.

WHAT OTHER INTERESTING RESEARCH HAVE YOU DONE LATELY?

We release a variety of research and other reports throughout the year. For the past few years, we've worked with Horizon Actuarial Services, LLC, to analyze 5,500 forms for multiemployer DB and DC plans. The resulting report is a rolling 10-year analysis of trends impacting these plans. We're very excited about this data because it gives us a better understanding of what's really happening in this sector. There's certainly a great deal of change in the multiemployer DB landscape. While our analysis illuminates the challenges facing these plans, we also get a clearer picture of their strengths. For our latest report, covering 2004 to 2013, we found the plans' median funded percentage in 2013 was 86 percent (based on the market value of assets). This was a significant improvement over the median funded percentage at the end of 2008 (68 percent). The increase in funding allowed more plans to enter the "green zone" under the Pension Protection Act (PPA). For 2013, 57 percent of plans had green zone status, up from 34 percent in 2009. Our next couple of reports will show the effects of market volatility and the Multiemployer Pension Reform Act of 2014.

We recently closed a survey on financial and retirement education being offered in the workplace—this is a follow-up to a survey we conducted in 2014. Our work spans nonpension areas as well. For example, we conduct a biennial survey on wellness programs and an annual survey looking at the impact of the Affordable Care Act (ACA) on employers. Other recent topics include educational assistance benefits, apprenticeship programs and corporate benefits staffing structures.

As we watch developments that are creating chatter in the industry, we'll occasionally do "quick" surveys tied to what's in the news. These surveys involve fewer questions needing less in-depth analysis. Our goal is to get the results released while the issue is still front-and center. Our members appreciate the just-in-time nature of these projects. For example, in 2015 we surveyed our members about domestic partner benefits (after the June 2015 Supreme Court decision on same-sex marriage), workplace threats (like violence, cybersecurity, illness and disasters), and hot ACA topics like the Cadillac tax and employer reporting.

HOW CAN PEOPLE ACCESS THE RESEARCH? WHICH PARTS ARE AVAILABLE TO THE PUBLIC?

Our survey reports are available at *www.ifebp.org/research*. Each report has its own web page where International Foundation members can download the full report for free. Survey highlights are available to the public on these pages; each page includes infographics and links to related blog posts and press releases. Nonmembers can purchase full reports, like through our *Online Store*. ■

What's Going on Here, Anyway?

By John M. Bragg

In 1990, I started a personal project which was unsuggested, unpaid and unbeholden. It was to find out all I could about old age mortality, particularly at 90 and older. The project was a bit like climbing Everest—I did it because it was there.

Well, its 25 years later, and the results are at hand. They contain a couple of surprises: (1) at *higher* ages, mortality is higher for females than for males, and (2) mortality after 97 doesn't increase; it *decreases*. What's going on here, anyway?

There are recent theoretical papers about longevity, but I looked in vain for explanations of these results, which are the facts on the ground. So, let me explore the issue.

THE RESULTS

For the field of study, here are the ratios of female-to-male mortality:

Central Age	Ratio
67	0.834
72	0.569
77	1.073
82	1.292
87	1.030
92	1.345
97	1.159
100+	0.703

The field of study is the important nonsmoker middle- to upper-class market. (Currently, this can be thought of as policies for $100,000 or higher.) The results are reinforced by an analysis of the data in the Society of Actuaries' (SOA's) Industry Life Experience, 2005-2007.

THE SPIKE AT SEVENTY-SEVEN

For the first time, the ratio spikes dramatically at age 77. My explanation for this is "stress." The average female is still looking after grown kids and is worried about finances, health, and health insurance issues.

I also consulted the New Health Contingencies. They showed that, for the age 77 bracket, the prevalence of mental illness was higher for females than for males (14.62 percent and 13.31 percent, respectively, of the total population) for the first time. This discovery seemed to corroborate the stress explanation.

But there is reason for optimism. At age 77, a female with mental illness requiring home health care only has a recovery rate of 13.32 percent per annum, compared with a disabled mortality rate of only 2.28 percent. Furthermore, it is vital to point out that the stress explanation is a two-way street. It can also explain why male mortality is higher than female mortality at younger ages.

THE SPIKE AT NINETY-TWO

Nowadays, I am 94 and barely hanging on to my good denominator position in that 90 to 94 bracket. I again consulted the New Health Contingencies (which are fascinating) and looked at prevalence in the "sick" category (other than mental illness). In this group, 63.9 percent of females were sick compared with 60.9 percent of males. Again, this seemed to corroborate the "spike" at 92.

Female to Male mortality ratio spikes dramatically at age 77. Explanation is "stress."

THE DECREASE AFTER NINETY-SEVEN

From age 97 to age 102, mortality decreases (by 17 percent for males and an astonishing 50 percent for females). Thereafter, it seems to reach a plateau. I consider this decrease after 97 to be the result of survivorship of the very fittest of the very fittest.

SPECIAL NOTE

I recently congratulated Anna Rappaport on her excellent article *"Ripe for Retirement"* in *The Actuary*. I especially agreed with her comment that "we need to consider disability benefits in the design of programs going forward." It seems to me that long-term care would be handled very efficiently through the pension plan mechanism.

I recommend the New Health Contingencies, which include the fascinating new subject of recovery. Discoveries about recovery have led me to advocate the use of recovery rates as a second decrement in reserving and pricing.

These days, the elderly are buffeted by health problems and a myriad of questions: Should I take out a reverse mortgage? Should I sell my life insurance policy? What about the kids? Will my defined contribution pension accumulation be enough? To help them cope, I believe that near-retirees need a "personal actuarial report" that could be supplied through plan administrators. There could be a competition for coming up with the best personal actuarial report for that particular plan.

We all continue to be proud of our actuarial profession. I've never had a dull day since I was recruited to the profession at age 19!

I would appreciate any comments from Pension Section members at *nbk@mindspring.com*. ■

John (Jack) M. Bragg, FSA, ACAS, MAAA, is chairman of John M. Bragg and Associates in Atlanta, Ga. He can be reached at *nbk@mindspring.com*.

Using Sound Actuarial Principles to Better Manage Retirement Finances

By Ken Steiner

This article briefly discusses advice currently being given to retirees on how to manage their finances in retirement and how the use of sound actuarial principles to develop a reasonable spending budget can improve that advice. It also discusses the potential benefits to retirees, financial advisors and the actuarial profession of using such principles or encouraging their use.

BACKGROUND

With the retirement of the baby boom generation and decline of defined benefit (DB) pension plans, there is considerable interest these days in managing personal finances, both at and during retirement. Individuals who are considering retirement wonder if they have enough resources to afford it, and individuals who have already retired wonder if they have enough resources to meet their ongoing financial needs for the duration of their retirement, however long that may be.

There is no shortage of advice on this subject from experts in the financial press and on the Internet. Unfortunately, most of this advice is aimed at the average individual who wants a quick and easy answer. Thus, we see a lot of what I call Rule-of-Thumb (RoT) recommendations to "tap your savings." Perhaps the most famous of these RoT recommendations is the 4 percent rule, by which the individual withdraws 4 percent of his or her accumulated savings in the first year of retirement and increases that initial withdrawal by the increase in inflation in each subsequent year until the earlier of one of three events: (1) the date the retiree runs out of accumulated savings, (2) the retiree dies, or (3) the retiree decides not to follow the 4 percent rule any longer (at which time, the advice becomes less clear). Many experts recommend variations of the 4 percent rule. These static "safe withdrawal" variations include using a lower safe withdrawal rate to reflect lower-than-historical economic expectations, using a higher safe withdrawal rate that is adjusted under certain circumstances, and simply increasing the amounts of withdrawals under the 4 percent rule when the retiree determines that not enough assets have been spent. There are also other "dynamic" RoT approaches that apply various percentages to the retiree's current accumulated savings. The most well-known of these withdrawal strategies is the required minimum distribution (RMD) approach. And, of course, there is the ever-popular "spend the investment return" approach that anticipates that the retiree will not dip into his or her principal.

Sometimes a financial expert will recommend that the retiree set aside assets for unexpected expenses or for future long-term care expenses. Other experts will recommend that the retiree separately consider essential spending and nonessential (or discretionary) spending. How this is accomplished with an RoT approach is not always clear.

To develop a spending budget with one of these RoT approaches, you generally add the withdrawal from accumulated savings under the approach being used to income you may receive during the year from other sources, such as Social Security, pensions, annuities and so on. Thus, the existence of these other sources of income will generally have no impact on the x percent withdrawn from accumulated savings under the RoT method.

In a November 2014 survey of financial advisors by Russell Investments, 234 participants were asked how they develop spending budgets for their clients near or in retirement. Twenty-five percent responded that they based their approach on levels of pre-retirement spending, 22 percent indicated that they used a rule of thumb like the 4 percent rule, 19 percent said they used some variation of the bucket strategy,[1] 16 percent said they compared assets with future liabilities, and 18 percent indicated some other approach.

The Russell Investments survey concluded that not enough financial advisors were using "math and science to develop spending budgets for their clients and should be periodically comparing the client's assets with the client's liability (the present value of the future withdrawals from the accumulated assets) similar to how actuaries measure the funded status of pension plans." This was a clear shout-out to the actuarial profession to step up its game and become part of the solution.

USING SOUND ACTUARIAL PRINCIPLES TO DEVELOP A RETIREMENT SPENDING BUDGET

The problem of how much to spend each year in retirement is an actuarial problem that requires an actuarial solution. Fortunately, we can apply the same actuarial principles used for pension plan funding and measuring Social Security actuarial balances to this problem. The basic equation for this purpose is:

> Market value of assets + Present value of future income from all sources = Present value of future budgets + Present value of amounts to be left at death (Eq. 1)

This is the classic actuarial balance equation, where assets are equal to the items on the left-hand side of the equation, and liabilities are equal to the items on the right-hand side. If this is beginning to look to you pension actuaries like I am going to

recommend an annual (or periodic) actuarial valuation of assets and liabilities to solve for a current year's budget, you're with me. This equation tells us that the present value of the retiree's current and future spending is a function of his or her current assets.

At retirement, and at least once a year thereafter, the retiree (with possible help from a financial advisor or qualified actuary/financial advisor) is going to select reasonable assumptions for a discount rate, a rate of future inflation, mortality (or expected period of retirement) and other relevant elements. Once these assumptions have been selected, the present value of future income from all sources is calculated and added to the retiree's current assets. The retiree decides how much of a bequest motive he or she wants to have and subtracts the present value of this desired bequest motive from his or her total assets (current assets plus present value of future income). The result is the present value of current and future budgets.

The next step in the budget-solving process is to determine the desired pattern of future budgets. For example, the retiree may decide that future budgets should increase each year with inflation. Once the pattern of future budgets has been determined, the current year's actuarially determined budget can be determined.

Many retirees are going to want a more refined spending budget than one determined with a single assumption about future year's budget increases. For example, the retiree may have different expectations or desires about future increases applicable to health care costs, essential expenses, nonessential expenses and so forth. In this case, the right-hand side of Equation 1 becomes:

> Present value of future expense type #1 budgets + Present value of future expense type #2 budgets + Present value of future expense type #3 budgets (etc.) + Present value of amounts to be left at death (Eq. 2)

Some retirees may find it beneficial to dedicate certain assets to fund specific types of expenses. Certainly, fertile actuarial minds can find a way to improve, refine or otherwise complicate the simple formulas set forth here.

EXAMPLES

Let's illustrate the Equation 1 calculations for two retirees and compare the resulting budgets and expected first-year withdrawals from accumulated savings with results developed under the 4 percent rule. We will assume each of our example retirees is age 65, single and receiving a Social Security benefit of $18,000 per annum. We will further assume zero bequest motive, a 30-year retirement period, a 4.5 percent discount rate and 2.5 percent inflation. Both retirees are assumed to have $300,000 in accumulated savings. Example Retiree #1 also has a fixed dollar,

immediate single life annuity of $25,000 per year, and Example Retiree #2 has a fixed dollar, deferred annuity of $25,000 per year payable commencing at age 75, with no death benefits either before or after commencement. For calculation simplicity, all present values assume beginning-of-year annual payments. Both retirees develop their spending budgets for the first year of their retirement by deciding that their future spending budgets should increase each year with expected inflation.

Example Retiree #1's assets under these assumptions are $1,139,319. This is the total of her accumulated savings of $300,000, the present value of her Social Security benefits of $413,772 and the present value of her single life annuity benefits of $425,547. To determine her spending budget for her first year of retirement, we divide her total assets by the present value of an increasing 30-year certain annuity due factor of 22.98736 to produce a total first-year spending budget of $49,563. Assuming she spends exactly her budget and all of her Social Security and life annuity benefits, she will withdraw $6,563 ($49,563 – $18,000 – $25,000) from her accumulated savings this year. This withdrawal is equal to about 2.19 percent of her accumulated savings. By comparison, if she had used the 4 percent rule, she would withdraw $12,000 (4 percent) from her accumulated savings, and if she planned on spending her life annuity and Social Security benefits, her spending budget would total $55,000.

If all assumptions are realized in the future, Retiree #1's spending budget (developed using basic actuarial principles) is expected to remain constant in real dollars over her expected period of retirement, while her spending budget (developed using the

4 percent rule) is expected to constantly decrease in real dollars over her expected period of retirement.

Example Retiree #2's assets under the outlined assumptions are $932,599. This is the total of his accumulated savings of $300,000, the present value of his Social Security benefits of $413,772 and the present value of his deferred annuity benefits of $218,827. Dividing this amount by 22.98736, we develop a first-year spending budget of $40,570, and Example Retiree #2's withdrawal from accumulated savings this year is $22,570 ($40,570 – $18,000), or about 7.52 percent of his accumulated savings. By comparison, if he had used the 4 percent rule, he would withdraw $12,000, and his total spending budget would be $30,000.

If all assumptions are realized in the future, Retiree #2's spending budget (developed using basic actuarial principles) is expected to remain constant in real dollars over his expected period of retirement, while his spending budget (developed using the 4 percent rule) is expected to significantly increase at age 75 when the deferred annuity benefits commence.

These simple examples illustrate the advantage of using basic actuarial principles rather than an RoT to determine a retiree's budget in accordance with the retiree's spending objectives. As discussed in the section that follows, there are also advantages to using the annual valuation process to redetermine the spending budget each year.

BENEFITS TO RETIREES AND THEIR FINANCIAL ADVISORS OF USING AN ACTUARIAL APPROACH

Yes, the actuarial approach already outlined is more complicated than using an RoT approach, but here are some of the benefits to the retiree and the retiree's financial advisor of using the actuarial approach:

- It adjusts the retiree's spending budget to remain on track through various economic environments.
- It enables a person considering retirement to see whether he or she is financially ready to retire.
- It permits the financial advisor to help the client strategize alternative approaches if desired spending exceeds the actuarially determined spending budget.
- It helps the client develop a plan for managing the difference between desired and actuarially determined spending levels.
- It permits the financial advisor to measure the implications of alternative investment approaches based on client circumstances and objectives.
- It coordinates income from other sources such as fixed dollar pensions, immediate annuities, deferred income annuities and deferred Social Security benefits better than most RoT approaches.

BENEFITS TO THE ACTUARIAL PROFESSION AND MEMBERS OF ENCOURAGING THE USE OF AN ACTUARIAL APPROACH

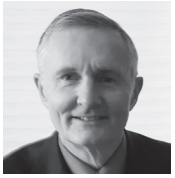
Applying actuarial principles to retirement spending plans may create opportunities for actuaries who are also qualified financial advisors. It is entirely consistent with many of the goals expressed in the mission statements of both the Society of Actuaries and the American Academy of Actuaries, including:

- Address pressing issues that require or would benefit by the sound application of actuarial principles
- Have actuaries recognized as preeminent experts in risk and financial security
- Serve the public and the U.S. actuarial profession
- Identify and address issues on behalf of the public interest on matters in which actuarial science provides a unique understanding
- Increase the public's understanding and recognition of the value of the actuarial profession
- Provide basic education in the fundamental principles of actuarial science
- Improve decision making to benefit society
- Enhance the ability of actuaries to be trusted financial and business advisors on problems involving uncertain future events

CONCLUSION

The public deserves better advice on managing spending in retirement. The answer to this problem lies in the application of sound actuarial principles to develop a reasonable spending budget. The profession and its members should encourage the application of basic actuarial concepts for this purpose.

Ken Steiner, FSA, is passionate about this issue and has been blogging on this subject since he retired in 2010. If you like what you have read in this article, you can find a lot more of his writing (as well as examples and calculation spreadsheets) at the following blogsite: http://howmuchcaniaffordtospendinretirement.blogspot.com/. ■



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ENDNOTE

[1] See the following link for a description of a bucket strategy: *http://www.bankrate.com/finance/retirement/retirement-income-strategy-using-buckets.aspx?ic_id=outb_27769452*. My 2014 blog response to it can be found here: *http://howmuchcaniaffordtospendinretirement.blogspot.com/2014/08/the-actuarial-approach-vs-bucket-system.html*.

Expected Geometric Returns

By Philip Martin McCaulay

The best estimate for the investment return assumption is ageometric return that includes a reduction for the volatility drag on the long-term expected return.

The expected long-term compounded geometric annual rate of return is calculated by taking the expected arithmetic annual return and adjusting it for variance drain or volatility drag, resulting in a reduction of about 50 percent of the variance.[1] Risk is measured using the standard deviation.

For example, suppose a portfolio with a mix of 50 percent domestic equities and 50 percent domestic fixed income has an expected arithmetic annual return of 7.50 percent and a standard deviation for the portfolio of 10 percent. The approximate expected annual compounded rate of return is $\mu p - 0.5\sigma_p^2$, or 7.50% – [.5 (10%)^2], which is 7.00 percent.

Just as the geometric mean is less than the arithmetic mean when the returns are not identical, the compounded return is lower than the expected annual return because of volatility. The reasons for the volatility drag are explained in an article by James D. MacBeth.[2] The variance drain would be about half the variance of the portfolio. For example, a sample portfolio of 100 percent equities with an annual expected rate of return of 10.0 percent and a standard deviation of 20 percent will have variance drain of about 200 basis points, and the compounded expected return is about 8.0 percent. Exact formulas for the compounded return after adjusting for the variance drain were developed by de La Grandville.[3]

To improve on the estimate for the variance drain, a factor of 0.46 could be used instead of 50 percent (Figure 1). For example, a sample portfolio of 100 percent equities with an annual expected rate of return of 10 percent and a standard deviation of 20 percent would have a variance drain of about 200 basis points, and the compounded expected return would be about 8.2 percent before expenses.

Figure 1: Formula for Rate of Return

Annual Compounded Rate of Return =

Expected Annual Return – [0.46 (Variance)]

$= \mu_p - 0.46\ \sigma_p^2$

Table 1 shows the expected geometric rates of return for sample portfolios of various equity and fixed-income mixes. These amounts precede the subtraction of expenses. For a portfolio with 75 percent in equities and 25 percent in fixed income, the arithmetic annual real return for the portfolio is 6.0 percent and the standard deviation is 15.0 percent. Using these assumptions, the expected compounded annual real return is 5.0 percent.

Equity Percent	Fixed Income Percent	Arithmetic Annual Real Return	Standard Deviation	Expected Compounded Annual Real Return
1%	99%	0.8%	0.8%	0.8%
10%	90%	2.2%	3.1%	2.2%
20%	80%	3.3%	5.2%	3.2%
30%	70%	3.8%	6.8%	3.6%
40%	60%	4.3%	8.5%	4.0%
50%	50%	4.8%	10.3%	4.3%
60%	40%	5.3%	12.1%	4.6%
70%	30%	5.8%	14.0%	4.9%
75%	25%	6.0%	15.0%	5.0%
80%	20%	6.2%	15.7%	5.0%
90%	10%	6.5%	17.0%	5.2%
100%	0%	7.0%	19.2%	5.3%

The best estimate for the investment return assumption is a geometric return that includes a reduction for the volatility drag on the long-term expected return. Based on the asset mix, the expected compounded return assumption before expenses can be developed by taking the expected annual return and subtracting about 50 percent, or 0.46, of the variance. ■

ENDNOTES

1 The variance is the standard deviation squared (σ^2).

2 James D. MacBeth, "What's the Long-Term Expected Return to Your Portfolio?" *Financial Analysts Journal* 51, no. 5 (1995): 6–8.

3 Olivier de La Grandville, "The Long-Term Expected Rate of Return: Setting It Right," *Financial Analysts Journal* 54, no. 6 (1998): 75–80.

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