SOCIETY OF ACTUARIES

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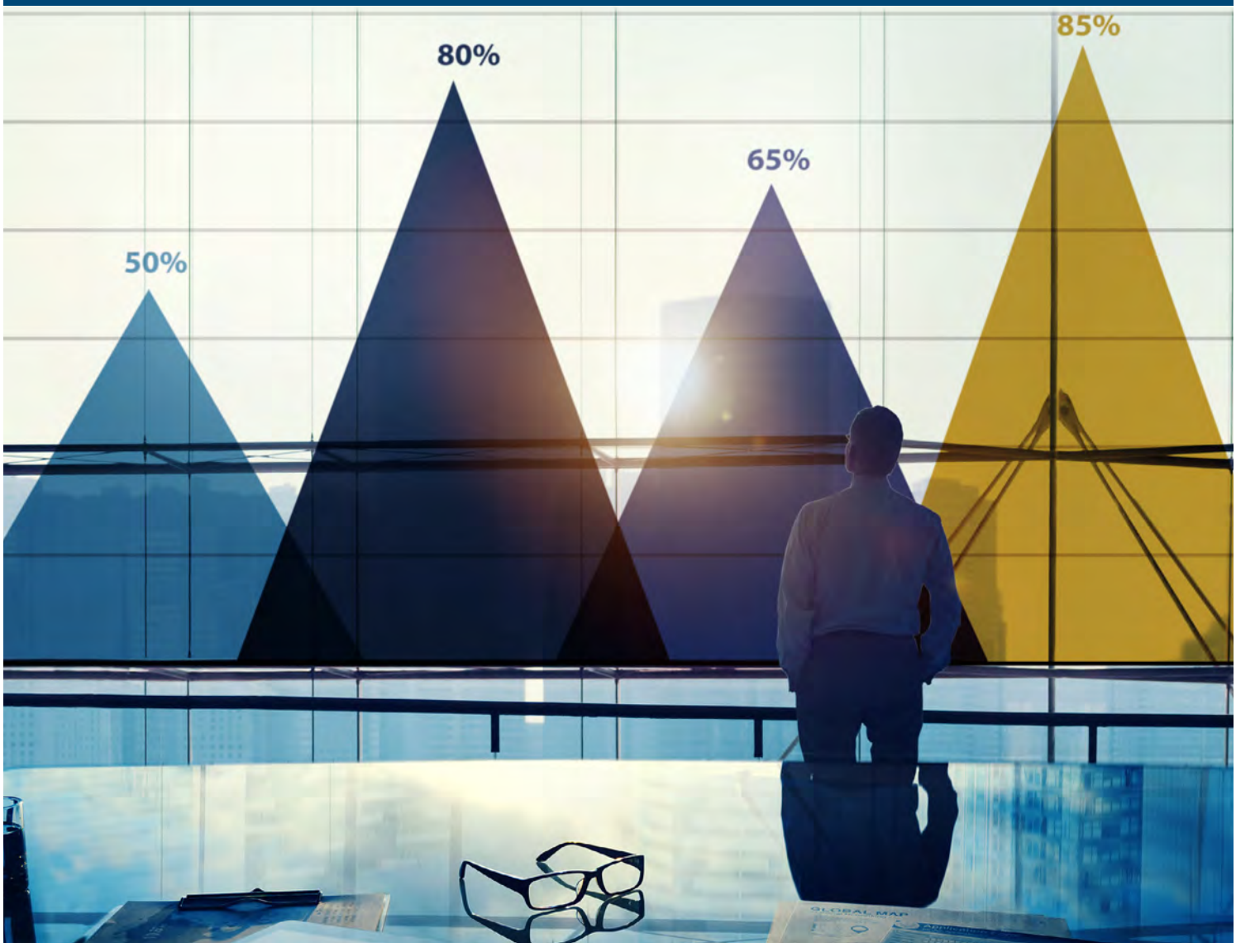
Diverse Risks

2016 Call for Essays



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Prize Winners

First Prize

The "Feel Free" Retirement Spending Strategy
R. Evan Inglis

Second Prize

Retirement: Choosing Between Bismarck and Copernicus
Krzysztof Ostaszewski

Third Prize

Thinking About the Future of Retirement
Anna M. Rappaport

Longevity Insurance Benefits for Social Security
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Designing and Communicating Retirement Plans for "Humans"
Steve Vernon

A Portfolio Approach to Retirement Income Security
Steve Vernon

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Introduction

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).

In response to the call for essays, the SOA received 20 submissions and selected 18 for this compendium. After careful review and consideration, the committee chose the following essays 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.

The Committee on Post Retirement Needs and Risks is pleased to make available this full collection of essays, which will inform future efforts. As always, comments are welcome on this collection and as suggestions for future Committee topics.

John Cutler, J.D., served as chairperson for the Project Oversight Group for this effort. 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 adviser 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.

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

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).

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

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.

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.

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 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%**

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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Retirement: Choosing Between Bismarck and Copernicus

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.*

Thinking About the Future of Retirement

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.

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Longevity Insurance Benefits for Social Security

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.

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.

2 Expert Committee on the Future of the Quebec Retirement System, "Innovation for a Sustainable Retirement System," report (April 2013).

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.

3 Moshe Milevsky, "Real Longevity Insurance with a Deductible: Introduction to Advanced-Life Delayed Annuities (ALDA)," *North American Actuarial Journal* 9, no. 4 (2005): 109–22; Anthony Webb, Guan Gong and Wei Sun, "An Annuity That People Might Actually Buy," Center for Retirement Research at Boston College, Issue in Brief No. 7-10 (July 2007); J. Mark Iwry and John A. Turner, "Automatic Annuitization: New Behavioral Strategies for Expanding Lifetime Income in 401(k)s," in *Automatic: Changing the Way America Saves*, ed. William G. Gale et al. (Washington, DC: Brookings Institution Press, 2009); John A. Turner, *Longevity Policy: Facing Up to Longevity Issues Affecting Social Security, Pensions, and Older Workers* (Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2011); John A. Turner, "Providing Longevity Insurance Annuities: A Comparison of the Private Sector versus Social Security," *The Journal of Retirement* 1, no. 2 (Fall 2013): 125–30; John A. Turner and David D. McCarthy, "Longevity Insurance Annuities in 401(k) Plans and IRAs," *Benefits Quarterly* 29 (First Quarter 2013): 58–62; Katharine G. Abraham and Benjamin H. Harris, "Better Financial Security in Retirement? Realizing the Promise of Longevity Annuities," *Economic Studies at Brookings* (November 2014): 1–20; David Blake and John A. Turner, "Longevity Insurance Annuities: Lessons from the United Kingdom," *Benefits Quarterly* 1 (2014): 39–47, http://www.ifebp.org/inforequest/0165164.pdf; Tianhong Chen and John A. Turner, "Longevity Insurance Annuities: China Adopts a Benefit Innovation from the Past," *International Social Security Review* 68, no. 2 (2015), doi:10.1111/issr.12063.

4 James W. Glover, *United States Life Tables: 1890, 1901, 1910, and 1901-1910* (U.S. Bureau of the Census, Washington, DC: U.S. Government Printing Office, 1921).

5 Elizabeth Arias, "United States Life Tables, 2009," *National Vital Statistics Reports* 62, no. 7 (January 6, 2014).

6 Ibid.

7 Turner and McCarthy, "Longevity Insurance Annuities."

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

8 New York Life, comment letter on IRS REG 115809-11, Longevity Annuity Contracts, May 3, 2012.

9 Arias, "United States Life Tables, 2009."

10 Denise Smith, "The Older Population in the United States: March 2002," U.S. Census Bureau report P20 546 (April 2003).

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.

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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Designing and Communicating Retirement Plans for "Humans"

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]

1 Ruth Helman, Craig Copeland and Jack VanDerhei, "The 2015 Retirement Confidence Survey: Having a Retirement Savings Plan a Key Factor in Americans' Retirement Confidence," Employee Benefit Research Institute Issue Brief, no. 413 (April 2015).

2 Steve Vernon and Elizabeth Borges, "The MORE Design: Integrating Psychological Science and Behavioral Economics to Engineer Better Outcomes with Human Resources, Benefits, and Retirement Programs," Stanford Center on Longevity project (forthcoming).

3 Steve Vernon, "The Next Evolution in Defined Contribution Retirement Plan Design: A Guide for DC Plan Sponsors to Implementing Retirement Income Programs," Stanford Center on Longevity project (September 2013).

4 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).

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,

5 Vernon, "The Next Evolution."

6 Vernon, Pfau and Tomlinson, "Optimizing Retirement Income Solutions."

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

7 Steve Vernon, "Foundations in Research for Regulatory Guidelines on the Design and Operation of Retirement Income Solutions in DC Plans," Stanford Center on Longevity project (September 2014).

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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8 Vernon, "The Next Evolution."

A Portfolio Approach to Retirement Income Security[1]

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

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).

- 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:

- 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.

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

- 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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Decumulation for a New Generation

Elizabeth Bauer

How should we, as actuaries, think about the issue of decumulation/spending in retirement? And how should we, as pension actuaries, advise the public at large—or should we?

The answer seems obvious: Defined benefit (DB) plans, once the norm for employees at larger companies, have mostly disappeared for, say, Generation X, leaving them exposed to the investment and especially longevity risks from which they would have otherwise been protected by those pensions; hence, when they reach retirement age, these future retirees should be nudged/incented/required to annuitize some portion of their benefit.

But, up to now, retirees have stubbornly refused to do so—and, truth be told, with good reason:

- Annuities are expensive, when measured against actual and perceived alternatives.
- Consumers distrust annuities, and insurance providers.
- Employees are conditioned to think of defined contribution (DC) as a "pot of money" and want to get the full value, also they're more afraid to "waste" money by dying too soon than "outliving" the money by dying too late

So, what to do?

The Price of Annuities

Here's a quick calculation of a money's worth ratio (MWR): USAA, a mutual insurance company for service members and their children, offers an online annuity calculator. As of October 2015, a woman age 65 with $100,000 could purchase, on a single-life basis, an annuity of $498 per month. Using the most conservative annuity table readily available on my company's annuity calculator, and the Sept. 30, 2015, Moody's Aa corporate bond rate of 4.13 percent, produces a monthly benefit of $553—that's a MWR of 90 percent. Or, if I work backward to get an equivalent annuity factor, I get an implied actual discount rate of 3.13 percent, or a 100 basis point cost for expenses and margins for conservatism—and that's assuming that USAA, which sells online and by phone rather than via agents, has a lower marketing expense than a typical commission-based product.

Is that about right? According to the admittedly outdated information available online, money's worth ratios are significantly worse in the United States than elsewhere. At a time when, on a corporate bond basis, the U.S. MWR was 0.80, for a 65-year-old female in an annuitant population, the equivalent ratio in Australia was 0.89, or 0.90 in the United Kingdom, 0–0.94 in Canada and 1.08 in Switzerland.[1] In the Netherlands, too, ratios are high.[2] In the Netherlands and in Switzerland, and formerly in the United Kingdom, annuitization is mandatory, reducing marketing expenses and antiselection issues. In addition, the annuities in question are deferred annuities, where the provider may offer more generous annuitizations subsidized by lower accumulation rates.

And how does a typical consumer determine whether this is "too expensive"? There seem to be three strategies retirees follow in deciding how to spend their assets: they either try to live off the interest, follow the "4 percent rule" now in common currency, or pick the age they expect to live to and work backward. This is, at any rate, what the Morningstar Guide to Retirement, which came in my newspaper a couple months ago as a Sunday supplement, tells me. (The guide didn't have much to say about annuities, not surprising since they'd really rather you kept your funds invested with them.)

What does 4 percent buy you, on our sample $100,000? A measly $333 per month, which looks pretty lousy compared to our $500 annuity, but it's not apples to apples because the 4 percent rule is meant to offer inflation protection and a bequest to heirs in

1 G.A. "Sandy" Mackenzie, "The Role of Private Sector Annuities Markets in an Individual Accounts Reform of a Public Pension Plan," International Money Fund Working Paper WP/02/161 (2002).

2 Edmund Cannon, Ralph Stevens and Ian Tonks, "Price Efficiency in the Dutch Annuity Market," Netspar Discussion Paper DP 04/2013-16 (April 2013). The authors calculate their ratios on a government bond basis, which means they're not directly comparable to the others.

the event of untimely death, to boot. If I apply some rudimentary math to my employer's annuity calculator, and assume a long-term inflation of 2 percent, that brings the initial benefit down to $400; at a 3 percent inflation assumption, the benefit is $345. In the real world, inflation-protected annuities don't really exist; instead, they take the form of fixed annual increases. If you add in an expectation for higher expenses and fees than a fixed annuity, it could well be that the actual monthly payment for such an annuity might not be any better than this $333. And whether the 4 percent rule is "right" in an absolute sense is not necessarily relevant; the point is that it looks like a good deal to a retiree engaged in financial planning.

What about the "pick a life expectancy" method? If we imagine that a retiree plans for living, say, 30 years in retirement, that is, to age 95, then at our corporate bond rate, they could plan on an income of $485 per month. If they assume, because they'll be investing in a diversified manner, a higher return, say 5 percent or 6 percent, they could plan on $535 or even $600. Is this a sensible strategy? Maybe not. Although it appears to nearly eliminate longevity risk by means of this conservative assumption, it exposes retirees to investment risk. But to an individual retiree making plans, it looks appealing.

And "live off the interest"? Rates are low, but it offers the reassurance of no capital loss, and it offers retirees hope that, even though today's interest rate environment is low, they haven't locked themselves into anything and will gain when interest rates increase in the future.

How to Make Annuities a Better Value for the Money

To a certain extent, it's a catch-22: Costs are high because the customer base is small, requiring more in marketing/commission costs and more conservatism for antiselection; however, the customer base is small because the costs are high. To the extent that more customers would reduce expenses, one could imagine a set of **government subsidies** (e.g., tax credits) similar to those for hybrid cars, intended to incent consumers to choose annuities for retirement spend-down, but time-limited with a phase out as volume grows.

Even in a perfect market, in which the volume of annuity sales reduced their cost, there would still be the fundamental issue that asset returns on annuities are hampered by the need to invest in low-return fixed income products. Are there work-arounds? In 2014, Sen. Tom Harkin, D-Iowa, introduced the USA Retirement Funds Act,[3] which, among other things, would have established a form of auto-enrollment based **pooled retirement fund**, which would have aimed at providing lifetime income for its participants, but with mechanisms for adjusting benefits as needed to protect the fund's finances. Such a fund, due to its adjustment mechanisms, could have been less restricted to fixed income investments. In its final form, it might have offered Pension Benefit Guaranty Corp.-like protections outside the realm of employer sponsorship to further enable careful yet diversified asset allocation. Needless to say, the bill, which also included a catch-all set of pension funding and regulatory provisions, didn't pass and didn't appear to have generated much interest.

Was the bill inherently flawed? Perhaps it attempted too much, with the auto-enrollment provisions, for instance, or perhaps it was a matter of "wrong place, wrong time," especially with Senator Harkin now having retired. It's too facile an explanation to say it was doomed by partisanship, given that pension legislation has historically been bipartisan, even if it's as simple as the periodic funding relief amendments tucked into larger must-pass legislation. More likely, this legislation had no support base, no constituency pushing for its passage in this or an amended form. The actuarial profession, despite growing concerns about the need for protection against longevity risk, has no real history of political advocacy, especially to the extent that pooled funds would appear to be competitor products to existing 401(k) funds and traditional annuities (though, in principle, either of these types of providers could expand their business into a new market). Harkin also envisioned these funds being offered by nonprofits (though perhaps managed by insurers, asset managers and employee benefit administrators), which might have **countered the current consumer distrust of annuities**. As actuaries, we know that the probabilities of death as an annuitant ages are simply baked into the pricing of the annuity, but too many

3 Text available at https://www.govtrack.us/congress/bills/113/s1979.

consumers perceive the annuity as a "bet" the insurer makes with the consumer: If you die young, you lose and the insurer wins. To the extent that pooled funds can escape this perception, and can instead re-brand themselves as, similar to mutual insurance, shared risk among your fellow participants in the fund, this may offer a way forward here, too.

Absent these two changes, there's another seemingly simple legislative change that could offer a cost-effect means of funding annuity income out of retirement savings. The full implementation of late retirement Social Security benefit increases, and the fact that benefits taken at age 70 are 76 percent higher than if taken at age 62, are beginning to make their way into media reporting, though those articles often contain the (quite reasonable) caveat that you don't get "something for nothing" because the benefits are actuarially equivalent and, if you die young, you get nothing.[4] But if the opportunity for actuarially equivalent increased benefits due to late retirement were extended even beyond age 70, to age 75, for instance, this would **transform Social Security into a longevity annuity** for those individuals who are able to spend down their savings in the intervening years, and who would value the longevity protection even at the risk of not collecting a benefit at all should they die early, in a cost-free manner. True, Social Security's finances are uncertain, but nearly all proposals envision a tinkering around the edges rather than a major reworking of the entire structure.

If no political changes are on the horizon, perhaps there are opportunities for a re-marketing of annuities by means of a competitor in the "rule of thumb" business, advising retirees to direct some portion of their assets to an annuity rather than, or as part of, a bond asset allocation, using a formula keying off of Social Security, other pension benefits (if they exist) and total savings. Such a rule of thumb might be "**cover your 'age 85' expenses** with an annuity, and spend down assets on the rest"—with age 85 expenses defined as your basic daily living needs, stripping out the travel, the golf and perhaps even the maintenance that goes along with car ownership or keeping the four-bedroom family home. (What about medical care and long-term care? I'm hoping someone else figures that one out.) Or advice might be a modification of the standard asset allocation recommendation: To the extent you're planning on investing in bonds as part of your portfolio, there's not as much loss, in return expectations, in purchasing an annuity.

Promoting Annuities

This all leads to a final question: Why aren't annuity providers doing more to promote their product themselves? I can guess—but only guess—that it's because direct-to-consumer immediate annuities are a small part of their product line and, perhaps, in an agent-based sales structure, agents are more keen on selling other products with higher commissions. Perhaps this will change, as Generation X heads to retirement as the first generation after the end of DB pensions, and as they (OK, ***we***) must cope with making our way as the ever-ignored middle child, sandwiched between the two media-darling generations, the baby boomers and the new favorite, the millennials. What's more, the older generation knows annuities primarily as a high-fee retirement savings vehicle that made sense in a pre-401(k) era, when tax-deferred options were few; the lifetime income option is almost an afterthought. Perhaps this leaves them ripe for re-invention for a new generation.

Conclusion

The preceding is more a collection of ideas than a single new, compelling insight. Tax credits, pooled retirement plans, Social Security as longevity annuity, new rules of thumb—nothing new under the sun here. But that's what's needed, isn't it? A variety of strategies and some hard work at implementation, along with an advocacy group that goes to bat for these ideas where political changes are needed.

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4 A quick Internet search turned up two items: Philip Moeller, "Delay Social Security Till Age 70? Not in The Real World," *Time Money*, May 23, 2014, and "3 Reasons It's Smart to Take Social Security Benefits at 62," *The Motley Fool*, Dec. 30, 2015.

Enhanced Risk Sharing Savings Accounts

Martin Bauer

Current defined contribution pension plans expose participants to investment risk and longevity risk. Individual account owners are ill equipped to deal with either of these risks.

What is therefore needed, and what this paper is trying to explore, are approaches that attempt to:

1. Maintain the zero risk position for plan sponsors
2. Reduce or eliminate longevity risk
3. Reduce investment risk to the individual participant
4. Maximize retirement income by

4a. Maintaining the upside potential associated with risky assets, and

4b. Minimizing administrative expenses

There is no solution that addresses all five of these objectives perfectly. However, it is clear that current approaches in the context of defined contribution plans fall well short of achieving an acceptable balance. The typical "live off your savings" approach, presented in recommendations such as "consume only your interest earnings" or the "4 percent rule," completely fails to address some of the above mentioned goals. Annuities, on the other hand, do a near perfect job at addressing goals 1 through 3—but at the expense of goal 4.

This paper introduces the concept of enhanced risk sharing savings accounts (or ERiSSA plans[1]). Besides admittedly being chosen to remind the reader of the original goals of the now over 40-year-old Employee Retirement Income Security Act of 1974 (ERISA), in particular the "retirement income security" part that it in the end has fallen so woefully short of, the name is deliberately new (so as to not be confused with existing concepts such as "collective DC plans" in the Netherlands) and is meant to suggest the following elements:

- Risk sharing across account holders
- Individual accounts with individual ownership
- Enhanced features by virtue of combination with deferred annuities to address longevity risk

While much of the concept can apply during the accumulation phase of defined contribution plans as much as during the decumulation phase, this paper focuses primarily on the decumulation phase to be consistent with the objective of the call for papers.

The Concept

ERiSSA plans can be described as follows. There are individual (savings) accounts much like in traditional defined contribution accounts. At retirement, however, a small portion of the assets is used to purchase a deferred annuity, likely to age 85 or 90.

The remainder of the assets is invested based on the individual account holder's preference and risk tolerance. This means there is room for investment in risky assets such as equities.

The difference from traditional defined contribution accounts lies in the approach in which individual accounts are credited with investment returns. Specifically, there is a separate "buffer account" collectively owned by all participants in the plan rather than by any one individual account owner. This buffer account is intended to smooth actual realized investment returns. During years of favorable investment returns, only a portion of those returns are credited to the individual accounts, with the remainder going toward the buffer. Conversely, in years of unfavorable returns, the buffer is available to supplement returns credited to individual accounts. In addition, a one-time "buy in" would likely have to be assessed at the time of joining a fund that would be credited toward the buffer.

The details of what portion of the investment returns flow into the buffer and how the buffer is accessed to subsidize poor investment returns could differ from plan to plan and might be left to the market place to decide. However, a straight-forward example might call for a "central return area," consisting of a target return

1 The use of the term "plan" to denote ERiSSA arrangements is a loose one. It is certainly not meant to indicate any specific involvement by an employer. In fact, it is foreseen that most such arrangements would be provided by financial institutions.

(likely equal to something close to the historic average return for similar asset classes) along with more or less symmetrical bands around this target return. For example, a fund that invests in equities could have a central return area of 0 percent to 15 percent, centered around a target return of 7.5 percent. In years in which the actual investment return falls within this central return area, the buffer isn't impacted at all. No investment earnings flow into the buffer, nor are there any outflows. However, in years in which investment returns exceed the upper end of the central return area, some or all of the excess returns flow into the buffer. Conversely, when actual investment returns fall short of the lower end of the central return area, the buffer is used to at least partially make up for the shortfalls. The intent and expectation is that in most years, the return that is actually achieved will fall within the central return area and will therefore be acceptable to the account holder. More importantly, we expect that over the long run, the return will exceed that of risk-free assets and will do so with an acceptable level of risk.

Further, there can be rules about what to do in case of a very small or very large buffer. A very small buffer might result in the entire unfavorable investment return hitting the individual accounts (it would have to in the extreme case of the buffer being used up entirely). Conversely, an unusually large buffer might result in additional "bonus" returns being credited to the account.

However, no one individual account owner owns the buffer, nor even a part thereof. When an account owner dies, or withdraws their assets, any contribution to the buffer that could mathematically be attributed to their account stays behind and will serve to assist other members of the plan.

Comparison Against Goals

The following discusses how ERiSSA plans fare against the above mentioned objectives 1 through 4.

MAINTAIN THE ZERO RISK POSITION FOR PLAN SPONSORS

This one is easy. Employers can rest easy by knowing that the defined contribution status of their plans is not touched. ERiSSA plans don't oblige them to do anything beyond what they are currently doing. No risk, no higher cost, no adverse accounting implications.

REDUCE OR ELIMINATE LONGEVITY RISK

The only practical manner known to the author of how to deal with longevity risk is through insurance. A deferred annuity is comparatively inexpensive yet does a fine job eliminating the potential financial difficulties associated with very long life. Arguably, it deals precisely with the kind of situation insurance is meant for: to deal with the potentially high cost associated with a rare event.

The precise starting point (85 or 90 or maybe even 95) of the deferred annuity is relatively unimportant. It can differ between single men and single women. In cases where a pool of money has to last for the joint lifetimes of a couple, it might be tied to the younger spouse's age. Either way, the objective is purely to eliminate the financial risk of very long life. A challenge to the insurance industry would be to find more effective ways to deal with the inflation risk so as to ensure that payouts 30 or more years in the future are still meaningful in a variety of inflation scenarios.

Note that while long life is the primary concern when discussing longevity risk, when interpreted as the risk of living for a period of time significantly different than average—longer or shorter—then the risk of dying shortly after benefit commencement has to be taken into account as well. The author is convinced that the concern of "wasting" money when buying a traditional annuity (not one with a certain period) and dying young is at least one hurdle which prevents many consumers from annuitizing their DC accounts. ERiSSA plans maintain the individual account balance aspect of DC plans. In cases of an untimely death, the majority of the assets fall to the deceased's estate.

REDUCE INVESTMENT RISK TO THE INDIVIDUAL PARTICIPANT

This is the most difficult objective to address in a satisfactory manner. ERiSSA plans are not free of risk. In the most extreme adverse scenarios, the (then nonexistent) buffer does little to protect the individual account holder.

However, the author believes that some residual risk is acceptable if the overall package is more appealing, i.e., if it pushes out the kind of efficient frontier which balances risk and reward.

ERiSSA plans undoubtedly share risk. They are designed to do so by shifting returns between years, i.e., less return in particularly favorable years balanced with higher return in particularly unfavorable years. They are also designed to do so between individuals and between generations. A large buffer built up throughout a period of high returns will likely be available to help future generations throughout periods of low returns. As such, it stands to reason that from an individual perspective, investment risk is reduced, albeit not eliminated.

MAXIMIZE RETIREMENT INCOME

As indicated above, the objective is to maximize retirement income. This is accomplished in a number of ways:

a. Investment in risky assets—and the corresponding expected higher average returns over the long term—are possible. This means that over the long term, more money is available overall, which means more money goes toward retirement income.
b. Given the knowledge that an annuity kicks in at some point, the account balance does not have to last beyond a predetermined point in the future. As a result, it is acceptable for the money to be significantly depleted at around that time. Conversely, this means that more money is available for retirement income until that point.
c. All money—including the buffer—ultimately goes to the account holders. Excess returns that feed the buffer are ultimately used to supplement lower returns and to prop up retirement income at times when particularly needed.
d. The concept is fairly simple. It does not require a large administrative overhead or any risk charges. In fact, the administrative requirements of the individual account component of ERiSSA plans (as opposed to the deferred annuity aspect) is well within the scope of what fund managers along with 401(k) and IRA providers currently do—for fairly low fees. Low costs translate into higher retirement income.

Variations

We mentioned above that the specifics of how such arrangements are structured are best left to the market place to determine.

This might mean different smoothing techniques beyond the simple "all or nothing" approach outlined in the central return area shown above. Also, the concept of an initial "buy-in charge" was merely mentioned in passing above. Some charge is needed to build the initial buffer as well as to avoid diluting an already existing buffer by virtue of new joiners. On the other hand, an unrealistically large buy-in charge would discourage individuals from joining in the first place.

Similarly, the use of the buffer could be more sophisticated than a simple "peanut butter" approach for all. For example, account holders who have suffered particularly large losses in the past might get a larger share.

In general, there should also be rules or suggestions around the annual withdrawal amounts. The easiest approach consists of a table that gives percentages by age of the account balance at the beginning of the year, similar to the IRS' current required minimum withdrawal rules. Such percentages can vary based on deferral age, the targeted annual cost-of-living increase, etc. Alternatively, there could be some further smoothing to attempt to maintain a given level of annual withdrawals for as long as possible.

In reality, providers would likely want to perform extensive modeling as well as consumer research to determine the ideal combination of a nearly endless array of possible parameters. It would be up to some regulator or consumer protection agency to determine what illustrations to require to ensure the fair comparison of alternatives offered in the market place.

Regardless, the principles outlined above should hold true regardless of the specific variation.

An Example and Analysis

To illustrate the mechanics of ERiSSA plans, let's contemplate a simple example:

- $100,000 is invested into an ERiSSA arrangement that invests exclusively in equities. In fact, we assume the equities to mirror the Standard & Poor's 500 index[2] with a 25 basis point (bp) fee charged by the provider.

2 Historical returns for the S&P 500 taken from http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histretSP.html.

- The decumulation phase starts at age 65, and a deferred annuity to age 85 is purchased. The cost of the annuity is assumed to be 12 percent of the principal.
- A central return area of 0 percent to 14 percent is chosen. Actual returns within that range are credited to the individual accounts without impact to the buffer. Excess returns go straight to the buffer (with no maximum), and shortfalls are compensated by the buffer to the maximum extent possible (even if it means completely depleting it).
- The initial buy-in premium is 10 percent. However, two variations are considered. In one example, the arrangement is completely new and therefore a buffer equal to 11 percent (i.e., 10/90) of the account balances exists. In the other example, the arrangement has been in effect for a while and a buffer has been built up equal to 33 percent of the account balances.
- Returns are credited annually (at the end of the year), and withdrawals are also made annually (at the beginning of the year). Withdrawal amounts equal what could be purchased for the account balance at any given time if investment returns of 7 percent (the target rate) were to be realized for the remainder of the period until age 85—at which point the capital is exhausted.

Tables 1 and 2 show the development of the relevant balances over time under both buffer scenarios. The investment returns assumed are those of the S&P 500 from 1970 to 1990.

The appendix shows the results of the calculations for the 20-year S&P 500 scenarios from 1930–50 through 1990–2010 in 10-year intervals. The development of the annual retirement income under each of these scenarios is shown in Tables 3 and 4 and Figures 1 and 2.

Overall, even in this simple example (real implementations would likely be more complex), the arrangement does a decent job maintaining reasonably steady retirement income that exceeds what would be available from annuities or via the 4 percent rule.

The exception is the 1930–50 scenario, which starts with catastrophic returns of −25 percent, −44 percent and −9 percent, which deplete the buffer and account balances in a manner that cannot be recovered from. This illustrates the unfortunate reality of the residual risk that exists with risky investments.

Open Questions

We recognize that there are some open questions. Specifically, there are potential questions on how the buffer is generated when a product is first launched. There are related questions about the size of a buy-in premium and about portability rules in general. Such questions, however, go beyond the scope of this paper, and are therefore best left for future research and contemplation.

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Table 1 1970–90 Scenario with Small Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/ (Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	3.56%	3.36%	3.36%	0.00%	2,426.36	8,800	144	8,944
66	74,640	9.04%	6,749	14.22%	14.02%	14.00%	0.02%	9,504.65	8,944	149	9,094
67	77,395	9.29%	7,191	18.76%	18.56%	14.00%	4.56%	9,828.61	9,094	3,342	12,436
68	80,033	9.57%	7,661	-14.31%	-14.51%	0.00%	-14.51%	-	12,436	(10,356)	2,079
69	72,372	9.89%	7,160	-25.90%	-26.10%	-22.71%	-3.39%	(14,810.78)	2,079	(2,079)	-
70	50,401	10.26%	5,172	37.00%	36.80%	14.00%	22.80%	6,332.11	-	10,403	10,403
71	51,561	10.69%	5,510	23.83%	23.63%	14.00%	9.63%	6,447.20	10,403	4,527	14,930
72	52,499	11.18%	5,871	-6.98%	-7.18%	0.00%	-7.18%	-	14,930	(3,255)	11,675
73	46,628	11.77%	5,487	6.51%	6.31%	6.31%	0.00%	2,596.03	11,675	82	11,757
74	43,738	12.46%	5,451	18.52%	18.32%	14.00%	4.32%	5,360.10	11,757	1,731	13,488
75	43,647	13.31%	5,808	31.74%	31.54%	14.00%	17.54%	5,297.43	13,488	6,713	20,200
76	43,136	14.34%	6,188	-4.70%	-4.90%	0.00%	-4.90%	-	20,200	(1,737)	18,464
77	36,949	15.65%	5,783	20.42%	20.22%	14.00%	6.22%	4,363.19	18,464	2,001	20,465
78	35,529	17.34%	6,161	22.34%	22.14%	14.00%	8.14%	4,111.47	20,465	2,449	22,914
79	33,479	19.61%	6,564	6.15%	5.95%	5.95%	0.00%	1,601.43	22,914	54	22,968
80	28,516	22.79%	6,500	31.24%	31.04%	14.00%	17.04%	3,082.30	22,968	3,796	26,763
81	25,099	27.59%	6,925	18.49%	18.29%	14.00%	4.29%	2,544.30	26,763	816	27,579
82	20,718	35.61%	7,378	5.81%	5.61%	5.61%	0.00%	748.36	27,579	27	27,606
83	14,088	51.69%	7,282	16.54%	16.34%	14.00%	2.34%	952.82	27,606	173	27,779
84	7,759	100.00%	7,759	31.48%	31.28%	n/a	n/a	-	27,779	-	27,779

Note: BOY indicates beginning of year; EOY indicates end of year.

Table 2 1970–90 Scenario with Larger Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	3.56%	3.36%	3.36%	0.00%	2,426.36	26,400	144	26,544
66	74,640	9.04%	6,749	14.22%	14.02%	14.00%	0.02%	9,504.65	26,544	149	26,694
67	77,395	9.29%	7,191	18.76%	18.56%	14.00%	4.56%	9,828.61	26,694	3,342	30,036
68	80,033	9.57%	7,661	-14.31%	-14.51%	0.00%	-14.51%	-	30,036	(10,356)	19,679
69	72,372	9.89%	7,160	-25.90%	-26.10%	0.00%	-26.10%	-	19,679	(16,890)	2,789
70	65,212	10.26%	6,692	37.00%	36.80%	14.00%	22.80%	8,192.85	2,789	13,460	16,249
71	66,713	10.69%	7,129	23.83%	23.63%	14.00%	9.63%	8,341.76	16,249	5,857	22,106
72	67,926	11.18%	7,596	-6.98%	-7.18%	0.00%	-7.18%	-	22,106	(4,211)	17,895
73	60,330	11.77%	7,099	6.51%	6.31%	6.31%	0.00%	3,358.89	17,895	106	18,001
74	56,590	12.46%	7,053	18.52%	18.32%	14.00%	4.32%	6,935.21	18,001	2,239	20,241
75	56,472	13.31%	7,514	31.74%	31.54%	14.00%	17.54%	6,854.12	20,241	8,685	28,926
76	55,812	14.34%	8,006	-4.70%	-4.90%	0.00%	-4.90%	-	28,926	(2,247)	26,679
77	47,806	15.65%	7,482	20.42%	20.22%	14.00%	6.22%	5,645.35	26,679	2,589	29,268
78	45,969	17.34%	7,972	22.34%	22.14%	14.00%	8.14%	5,319.66	29,268	3,169	32,437
79	43,317	19.61%	8,493	6.15%	5.95%	5.95%	0.00%	2,072.03	32,437	70	32,506
80	36,896	22.79%	8,410	31.24%	31.04%	14.00%	17.04%	3,988.05	32,506	4,911	37,417
81	32,474	27.59%	8,960	18.49%	18.29%	14.00%	4.29%	3,291.97	37,417	1,056	38,473
82	26,806	35.61%	9,546	5.81%	5.61%	5.61%	0.00%	968.27	38,473	35	38,508
83	18,228	51.69%	9,422	16.54%	16.34%	14.00%	2.34%	1,232.82	38,508	224	38,731
84	10,039	100.00%	10,039	31.48%	31.28%	n/a	n/a	-	38,731	-	38,731

Note: BOY indicates beginning of year; EOY indicates end of year.

Table 3 All Scenarios with Small Buffer

Year	1930-50	1940-60	1950-70	1960-80	1970-90	1980-2000	1990-2010
1	6,987	6,987	6,987	6,987	6,987	6,987	6,987
2	5,685	6,530	7,444	6,539	6,749	7,444	6,530
3	2,984	5,425	7,931	6,967	7,191	6,957	6,957
4	2,548	5,780	8,450	6,511	7,661	7,412	6,976
5	2,714	6,158	7,897	6,937	7,160	7,897	7,156
6	2,537	6,561	8,414	7,391	5,172	7,819	6,764
7	2,703	6,990	8,964	7,750	5,510	8,331	7,206
8	2,880	6,533	8,984	7,243	5,871	8,876	7,678
9	2,691	6,411	8,396	7,717	5,487	8,761	8,180
10	2,867	6,321	8,946	7,977	5,451	9,334	8,715
11	2,680	6,734	9,352	7,455	5,808	9,945	9,285
12	2,504	7,175	8,752	7,202	6,188	9,294	8,678
13	2,341	7,644	9,325	7,673	5,783	9,902	8,110
14	2,494	8,144	8,715	8,175	6,161	9,929	7,580
15	2,657	7,612	9,285	7,640	6,564	10,186	8,075
16	2,831	8,110	9,893	7,140	6,500	9,627	8,343
17	3,016	8,640	10,373	7,607	6,925	10,257	8,158
18	2,819	8,659	9,695	8,105	7,378	10,928	8,691
19	2,766	8,093	10,329	7,575	7,282	11,643	8,552
20	2,727	8,622	10,677	7,526	7,759	12,404	7,992
Avg.	**3,071**	**7,156**	**8,940**	**7,406**	**6,479**	**9,197**	**7,831**

Table 4 All Scenarios with Large Buffer

Year	1930-50	1940-60	1950-70	1960-80	1970-90	1980-2000	1990-2010
1	6,987	6,987	6,987	6,987	6,987	6,987	6,987
2	6,530	6,530	7,444	6,539	6,749	7,444	6,530
3	4,195	6,103	7,931	6,967	7,191	6,957	6,957
4	3,582	6,502	8,450	6,511	7,661	7,412	6,976
5	3,816	6,927	7,897	6,937	7,160	7,897	7,156
6	3,566	7,380	8,414	7,391	6,692	7,819	6,764
7	3,799	7,863	8,964	7,750	7,129	8,331	7,206
8	4,048	7,349	8,984	7,243	7,596	8,876	7,678
9	3,783	7,211	8,396	7,717	7,099	8,761	8,180
10	4,031	7,110	8,946	7,977	7,053	9,334	8,715
11	3,767	7,575	9,352	7,455	7,514	9,945	9,285
12	3,521	8,071	8,752	7,202	8,006	9,294	8,678
13	3,290	8,599	9,325	7,673	7,482	9,902	8,110
14	3,506	9,162	8,715	8,175	7,972	9,929	7,580
15	3,735	8,562	9,285	7,640	8,493	10,186	8,075
16	3,979	9,122	9,893	7,140	8,410	9,627	8,343
17	4,240	9,719	10,373	7,607	8,960	10,257	8,158
18	3,962	9,741	9,695	8,105	9,546	10,928	8,691
19	3,888	9,104	10,329	7,575	9,422	11,643	8,552
20	3,834	9,699	10,677	7,526	10,039	12,404	7,992
Avg.	**4,103**	**7,966**	**8,940**	**7,406**	**7,858**	**9,197**	**7,831**

Figure 1 All Scenarios with Small Buffer

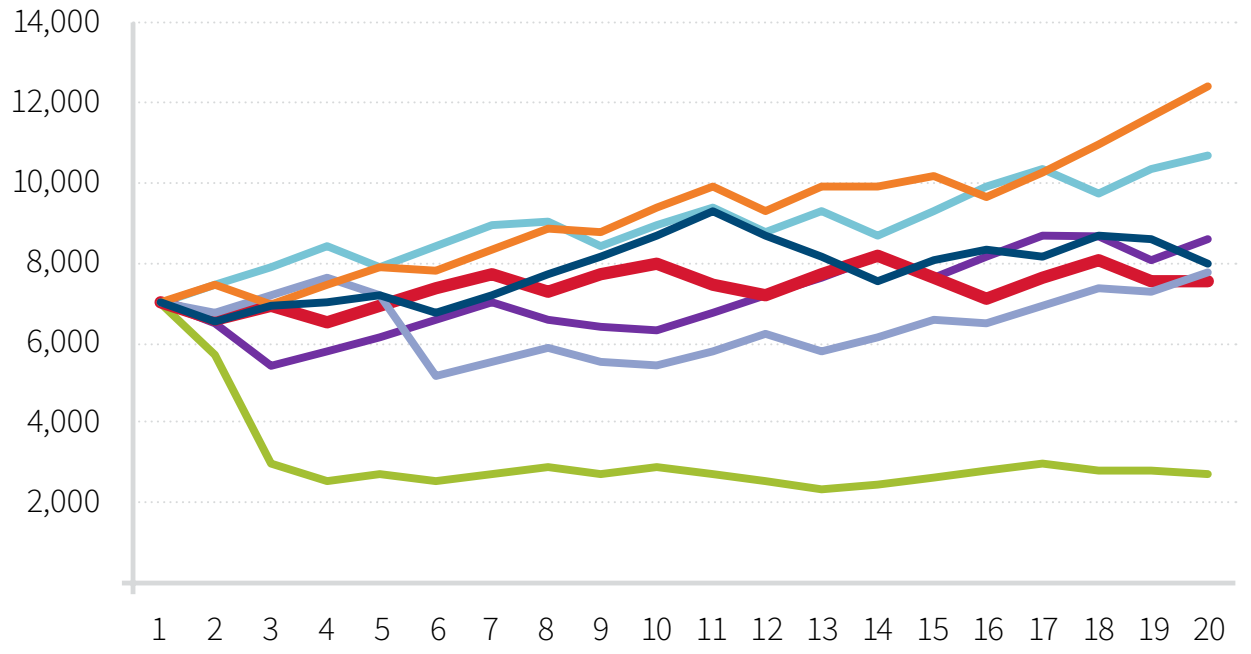
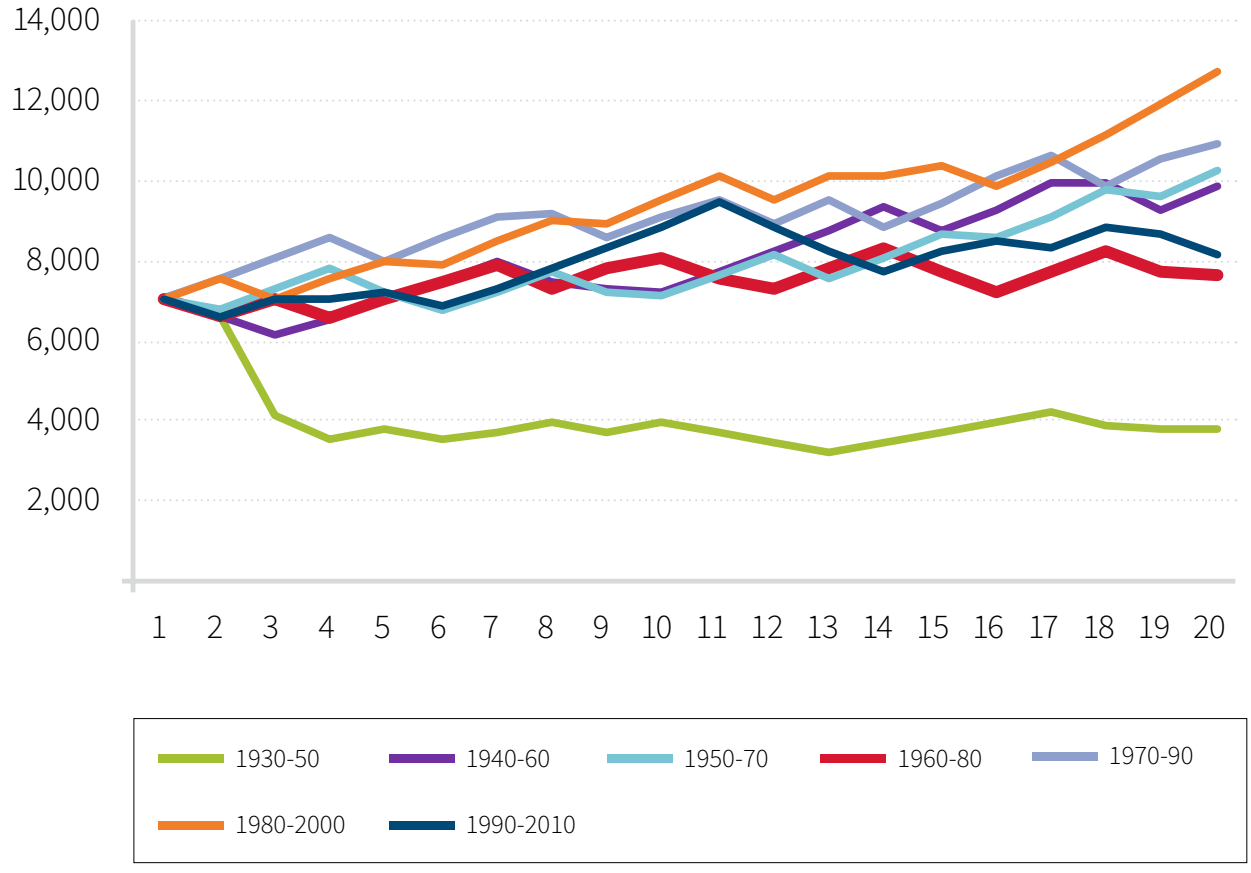


Figure 2 All Scenarios with Large Buffer



Appendix

Table 1A 1930–50 Scenario with Small Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	-25.12%	-25.32%	-12.93%	-12.39%	(9,339.95)	8,800	(8,800)	—
67	32,117	9.29%	2,984	-8.64%	-8.84%	-8.64%	-0.20%	(2,517.08)	—	—	—
68	26,616	9.57%	2,548	49.98%	49.78%	14.00%	35.78%	3,369.52	—	8,660	8,660
69	27,438	9.89%	2,714	-1.19%	-1.39%	0.00%	-1.39%	—	8,660	(294)	8,365
70	24,723	10.26%	2,537	46.74%	46.54%	14.00%	32.54%	3,106.06	8,365	7,264	15,629
71	25,292	10.69%	2,703	31.94%	31.74%	14.00%	17.74%	3,162.52	15,629	4,053	19,682
72	25,752	11.18%	2,880	-35.34%	-35.54%	0.00%	-35.54%	—	19,682	(8,083)	11,599
73	22,872	11.77%	2,691	29.28%	29.08%	14.00%	15.08%	2,825.34	11,599	3,084	14,682
74	23,006	12.46%	2,867	-1.10%	-1.30%	0.00%	-1.30%	—	14,682	(222)	14,461
75	20,139	13.31%	2,680	-10.67%	-10.87%	0.00%	-10.87%	—	14,461	(1,863)	12,598
76	17,459	14.34%	2,504	-12.77%	-12.97%	0.00%	-12.97%	—	12,598	(1,910)	10,688
77	14,955	15.65%	2,341	19.17%	18.97%	14.00%	4.97%	1,765.98	10,688	652	11,340
78	14,380	17.34%	2,494	25.06%	24.86%	14.00%	10.86%	1,664.10	11,340	1,315	12,655
79	13,551	19.61%	2,657	19.03%	18.83%	14.00%	4.83%	1,525.11	12,655	548	13,203
80	12,419	22.79%	2,831	35.82%	35.62%	14.00%	21.62%	1,342.34	13,203	2,092	15,295
81	10,930	27.59%	3,016	-8.43%	-8.63%	0.00%	-8.63%	—	15,295	(667)	14,628
82	7,915	35.61%	2,819	5.20%	5.00%	5.00%	0.00%	254.80	14,628	10	14,638
83	5,351	51.69%	2,766	5.70%	5.50%	5.50%	0.00%	142.17	14,638	5	14,643
84	2,727	100.00%	2,727	18.30%	18.10%	n/a	n/a	—	14,643	—	14,643

Table 2A 1930–50 Scenario with Large Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	-25.12%	-25.32%	0.00%	-25.32%	-	26,400	(18,140)	8,260
66	72,213	9.04%	6,530	-43.84%	-44.04%	-31.26%	-12.78%	(20,535.55)	8,260	(8,260)	-
67	45,148	9.29%	4,195	-8.64%	-8.84%	-8.64%	-0.20%	(3,538.36)	-	-	-
68	37,415	9.57%	3,582	49.98%	49.78%	14.00%	35.78%	4,736.67	-	12,173	12,173
69	38,570	9.89%	3,816	-1.19%	-1.39%	0.00%	-1.39%	-	12,173	(414)	11,760
70	34,754	10.26%	3,566	46.74%	46.54%	14.00%	32.54%	4,366.32	11,760	10,211	21,971
71	35,554	10.69%	3,799	31.94%	31.74%	14.00%	17.74%	4,445.67	21,971	5,697	27,667
72	36,200	11.18%	4,048	-35.34%	-35.54%	0.00%	-35.54%	-	27,667	(11,363)	16,305
73	32,152	11.77%	3,783	29.28%	29.08%	14.00%	15.08%	3,971.69	16,305	4,335	20,640
74	32,341	12.46%	4,031	-1.10%	-1.30%	0.00%	-1.30%	-	20,640	(311)	20,328
75	28,310	13.31%	3,767	-10.67%	-10.87%	0.00%	-10.87%	-	20,328	(2,619)	17,709
76	24,543	14.34%	3,521	-12.77%	-12.97%	0.00%	-12.97%	-	17,709	(2,685)	15,025
77	21,023	15.65%	3,290	19.17%	18.97%	14.00%	4.97%	2,482.52	15,025	917	15,942
78	20,215	17.34%	3,506	25.06%	24.86%	14.00%	10.86%	2,339.29	15,942	1,848	17,790
79	19,049	19.61%	3,735	19.03%	18.83%	14.00%	4.83%	2,143.91	17,790	770	18,560
80	17,458	22.79%	3,979	35.82%	35.62%	14.00%	21.62%	1,886.97	18,560	2,941	21,501
81	15,365	27.59%	4,240	-8.43%	-8.63%	0.00%	-8.63%	-	21,501	(938)	20,563
82	11,126	35.61%	3,962	5.20%	5.00%	5.00%	0.00%	358.18	20,563	14	20,577
83	7,522	51.69%	3,888	5.70%	5.50%	5.50%	0.00%	199.86	20,577	7	20,585
84	3,834	100.00%	3,834	18.30%	18.10%	n/a	n/a	-	20,585	-	20,585

Table 3A 1940–60 Scenario with Small Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	-10.67%	-10.87%	0.00%	-10.87%	-	8,800	(7,705)	1,095
66	72,213	9.04%	6,530	-12.77%	-12.97%	-11.10%	-1.87%	(7,292.91)	1,095	(1,095)	-
67	58,390	9.29%	5,425	19.17%	18.97%	14.00%	4.97%	7,415.17	-	2,738	2,738
68	60,381	9.57%	5,780	25.06%	24.86%	14.00%	10.86%	7,644.10	2,738	6,039	8,777
69	62,245	9.89%	6,158	19.03%	18.83%	14.00%	4.83%	7,852.15	8,777	2,821	11,598
70	63,939	10.26%	6,561	35.82%	35.62%	14.00%	21.62%	8,032.93	11,598	12,520	24,118
71	65,411	10.69%	6,990	-8.43%	-8.63%	0.00%	-8.63%	-	24,118	(4,925)	19,193
72	58,421	11.18%	6,533	5.20%	5.00%	5.00%	0.00%	2,594.40	19,193	104	19,297
73	54,482	11.77%	6,411	5.70%	5.50%	5.50%	0.00%	2,643.95	19,297	96	19,393
74	50,716	12.46%	6,321	18.30%	18.10%	14.00%	4.10%	6,215.29	19,393	1,909	21,302
75	50,610	13.31%	6,734	30.81%	30.61%	14.00%	16.61%	6,142.62	21,302	7,376	28,678
76	50,018	14.34%	7,175	23.68%	23.48%	14.00%	9.48%	5,998.10	28,678	4,147	32,825
77	48,842	15.65%	7,644	18.15%	17.95%	14.00%	3.95%	5,767.63	32,825	1,710	34,535
78	46,965	17.34%	8,144	-1.21%	-1.41%	0.00%	-1.41%	-	34,535	(470)	34,065
79	38,821	19.61%	7,612	52.56%	52.36%	14.00%	38.36%	4,369.26	34,065	12,034	46,099
80	35,578	22.79%	8,110	32.60%	32.40%	14.00%	18.40%	3,845.62	46,099	5,109	51,208
81	31,314	27.59%	8,640	7.44%	7.24%	7.24%	0.00%	1,641.62	51,208	45	51,254
82	24,316	35.61%	8,659	-10.46%	-10.66%	0.00%	-10.66%	-	51,254	(1,638)	49,616
83	15,656	51.69%	8,093	43.72%	43.52%	14.00%	29.52%	1,058.89	49,616	2,248	51,864
84	8,622	100.00%	8,622	12.06%	11.86%	n/a	n/a	-	51,864	-	51,864

Table 4A 1940–60 Scenario with Large Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	-10.67%	-10.87%	0.00%	-10.87%	-	26,400	(7,705)	18,695
66	72,213	9.04%	6,530	-12.77%	-12.97%	0.00%	-12.97%	-	18,695	(8,388)	10,307
67	65,683	9.29%	6,103	19.17%	18.97%	14.00%	4.97%	8,341.32	10,307	3,080	13,387
68	67,922	9.57%	6,502	25.06%	24.86%	14.00%	10.86%	8,598.85	13,387	6,793	20,181
69	70,019	9.89%	6,927	19.03%	18.83%	14.00%	4.83%	8,832.88	20,181	3,174	23,354
70	71,925	10.26%	7,380	35.82%	35.62%	14.00%	21.62%	9,036.24	23,354	14,084	37,438
71	73,581	10.69%	7,863	-8.43%	-8.63%	0.00%	-8.63%	-	37,438	(5,540)	31,898
72	65,718	11.18%	7,349	5.20%	5.00%	5.00%	0.00%	2,918.44	31,898	117	32,014
73	61,287	11.77%	7,211	5.70%	5.50%	5.50%	0.00%	2,974.17	32,014	108	32,123
74	57,050	12.46%	7,110	18.30%	18.10%	14.00%	4.10%	6,991.57	32,123	2,147	34,270
75	56,931	13.31%	7,575	30.81%	30.61%	14.00%	16.61%	6,909.82	34,270	8,297	42,567
76	56,266	14.34%	8,071	23.68%	23.48%	14.00%	9.48%	6,747.25	42,567	4,665	47,232
77	54,942	15.65%	8,599	18.15%	17.95%	14.00%	3.95%	6,488.00	47,232	1,923	49,155
78	52,831	17.34%	9,162	-1.21%	-1.41%	0.00%	-1.41%	-	49,155	(528)	48,627
79	43,669	19.61%	8,562	52.56%	52.36%	14.00%	38.36%	4,914.98	48,627	13,537	62,164
80	40,022	22.79%	9,122	32.60%	32.40%	14.00%	18.40%	4,325.93	62,164	5,747	67,911
81	35,225	27.59%	9,719	7.44%	7.24%	7.24%	0.00%	1,846.65	67,911	51	67,962
82	27,353	35.61%	9,741	-10.46%	-10.66%	0.00%	-10.66%	-	67,962	(1,842)	66,120
83	17,612	51.69%	9,104	43.72%	43.52%	14.00%	29.52%	1,191.14	66,120	2,529	68,649
84	9,699	100.00%	9,699	12.06%	11.86%	n/a	n/a	-	68,649	-	68,649

Table 5A 1950–70 Scenarios with Small Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	30.81%	30.61%	14.00%	16.61%	10,109.84	8,800	12,139	20,939
66	82,323	9.04%	7,444	23.68%	23.48%	14.00%	9.48%	10,483.07	20,939	7,248	28,187
67	85,362	9.29%	7,931	18.15%	17.95%	14.00%	3.95%	10,840.37	28,187	3,213	31,401
68	88,272	9.57%	8,450	-1.21%	-1.41%	0.00%	-1.41%	-	31,401	(966)	30,435
69	79,822	9.89%	7,897	52.56%	52.36%	14.00%	38.36%	10,069.48	30,435	27,734	58,169
70	81,994	10.26%	8,414	32.60%	32.40%	14.00%	18.40%	10,301.31	58,169	13,686	71,855
71	83,882	10.69%	8,964	7.44%	7.24%	7.24%	0.00%	5,424.07	71,855	150	72,005
72	80,342	11.18%	8,984	-10.46%	-10.66%	0.00%	-10.66%	-	72,005	(7,464)	64,541
73	71,358	11.77%	8,396	43.72%	43.52%	14.00%	29.52%	8,814.63	64,541	18,712	83,253
74	71,776	12.46%	8,946	12.06%	11.86%	11.86%	0.00%	7,451.71	83,253	126	83,379
75	70,282	13.31%	9,352	0.34%	0.14%	0.14%	0.00%	85.30	83,379	122	83,501
76	61,016	14.34%	8,752	26.64%	26.44%	14.00%	12.44%	7,316.85	83,501	6,606	90,107
77	59,580	15.65%	9,325	-8.81%	-9.01%	0.00%	-9.01%	-	90,107	(4,427)	85,679
78	50,255	17.34%	8,715	22.61%	22.41%	14.00%	8.41%	5,815.62	85,679	3,577	89,256
79	47,356	19.61%	9,285	16.42%	16.22%	14.00%	2.22%	5,329.90	89,256	921	90,177
80	43,401	22.79%	9,893	12.40%	12.20%	12.20%	0.00%	4,087.98	90,177	67	90,244
81	37,596	27.59%	10,373	-9.97%	-10.17%	0.00%	-10.17%	-	90,244	(2,714)	87,530
82	27,223	35.61%	9,695	23.80%	23.60%	14.00%	9.60%	2,453.94	87,530	1,718	89,248
83	19,982	51.69%	10,329	10.81%	10.61%	10.61%	0.00%	1,024.20	89,248	19	89,267
84	10,677	100.00%	10,677	-8.24%	-8.44%	n/a	n/a	-	89,267	-	89,267

Table 6A 1950–70 Scenarios with Large Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	30.81%	30.61%	14.00%	16.61%	10,109.84	26,400	12,139	38,539
66	82,323	9.04%	7,444	23.68%	23.48%	14.00%	9.48%	10,483.07	38,539	7,248	45,787
67	85,362	9.29%	7,931	18.15%	17.95%	14.00%	3.95%	10,840.37	45,787	3,213	49,001
68	88,272	9.57%	8,450	-1.21%	-1.41%	0.00%	-1.41%	-	49,001	(966)	48,035
69	79,822	9.89%	7,897	52.56%	52.36%	14.00%	38.36%	10,069.48	48,035	27,734	75,769
70	81,994	10.26%	8,414	32.60%	32.40%	14.00%	18.40%	10,301.31	75,769	13,686	89,455
71	83,882	10.69%	8,964	7.44%	7.24%	7.24%	0.00%	5,424.07	89,455	150	89,605
72	80,342	11.18%	8,984	-10.46%	-10.66%	0.00%	-10.66%	-	89,605	(7,464)	82,141
73	71,358	11.77%	8,396	43.72%	43.52%	14.00%	29.52%	8,814.63	82,141	18,712	100,853
74	71,776	12.46%	8,946	12.06%	11.86%	11.86%	0.00%	7,451.71	100,853	126	100,979
75	70,282	13.31%	9,352	0.34%	0.14%	0.14%	0.00%	85.30	100,979	122	101,101
76	61,016	14.34%	8,752	26.64%	26.44%	14.00%	12.44%	7,316.85	101,101	6,606	107,707
77	59,580	15.65%	9,325	-8.81%	-9.01%	0.00%	-9.01%	-	107,707	(4,427)	103,279
78	50,255	17.34%	8,715	22.61%	22.41%	14.00%	8.41%	5,815.62	103,279	3,577	106,856
79	47,356	19.61%	9,285	16.42%	16.22%	14.00%	2.22%	5,329.90	106,856	921	107,777
80	43,401	22.79%	9,893	12.40%	12.20%	12.20%	0.00%	4,087.98	107,777	67	107,844
81	37,596	27.59%	10,373	-9.97%	-10.17%	0.00%	-10.17%	-	107,844	(2,714)	105,130
82	27,223	35.61%	9,695	23.80%	23.60%	14.00%	9.60%	2,453.94	105,130	1,718	106,848
83	19,982	51.69%	10,329	10.81%	10.61%	10.61%	0.00%	1,024.20	106,848	19	106,867
84	10,677	100.00%	10,677	-8.24%	-8.44%	n/a	n/a	-	106,867	-	106,867

Table 7A 1960–80 Scenario with Small Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	0.34%	0.14%	0.14%	0.00%	101.10	8,800	144	8,944
66	72,314	9.04%	6,539	26.64%	26.44%	14.00%	12.44%	9,208.55	8,944	8,314	17,258
67	74,984	9.29%	6,967	-8.81%	-9.01%	0.00%	-9.01%	-	17,258	(5,992)	11,266
68	68,017	9.57%	6,511	22.61%	22.41%	14.00%	8.41%	8,610.88	11,266	5,296	16,562
69	70,117	9.89%	6,937	16.42%	16.22%	14.00%	2.22%	8,845.25	16,562	1,529	18,091
70	72,026	10.26%	7,391	12.40%	12.20%	12.20%	0.00%	7,885.46	18,091	129	18,220
71	72,520	10.69%	7,750	-9.97%	-10.17%	0.00%	-10.17%	-	18,220	(6,458)	11,762
72	64,771	11.18%	7,243	23.80%	23.60%	14.00%	9.60%	8,053.87	11,762	5,638	17,400
73	65,582	11.77%	7,717	10.81%	10.61%	10.61%	0.00%	6,139.46	17,400	116	17,516
74	64,004	12.46%	7,977	-8.24%	-8.44%	0.00%	-8.44%	-	17,516	(4,617)	12,899
75	56,027	13.31%	7,455	3.56%	3.36%	3.36%	0.00%	1,632.02	12,899	97	12,996
76	50,204	14.34%	7,202	14.22%	14.02%	14.00%	0.02%	6,020.37	12,996	95	13,091
77	49,023	15.65%	7,673	18.76%	18.56%	14.00%	4.56%	5,789.04	13,091	1,968	15,059
78	47,139	17.34%	8,175	-14.31%	-14.51%	0.00%	-14.51%	-	15,059	(5,576)	9,483
79	38,965	19.61%	7,640	-25.90%	-26.10%	0.00%	-26.10%	-	9,483	(8,113)	1,370
80	31,325	22.79%	7,140	37.00%	36.80%	14.00%	22.80%	3,385.88	1,370	5,563	6,933
81	27,571	27.59%	7,607	23.83%	23.63%	14.00%	9.63%	2,794.90	6,933	1,962	8,895
82	22,758	35.61%	8,105	-6.98%	-7.18%	0.00%	-7.18%	-	8,895	(1,023)	7,872
83	14,654	51.69%	7,575	6.51%	6.31%	6.31%	0.00%	446.69	7,872	14	7,887
84	7,526	100.00%	7,526	18.52%	18.32%	n/a	n/a	-	7,887	-	7,887

Table 8A 1960–80 Scenario with Large Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	0.34%	0.14%	0.14%	0.00%	101.10	26,400	144	26,544
66	72,314	9.04%	6,539	26.64%	26.44%	14.00%	12.44%	9,208.55	26,544	8,314	34,858
67	74,984	9.29%	6,967	-8.81%	-9.01%	0.00%	-9.01%	-	34,858	(5,992)	28,866
68	68,017	9.57%	6,511	22.61%	22.41%	14.00%	8.41%	8,610.88	28,866	5,296	34,162
69	70,117	9.89%	6,937	16.42%	16.22%	14.00%	2.22%	8,845.25	34,162	1,529	35,691
70	72,026	10.26%	7,391	12.40%	12.20%	12.20%	0.00%	7,885.46	35,691	129	35,820
71	72,520	10.69%	7,750	-9.97%	-10.17%	0.00%	-10.17%	-	35,820	(6,458)	29,362
72	64,771	11.18%	7,243	23.80%	23.60%	14.00%	9.60%	8,053.87	29,362	5,638	35,000
73	65,582	11.77%	7,717	10.81%	10.61%	10.61%	0.00%	6,139.46	35,000	116	35,116
74	64,004	12.46%	7,977	-8.24%	-8.44%	0.00%	-8.44%	-	35,116	(4,617)	30,499
75	56,027	13.31%	7,455	3.56%	3.36%	3.36%	0.00%	1,632.02	30,499	97	30,596
76	50,204	14.34%	7,202	14.22%	14.02%	14.00%	0.02%	6,020.37	30,596	95	30,691
77	49,023	15.65%	7,673	18.76%	18.56%	14.00%	4.56%	5,789.04	30,691	1,968	32,659
78	47,139	17.34%	8,175	-14.31%	-14.51%	0.00%	-14.51%	-	32,659	(5,576)	27,083
79	38,965	19.61%	7,640	-25.90%	-26.10%	0.00%	-26.10%	-	27,083	(8,113)	18,970
80	31,325	22.79%	7,140	37.00%	36.80%	14.00%	22.80%	3,385.88	18,970	5,563	24,533
81	27,571	27.59%	7,607	23.83%	23.63%	14.00%	9.63%	2,794.90	24,533	1,962	26,495
82	22,758	35.61%	8,105	-6.98%	-7.18%	0.00%	-7.18%	-	26,495	(1,023)	25,472
83	14,654	51.69%	7,575	6.51%	6.31%	6.31%	0.00%	446.69	25,472	14	25,487
84	7,526	100.00%	7,526	18.52%	18.32%	n/a	n/a	-	25,487	-	25,487

Table 9A 1970–90 Scenario with Small Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	3.56%	3.36%	3.36%	0.00%	2,426.36	8,800	144	8,944
66	74,640	9.04%	6,749	14.22%	14.02%	14.00%	0.02%	9,504.65	8,944	149	9,094
67	77,395	9.29%	7,191	18.76%	18.56%	14.00%	4.56%	9,828.61	9,094	3,342	12,436
68	80,033	9.57%	7,661	-14.31%	-14.51%	0.00%	-14.51%	-	12,436	(10,356)	2,079
69	72,372	9.89%	7,160	-25.90%	-26.10%	-22.71%	-3.39%	(14,810.78)	2,079	(2,079)	-
70	50,401	10.26%	5,172	37.00%	36.80%	14.00%	22.80%	6,332.11	-	10,403	10,403
71	51,561	10.69%	5,510	23.83%	23.63%	14.00%	9.63%	6,447.20	10,403	4,527	14,930
72	52,499	11.18%	5,871	-6.98%	-7.18%	0.00%	-7.18%	-	14,930	(3,255)	11,675
73	46,628	11.77%	5,487	6.51%	6.31%	6.31%	0.00%	2,596.03	11,675	82	11,757
74	43,738	12.46%	5,451	18.52%	18.32%	14.00%	4.32%	5,360.10	11,757	1,731	13,488
75	43,647	13.31%	5,808	31.74%	31.54%	14.00%	17.54%	5,297.43	13,488	6,713	20,200
76	43,136	14.34%	6,188	-4.70%	-4.90%	0.00%	-4.90%	-	20,200	(1,737)	18,464
77	36,949	15.65%	5,783	20.42%	20.22%	14.00%	6.22%	4,363.19	18,464	2,001	20,465
78	35,529	17.34%	6,161	22.34%	22.14%	14.00%	8.14%	4,111.47	20,465	2,449	22,914
79	33,479	19.61%	6,564	6.15%	5.95%	5.95%	0.00%	1,601.43	22,914	54	22,968
80	28,516	22.79%	6,500	31.24%	31.04%	14.00%	17.04%	3,082.30	22,968	3,796	26,763
81	25,099	27.59%	6,925	18.49%	18.29%	14.00%	4.29%	2,544.30	26,763	816	27,579
82	20,718	35.61%	7,378	5.81%	5.61%	5.61%	0.00%	748.36	27,579	27	27,606
83	14,088	51.69%	7,282	16.54%	16.34%	14.00%	2.34%	952.82	27,606	173	27,779
84	7,759	100.00%	7,759	31.48%	31.28%	n/a	n/a	-	27,779	-	27,779

Table 10A 1970–90 Scenario with Large Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	3.56%	3.36%	3.36%	0.00%	2,426.36	26,400	144	26,544
66	74,640	9.04%	6,749	14.22%	14.02%	14.00%	0.02%	9,504.65	26,544	149	26,694
67	77,395	9.29%	7,191	18.76%	18.56%	14.00%	4.56%	9,828.61	26,694	3,342	30,036
68	80,033	9.57%	7,661	-14.31%	-14.51%	0.00%	-14.51%	-	30,036	(10,356)	19,679
69	72,372	9.89%	7,160	-25.90%	-26.10%	0.00%	-26.10%	-	19,679	(16,890)	2,789
70	65,212	10.26%	6,692	37.00%	36.80%	14.00%	22.80%	8,192.85	2,789	13,460	16,249
71	66,713	10.69%	7,129	23.83%	23.63%	14.00%	9.63%	8,341.76	16,249	5,857	22,106
72	67,926	11.18%	7,596	-6.98%	-7.18%	0.00%	-7.18%	-	22,106	(4,211)	17,895
73	60,330	11.77%	7,099	6.51%	6.31%	6.31%	0.00%	3,358.89	17,895	106	18,001
74	56,590	12.46%	7,053	18.52%	18.32%	14.00%	4.32%	6,935.21	18,001	2,239	20,241
75	56,472	13.31%	7,514	31.74%	31.54%	14.00%	17.54%	6,854.12	20,241	8,685	28,926
76	55,812	14.34%	8,006	-4.70%	-4.90%	0.00%	-4.90%	-	28,926	(2,247)	26,679
77	47,806	15.65%	7,482	20.42%	20.22%	14.00%	6.22%	5,645.35	26,679	2,589	29,268
78	45,969	17.34%	7,972	22.34%	22.14%	14.00%	8.14%	5,319.66	29,268	3,169	32,437
79	43,317	19.61%	8,493	6.15%	5.95%	5.95%	0.00%	2,072.03	32,437	70	32,506
80	36,896	22.79%	8,410	31.24%	31.04%	14.00%	17.04%	3,988.05	32,506	4,911	37,417
81	32,474	27.59%	8,960	18.49%	18.29%	14.00%	4.29%	3,291.97	37,417	1,056	38,473
82	26,806	35.61%	9,546	5.81%	5.61%	5.61%	0.00%	968.27	38,473	35	38,508
83	18,228	51.69%	9,422	16.54%	16.34%	14.00%	2.34%	1,232.82	38,508	224	38,731
84	10,039	100.00%	10,039	31.48%	31.28%	n/a	n/a	-	38,731	-	38,731

Table 11A 1980–2000 Scenario with Small Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	31.74%	31.54%	14.00%	17.54%	10,109.84	8,800	12,811	21,611
66	82,323	9.04%	7,444	-4.70%	-4.90%	0.00%	-4.90%	-	21,611	(3,519)	18,091
67	74,879	9.29%	6,957	20.42%	20.22%	14.00%	6.22%	9,509.10	18,091	4,361	22,452
68	77,431	9.57%	7,412	22.34%	22.14%	14.00%	8.14%	9,802.68	22,452	5,840	28,291
69	79,822	9.89%	7,897	6.15%	5.95%	5.95%	0.00%	4,279.53	28,291	144	28,435
70	76,204	10.26%	7,819	31.24%	31.04%	14.00%	17.04%	9,573.89	28,435	11,790	40,225
71	77,959	10.69%	8,331	18.49%	18.29%	14.00%	4.29%	9,747.89	40,225	3,126	43,351
72	79,376	11.18%	8,876	5.81%	5.61%	5.61%	0.00%	3,955.03	43,351	141	43,492
73	74,455	11.77%	8,761	16.54%	16.34%	14.00%	2.34%	9,197.15	43,492	1,669	45,161
74	74,891	12.46%	9,334	31.48%	31.28%	14.00%	17.28%	9,178.01	45,161	11,459	56,620
75	74,735	13.31%	9,945	-3.06%	-3.26%	0.00%	-3.26%	-	56,620	(1,983)	54,638
76	64,791	14.34%	9,294	30.23%	30.03%	14.00%	16.03%	7,769.55	54,638	9,007	63,645
77	63,266	15.65%	9,902	7.49%	7.29%	7.29%	0.00%	3,890.27	63,645	107	63,751
78	57,255	17.34%	9,929	9.97%	9.77%	9.77%	0.00%	4,623.74	63,751	95	63,846
79	51,950	19.61%	10,186	1.33%	1.13%	1.13%	0.00%	471.93	63,846	84	63,930
80	42,236	22.79%	9,627	37.20%	37.00%	14.00%	23.00%	4,565.23	63,930	7,565	71,495
81	37,174	27.59%	10,257	22.68%	22.48%	14.00%	8.48%	3,768.40	71,495	2,336	73,831
82	30,686	35.61%	10,928	33.10%	32.90%	14.00%	18.90%	2,766.08	73,831	3,774	77,605
83	22,524	51.69%	11,643	28.34%	28.14%	14.00%	14.14%	1,523.35	77,605	1,560	79,165
84	12,404	100.00%	12,404	20.89%	20.69%	n/a	n/a	-	79,165	-	79,165

Table 12A 1980–2000 Scenario with Large Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	31.74%	31.54%	14.00%	17.54%	10,109.84	26,400	12,811	39,211
66	82,323	9.04%	7,444	-4.70%	-4.90%	0.00%	-4.90%	-	39,211	(3,519)	35,691
67	74,879	9.29%	6,957	20.42%	20.22%	14.00%	6.22%	9,509.10	35,691	4,361	40,052
68	77,431	9.57%	7,412	22.34%	22.14%	14.00%	8.14%	9,802.68	40,052	5,840	45,891
69	79,822	9.89%	7,897	6.15%	5.95%	5.95%	0.00%	4,279.53	45,891	144	46,035
70	76,204	10.26%	7,819	31.24%	31.04%	14.00%	17.04%	9,573.89	46,035	11,790	57,825
71	77,959	10.69%	8,331	18.49%	18.29%	14.00%	4.29%	9,747.89	57,825	3,126	60,951
72	79,376	11.18%	8,876	5.81%	5.61%	5.61%	0.00%	3,955.03	60,951	141	61,092
73	74,455	11.77%	8,761	16.54%	16.34%	14.00%	2.34%	9,197.15	61,092	1,669	62,761
74	74,891	12.46%	9,334	31.48%	31.28%	14.00%	17.28%	9,178.01	62,761	11,459	74,220
75	74,735	13.31%	9,945	-3.06%	-3.26%	0.00%	-3.26%	-	74,220	(1,983)	72,238
76	64,791	14.34%	9,294	30.23%	30.03%	14.00%	16.03%	7,769.55	72,238	9,007	81,245
77	63,266	15.65%	9,902	7.49%	7.29%	7.29%	0.00%	3,890.27	81,245	107	81,351
78	57,255	17.34%	9,929	9.97%	9.77%	9.77%	0.00%	4,623.74	81,351	95	81,446
79	51,950	19.61%	10,186	1.33%	1.13%	1.13%	0.00%	471.93	81,446	84	81,530
80	42,236	22.79%	9,627	37.20%	37.00%	14.00%	23.00%	4,565.23	81,530	7,565	89,095
81	37,174	27.59%	10,257	22.68%	22.48%	14.00%	8.48%	3,768.40	89,095	2,336	91,431
82	30,686	35.61%	10,928	33.10%	32.90%	14.00%	18.90%	2,766.08	91,431	3,774	95,205
83	22,524	51.69%	11,643	28.34%	28.14%	14.00%	14.14%	1,523.35	95,205	1,560	96,765
84	12,404	100.00%	12,404	20.89%	20.69%	n/a	n/a	-	96,765	-	96,765

Table 13A 1990–2010 Scenario with Small Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	-3.06%	-3.26%	0.00%	-3.26%	-	8,800	(2,210)	6,590
66	72,213	9.04%	6,530	30.23%	30.03%	14.00%	16.03%	9,195.68	6,590	10,660	17,251
67	74,879	9.29%	6,957	7.49%	7.29%	7.29%	0.00%	4,951.52	17,251	136	17,387
68	72,874	9.57%	6,976	9.97%	9.77%	9.77%	0.00%	6,438.22	17,387	132	17,518
69	72,336	9.89%	7,156	1.33%	1.13%	1.13%	0.00%	736.53	17,518	130	17,649
70	65,916	10.26%	6,764	37.20%	37.00%	14.00%	23.00%	8,281.34	17,649	13,723	31,372
71	67,434	10.69%	7,206	22.68%	22.48%	14.00%	8.48%	8,431.85	31,372	5,228	36,600
72	68,659	11.18%	7,678	33.10%	32.90%	14.00%	18.90%	8,537.43	36,600	11,647	48,247
73	69,519	11.77%	8,180	28.34%	28.14%	14.00%	14.14%	8,587.47	48,247	8,796	57,043
74	69,927	12.46%	8,715	20.89%	20.69%	14.00%	6.69%	8,569.60	57,043	4,217	61,261
75	69,781	13.31%	9,285	-9.03%	-9.23%	0.00%	-9.23%	-	61,261	(5,463)	55,798
76	60,496	14.34%	8,678	-11.85%	-12.05%	0.00%	-12.05%	-	55,798	(6,140)	49,658
77	51,818	15.65%	8,110	-21.97%	-22.17%	0.00%	-22.17%	-	49,658	(9,603)	40,055
78	43,708	17.34%	7,580	28.36%	28.16%	14.00%	14.16%	5,057.96	40,055	5,188	45,243
79	41,186	19.61%	8,075	10.74%	10.54%	10.54%	0.00%	3,489.88	45,243	66	45,309
80	36,601	22.79%	8,343	4.83%	4.63%	4.63%	0.00%	1,308.35	45,309	57	45,366
81	29,566	27.59%	8,158	15.61%	15.41%	14.00%	1.41%	2,997.21	45,366	345	45,710
82	24,406	35.61%	8,691	5.48%	5.28%	5.28%	0.00%	829.72	45,710	31	45,742
83	16,544	51.69%	8,552	-36.55%	-36.75%	0.00%	-36.75%	-	45,742	(2,921)	42,821
84	7,992	100.00%	7,992	25.94%	25.74%	n/a	n/a	-	42,821	-	42,821

Table 14A 1990–2010 Scenario with Large Buffer

BOY Age	BOY Principal	With-drawal Percentage	With-drawal ($)	Return					Buffer BOY Balance	Buffer In/(Out)	Buffer EOY Balance
				S&P 500	After Fee	To Acct	To Buffer	To Acct ($)			
65	79,200	8.82%	6,987	-3.06%	-3.26%	0.00%	-3.26%	-	26,400	(2,210)	24,190
66	72,213	9.04%	6,530	30.23%	30.03%	14.00%	16.03%	9,195.68	24,190	10,660	34,851
67	74,879	9.29%	6,957	7.49%	7.29%	7.29%	0.00%	4,951.52	34,851	136	34,987
68	72,874	9.57%	6,976	9.97%	9.77%	9.77%	0.00%	6,438.22	34,987	132	35,118
69	72,336	9.89%	7,156	1.33%	1.13%	1.13%	0.00%	736.53	35,118	130	35,249
70	65,916	10.26%	6,764	37.20%	37.00%	14.00%	23.00%	8,281.34	35,249	13,723	48,972
71	67,434	10.69%	7,206	22.68%	22.48%	14.00%	8.48%	8,431.85	48,972	5,228	54,200
72	68,659	11.18%	7,678	33.10%	32.90%	14.00%	18.90%	8,537.43	54,200	11,647	65,847
73	69,519	11.77%	8,180	28.34%	28.14%	14.00%	14.14%	8,587.47	65,847	8,796	74,643
74	69,927	12.46%	8,715	20.89%	20.69%	14.00%	6.69%	8,569.60	74,643	4,217	78,861
75	69,781	13.31%	9,285	-9.03%	-9.23%	0.00%	-9.23%	-	78,861	(5,463)	73,398
76	60,496	14.34%	8,678	-11.85%	-12.05%	0.00%	-12.05%	-	73,398	(6,140)	67,258
77	51,818	15.65%	8,110	-21.97%	-22.17%	0.00%	-22.17%	-	67,258	(9,603)	57,655
78	43,708	17.34%	7,580	28.36%	28.16%	14.00%	14.16%	5,057.96	57,655	5,188	62,843
79	41,186	19.61%	8,075	10.74%	10.54%	10.54%	0.00%	3,489.88	62,843	66	62,909
80	36,601	22.79%	8,343	4.83%	4.63%	4.63%	0.00%	1,308.35	62,909	57	62,966
81	29,566	27.59%	8,158	15.61%	15.41%	14.00%	1.41%	2,997.21	62,966	345	63,310
82	24,406	35.61%	8,691	5.48%	5.28%	5.28%	0.00%	829.72	63,310	31	63,342
83	16,544	51.69%	8,552	-36.55%	-36.75%	0.00%	-36.75%	-	63,342	(2,921)	60,421
84	7,992	100.00%	7,992	25.94%	25.74%	n/a	n/a	-	60,421	-	60,421

News Flash: Retirement Takes Over Long-Term Care

John Cutler

Protecting oneself in older age from risks is the sine qua non of retirement planning. But far too many people don't approach retirement (or retirement planning) well. From a policy perspective, we know about half the senior population will have some sort of long-term care event or need that meets the government's Health Insurance Portability and Accountability Act (HIPAA) definition of severity. And one in six (14 percent) will see serious use of long-term care services (like over five years).

The way to protect against the financial burden for this varies. The main way is for people to self-insure, drawing down what they have saved and invested. Others see their house as their best tool for converting wealth to long-term care financing. Both have limitations we won't dwell on here. Some others go into continuing care retirement communities (CCRCs). But too few think of this as a real solution (though it is nice to see the housing component included and not just the medical side). Still others use life insurance … if they have enough and it is structured to be tapped for long-term care. Another not so good solution.

What an actuary or policymaker would say is that what's really needed is protection designed solely for the long-term care risk. And there it is. Along came long-term care (LTC) insurance.

Unfortunately, LTC insurance as a stand-alone product is not working. In addition to near systemic pricing uncertainty, there is resistance from buyers. The *best* scenario, in fact, is that only one-third of the public will buy the product. So yet another solution that wasn't, as it turned out.

And it is not as if the long-term care insurance carriers have not tried to alter the glide path of these products. My take is that carriers have responded to the perceived lack of value by going in two different directions. One is to create shorter/cheaper insurance in the hopes more people will buy it. That probably is not going to work if people think it is *too* cheap a solution. Why bother to buy what amounts to a piece of paper saying you are protected when you really aren't for a substantial long-term care event?

The other direction carriers have taken is to *enhance* the product. Here the idea is to meet the value needs of the buying public by tying the LTC insurance to annuity and life products. While the cost is higher, the perceived value is greater—at least in theory. These are not truly new products and the merger of the two product lines just for the appearance of adding value for consumers does not represent new or creative thinking about how to really increase the market. My guess is that after an initial flurry of sales, this market will be just as small as stand-alone products.

As an aside, there aren't many successful ideas coming out of the advocacy/policymaking universe either. The Community Living Assistance Services and Support (CLASS) Act was essentially employer-based disability/long-term care insurance. The Federal Long Term Care Insurance Program (FLTCIP) experience is that employer-based insurance without a premium subsidy has a take-up rate of about 6 percent. Since I was the architect of this program, I'm quite happy to say it is a long-term care insurance success, with over 270,000 enrollees. However, as a policymaker myself, this is NOT a policy success.

Shift to Retirement Products

We need to recognize that long-term care risk is a component not just of aging but of retirement. Placing the solutions in the retirement space is critical to reaching the bulk of the population. I believe a retirement focus is the next likely arena for long-term care (aka, long-term services and supports or LTSS) reform. In the retirement policy world, the concept of annuitization of retirement is the current "big" idea. Combined with the additional element—recognition of risk—this would be both a powerful protection but also a natural one for individuals to understand.

One particularly exciting idea is to tap into IRAs and 401(k) products for long-term care. For IRAs, tapping into these funds is currently allowed as a penalty-free event only in case of a permanent disability. It makes

sense for this to be extended to LTC as well. What is interesting is that the cost to the federal government should be essentially neutral since these products are already tax-protected. Going further, one can see changing the regulatory structure around 401(k) products so the funds can be treated as a retirement risk protection account (an idea proposed by, among others, Anna Rappaport of the Society of Actuaries). The funds could be used to purchase a variety of options including lifetime income, supplemental health insurance and/or long-term care protection. It should be noted the Treasury Department issued regulations on longevity annuities last year, yet another indication of this interest in melding retirement and long-term planning.

A related idea here would be to standardize annuities as was done with Medicare supplement insurance. Jeffrey Brown et al.[1] recently wrote that many policymakers would consider the optimal choice in retirement to be a decumulation strategy based on annuitizing large sums of assets. Yet people do not know or trust annuities: They would rather keep what they have. (In social science parlance, they have a strong bias in favor of the pre-existing default.) Having a few core standard annuity products offered via a regulated private market at a distinct age (like Medigap is at 65) might better focus consumer interest.

Social Security

With all the concern over Social Security solvency it might be odd to suggest changes here to add long-term care protection. But if you look at work by Nancy Altman and others, this concern about Social Security is somewhat misplaced.[2] One idea that might help long-term care coverage within the Social Security context is what Bing Chen (then at Boston University) proposed in 2007.[3]

Chen's idea was to create a Social Security/long-term care plan by trading off a small portion of Social Security benefits that would provide a basic level of long-term care protection via social insurance as a base. Supplemental private long-term care insurance would be added on top. (Of note, he exempted low earners from the trade-off, relying on Medicaid as the safety net for them.) The importance of this approach is that it augments social insurance with private insurance by combining several sources of funds that currently exist in both the private and public realms.

It is probably obvious to many in this field that most policymakers undervalue private insurance. But, at its core, private long-term care insurance is not just an insurance mechanism (like Social Security); it also has the strength of holding/moving money over time and gaining the power of compound investment. Social Security for all its strengths does not do this. Social Security is a pay-as-you-go program and does not rely on the time value of money. Instead it relies on the power of taxing everyone. By combining the two concepts, you get the strength of each.

Role of Medicare

Another approach that merits interest lies in enhancing Medicare, though one does not normally think of this as a retirement product. But given Medicare's role, along with Social Security, in protecting against the financial risk or ruin for seniors, it has to be on the table. It is an artificial divide to say Medicare is health insurance and not recognize its financial importance. When Medicare was passed, more than one in four seniors were in poverty. That has been cut dramatically. Along with Social Security increases, Medicare has reduced that number to more like only one in 10 seniors.

That means a part of any retirement calculation is reliance on one's health care by Medicare. (And for poorer people, the dual eligibility for Medicaid as well.) Technically, Medicare really only covers short spells (up to 100 days) for post-acute care. Yet one surprising development over the last couple decades is how much is going to skilled nursing facilities (SNF) and home health, what most people would think of as long-term

1 Jeffrey Brown et al., "Are Cognitive Constraints a Barrier to Annuitization?" Boston College's Center for Retirement Research Issue Brief no. 15-6 (March 2015).

2 See Nancy Altman and Eric Kingson, *Social Security Works!: Why Social Security Isn't Going Broke and How Expanding It Will Help Us All* (New York: New Press, 2015).

3 Yung-Ping "Bing" Chen, "A Trade-Off Proposal for Funding Long-Term Care," Georgetown University Long-Term Care Financing Project (June 2007).

care. Coverage has risen from just 3 percent in 1988 to more like 18 percent of the total Medicare budget in 2011. This does not count drug coverage, which is more important to an SNF or home health user than to a healthy 65-year-old. It does not take much to imagine we are seeing Medicare becoming that "short and fat" program which many advocates had sought as a long-term care reform proposal.

Next Steps

For those of us toiling away in the long-term care universe, this potential shift to retirement thinking is something for the researcher in all of us to watch. But the policymaker and advocate would be more active: Discrete ideas always attract attention. The CLASS Act is an example; love it or hate it, you had to pay attention to it. Product designs could (should) be created around the idea of better accessing 401(k) and IRAs for long-term care. Also, a standardized annuity suite of products could be structured (including longevity annuities).

Further design work on Chen's idea of adding LTC to Social Security is also an obvious idea, particularly in how private insurance can enhance Social Security with the addition of private financing and the power of investments. Design work on how one could alter Medicare's structure is also called for. Augmenting skilled nursing facility and home health care makes more sense than continuing to restrict the program to its origins as post-acute coverage.

This is the time to broach those topics and put new ideas on the table.

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How the American Retirement Savings System Magnifies Wealth Inequality

Karl Polzer

Economic inequality and wealth concentration have emerged as central issues in the U.S. presidential race. While these concerns appear to have risen to the forefront quite suddenly, forces driving wealth concentration have been building for decades. As more analysts probe the dynamics beneath these once-dormant issues in various policy areas, they may find that America's continuing shift to a defined contribution (DC) retirement system is playing a role in increasing the concentration of wealth.

While the DC system has many merits, it currently creates significant barriers to entry for many people at the lower end of the economic spectrum and those entering the workforce. About one-third of Americans report having no retirement savings at all.[1] More than half of households with DC accounts have very little in them. Among households with DC savings, the median balance in 2013 was $4,700 for those in the lowest quartile by net worth. The median balance was $12,100 for those in the next quartile (with net worth of 25 percent to 49.9 percent), almost 40 times less than median balance for those in the top 10 percent. A similar pattern can be seen comparing balances by family income (see Table 1).

Among the factors contributing to the difference in account balances between those at the top and the bottom is that people higher up the economic scale are more likely to have access to a retirement plan at work. People with low incomes wanting to start an IRA outside the workplace face barriers including minimum account balance requirements and high fees.

People with more income put more money into their retirement accounts—so they start from a larger base. By granting tax-favored status to retirement contributions, U.S. policy widens this base somewhat more as people's tax rates rise. The more you make, the bigger your tax break.

One of the most powerful drivers of what may be a widening gap between balances over time is how individuals invest their DC savings. Greater tolerance for

Table 1 Median Combined IRA, Defined Contribution Retirement Plan Balances for Families with Such Accounts, 2010 and 2013

	2010	2013
Total	**$47,155**	**$59,000**
Family Income		
$10,000–$24,999	$12,860	$10,300
$25,000–$49,999	$18,219	$18,000
$50,000–$99,999	$34,294	$45,000
$100,000 or more	$168,257	$171,000
Age of Head of Household		
35-44	$33,223	$42,700
45-54	$64,302	$87,000
55–64	$107,170	$104,000
65 or older	$76,091	$118,000
Net Worth Percentile		
Bottom 25%	$5,359	$4,700
25–49.9%	$12,806	$12,100
50–74.9%	$43,940	$52,000
75–89.9%	$144,680	$165,000
Top 10%	$442,612	$450,000

Source: Employee Benefit Research Institute estimates of 2010 and 2013 Survey of Consumer Finances. Income and asset values are in 2013 USD. For families with incomes <$10,000, sample size was not sufficient for reliable estimates.

1 Ruth Helman, Craig Copeland and Jack VanDerhei, "The 2015 Retirement Confidence Survey: Having a Retirement Savings Plan a Key Factor in Americans' Retirement Confidence," Employee Benefit Research Institute Issue Brief, no. 413 (April 2015).

investment risk can mean much higher return over time. Stocks compared to bonds and cash, for example, tend to generate significantly higher returns over long periods of time, though greater fluctuations can make them riskier in the short run. Therefore, it stands to reason that young people should put a greater percentage in their retirement accounts in stocks since they have an investment time window of many decades. But data show they tend to do otherwise. As seen in Table 2, 401(k) participants in their 20s are more likely to invest none of their money in stocks

Table 2 Asset Allocation Distribution of 401(k) Participant Account Balance to Equity Funds, by Participant Age, Tenure or Salary (Percentage of Participants, 2012)

Percentage of Account Balance Invested in Equity Funds				
	Zero	**1%–20%**	**>20%–80%**	**>80%**
All	51.2%	6.2%	27.4%	15.0%
Age Group				
20s	68.8%	2.9%	17.1%	11.2%
30s	53.0%	5.0%	26.0%	15.9%
40s	46.2%	6.1%	30.2%	17.5%
50s	46.2%	7.7%	31.6%	14.6%
60s	51.1%	8.4%	28.0%	12.5%
Tenure (years)				
0–2	66.7%	2.7%	19.0%	11.6%
>2–5	59.5%	4.2%	23.0%	13.3%
>5–10	50.2%	6.1%	28.6%	15.2%
>10–20	40.5%	8.1%	33.9%	17.5%
>20–30	37.4%	10.6%	35.6%	16.4%
>30	41.0%	12.1%	33.0%	14.0%
Salary				
$20,000–$40,000	61.3%	5.4%	23.2%	10.2%
>$40,000–$60,000	51.4%	7.5%	29.3%	11.8%
>$60,000–$80,000	44.3%	8.5%	33.9%	13.3%
>$80,000–$100,000	38.6%	9.3%	37.9%	14.1%
>$100,000	30.8%	10.1%	43.0%	16.2%

Note: Row percentages may not add to 100% because of rounding. "Equity funds" include mutual funds, bank collective trusts, life insurance separate accounts and any pooled investment product primarily invested inequities. The tenure variable is generally years working at current employ, and thus may overstate years of participation in the 401(k) plan.

Source: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project. Reprinted by permission.

compared with older workers. People with lower incomes tend to be similarly risk averse.

People on tight budgets or who are starting out in the work force may have relatively less tolerance for investment risk because they have little capital that they can afford to lose. By necessity, they may perceive a high likelihood of having to draw on funds available for retirement savings for more immediate purposes arising in the event of a job loss, the need for pay for education or the need to make an alternative investment, like a down payment on a house. This is only common sense but differences in long-term rates of return can greatly magnify or diminish retirement account balances over time.

Table 3 illustrates how different levels of risk tolerance can widen the gap between levels of wealth by comparing balances begun by setting aside 10 percent of the income of a worker making $10,000 a year with the same percentage set aside from the salary of a worker making $100,000. In this example, the lower-paid person is assumed to have a 10 percent tax rate and the higher-paid worker a 30 percent tax rate, and they are assumed to re-channel half their respective tax savings back into their retirement funds. Using this assumption, the tax break increases the original differential between account balances a little, moving it from 10-1 to 11-1.

As long as the two accounts earn the same return on investment (ROI), the proportional difference between balances will remain at 11-1 over time. But differences in ROI can change the balance differential dramatically. For example, if the higher-income worker invests in a fund that averages 10 percent ROI annually and the lower-paid worker's account makes 5 percent, then balance differentials generated from the original investment will increase from 11 times to 28 times after 20 years, 44 times after 30 years, 70 times after 40 years and 112 times after 50 years (as shown in Table 3). Balance differentials are far greater if the lower-paid worker's account makes only 3 percent, rising to 152 times after 40 years and 293 times after 50 years.

Table 3 Growth of Retirement Funds Invested by Low- and Higher-Wage Workers, Compared at Different Rates of Return

		Amount Invested	Growth in Balance				ROI
Income	Tax Rate	10% of Salary Plus Half of Tax Savings	20 Years	30 Years	40 Years	50 Years	
$10,000	10%	$1,050	$2,786	$4,538	$7,392	$12,041	at 5% ROI
			$7,064	$18,322	$47,522	$123,260	at 10% ROI
$100,000	30%	$11,500	$30,513	$49,702	$80,960	$131,875	at 5% ROI
			$77,366	$200,668	$520,481	$1,349,995	at 10% ROI
How Many Times Greater is One Account Balance Than the Other? (10 = 10 times)							
10 times (before tax break effect)		11 times	11	11	11	11	at 5% ROI
			11	11	11	11	at 10% ROI
			28	44	70	112	$10K earner at 5%, $100K earner at 10%
			41	79	152	293	$10K at 3%, $100K at 10%
			4.3	2.7	1.7	1.1	$10K at 10%, $100K at 5%

The myRA accounts now being organized by the federal government for people who don't have access to retirement plans channel invested money into derivatives of government-issued bonds guaranteeing an ROI near the rate of inflation. While myRAs may serve a valuable purpose in giving young people a way to accumulate seed capital in a stable environment, investment professionals might argue that they are a questionable choice of long-term investment for people in this age group because of the very low ROI. Something like a myRA, however, could make more sense for the very old living primarily on fixed incomes seeking to protect small accounts from inflation and sudden market fluctuations, especially if it could deliver a somewhat higher yield along with a stream of income protected from inflation.

If the risk-taking behavior is reversed in the above example, the wealth gap closes. If the higher-paid person puts her $11,500 in a conservative fund earning 5 percent and the lower-paid person puts his $1,050 in a higher-risk fund that averages 10 percent ROI, then the 11-1 differential diminishes to just over 4 to 1 in 20 years and to almost 3 to 1 in 30 years. The wealth gap virtually disappears after 50 years.

Risk tolerance involves the relationship between what a person has in assets compared to what they can afford to lose. In preparing a report for the Society of Actuaries' 2014 Annual Meeting & Exhibit,[2] I began developing the equation below to illustrate how retirees' need for funds to meet the basic expenses of living may constrain their ability to tolerate investment risk.

$$\textbf{Relative Investment Risk} = \frac{\textbf{What I need}}{\textbf{What I have – \$\$ Risked}}$$

or, when underlying concepts are expanded:

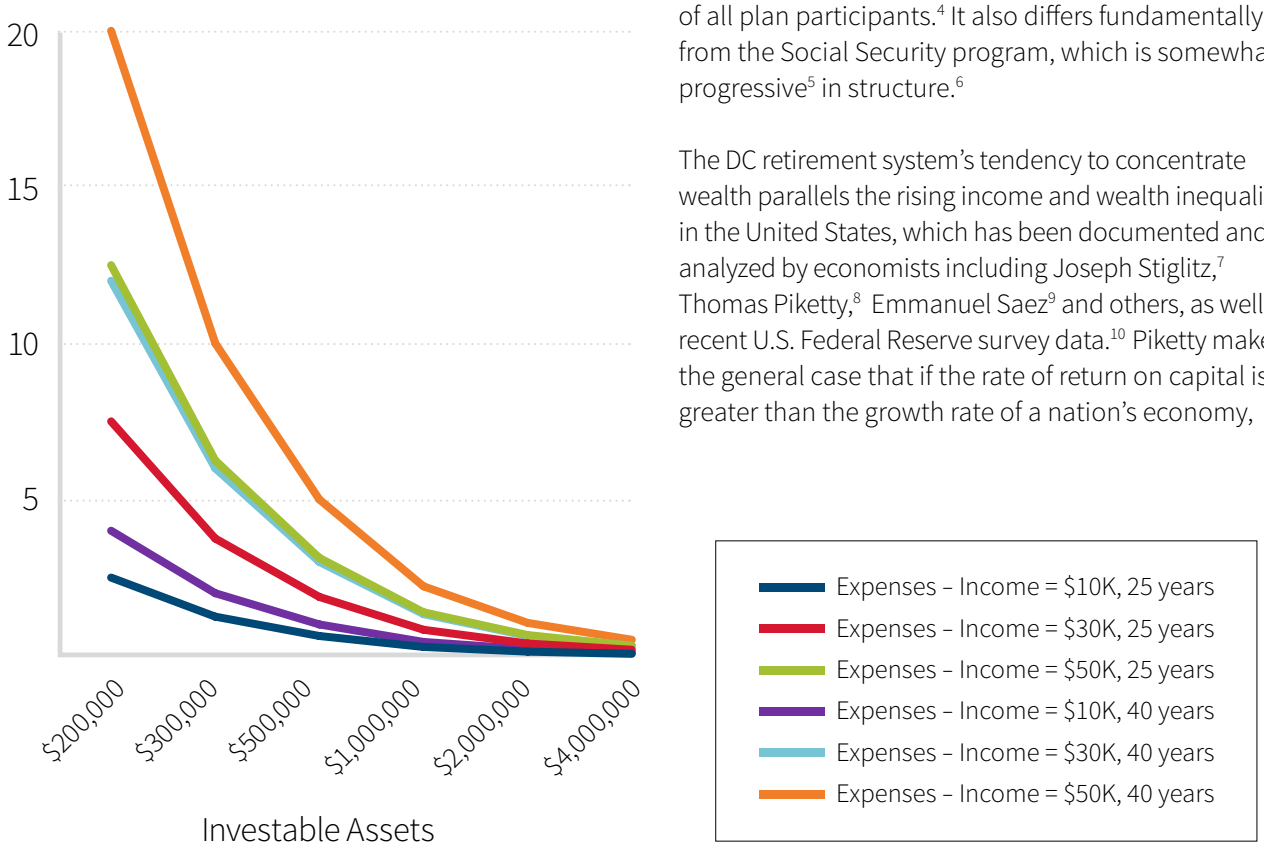
$$\textbf{Relative Investment Risk} = \frac{\textbf{Expenses Exceeding Secure Income} * \textbf{Expected Years of Life}}{\textbf{Investable Assets – Maximum Potential Loss of \$\$ Invested}}$$

Figures 1 and 2 use this equation to illustrate the variance in investment risk tolerance for retirees deciding how to invest funds in a retirement account depending on a number of factors. Scale is arbitrary and for illustrative purposes only. In this model, the more that expenses exceed secure income such as Social Security (the numerator), the greater the risk. The greater the difference between total investable assets and total potential losses (the denominator), the less the risk. The more years of expected life, the greater the risk.

Figure 1 Retiree's Relative Investment Risk: The Higher the Value, the Greater the Perceived Risk ($100K Investment, 25 Years of Expected Life)

2 See Karl Polzer, "Financing Future LTSS and Long Life Through More Flexible 401(k)s and IRAs," *Managing the Impact of Long-Term Care Needs and Expense on Retirement Security Monograph* (Schaumburg, IL: Society of Actuaries, 2014).

Figure 2 Retiree's Relative Investment Risk: The Higher the Value, the Greater the Perceived Risk ($100K Investment, 25 & 40 Years of Expected Life)



The DC system magnifies wealth inequality through differences in individual risk tolerance and returns on investment. This contrasts with the disappearing defined benefit system, in which fiduciaries and institutional investors[3] manage pooled assets on behalf of all plan participants.[4] It also differs fundamentally from the Social Security program, which is somewhat progressive[5] in structure.[6]

The DC retirement system's tendency to concentrate wealth parallels the rising income and wealth inequality in the United States, which has been documented and analyzed by economists including Joseph Stiglitz,[7] Thomas Piketty,[8] Emmanuel Saez[9] and others, as well as recent U.S. Federal Reserve survey data.[10] Piketty makes the general case that if the rate of return on capital is greater than the growth rate of a nation's economy,

3 See Alicia H. Munnell et al., "Investment Returns: Defined Benefit vs. 401(k) Plans," Center for Retirement Research Issue Brief, no. 52 (September 2006).

4 The defined benefit system, however, has issues of its own. For example, most workers do not have access to these traditional pension plans. Vesting periods and benefit formulas can create major barriers for workers changing jobs frequently.

5 Debate continues over whether Social Security is more progressive or regressive in structure (that is, whether the program tends to redistribute funds from the wealthier to the poorer, or vice versa). Progressive characteristics include that Social Security benefits are distributed in a narrower range than individual incomes and asset levels in general. Regressive characteristics include that, unlike the income tax, Social Security tax rates are not adjusted by income and Social Security taxes are not levied on income exceeding a set amount.

6 An argument can be advanced that anticipated income from Social Security, which is indexed to keep up with the cost of living, complements the DC system in that its presence allows individuals to take more investment risk. Furthermore, the barriers to entry, risks and inequity inherent in the DC system, could lead policymakers to consider bolstering Social Security benefits for those at the lower end of the economic spectrum (rather than trying to displace Social Security benefits with private accounts, as has been debated in the past).

7 See Joseph Stiglitz, *The Price of Inequality: How Today's Divided Society Endangers Our Future* (New York, NY: W.W. Norton, 2013).

8 See Thomas Piketty, *Capital in the Twenty-First Century*, trans. Arthur Goldhammer (Cambridge, MA & London, UK: The Belknap Press of Harvard University Press, 2014).

9 See Emmanuel Saez and Gabriel Zucman, "Wealth Inequality in the United States since 1913," (October 2014).

10 See Jesse Bricker et al., "Changes in U.S. Family Finances from 2010 to 2013: Evidence from the Survey of Consumer Finances," *Federal Reserve Bulletin* 100, no. 4 (September 2014). The survey is done every three years.

then wealth will tend to concentrate at the top of the economic spectrum. Growing awareness of this phenomenon has raised many concerns. Without shifts in policy, greater concentration of wealth could lead to a smaller middle class; higher levels of poverty; greater pressure for spending to meet the needs of the elderly, disabled and poor; constrained aggregate demand for goods and services; and less capacity to raise tax revenue.

To gain insight into why people who begin with more capital have higher rates of return, Piketty examined available data on the financial performance of university endowments in the United States and found that returns increase rapidly with the size of the endowment. Portfolios of all sizes endowments were highly diversified. However, the larger endowments were far more likely to use "alternative investment strategies," including higher-yield strategies such as including shares in private equity funds, unlisted foreign stocks, hedge funds, derivatives, real estate and raw materials, and other relatively high-risk options. He notes these kinds of investments require sophisticated expert advice that is costly and may not be available to smaller portfolio managers.[11]

Building on Piketty's insights, this paper suggests that differences in rates of return may result, not only from inability to afford the best investment advice. Lower rates of return can naturally result from the lower risk tolerance of a potential investor who cannot afford to lose savings that may be needed for survival.
In theory, the DC system, pinioned on a base of Social Security, could offer all workers an opportunity to share in the benefits of a free-market economy. For this to become reality, however, would require major changes. These include getting all Americans started in the retirement system at an early age and invested in options that provide the best long-term chance of financial security.

In the United States, many ideas have been advanced to help reduce wealth inequality that could be applied to the DC system. The Urban Institute, for example, recently included "establishing automatic savings in retirement plans" and "matched savings such as universal children's savings accounts" in a list "promising policies to shrink wealth inequality and racial wealth gaps."[12] Other proposals in the United States include setting up automatic IRAs;[13] setting up and funding "seed accounts" for newborns;[14] and setting up and funding "starter IRAs" while providing hands-on financial education for young people to prepare them to navigate the DC retirement system.[15]

Some states and cities are experimenting with models for universal accounts geared at saving for college and promoting long-term financial inclusion. In Oklahoma's SEED OK experiment, accounts were opened automatically for every child in a treatment group. A small initial deposit was made and held in state 529 college savings accounts and financial education was provided. Versions of this type of approach have been implemented in Singapore, Canada, Korea, the United Kingdom as well as Maine, Nevada, Connecticut and Rhode Island. In the Oklahoma program, only one family chose not to participate and initial deposits grew by more than 40 percent over seven years, despite initial losses during the Great Recession, according to a recently published evaluation.[16]

Many of the United States' trading partners offer models for near-universal savings and retirement systems. Under the Pensions Act of 2008, Great Britain is setting up a system in which workers must opt-out of retirement savings plans, rather than opt-in. The United Kingdom also has created the National Employment Savings Trust (NEST) to serve those who do not have an employer pension; NEST will function as a low-fee pension scheme in competition with existing institutions and funds. Features of the new system include automatic enrollment, mandated

11 See Piketty, *Capital in the Twenty-First Century*, 447–51.

12 See "Nine Charts About Wealth Inequality in America," Urban Institute, accessed March 15, 2016.

13 See David C. John, "Pursuing Universal Retirement Security Through Automatic IRAs and Account Simplification," Testimony before the Committee on Ways and Means, U.S. House of Representatives (April 17, 2012).

14 See "Congressman Crowley Announces Plan to Create a Savings and Investment Program for American Families," press release (March 4, 2014).

15 See Karl Polzer, "Proposal: Create a Universal Retirement Platform Including Starter IRAs," Center on Capital & Social Equity (November 2015).

16 See Sondra Beverly, et al., "Research Brief: The SEED for Oklahoma Kids Child Development Account Experiment: Accounts, Assets, Earnings, and Savings," Washington University in St. Louis, CSD Research Brief, no. 15–29 (September 2015).

contributions and a choice of diversified investment funds, including those based on a person's age.[17] Australia's "superannuation" system requires employers to contribute a percentage of employees' income into diversified retirement funds managed by trustees.[18] By 1999, 97 percent of Australia's full-time employees and 76 percent of part-time employees were covered by the superannuation system. Over the years, Australia has increased required contributions and continued to refine the system, which has been credited with raising levels of capital accumulation and improving retirement security.[19]

In conclusion, increasing inequality, wealth concentration and economic insecurity have emerged as major issues in the United States and most other Western nations. The United States' defined contribution retirement savings system presents a laboratory that may provide some clues about how wealth is concentrating. Unless major policy changes are made, the American retirement savings system is likely to continue leaving a good share of the population without adequate savings and accelerate growing disparities in wealth.

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17 For a summary of the new U.K. retirement savings requirements, see "New Pension Rules," National Employment Savings Trust, retrieved March 14, 2016.

18 See Michael E. Drew and Jon Stanford, "A Review of Australia's Compulsory Superannuation Scheme after a Decade," University of Queensland, School of Economics, Discussion Paper, no. 322 (March 2003).

19 Nick Summers, "In Australia, Retirement Saving Done Right," *Bloomberg Business*, May 30, 2013.

Women and Retirement Risk: What Should Plan Sponsors, Planners, Software Developers and Product Developers Know?

Anna M. Rappaport

As baby boomers reach retirement age, concern grows that many Americans may not be adequately prepared for retirement. There are special concerns with regard to women in retirement. Women face the same lifetime risks as men: outliving their assets, facing a long-term care event, getting disabled earlier in life, not saving enough, not investing well enough or suffering a loss due to a scam. This raises the issue of why focus on women's issues rather than retirement issues in general. I propose we consider women's needs because they have different life paths leading to greater challenges for them later in life.

The Differences by Gender

There are many reasons for the differences in retirement experiences.

- Women live longer and the population at the highest ages is primarily female.
- A high percentage of older women are widows and some spend many years as widows.
- Women are likely to be alone in old age whether never married, widowed or divorced.
- Overall, women have fewer years of paid work and lower career earnings.
- In the allocation of family responsibility, women often assume more responsibility at home and for caregiving at many life stages.
- Women are more likely to need help with activities of daily living later in life.
- Women are less likely to have a family caregiver.
- On a societal basis, women experience higher long-term care costs.
- Mothers are the first line of help for children and are extremely devoted to their children.
- Many women have trouble thinking about their needs first (or at the same time) when others have needs, with the result that their needs become secondary or may even be forgotten for long periods of time.

Lessons Learned from Retirees

The Society of Actuaries Committee on Post-Retirement Needs and Risks (CPRNR) recently conducted focus groups with financially resource-constrained retirees retired more than 15 years and with retirees who were more recently retired. Focus groups were conducted separately by gender. The CPRNR has also surveyed retirees and near retirees with regard to post-retirement risks every two years starting in 2001. Some of the findings from this work include:

- Gaps in knowledge and misperceptions are very common.
- People commonly deal with things as they happen rather than anticipating and planning for financial shocks.
- Retirees are very resilient and adapt to many unexpected changes and shocks.
- Widows often adapt quite well.
- Divorce after retirement and a major long-term care event cause major financial disruption.
- Some retirees make very large gifts to children when the children lose jobs or experience major problems.
- Dental expenses and home repairs are major items of unexpected expenses for retirees.
- Women are much more likely to be caregivers and to time their retirement because of the caregiving needs of others.
- Women are more concerned about retirement risks.
- Many people have retirement planning horizons that are too short.

How are Retirement Risks, Needs Affected by Women's Different Experiences?

All Americans are faced with some key issues on the road to retirement security. However, women face these risks in a different manner than men.

OUTLIVING THEIR ASSETS

This is a bigger risk for women because they live longer, which requires more assets to support their longer lives. I believe women are more in need of planning to make sure assets last a lifetime. Annuities can be of particularly value for them.

Women are also more vulnerable to running out of assets if they are married or in a relationship at retirement because if one partner in a relationship is ill first and funds are spent on their care, that leaves the survivor at risk of not having enough remaining assets for their remaining single lifetime. It is much more common for the female to be the surviving partner.

A strategy worthy of serious consideration is separating assets, so that each partner in a relationship has their own assets.

NOT SAVING ENOUGH

It is important to save early, save enough and not use it early for nonretirement purposes. Women who have made decisions to work less so that they can devote more time to family need to think about protecting their financial security. A person who works less in the paid workforce and more as a homemaker is depending on the other person's earnings to generate retirement savings. Most often the woman spends less time in the workforce and does not develop a full career and earnings history during her lifetime.

If a woman is going to depend on a partner's future earnings to build retirement security, then protecting that earnings stream is very important. An earnings stream can be disrupted by premature death and disability. Having adequate life insurance and disability insurance for the working spouse is the best means to assure the earnings stream will be available to the nonworking spouse.

NEEDING LONG-TERM CARE SUPPORT IN RETIREMENT

There is a bigger risk that women will need long-term care and also a greater risk they will not have a family member available to provide it.

Women should give consideration to the purchase of long-term care insurance including products that combine life insurance or annuity benefits with long-term care. Otherwise, if they plan to finance long-term care from savings, a larger amount of savings is needed.

NOT INVESTING WELL

This is a risk for everyone, and there is no easy answer. The employee benefit plan sponsor can help for money saved within a 401(k) plan by offering good investment options and having good default options. The individual may wish to secure professional advice.

AVOIDING SCAMS

Scams come in many different forms. It is important to be vigilant and aware of various forms of scams. Vulnerability seems to increase with increasing age.

The Importance of Choices Made Early in Life

Choices made early in life are very likely to affect long-term financial security later on. Career choice can often make a huge difference, as can the commitment to pursue a career. The career and job chosen will have a big impact on benefits and risk protection. Personal choices with regard to spending and saving early also can have a very big long-term impact. Dollars saved early make a big difference later on. Women also often have a choice of pursuing a career or spending much more time raising a family. Even if they work, some women work sporadically or part time rather than pursuing a career that leads to longer-term security. Many people do not focus on the long-term impact of choices when they are young.

Planning for Money in Marriage and Relationships

Traditionally, most people married without thinking through in advance the financial arrangements between them. The issues have become more complex as there are more divorces, more second marriages including many with children from prior marriages, and dual career households. Some people enter marriages with assets and/or debts. Family decisions affect the long-term future of both members of the couple. *The New Love Deal*[1] provides advice on structuring financial arrangements in marriage and unmarried partnerships and on structuring the arrangements so that women will not end up with a bad result in divorce

1 Gemma Allen, Michele Lowrance and Terry Savage, *The New Love Deal: Everything You Must Know Before Marrying, Moving In, or Moving On!* (Chicago: The New Love Deal, 2014).

or another split-up. The authors are a retired family court judge turned mediator, a family law attorney and a financial writer. Key messages are that it is vitally important to make agreements about money in relationships and think about the long term. Thinking about money needs to start at the time when the relationship becomes a partnership. Women are sometimes asked to sign prenuptial agreements they do not understand. They should never do this. If they bring assets into a relationship, they need to think about how to protect them. They need to think about what is a fair allocation of the assets during the relationship. They also need to think about ensuring money is saved for retirement and debts are not allowed to grow.

It is also important to remember that pension benefits, both defined contribution (DC) and defined benefit (DB), can be split on divorce, but there is no mandate that they be split. They are considered assets and, therefore, it is important to understand their value and recognize their importance. For pension plan assets to be split, the provisions of applicable pension law[2] must be followed. Many divorces do not include proper consideration of pension assets.

Traps to Avoid

- **Getting too much into debt.** Credit cards are easy to get and they make it easy to run up debt that is difficult to deal with. Don't overspend and don't run up balances.
- **Giving too much money to children.** Often adult children seek help from parents. Women are particularly vulnerable to giving too much of their assets to children.
- **Giving up a job for caregiving.** It is very tempting to devote one self to caregiving when it is needed, but the cost to the caregiver can be huge. Some of these costs include lost wages, lost retirement savings, extra spending of assets to help others and a loss of one's own health, physical and mental, during the caregiving years. If there is no understanding of the long-term price, this can be a costly decision that results in a bad result for the caregiver.
- **Spending too much on housing.** Housing is the greatest expense for most retirees as well as for many households at all ages. People are often encouraged to buy as much house as they can with the theory that house prices go up. But they can also go down, and real estate taxes can go up. Keeping a large family home in a divorce settlement or staying after the death of the spouse or when children are gone is a common mistake women make. The upkeep and costs of maintaining a residence that is too large for your needs or does not fit with your current lifestyle needs is expensive. Retirees often find the cost of repairs to be a burden.
- **Not understanding family finances.** Often one person pays the bills and handles much of the money. Most often men are the keepers of the family finances. Women must make sure they know what the family finances are and understand the insurance and investments positions even if their partner is primarily handling them.
- **Not having an emergency fund.** When there is no emergency fund, people commonly dip into retirement savings for recurring but irregular expenses and for unexpected expenses. This can easily become a habit. It is better planning to have an emergency fund and to leave retirement funds for the long term.

What Employee Benefits and Financial Products Are Helpful

During working years, it is important to build up enough assets for retirement. This means saving enough and including protection so that asset build-up can continue in the event of disability during those years. DB plans, where offered, generally include disability protection of continued retirement savings as well as pension accumulation, but they only work well for longer-term employees. DC plans offer a vehicle for retirement savings and participation is definitely recommended. It is ideal when the individual can save 12 percent to 15 percent of earnings each year for a long period. Employer-sponsored long-term disability together with Social Security protects earnings in the event of long-term disability, but more needs to be done to continue retirement savings. Such disability coverage usually continues to normal retirement age.

2 The Employee Retirement Income Security Act of 1974, for private pension plans and usually state law for plans covering public sector employees. ERISA provides for the splitting of pension benefits and requires the use of a qualified domestic relations order as part of the divorce. State requirements vary.

For individuals without access to employee benefits, savings are very important and individual retirement accounts offer access to some tax-preferred retirement savings. Individual disability insurance can also offer protection of income in the event of disability and there may be a rider (an optional add-on to the policy) available to protect retirement savings. There is no general disability protection available to homemakers. There are a wide range of investment options available for savings and that is beyond the scope of this article.

Post-retirement, it is very important to make savings last throughout life, and there are a range of options for doing this. The only method of converting savings to a guaranteed lifetime income is through purchase of a payout life annuity. Social Security payments are guaranteed for life and indexed for inflation. The amount of income provided by Social Security increases if benefits are started at a later age, and starting Social Security later is a very good deal compared to buying an annuity in the marketplace. Delaying Social Security (up to age 70) should be the first method used to increase lifetime income. If more guaranteed income is needed, then an annuity is recommended.

Recommendations: Creating a Better Future

This essay is about some of the challenges facing women. It offers the proposition that women really have different life circumstances which affect their retirement needs. Individuals, actuaries, financial service companies, advisers, plan sponsors and policymakers all have roles in creating a better future.

Steps to a better future include:

- A planning checklist for women; the following is a start:
  - Plan for the long term and don't forget there will probably be a time when you cannot work
  - Balance short- and long-term thinking
  - Understand family resources and what will be there for you in the event of a family breakup
  - Save enough for the long term
  - Provide for continued income and asset building in the event of disability
  - Provide for the family in the event of the death of income earners
  - Be careful about gifts to children
  - Do not overuse credit and build up debt
  - Evaluate the options if you are asked to be a caregiver, and do not sacrifice your future for others
  - Maintain an emergency fund
  - Have a plan for dealing with longevity risk; consider using payout annuities
  - Have a plan for dealing with long-term care needs; consider using long-term care insurance
- More personal retirement planning by women and emphasize focusing on the long term
- A review of financial planning software in order to produce a list of tools that address women's issues
- Advisers knowledgeable about the issues facing women, and women seeking more unbiased advice
- Benefit plan sponsors including women's retirement issues in their employee education programs and offering retirement advice
- Model financial agreements from an unbiased source that can be used by married and unmarried couples as a starting point for making deals
- Employers establishing more financial wellness programs and including women's issues

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Diverse Risks and Considerations in Retirement

Zenaida Samaniego

When I was very young, I wondered what I would be when I grow up. As I got older, I wondered what I would do to prepare for retirement. Now that I am fully retired, I continue to wonder what the future holds.

What I learned so far is that one's life is marked with so many milestones, starting at birth and ending at death. Throughout that time, one experiences varying rates of growth in physical, intellectual, moral, social, financial and other senses of well-being.

Financially speaking, planning starts at birth, even if one relies on others such as family as a major if not sole resource up until young adulthood, whence one begins in earnest to plan for his/her own future.

Financial planning entails saving and spending goals that may be protracted over time, and include secondary education, gainful employment, starting a family, buying a home, child care and education, travel and recreation, health care and retirement.

Enter budgeting. During childhood, one looks to his/her allowance to fund small wants, and for bigger wants, works small jobs if able to supplement said allowance. During the long period from young adulthood to middle age, such wants grow in magnitude and urgency and credit is increasingly used as a budget tool to meet current needs with the promise of steadily growing wages to repay loans. Even then, unless one has sound budgeting and planning, the risks of being overextended, experiencing sudden loss of income or unexpected health costs can be disastrous and untenable.

One is usually well advised to set aside funds not only for a "rainy day," but for a number of special purposes or spending goals. Hence, the concept of saving and investing said funds in buckets, for liquidity as well as earnings and growth commensurate with intermediate and long-term needs, applies not only through one's working life but even in retirement.

For most, retirement means the steady flow of wage income ceases and one must rely instead on income from Social Security, pensions and other distribution from retirement assets that heretofore grew from tax-deferred contributions and earnings but are now being drawn down to meet retirement needs and risks for the rest of life. However, the basic tenets of saving and investment remain, albeit with a different focus.

As a recent retiree, I want to share my personal experiences to date, with focus on some of the key questions and considerations I grapple with when planning the rest of my future in retirement.

Activities While Retired

How is my health? If healthy, do I continue to work part time or totally quit gainful employment? Depending on what I decide, I can have more income but less time to volunteer and for travel or leisure.

If in poor health, I know that not only will my activities be limited, but my spending needs will most likely be higher and require additional outlay from my retirement savings.

Retirement Spending

What are my expected basic expenses in retirement? Depending on my employment status, some or all of my work-related expenses will change, such as commuting, taxes and cost of health coverage. I will also need to make personal provisions for payment of certain of these items, such as income taxes and medical insurance premiums, which previously were automatically withheld from my paycheck. On the other hand, I may expect to incur new or higher expenses from more leisure or volunteer activities. I will also need to examine whether or not my other risk protections are necessary and/or adequate. For example, do I have provisions for inflation effects on my spending levels in the future, particularly the cost of health care? Have I considered my Medicare eligibility and enrolling in same, as well as its impact on my insurance protection for medical, dental and critical care or catastrophic care costs? Do I have insurance protection or provisions for long-term care? Do I have personal insurance to safeguard against homeowner or renter, automobile or other personal property loss? How much if any life

insurance coverage do I maintain, such as for bequest purposes, so that I may examine my retirement spending needs realistically? For example, am I being cautious with my spending so I do not outlive my assets, not because I dread not leaving enough to my heirs? Do I have existing debt, such as a home mortgage, car loan or credit cards? Based on the foregoing, I can tally my total insurance premiums, debt amortization, taxes, etc. in addition to my basic spending needs, perhaps adding some provision for discretionary spending as well.

Sources of Income

What benefits am I eligible for? For example, depending on the age I claim Social Security retirement benefits, if eligible, I know that such benefits, otherwise payable at my full normal retirement age, may be actuarially reduced by as much as −25 percent if I choose to claim early at age 62, or increased by as much as +35 percent if deferred to age 70. But first, I ask myself whether my spouse has commenced his Social Security benefits, and further if my claiming for a spouse benefit, which is generally half of my spouse's retirement benefit, fits in with my current spending levels and health considerations. This may help me decide to forego claiming my own retirement benefits until I attain age 70 when they are much higher, thus providing the best form of longevity insurance protection for me.

Medicare is an important source of health protection that provides coverage of the majority but not all of my medical spending. I will also have supplementary insurance coverage for medical and other purposes. I note that Medicare premiums are deducted from my Social Security benefits.

Another source of income is a **defined benefit pension plan**, which consists of a vested pension benefit from one or more of my former employers that may have offered such plans in the past, or more recent benefits that are increasingly made available today, such as a **cash balance plan** and/or a **defined contribution plan (401k, 403b, thrift plan),** where I have the option to select the timing and form of payment for my plan benefits, as either cash, applied toward an income annuity or a periodic benefit stream payable in my retirement.

Deferred annuities (IRAs, nonqualified) provide another source of current or future income. As with defined contribution plans, IRAs are subject to required minimum distribution (RMD) rules, which means I must distribute a required percentage (per the IRS life table) starting generally in the year I attain age 70 1/2 (or retirement, if later under defined contribution plans).

Investments (bonds, stocks, mutual funds and equity real estate) can generate income from interest, dividends, capital gains, rent and depreciation, etc. For example, where I have reinvested mutual fund earnings in the past, I can choose to receive in cash all future dividends and realized capital gains especially as they are taxed anyway in the year earned.

Savings (bank, CD) constitute my main source of liquid (rainy day) funds and help me better manage the distribution of my aforementioned sources of retirement income.

Financial Consideration

How adequate is my retirement paycheck, i.e., my current sources of income to cover my basic spending today, plus a margin for inflation?

Regardless, I will want to review my current spending for reasonableness and potential changes, particularly in connection with planned activities or pursuits at least in the next one to three years. I may also need to consider ways to increase my income if inadequate now or expected to be in the next year or so. Having backup funds, preferably cash in bank reviewing or short-term investments, worth at least six months of my living expenses, is useful in cases of emergency (e.g., home repair, out-of-pocket health spending and other unexpected but necessary expenditure), as well as to bridge the time gap until I start my RMD and/or Social Security retirement benefit.

If I have investments that automatically reinvest dividends and capital gains, even though they are taxable to me in the year they are earned, I may consider having these distributed to me instead, thus providing additional income or deposits to my cash pool.

What other considerations do I have when reviewing my investment portfolio and/or deciding if/when and how to change my investment fund allocations by short-, immediate- and long-term buckets? For

example, as I draw down my short-term bucket for immediate needs, I may want to shift some funds among the other buckets. I will also need to consider when and how I distribute my retirement savings, either to increase my income as needed to cover projected expenses or more importantly, when I have no choice but to start the RMD of my tax-qualified retirement accounts, and pay any taxes that have been previously deferred on said funds.

Decumulation

I will want to preserve my tax-qualified funds for last, that is, until my RMD. Until such time, I will first consider my taxable savings, such as bank deposits that constitute my back-up fund.

Next I will look at my other taxable savings held outside my retirement accounts, such as investments in bonds, stocks or mutual funds. If I sell these investments that have shown capital growth since I held them, I will be taxed on such realized capital gains. I will want to sell first any long-term assets, i.e., assets I have owned for more than one year. Capital gains rates are lower than for ordinary income, while short-term capital gains are taxed the same as ordinary income. However, I may also figure in whether my income tax bracket in retirement has dropped significantly from when I worked.

If selling real estate held for investment, long- versus short-term capital gains tax considerations also apply. I will also consider any income that I will forego relative to what I can earn if I invest the sales proceeds elsewhere, or apply such proceeds toward an income annuity, as well as any maintenance costs and tax differentials. Similarly I will need to weigh the costs and benefits if I decide to sell real estate that I occupy as my primary residence, so I can rent instead or move to senior housing. Under certain circumstances, I may look at reverse mortgages as a potential tool but need to understand the use, terms and restrictions of this complex product.

What other disposable assets of value do I have? For example, do I own a car that I no longer need to get around, or personal property that I do not use, and can trade-in for cash equal to its depreciated value? This will save me maintenance costs on fuel and insurance costs. How much life insurance do I need for bequests to my survivors and heirs? Unless my policies are paid up, I may also consider potential income from cash value proceeds as well as savings from reduction of all or part of my costs of insurance.

I may have retirement savings held in nonqualified annuities, for which I made after-tax contributions but tax on income is deferred until these funds are distributed to me. At the time of distribution, I will be taxed on the portion that is constituted by accumulated income earned on such funds.

If I have a 401(k) plan where I made after-tax contributions that I have not rolled over when I separated or retired, and I am one or more years away from my RMD, I can bypass current taxes by rolling over my 401(k) account to a Roth IRA,[1] for the portion attributable to after-tax contributions, and an IRA, for the qualified or tax-deferred portion including accumulated earnings on after-tax contributions. I will need to hold the Roth IRA for at least five years—and past age 59 1/2—after which all withdrawals are income tax free. If I want to consider smoothing my tax payments, I have the option to convert, in kind, said after-tax contributions in my 401(k) plan to a designated Roth 401(k)[2] within the plan, meaning my earnings will no longer be tax-deferred but currently taxed. The same withdrawal rules for Roth IRAs apply to a designated Roth 401(k).

For RMD purposes, the rules apply to all of my funds held in employer-sponsored retirement plans, including my 401(k) and thrift plans, as well as traditional IRA or IRA-based plans. The first such distribution must occur on April 1 (i) in the year following the calendar year in which I reach age 70 1/2. Subsequent distributions (ii) start on Dec. 31 in the first year following the year I reach age 70 1/2. For defined contribution plans, my required distribution starts generally on the later of (i) or (ii) the year I retire. Such rules state that the entire RMD, not necessarily from any specific retirement account, must be distributed each year over my federally prescribed life expectancy. I can delay the first distribution until the April 1 following the year I reach

1 "Rollovers of After-Tax Contributions in Retirement Plans," Internal Revenue Service, last updated Sept. 2, 2015.

2 Ashlea Ebeling, "The In-Plan 401(k) Roth Conversion Strategy," *Forbes*, Jan. 3, 2014.

age 70 1/2, but I must also take RMD by Dec. 31 of that year and each subsequent year.

In a manner of speaking, RMD provides automatic smoothing of my payment of deferred taxes that are now coming due. More importantly it enables me to smooth out my benefit distribution over my expected lifetime, as opposed to a lump sum distribution where there is a strong temptation to spend unnecessarily and increase my risk of outliving my savings. I need to weigh carefully choosing between immediate cash versus a benefit stream because managing my retirement savings over my lifetime must take priority over what may be impulsive spending today. Thus, I may invest my distribution until needed, or annuitize all or part of it to generate additional income. If I decide to annuitize, I have to make additional decisions on the timing of purchase (e.g., serial), frequency and form of payment—annuity income for a fixed period, life with or without certain period, joint life with percent continuation to survivor, cash refund or guaranteed withdrawal, to name a few.

Conclusion

All of the above will need careful consideration and ongoing planning from several perspectives, including tax, legal, health, bequest, etc. which can impact my own retirement. How do I make my money last so I do not outlive my retirement savings? I will also want to make provisions for my spouse or partner, especially after I am gone.

I know that I will continue to have additional questions and lessons to learn. By sharing my approaches, I do not profess that they are correct or appropriate for anyone, including myself, rather I hope I have at the very least raised awareness of what I think are some of the more important issues and concerns in retirement. Thus, I encourage others not only to ask questions and search for answers—there is a lot of information available on the Internet, government websites, and trusted benefit, financial and professional advisers—but also look forward to engaging others in a thoughtful discussion of their experiences and potential ideas for the development of practical tools and solutions.

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Multiple Objective Asset Allocation for Retirees Using Simulation

Kailan Shang and Lingyan Jiang

The asset portfolios of retirees' serve many purposes. Retirees may need them to provide stable cash flow to cover living costs. They may gradually sell their assets when social retirement benefits and asset cash flows are not enough to meet financial needs such as unexpected medical costs. They may also want to leave a certain amount of their estate to their children. Multiple objectives with different levels of importance lead to a complex asset allocation problem for retirees.

Multiple Objectives

Depending on the retiree's specific situation, a variety of objectives are expected for asset allocation.

1. **Current income.** With limited income after retirement, a retiree is likely to draw down his/her asset to pay for living costs. Assets that can generate stable and regular cash flow are more favorable.
2. **Liquidity.** A higher level of liquidity is needed for retirees compared to workers. A reduced amount of income leads to a higher probability that assets need to be sold to meet liquidity requirements. Liquid assets with less bid-ask spread are more favorable for retirees.
3. **Purchasing power.** Retirees are concerned with maintaining their living standard in case of hyperinflation. Assets that grow with inflation are preferred.
4. **Longevity risk.** Retirees are also concerned they may outlive their assets. Annuity products that protect retirees from longevity risk need be included in the asset allocation plan.
5. **Wealth growth.** A higher return is always better; however, it may not be the top priority.
6. **Estate.** Some retirees may want to leave an estate for their heirs. This also needs to be considered in the asset allocation plan depending on the importance of this objective to the retiree.
7. **Time horizon.** The asset allocation plan for a new retiree would be very different from that for a retiree after 15 years of retirement.
8. **Tax minimization.** Retirees would also want to take advantage of tax-efficient assets to reduce both estate tax and investment income tax.
9. **Relative importance of multiple objectives.** The final asset allocation plan needs to find an appropriate balance among multiple objectives according to their relative importance to the investor.

Current Methods

Existing asset allocation methods normally focus on a subset of the multiple objectives of retirees in an approximate way. Age-based asset allocation uses this rule of thumb to determine the allocation between equity and fixed income securities: (100 – age) percent of assets is suggested to be invested in equity. This can only provide high level guidance to limit the risk without recognizing specific situations of each retiree. Many other objectives are neglected by this method.

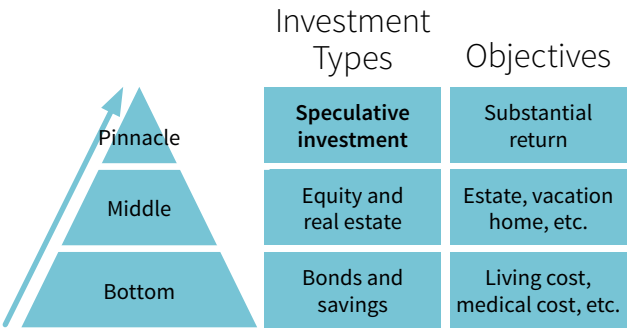
Asset allocation based on modern portfolio theory such as mean-variance optimization has the goal of maximizing the expected return given a specified level of risk. The risk level is determined by the investor's willingness and ability to take risk. In theory, this single objective decision-making method can lead to the maximal expected economic value for investors. However, some objectives of retirees need to be translated into a risk-aversion score and the translation could be quite ambiguous and subjective. Other objectives such as current income and sufficient liquidity conflict with the goal return maximization and are hard to be incorporated into the model. The optimal solution is also very sensitive to assumptions of the expected return and volatility of each asset class and correlation between asset classes.

Contrary to asset allocation based on modern portfolio theory, asset allocation based on the risk pyramid sets the allocation plan by meeting individual objectives sequentially. It starts from the most important objective such as paying basic living costs and uses the most conservative assets such as bank savings and government bonds to achieve the objective. It then

goes up to less important objectives such as estate or vacation and uses riskier assets to support them. Retirees are willing to accept uncertainty for a higher expected return for less critical objectives.

Figure 1 shows the risk pyramid including objectives and corresponding asset classes. The pyramid structure does not consider all the objectives together, nor does it consider the diversification between asset classes. The resulting asset allocation plan is not economically optimal.

Figure 1 Asset Allocation Based on Risk Pyramid



The asset allocation method based on the analytic hierarchy process (AHP)[1] explicitly considers the multiple objectives and their priorities when choosing an allocation plan. Investors need to provide pairwise assessment of objectives regarding their importance. Asset allocation plans are ranked by the weighted performance for all the objectives where the weight is based on the priorities of the objectives. However, the resulting asset allocation is often subjective and not economically optimal.

None of the current methods discussed above has a clear way to find the optimal solution when considering all the objectives together. A more direct method is needed to make sure all objectives are incorporated in the optimization process according to their relative importance.

Simulation-Based Multiple Objective Asset Allocation

The simulation-based multiple objective asset allocation method objectively assesses each allocation plan against multiple objectives in a consistent way and provides a more holistic picture of possible outcomes. This information is critical for finding the optimal allocation plan. The optimization is based on the weighted performance relative to multiple objectives. The implementation follows several steps:

1. With a specified asset allocation plan, the retiree's future income and spending under different economic, mortality and morbidity scenarios are projected. Under each scenario, the projected result is checked against each objective in terms of whether the objective can be met and how well it is met. The weighted performance is used to measure the aggregate performance regarding the objectives. The weight is the relative importance of each objective. The return measure is the average of the weighted performance in each scenario. The risk measure could be the volatility, value at risk (VaR) or tail value at risk (TVaR) of weighted performance.
2. Repeat the exercise for all possible asset allocation plans.
3. Construct the efficient frontier using the average weighted performance as the return measure and the volatility/VaR/TVaR as the risk measure.
4. Choose the portfolio on the efficient frontier according to the investor's risk tolerance.

Figure 2 illustrates the process of simulation-based multiple objective asset allocation.

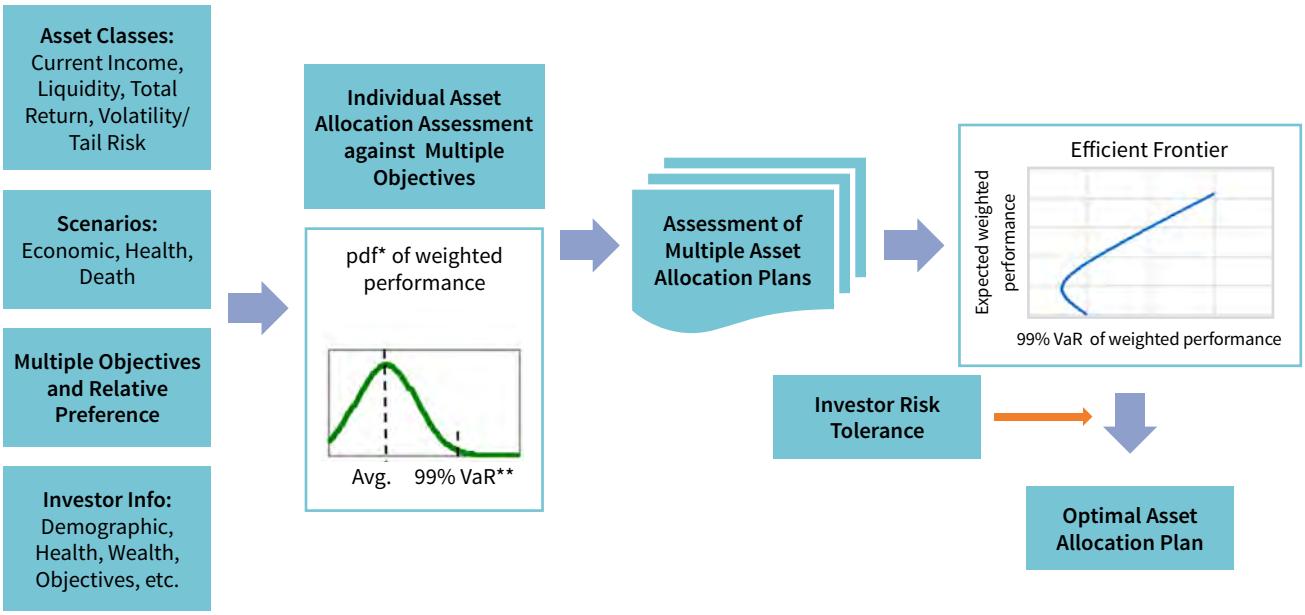
Example

A simplified example is illustrated here to show the process of simulation-based multiple objective asset allocation. Assume a male retiree at age 65 is considering his asset allocation plan. He has five objectives:

1. High current income no less than 2 percent of the asset value (CI)
2. Maintain the purchase power of the portfolio (PP)
3. Maintain sufficient liquidity to cover living costs and unexpected medical costs (AL)
4. Minimize longevity risk (LR)
5. Leave an estate of $100,000 for his children (ES)

1 Steven Le, "Asset Allocation: An Application of the Analytic Hierarchy Process," *Journal of Business & Economics Research 6,* no.9 (2008).

Figure 2 Simulation-Based Multiple Objective Asset Allocation Process



* pdf: probability density function

** 99% VaR is one of many possible risk measures and is for illustration only

Table 1 shows the retiree's relative preference of the five objectives.

The suggested scale for AHP by Hobbs and Meier (2000)[2] is used. For example, CI is moderately more important than PP. The reciprocal means that the relationship of the two objectives is switched.

Table 1 Relative Preference of Retirement Objectives

	CI	PP	AL	LR	ES
CI	1	5	3	1	7
PP	1/5	1	3	1/2	5
AL	1/3	1/3	1	3	5
LR	1	2	1/3	1	7
ES	1/7	1/5	1/5	1/7	1

a. 1: If the two attributes are judged to be equally important
b. 3: If attribute I is judged to be slightly more important than attribute II
c. 5: If attribute I is judged to be moderately more important than attribute II
d. 7: If attribute I is judged to be strongly more important than attribute II
e. 9: If attribute I is judged to be extremely more important than attribute II
f. 2,4,6,8: If intermediate values between two adjacent judgments are needed

Based on the preference matrix, the weight assigned to each objective can be calculated by dividing each entry by the sum of the column and then taking the average of the row, as in the AHP (see Table 2).

Each objective has its own measure of performance. The measurement could be performed for the entire time horizon to get the average performance or the time period with the worst performance. The measures need to be normalized before calculating the weighted

2 Benjamin F. Hobbs and Peter Meier, *Energy Decisions and the Environment: A Guide to the Use of Multicriteria Methods* (Boston: Kluwer Academic Publishers, 2000).

Table 2 Weight of Retirement Objectives

	CI	PP	AL	LR	ES
Weight	36%	18%	21%	22%	3%

Table 3 Performance Measure of Retirement Objectives

	CI	PP	AL	LR	ES
Type of measure	Average	Average	Worst	Average	Average
Performance measurement	1.5	2	0.9	0.75	–0.8

Table 4 Asset Class Profile

Asset Class	Expected Return	Risk	Liquidity	Current Income
Government bond	Low	Low	High	High
Stock index	High	High	Low	Low
Short-term savings	Very low	Very Low	High	Medium
Real estate	High	High	Very low	Very low
Life annuity	Medium	Low	Low	High

performance. In this example, normalization is omitted for simplicity.

1. **CI:** (current income rate – 2%)/2%. Current income rate is the weighted average of savings interest rate, bond coupon rate, stock dividend rate and real estate rental income rate.
2. **PP:** (investment return – inflation rate)/2%
3. **AL:** (AL – living cost – unexpected medical cost)/(living cost + unexpected medical cost)
4. **LR:** (age at which assets are outlived – age @ life expectancy)/(99th percentile of the age – age @ life expectancy)
5. **ES:** (estate @ life expectancy – 100,000)/100,000

Assume under one scenario, we get the performances against the five objectives shown in Table 3.

The weighted performance using the weights derived from the preference matrix is 1.22.

The retiree only considers four asset classes and one life annuity product. Assets are assumed infinitely divisible for simplicity although constraints can be added according to the reality. See Table 4.

The retiree's financial information is summarized in Table 5.

Table 5 Example: Financial Information

Net invested asset	$200,000
Real estate (residence)	$300,000
Retirement income (social program)	$2,000/month
Current living cost	$3,500/month
Contingent medical cost	$100,000

Stochastic scenarios including interest rate, equity return, inflation rate and mortality rate are used to generate the distribution of the aggregate performance. See Table 6.

By testing multiple asset allocation plans, the relationship between the return measure (average weighted performance) and the risk measure (average weighted performance – worst 1% performance) can be established. See Figure 3.

Table 6 Assumptions of Stochastic Scenarios

Stochastic Scenarios Assumption						
Insurance Assumption						
Mortality (MR)	2008 Valuation Basic Tables (VBT) with 20% volatility					
Economic Assumption*						
Initial yield curve	**Term**	**Risk Free Rate (%)**				
	1	0.30				
	2	0.64				
	3	1.05				
	4	1.54				
	5	2.03				
	7	2.74				
	10	3.42				
	30	4.35				
Interest rate model (IR)	One-factor Hull-White model (σ = 10%, α = 0.05)					
Equity model (EQ)	Log-normal model (Risk premium= 4%, σ = 25%)					
Real estate model (RE)	Log-normal model (μ = 4%, σ = 25%)					
Inflation rate model (IN)	Log-normal model (μ = 2.3%, σ = 13%)					
Correlation among variables		**MR**	**IR**	**EQ**	**IN**	**RE**
	MR	1	0	0	0	0
	IR	0	1	0.1	0.6	0.05
	EQ	0	0.1	1	–0.1	0.7
	IN	0	0.6	–0.1	1	0.2
	RE	0	0.05	0.7	0.2	1

** The economic assumptions used are for illustration purpose. They are based on the same framework used in Kailan Shang et al., "Pension Plan Embedded Option Valuation," Society of Actuaries report (2013). Details are not listed here, as they are not the focus of this article.*

A weighted performance of zero means that the minimum requirement is met. The efficiency of an asset plan can be measured using the risk measure divided by the (return measure – 0). The investor needs to have a minimum expected weighted performance of 0.5 with less than a 1 percent chance of having a performance less than –0.1. Based on this risk tolerance, we can find the optimal asset allocation plan with the highest Sharpe ratio. See Table 7.

Implementation Challenges

Assessing the relative preference of multiple objectives is a difficult task and could be time consuming. Normally, pair comparison is used to help investors quickly choose the more important objective of the two. But the number of pairs an investor needs to compare could be large. For example, nine objectives would need 36 pairs[3] of comparisons to finish assessment. In addition, the comparisons may

Figure 3 Performance (Return vs. Risk)

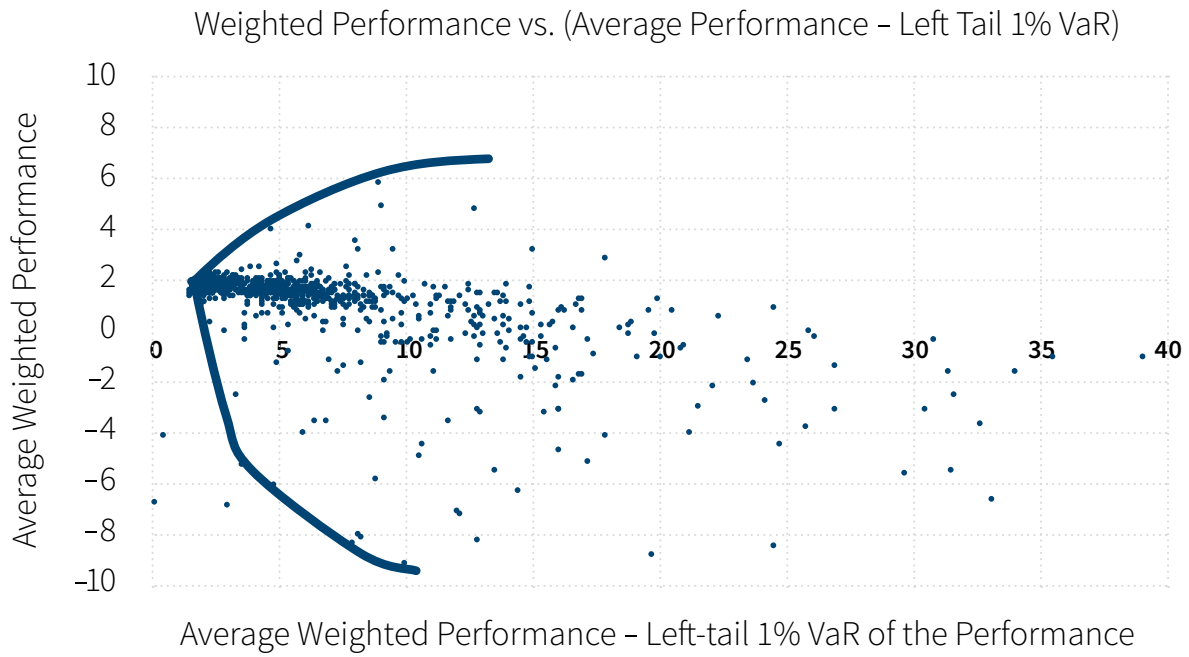


Table 7 Optimal Asset Allocation Plan

Savings	Bond	Equity	Real Estate	Annuity (Monthly Payment with 2% Annual Increase)	Weighted Performance	Risk	Sharpe Ratio
10%	90%	0%	0%	500	1.94	1.96	1.01

3 $C_9^2 = \frac{9\times8}{2} = 36$

be inconsistent. An investor may prefer objective A to B, prefer objective B to C and prefer objective C to A. Consistency of the matrix needs to be checked, as suggested by Saaty (1980, 1994).[4] Inconsistent preference inputs need to be communicated to the investor and adjusted.

For an integrated analysis using scenarios including economic and insurance risk factors, the correlation among risk variables need to be reflected. For example, an unexpected rising inflation could cause lower stock returns due to the rising input cost. Inflation may cause lower purchasing power and also higher medical costs. This would require complicated modeling using correlation matrices, copula or structured models. In addition, the result could be very sensitive to the correlation assumption. Stress testing is needed to test the robustness of the resulting optimal asset allocation plan.

Protection types of insurance products are also included in the financial planning. Unlike assets that return and risk depending on investment performance, the benefit of insurance products depend on insurance events such as death and sickness. Traditional approaches cannot be used for optimization that considers insurance products. A simulation-based multiple objective approach can consider assets and insurance products together using cash flow projection, but it significantly increases the number of asset allocation plans that need to be tested.

Time horizon is an important factor in asset allocation planning. The asset allocation plan needs to be reviewed regularly to reflect a changing time horizon.

Conclusion

A simulation-based multiple objective approach can systematically assess asset allocation plans against multiple objectives and use the aggregate performance to find the optimal plan. It is a flexible and extensible framework that can incorporate different objectives, asset classes and insurance products.

By projecting the cash flows over the time horizon, the new approach can easily measure the performance. At the same time, it requires more inputs and advanced modeling.

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4 Thomas L. Saaty, *The Analytic Hierarchy Process: Planning, Setting Priority, Resource Allocation*, 2nd ed. (Pittsburgh, Pa.: RWS Publications, 1980); Thomas L. Saaty, "How to Make a Decision: The Analytical Hierarchy Process," Interfaces 24, no. 6 (1994): 19–43.

Oh, No! Not Another Government Program

Mark Shemtob

Should any of the readers of this essay believe I have been living under a rock for the last decade, let me assure them I am very aware of the current trend to bash government programs. Such sentiment continues to thrive regardless of the fact that any attempt to curtail Medicare or Social Security is a career-limiting move for politicians. With that as a back drop, I want to outline some very basic ideas regarding a potential new government program.

Our profession is engaged in seeking actuarially based solutions that reduce financial risk. Few risks are more prominent today then the risk of retirees outliving their retirement nest eggs. This has become magnified by increasing lifespans and the demise of traditional pensions. Many approaches and solutions have been advanced over the years, ranging from encouraging changes in behavior such as delaying retirement, to the creation and refinement of insurance products designed to provide lifetime income such as longevity insurance and guaranteed minimum benefit products. Though these solutions have value, they are by no means adequate or appropriate for the vast majority of retirees. Not everyone wants to or can delay retirement. These newer insurance products come with costs, restrictions and risks and are often complex.

Thus there continues to be a need to provide solutions to the challenge to be faced by those seniors fortunate to live many years into retirement but who may not be fortunate enough to have sufficient financial resources. This challenge is generally referred to as longevity risk. However, longevity risk can be viewed differently from the perspectives of different stakeholders. For the retiree, it is the risk of running out of money on account of living longer than the money lasts and thus having to lower one's lifestyle below a reasonable or desired level. From an institutional point of view, such as a pension plan or insurance company, longevity risk can be viewed as the risk that benefit claims on annuity products exceed what has been reserved on account of underestimating life expectancy, thus leading to negative financial consequences. A third take on longevity risk is from the societal point of view; that is the financial impact on all members of society being confronted with an aged population with insufficient financial resources. Supporting a high percentage of the elder population reduces funds available for other societal needs or desires.

Longevity risk at the individual level can be mitigated through the use of risk pooling. Though solutions exist, they are far from ideal (and often unattractive) for reasons including high cost and complexity. If, however, pricing came down and the solutions more heavily utilized an increase in the longevity risk borne by institutions that guarantee these benefits (pension plans and insurance companies) increased utilization could follow. Should those institutions fail, the onus would then fall upon society to act as the ultimate back stop. Thus the risk ultimately falls upon us all when all else fails. We generally look to government to deal with such large societal issues and challenges, thus the logic for considering another government financial security program.

Key Principles

Such a program, a longevity insurance fund (LIF), could be designed based upon the following six key principles.

- **Must be well understood.** Far too many individuals lack an adequate understanding of longevity risk. They often plan for retirement based upon their normal life expectancy. At least 50 percent of these individuals will live beyond that expected age and thus could be prone to outliving their assets. For a longevity insurance program to succeed, it is crucial individuals understand that the purpose of the program is one of insurance, in this particular case, insurance covering the risk of living too long and depleting one's nest egg. Too many individuals lack a proper understanding of how insurance works and that insurance is a most cost-effective way to limit personal risk.
- **Must be universally available and voluntary.** Having a program that is available to all individuals has the benefit of creating public interest and

support as well as providing for lower expenses. The voluntary nature of a program is clearly a dual-edged sword. It is likely to be better received by citizens at large but may not be used by those who could most benefit from it.

- **Must be considered fair.** For citizens to support and participate in a voluntary program, they must perceive it as fair. Since fair has no universally accepted meaning, this creates a challenge. A majority of our citizens would agree that a program is fair if some are not favored over others. Unfortunately, this is not always possible. More to be said about this later on in the essay.
- **Must be cost efficient in respect to both administrative expenses and benefit level.** Among the negatives associated with current insurance products designed to provide lifetime income are high expenses. These expenses include administrative, marketing, sales, company profits and hedging (mortality and investment). For a longevity insurance product to be successful, it needs to be as actuarially fair as possible; that is a high percentage (as close to 100 percent as possible) of premiums paid (adjusted with investment earnings) should be paid as benefits. In addition, expenses to run the program must be very low.
- **Must provide for secure benefits.** Another drawback of current private market longevity type products is counterparty risk, the possibility that insurers will not make good on their promises. This concern becomes even more magnified when the benefits may not be payable for decades. Whether these concerns are legitimate or not when applied to private sector products is not as much an issue as the perception by the potential buyers of these products. For a longevity insurance program to be successful, there needs to be no doubt that benefits will be paid as promised. Having the backing of the U.S. federal government is the single most secure approach currently available.
- **Must provide for some flexibility to account for varying circumstances.** There are clearly individuals that will have no need for longevity insurance. This could be a result of having very large nest eggs or somewhat certain short life expectancies. There are others that have very modest nest eggs. Varying circumstances dictate a need to provide for some accommodations. However, having too much flexibility will complicate the program, which diminishes its value. The creation of a program that can accommodate different circumstances is critical to its success but must be done judiciously.

Hypothetical Program

A program might work as follows:[1]

- **Eligibility.** Upon attainment of age 65 (or some other age), an individual is offered the option to make a contribution into the longevity insurance fund (LIF).
- **Contribution details.** Single payment from an IRA, 401(k) or personal funds. An additional alternative could be provided that would allow reduction in Social Security benefits to be used to fund the LIF.
- **Benefit payout age.** 80 to 85 (or some other range) at the election of the individual to be made at the time of the contribution.
- **Benefit payout amount.** Accumulated value of contribution to benefit payout age converted to a life annuity based on then current life expectancy (with projections to the extent appropriate) and a market discount rate reflecting then current expected payout period.
- **Prepayout age death benefit.** Full refund upon death within the first two years of contribution funding. Thereafter several options available; must be elected at time of funding.
- **Accumulated value determination.** The contribution funded plus interest. The determination of the interest crediting rate should reflect expected returns on a long-term basis in accordance with the actual investment policy. Additional amounts to be credited based on mortality experience of individual's cohort based on death benefit option selected.
- **Longevity insurance fund.** Structured in a similar manner to the Social Security Trust

1 Note that the purpose of laying out a hypothetical program is to add context to the general concepts outlined above and hopefully stimulate discussion and in no way should be considered the author's definitive thoughts on the matter. There are a variety of complications that would need to be considered including, though not limited to, taxation, unisex table challenges and investment policy.

Fund, however, investments not restricted to government securities. To the extent that it is cost effective and appropriate, the federal government could outsource investment management responsibilities.

As noted earlier, one only needs to look to the popularity of Social Security and Medicare to appreciate how much our citizens rely on the safety nets provided. Criticisms of these programs center on their cost, not their value. The program as outlined above has been designed to limit (though not fully eliminate) the exposure to the federal government as well as to limit the extent of intergenerational wealth transfer. Establishing it as a voluntary program would clearly make it more palatable to many citizens. However, it would have the impact of potentially limiting its use by many who could most benefit from it. Thus its success would be contingent upon an appreciation of the value of protecting one's financial situation should they attain extreme old age. Those that may be reluctant to part with some of their nest egg in hopes of maximizing the amounts that might be available to their heirs must be made aware of the financial strain they will place on their heirs if they live beyond life expectancy and run short of funds. Those retirees without heirs or a desire to leave funds to heirs need to consider what their future would be like in 20 years if their nest egg is depleted. They need to answer the question: Is it not worth sacrificing a small bit of my early year retiree living standard to protect against old age poverty? Alternatives might be considered that would use a default strategy to get individuals automatically covered. This could be done by automatically using a portion of Social Security benefits to fund the longevity benefit. Of course, individuals could opt out if they wish.

Program Fairness

A couple of comments on the issue of fairness are in order. The program as outlined does offer a sense of fairness from a generational point of view since it is designed to not require future generations to pay for current generations. However, within a generation, the issue of fairness is more complicated. Even though each retiree is paying for his or her own benefit, not all retirees will have the funds available to divert to the purchase of longevity insurance. In addition, life expectancy differs based upon a multitude of factors ranging from gender to race. Thus the program will have greater value for some than others. I believe the way to consider the merits of such a program is not that it be universally fair but that it improve on the status quo. Though it is true that the program described above will do little or nothing for those retirees who have not accumulated sufficient retirement funds, it does serve a valuable purpose. The program as outlined in this essay is aimed at a different group of retirees—those who have accumulated meaningful funds for retirement but potentially not enough as a result of an uncertain lifespan. Those who have not accumulated sufficient funds will either need to work longer, turn to family for help or seek assistance from government programs designed for the indigent.

Conclusion

Some may feel that the idea of a universal longevity insurance program is a solution looking for a problem. Whether there will be millions of elderly citizens faced with significant declines in their standards of living in the future is not possible to predict with any certainty. However, trends seem to indicate an increasing possibility. It is possible that longevity improvements could cease or that retirement nest eggs will last longer than expected due to proper financial management and cooperative financial markets. Whether we wish to leave this to chance or initiate a program focused on dealing with this likely (though not certain) problem is a fair question. Though even if a crisis does not materialize, there are clear benefits to such a program. These include peace of mind for those who utilize it. In addition, knowing that funds are available in the future should a retiree survive to an advanced age may allow for a greater consumption of funds in the earlier stages of retirement. This both improves the personal retirement experience as well as aids the overall economy.

Though Social Security does provide lifetime income, it is seldom on its own sufficient to provide a respectable living standard for our elderly. The majority of our citizens will also rely on nest eggs that cannot last for multiple decades. Thus we need to create additional income sources for the super elderly. Fortunately, we have not yet reached the level of demographic danger that Japan and certain European countries are facing

and thus this issue may not seem pressing at the moment; however, waiting for a crisis to be upon us before we take action would be foolish. Whether our citizens would agree that the elderly financial challenge warrants a new government program would likely depend on how it is presented and structured. Whether private industry on its own can deliver a cost-efficient universal solution to the prospect of insufficient financial resources for the very elderly is doubtful. The reality is that certain challenges are too large for any entity other than the federal government. This is likely one of them.

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A Better Public-Private Approach to Resolving LTSS Financing Dilemma—Catastrophic Shared Stop-Loss:

Adapting Life Insurance to Meet Long-Term Care Needs

Morris Tenenbaum

A catastrophic, shared stop-loss program would provide long-term care for a majority of people by allowing participants to tap into life/death insurance benefits before accessing Medicare and Medicaid, thereby extending private coverage longer than current mechanisms do. Participants who reach the common LTC formula (three years of nursing care, six years of home care) would automatically be eligible for coverage, as needed. Death benefits could be used as a loan to avoid taxes and, when the patient dies, insurance would pay off the loan and heirs would still be entitled to the remaining assets.

In the case of the New York State Partnership, which serves as a model, the government is not only reducing its spiraling cost exposure—in 2013–14, the estimated savings to Medicaid was $34 million, part of a 19 percent annual decrease over the last eight years—but consumers feel secure in knowing they have the coverage they need, no matter what.

The Immediate Need for New Long-Term Services and Support Financing

The challenge of designing a comprehensive and sustainable long-term services and support (LTSS) system is considerable. The number of Americans who need LTSS is 12 million today, and an estimated 27 million by 2050. While 42 percent of people turning 65 will not use LTSS, 16 percent will spend $100,000 or more for it. To manage this risk, a reliable insurance mechanism is needed to help pay for these costs.

This rising need occurs against a backdrop of significant fiscal constraints, and levels of assistance and types of services vary widely.

Almost a third of the entire adult population—66 million Americans—are acting as unpaid caregivers for family members. Many are giving up jobs and income and paying out of their own pockets to help. Financial losses can be devastating for all but wealthiest people. Paid caregiving at home or in a facility is very expensive, especially over the long term, for people who rely on Social Security or disability benefits, pensions and retirement savings, and retirees don't have enough resources to pay for LTSS.

Private LTSS is not being utilized because of high costs and confusion about coverage, as well as a focus on more immediate financial demands. Younger consumers have no idea whether to buy long-term health insurance and how much to buy, and insurance companies don't know how much to recommend. Of those in need of LTC, only 7 percent are able to rely on private options. For Americans over 40, 65 percent have little to no planning for living expenses in retirement and only 8.2 million people are covered by private LTSS, representing fewer than 6 percent of Americans over 40. Even people earning more than $100,000 per year are foregoing LTSS insurance, expecting to rely on Medicaid and possibly transferring assets as the only viable way to pay for long-term care.

Another factor is the sale of long-term care insurance is not sufficiently profitable to carriers. Low interest rates lead to low investment yield, resulting in increasing premiums and much tighter underwriting for new policies. Also, the number of people on claim for four years or more has increased, mostly with older policies, and lapse rates are much lower than expected. People are also using services longer.

Spending for LTSS by Medicaid, the primary LTSS payer, will grow 6 percent annually, faster than GDP. Today individuals typically must exhaust almost all of their savings and spend a substantial portion of their income on health care and LTSS before they qualify for Medicaid.

Obstacles to Reforms

There are many hurdles to overcome, including fiscal constraints, which are difficult to conquer in a less than vibrant economy. Lawmakers are reluctant to increase spending. Also, partisan disagreement on the role of federal government continues to produce gridlock, and adding to social insurance programs like Medicare is unfeasible in the current climate.

Failure to provide solutions will overwhelm the existing structure, given the inevitable and increasing retirement of the baby boom generation—"the silver tsunami." For the next 18 years, 8,000 people will reach the age of 65 every day.

The vast majority of experts in the field call for a systemic overhaul of long-term care financing but little has been done. The Federal Long-Term Care Commission calls for "a sustainable balance of public and private financing" that (1) "provides the tools and protections to enable Americans to comprehend and better prepare for the financial risk of needing LTSS; and (2) ensures that individuals with limited financial resources or for whom the cost of their care exceeds their financial resources have access to needed high-quality services and supports."[1]

There Is a Way

The first step is to leverage life insurance/death benefits for LTSS by creating dual purpose coverage or "catastrophic shared stop-loss" insurance. Automatic (passive) enrollment minimizes resistance and costs. Medicaid would become the last resort for final coverage.

A program that provides some relief to individuals with catastrophic LTSS costs will generate greater Medicaid savings. New York State data shows that government will save money with this approach, which extends private coverage longer than private mechanisms today.

This is more palatable to fiscally conservative lawmakers and can accelerate death benefit as a loan to avoid taxes. When the patient dies, the loan is paid off by the benefit.

New York State Partnership for Long-Term Care model is currently set up to handle this type of system and is creating significant savings to the state, and it can be replicated in other states. The program lets individuals or couples who purchase a partnership policy to hold onto all or part of their assets (depending on the type of policy they purchase) under the Medicaid program if their long-term care needs extend beyond the period covered. Passive enrollment gives participants a helping hand at the point they need it.

INITIAL PURCHASE

The consumer buys catastrophic shared stop-loss insurance for life and/or long-term care. This addresses two major risks—income protection and long-term care costs. Consumers may also convert life insurance. A life insurance supplement of $100,000, for example, can act as a deductible for elder care, providing $300,000 long-term care coverage. About 70 percent of American have life insurance.

Stop-loss insurance attracts new customers to **insurance companies** and encourages current policyholders to purchase additional insurance.

The **employer** purchases tax-qualified stop-loss insurance in place of traditional term insurance, which generally offers a death benefit equal to one year's salary (at no extra cost to the employer). Today, at least $50,000 of employee term life insurance is tax-qualified for employers.

RETIREMENT

When the need for life insurance wanes for **retiree policy holders**, the need for long-term care insurance increases. Stop-loss insurance equals consumer choice.

Insurance companies develop and provide pay-out products for older consumers accessing stop-gap insurance, e.g., annuity options designed to protect policyholders.

With dual purpose insurance (DPI) flexibility *every option* can be covered, including individual situations and regional long-term care needs.

LONG-TERM CARE/END OF LIFE NEEDS

Consumers who need LTC can access funds available through their catastrophic shared stop-gap policy. In

1 Commission on Long-Term Care, *Report to the Congress*, at 60 (Sept. 30, 2013).

today's market, this is $160,000, sufficient for many LTC consumers.

If stop-gap policy funds are exhausted, consumer would be eligible for benefits under the Partnership for Long Term Care, which provides coverage after three years of nursing home care and/or six years of community-based care and/or a combination. This information is based on NYS Partnership projections.

To protect income and assets, rider payment options for consumers can be offered. This is not so with Medicaid today.

Insurance providers are obligated to dispense *only* funds insured by the stop-gap policy. There's no open-ended commitment to pay unlimited LTC costs of a single-purpose LTC policy. To protect insurance companies from unusual catastrophic losses, there could be a partnership with the government, which financially acts as a reinsurance entity for the existing liability.

Most importantly, stop-gap would greatly reduce the use of Medicaid to pay for long-term care, making more funds available for low income and disabled populations, as well as health care reform initiatives.

Corporations like IBM, or government personnel offices, can negotiate with their respective life insurance companies to provide "whichever comes first" life insurance, with the benefit payment decision to be made at the occurrence.

Possible Legislation to Spur Change

There are steps lawmakers could take to help. They could eliminate potential tax liabilities for accelerating death benefits while the person is alive. Alternatively, the benefit can be taken as a loan and paid in full on death. The partnership program should be federalized as an adjunct to Medicare or another federal entity to ensure portability. Legislation can also be created to allow tax deductions for premiums on life insurance policies that incorporate long-term care accessibility.

As an additional incentive to the insurance industry, the program should offer a rider allowing participants to protect their income as opposed to the current partnership under Medicaid where income is not protected.

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Decisions Misaligned With Priorities:
The Non-Annuitization of Retirement Savings

Paul J. Yakoboski

Providing a financially secure retirement is a primary objective for any employment-based retirement plan. For workers covered only by a defined contribution (DC) arrangement, this starts with accumulating sufficient wealth to fund retirement, but that is not enough. A retiree must then manage and decumulate that savings so it provides an adequate and secure income throughout retirement. The primary challenges in doing so are well understood. Retirees don't know what their investment returns will be over the course of their retirement. Nor do they know how long they or their spouse, if they are married, will live. If they decumulate assets "too quickly," retirees risk not having adequate retirement income in later life. If they do so "too conservatively," they can experience an unnecessarily lower standard of living. So adequate savings must be translated into income in a manner that efficiently manages investment and longevity risks.

Asset decumulation is not only a personal finance issue for individuals; it has significant public policy implications too, as growing numbers of workers accumulate retirement benefits solely in DC plans. To this end, the economic rationale for annuitization of (at least some) retirement savings has long been understood. However, annuitization rates historically have been low—very, very low—a phenomenon that is not well understood despite ample research. If retirees are making "rational" decisions based on full information, then low annuitization rates are not a concern. But given what we know about decision-making during the accumulation stage (regarding participation, contribution rates and investment allocation), rational behavior is probably not the norm for many retirees during decumulation.

Financial Priorities and Nonpriorities Among Retirees

Understanding the decisions that retirees make is a precursor both to identifying whether there is an issue concerning annuitization and to guiding individuals in the right direction given their circumstances. If retirees' choices are consistent with the pursuit of their financial priorities for retirement, then there is no reason for concern at either a micro and macro level (unless one wanted to argue that some retirees' priorities are flawed and need to be "fixed.") In this case, those who annuitize and those who do not must simply have different financial priorities for retirement.

Alternatively, if the strategies chosen do not align with retirees' financial priorities, then there is an issue to be addressed. This, in fact, appears to be the case with many retirees who choose to not annuitize, according to research by the TIAA Institute.[1] We surveyed 500 retirees who had annuitized at least some of their retirement savings and 500 retirees who had not annuitized any retirement savings. The survey was restricted to those who had retired with at least $400,000 in DC and/or IRA assets and who had no defined benefit (DB) pension income. In this case, retirement savings and Social Security likely represent the primary sources of retirement income, so management of that savings would be particularly important for retirement income security.

Survey respondents were asked to rate the priority they place on 10 items using a five-point scale ranging from "very high priority" to "not a priority." We found that annuitants and non-annuitants typically share the same top financial priorities for retirement. In fact, they generally share the same top, middle and low priorities. Furthermore, annuitization is consistent with meeting the top priorities.

More specifically, the top financial priorities for retirement among annuitants were protecting spouse's financial security from your death, not outliving savings and assets, and covering basic expenses with a guaranteed income stream. Each was deemed a "very high priority" by over one-half of those who have annuitized and as a "high

1 See Paul J. Yakoboski, "How Retirees Manage Retirement Savings for Retirement Income: A Survey of TIAA-CREF Participants," TIAA-CREF Institute *Data Summary* (October 2015).

priority" by more than one-third. The first two priorities also were the most important to non-annuitants, with analogous percentages rating each as "very high" and "high." Having guaranteed income sufficient to cover basic expenses ranked third among non-annuitants, but only one-third rated it a very high priority and another one-third as a high priority. Given these attitudes, there appears to be a disconnect between the top financial priorities of non-annuitants and their decision to not annuitize any retirement savings. Since they have not annuitized, their savings must be drawn conservatively to meet their financial objectives. (See Table 1.)

Not only do annuitants and non-annuitants tend to share the same top financial priorities, they generally agree on the lowest and mid-level priorities. The findings at the low end of the priority spectrum are striking: Items that rate lowest as financial priorities—having the flexibility to adjust your income as needed over time, earning a high rate of return on your financial assets, leaving an inheritance and having professionals manage your financial assets—are all consistent with not annuitizing retirement savings. But given that they are low priorities, they should not drive the decision to not annuitize. (See Table 2.)

Explaining the Non-Annuitant Disconnect

So, why do some retirees with significant DC/IRA accumulations, but no pension income, choose to not annuitize when all tend to share the same financial priorities and the top priorities are consistent with annuitization? Why the disconnect between priorities and decisions among non-annuitants?

When asked specifically about their reasons for annuitizing some retirement savings, the items annuitants rated highest in importance—cannot outlive the income stream and providing income for spouse if annuitant dies first—aligned with the top financial priorities previously noted. One-half rated each of these reasons as extremely important and an additional one-third rated each as very important.

In contrast, a strong, driving reason did not emerge when non-annuitants were asked about their decision to not annuitize any retirement savings; no item rated "extremely important" among a large share of these retirees. The most significant reason—maintaining direct control of the money—was rated as extremely important by only one-quarter of non-annuitants and very important by an additional 40 percent. Furthermore, this top reason does not align with any of

Table 1 Top Priorities for Managing Personal Finances During Retirement

How Much of a Priority is [This Issue] When it Comes to Managing Your Personal Finances During Retirement?				
	Very High	**High**	**Moderate**	**Low/Not**
Ensuring the financial security of your spouse if you die first				
Annuitants	57%	36%	5%	3%
Non-annuitants	51%	36%	8%	5%
Not outliving savings and financial assets				
Annuitants	54%	35%	7%	4%
Non-annuitants	49%	37%	10%	4%
Having a guaranteed income stream sufficient to cover basic expenses				
Annuitants	53%	38%	6%	3%
Non-annuitants	36%	35%	18%	10%

Source: Yakoboski, "How Retirees Manage Retirement Savings for Retirement Income."

Table 2 Low Priorities for Managing Personal Finances During Retirement

How Much of a Priority is [This Issue] When it Comes to Managing Your Personal Finances During Retirement?				
	Very High	**High**	**Moderate**	**Low/Not**
Having the flexibility to adjust your income as needed over time				
Annuitants	15%	49%	27%	10%
Non-annuitants	25%	45%	26%	4%
Earning a high rate of return on your financial assets				
Annuitants	9%	30%	49%	12%
Non-annuitants	11%	31%	48%	10%
Leaving an inheritance				
Annuitants	6%	26%	35%	34%
Non-annuitants	12%	27%	32%	28%
Having professionals manage your financial assets				
Annuitants	12%	20%	24%	43%
Non-annuitants	10%	20%	24%	46%

Source: Yakoboski, "How Retirees Manage Retirement Savings for Retirement Income."

their top financial priorities. Rather than a driving reason (or reasons) leading individuals to not annuitize, it appears more likely that non-annuitants simply do not perceive a driving reason to annuitize.

It's possible that non-annuitants do not understand that annuitization would address their top financial priorities. If so, why not and would a better understanding lead to decisions that are more aligned with priorities?

The survey responses suggest that advice impacts decumulation decision-making and that advice can cut both ways. Almost equal percentages of annuitants and non-annuitants (54 percent and 58 percent, respectively) worked with a financial adviser in deciding how to manage and draw income from retirement savings. Moreover, both groups tended to be equally likely to follow the advice they received. But the advice received was generally quite different between the two groups: Annuitants were more likely advised to annuitize than were non-annuitants, and very few annuitants were advised to not annuitize. Specifically, 60 percent of annuitants were advised to annuitize, versus 21 percent of non-annuitants. (See Table 3.) Thirty-seven percent of non-annuitants were advised to not annuitize, and 42 percent received no advice regarding annuitization. It can be argued that receiving no advice about annuitization is equivalent to being advised to not annuitize.

Table 3 Advice Received About Annuitizing Retirement Savings

	Do	**Don't**	**Not addressed**
Annuitants	60%	9%	30%
Non-annuitants	21%	37%	42%

Source: Yakoboski, "How Retirees Manage Retirement Savings for Retirement Income."

In addition, the investment decisions that workers make while saving for retirement during their working life have implications for how they manage savings for income during retirement. By extension, this implies that investment menu design during the accumulation stage matters for decumulation-stage decisions. More specifically, previous research found that retirees who annuitized were more than twice as likely, compared with retirees who had not annuitized, to have saved through a deferred annuity in a DC plan while working.[2] One-quarter of retirees who have not annuitized their retirement savings participated in a DC plan that offered an annuity investment option in the accumulation phase, and 25 percent of these retirees saved through the annuity. In comparison, retirees who have annuitized were slightly more likely to have participated in a DC plan that offered an annuity investment option, and 45 percent of them saved through the annuity. Additionally, 41 percent of retirees who annuitized participated in a DC plan that offered annuitization as a retirement payout option. It appears that in-plan deferred annuities present an opportunity for participants to become socialized to annuities and annuitization, thus increasing their propensity to annuitize.

Conclusion

Retirees with significant DC and/or IRA accumulations and no DB pension income tend to share the same top financial priorities for their personal finances in retirement, irrespective of whether or not they have annuitized any of their retirement savings. Furthermore, each of these top priorities is consistent with annuitization, and the primary reasons cited by annuitants for annuitizing align with these priorities. So why then do others who share the same financial priorities choose instead to not annuitize?

It is possible that non-annuitants simply do not understand that annuitization would address their financial priorities for retirement. If they are not advised to annuitize or if they are not socialized to annuities and annuitization while still working and saving, then they may not see the connection between their priorities and annuitization. In fact, one-quarter of non-annuitants rate their understanding of annuities and annuitization as merely fair or poor. Most non-annuitants do not have a good idea about the income level that annuitizing their savings would provide; among those professing to have a pretty good idea or somewhat of an idea, only one-third give a reasonable answer regarding what $100,000 would yield if annuitized.

Correcting this disconnect can help ensure that an adequate level of retirement savings translates into an adequate and secure retirement income—one that lasts a lifetime and meets retirees' top financial priorities.

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2 See Paul J. Yakoboski, "Retirees, Annuitization and Defined Contribution Plans," TIAA-CREF Institute Trends and Issues (April 2010). The analysis was based on a survey of individuals who had been retired at least three years, were not working for income during retirement, had $200,000 or more in DC and IRA assets at the time of retirement, and had less than $200 per month in defined benefit pension income. The survey population was not drawn from TIAA participants.

Decumulation Strategy for Retirees: Which Assets to Liquidate

Charles S. Yanikoski

When it's time to decumulate, most people have multiple assets from which they can draw. So which asset(s) should go first? Unfortunately, this simple question has no easy answer, either in general, or, typically, in specific cases. Furthermore,

- Making poor choices can have harmful affects which, for middle-income families, may be unaffordable.
- Most consumers know nothing about this subject—it's rarely addressed even in the professional literature, let alone in the consumer literature.
- Most professionals do know something about it but do not have a well-considered and well-organized methodology for choosing which assets to liquidate.
- In addition to the financial effects, choices based on guesswork that proves to be wrong are particularly subject to regret and recrimination.

The more assets one has, the more difficult it is to choose which to liquidate. Furthermore, the decision can be hard even if there are only a few assets because there are many factors that can enter into the decision, some of which are difficult to quantify and some of which cannot be quantified at all.

Among these factors are financial questions dealing with risk, liquidity, income generation, future growth potential, taxation, timing, liquidation costs (including penalties) and portfolio diversification. Nonfinancial considerations include whether the asset is used for personal purposes (e.g., a vacation home, a boat, a work of art) or whether there is a sentimental attachment to it.

The Ideal Solution

There is more than one way to approach decisions of this kind. Decisions involving multiple, complex choices are typically best handled by good software. The ideal software would

- Be fully informed about all the assets, including nonfinancial concerns.
- Be fully informed about all other current and probable (or even possible) features of the individual or household financial situation, including morbidity and mortality, so that both "normal" and exceptional scenarios could be projected. This is necessary so that future cash flows and marginal tax rates can be estimated.
- Know about the individual's desires and fears about money, not limited just to "risk tolerance."
- Have the capacity to evaluate all the assets against all of the issues previously listed, and to weigh them against one another, producing a financially and emotionally satisfying recommendation, with an English-language explanation of why the recommendation is being made.
- Include an asset allocation analysis to assure appropriate diversification.

Since such software does not exist, however, and is probably not even on the horizon, a more immediately practical approach is worth exploring.

A Practical Asset Disposal Worksheet

Less ambitiously, an automated spreadsheet could be created to help evaluate each asset based on various factors. Within the context of an essay, however, it is more immediately useful to devise a manual worksheet.

To begin, we identify seven main factors that affect the decision, though most have multiple subfactors. The worksheet (Figure 1) illustrates how the worksheet looks. Instructions explaining use of the worksheet follow, then a sample completed worksheet (Figure 2).

Figure 1 Worksheet Layout

(List Assets in This Column)	Taxes		Timing		Lost Income		Side Effects		Obligations		Efficiency		Sentiment and Risk		TOTAL SCORE
Column importance		X	5	X		X		X	5	X		X		X	X

WORKSHEET INSTRUCTIONS

1. **Assign values from 0 to 5 for each of the seven issues listed in the columns, placing the values in the row marked "Column importance."** These values should be 0 or 1 in a column that does not apply to you or matters very little. They should be 4 or 5 in columns where the issue is financially significant or personally meaningful to you. Here are factors to consider in determining these values.

    a. **Taxes.** Enter a **higher** number if you currently
    - are in a high federal tax bracket.
    - live in a state with high state taxes on ordinary income, investment income and/or capital gains.

    b. **Timing.** This has been prefilled as 5—timing is always important!

    c. **Lost income.** Normally, enter a 3 or 4 here, but it can be lower if none of your assets produce much income, and you live almost entirely from the **sale** of assets and from Social Security, pensions, annuities, gifts from family and/or other sources of income not connected with assets you own.

    d. **Side effects.** Enter a **higher** number if you are considering the sale of assets that you currently use, or that other people use (such as a vacation home, a car or boat, livestock or farm equipment). Or enter 0 if none of this applies.

    e. **Obligations.** Also prefilled as 5—if any of your assets are collateral for loans or liens or are pledged for some other purpose, then this is important; if none of them are restricted in these ways, or if the restrictions could be dealt with easily, then this column will have no impact anyway.

f. **Efficiency.** Enter a **higher** number if you
- need cash right away.
- are concerned about the amount of effort it might take to liquidate any of your assets (for example, real estate).

g. **Sentiment and risk.** Enter a **higher** number if
- you are risk-averse.
- your asset portfolio is not well diversified and balanced.
- you or anyone else has an emotional or nonfinancial attachment to any of your assets.

2. **List individual assets you would consider liquidating, and assign values from 0 to 5 for each of them in the narrower of the two columns in each of the eight vertical sections, excluding any columns that have 0's in the row marked "Column importance."** These values should be 0 or 1 in a column where that particular issue has little or no negative effect if that particular asset is disposed of. Enter a 4 or 5 if, instead, you expect a significant negative impact. Here are factors to consider in determining these values asset by asset.

a. **Taxes.**
- Enter a **higher** number if sale of this asset generates
  - ordinary income and you are in a high federal or state bracket, even more so if you expect to be in a lower bracket in the future or if this asset might be left to heirs who would be in a lower tax bracket.
  - capital gains and you are in a very low federal or state bracket (such that It would cost you more taxes than additional ordinary income would).
  - a significant capital gain and the asset could have a good chance of being left to an heir (for whom the asset would get a step-up in tax basis, eliminating the capital gain).
  - a short-term capital gain instead of a long-term gain, and this would be disadvantageous to you.
  - a tax loss likely to be more valuable some other year.
- Enter a **lower** number if sale of this asset generates
  - little or no tax liability.
  - a tax loss that can be used to offset other gains, all the more so if there is a chance of this asset going to an heir who would receive a step down in basis.

b. **Timing.**
- Enter a **higher** number if
  - the market (stock, bond, real estate, etc.) for this asset is below normal, so that selling now locks in losses (or precludes likely future gains).
  - sale of this asset generates a penalty for early withdrawal, a tax penalty, a surrender charge, or other penalty that will shrink or disappear if you dispose of the asset later.
  - by contract or for some other reason this asset is due to increase in value or produce a large dividend or other income in the relatively near future.
- Enter a **lower** number if
  - the market for this asset is currently above normal.
  - you feel that even though the asset is currently selling below normal, that's because of a serious problem that probably isn't going away.
  - by contract or for some other reason this asset is due to decrease value or produce a large expense or other loss in the near future.

c. **Lost income.**
- Enter a **higher** number if
  - this asset produces little or no income.
  - you expect, or worry, that the income it produces will decline.
- Enter a **lower** number if
  - this asset generates unusually high cash income.
  - you have a strong expectation this asset will generate future cash income or capital gains.

    - you consider the income this asset produces to be highly reliable.
    - income from this asset is tax-free or tax-sheltered.

d. **Side effects.**
    - Enter **5,** or
    - Enter a **lower** number if
        - this asset, in addition to its financial value, is currently in use by you or someone important to you in a way that would be inconvenient, difficult or even impossible to replace—the more difficult, the lower the number.
        - this asset is highly liquid, so it would be helpful to save for an emergency, and/or it cannot be disposed of at fair value.

e. **Obligations.**
    - Enter a **higher** number if
        - this asset is completely unrestricted.
        - this asset will be liquidated or partially liquidated without your choice (e.g., a bond is maturing, or required distributions must be taken from an IRA).
    - Enter **0** (or some other low number) if
        - this asset is collateral for a loan you do not intend to pay off, has a lien that you cannot easily clear off, is co-owned by someone else, requires the approval of an uncooperative ex-spouse to liquidate, or is pledged or restricted in some other fashion.

f. **Efficiency.**
    - Enter a **higher** number if
        - this asset requires a lot of effort to maintain.
        - it complicates your financial records or tax accounting.
        - it is not very liquid or marketable and might not be sellable at the time you need to do it.
    - Enter a **lower** number if
        - this asset is trouble-free.
        - it would be time-consuming or expensive for you to dispose of it.

g. **Sentiment and risk.**
    - Enter a **higher** number if
        - this asset is risky (because it's value fluctuates, income from it fluctuates, it's future is uncertain, or you're just not comfortable with it).
        - you have too high a percentage of your net worth in this asset, so that there's risk from insufficient diversification in your portfolio.
        - you inherited the asset or were talked into acquiring it and you aren't sure whether or why you should still have it.
    - Enter a **lower** number if
        - this asset helps balance your portfolio, because it's of a different type, from other assets.
        - you have a not strictly financial attachment to the asset (e.g., it was given to you by someone you love, it's connected with your past, it supports a cause you believe in, etc.).
        - another family member or heir is attached to it and/or hopes to inherit it.

3. **Tally the scores.** In each of the eight vertical issue sections, multiply the individual score for each asset times the overall weighting factor (from "Column importance") and put the answer to the wider column to the right of each asset score. Then add these scores horizontally to produce a total for each asset. Assets with high scores are normally the most ripe to be disposed of.

Reality Test and Decision

Although the obvious final step is to dispose of as much of the assets with the highest score(s) as needed, this is too simplistic, for several reasons.

- There might be reasons to either keep or sell an asset that are more important than this method reflects.
- Several assets might have high scores that are only slightly different. The methodology is not so precise or perfect in design that these differences are necessarily meaningful.
- Some assets (e.g., real estate, businesses, vehicles, collectibles) may have to be sold as an entirety, or

Figure 2 Sample Completed Worksheet

(List Assets in This Column)	Taxes		Timing		Lost Income		Side Effects		Obligations		Efficiency		Sentiment and Risk		TOTAL SCORE
Column importance	5	X	5	X	3	X	1	X	5	X	2	X	3	X	X
401(k)	4	**20**	3	**15**	4	**12**	5	**5**	5	**25**	5	**10**	5	**15**	**102**
Employer stock	2	**10**	2	**10**	1	**3**	5	**5**	5	**25**	5	**10**	5	**15**	**78**
Apple stock	3	**15**	5	**25**	3	**9**	3	**3**	5	**25**	5	**10**	3	**9**	**96**
Savings bonds	1	**5**	0	**0**	2	**6**	4	**4**	5	**25**	4	**8**	2	**6**	**54**
Bank CDs	0	**0**	0	**0**	1	**3**	5	**5**	5	**25**	4	**8**	5	**15**	**56**
Empty house lot	3	**15**	2	**10**	0	**0**	3	**3**	2	**10**	2	**4**	1	**4**	**46**

Note: In this sample case, withdrawals from the 401(k) and the Apple stock are about of equal attractiveness. This individual would probably do best to withdraw from one or the other, or from a combination (especially since 401(k) withdrawals and common stock sales have very different tax consequences).

not at all. It might not make sense to dispose of such assets if the cash needed is not that large.

- Even if the needed cash can be obtained from the sale of a single asset, there may be little reason to actually do so. It might make more sense to take a smaller amount from several places.
- Investments should continue to be diversified. It's important to consider what the asset allocation will be after assets are sold.
- Splitting up the sale of assets can help to optimize income taxes on a year-by-year basis. If some sales generate taxes while others do not (or actually generate losses), then one can mix and match these sales to avoid taxes if one is already in a high bracket, or to generate tax liabilities deliberately if one is currently in a lower tax bracket than normal, or to do some of both. If tax-generating sales would push the taxpayer into a higher tax bracket, for instance, such assets could be sold only up that limit and then non-tax-generating sales used to avoid entering the higher bracket.

Finally, the user of this worksheet should step back and ask: Am I satisfied disposing of the assets I have chosen? Am I satisfied with what my portfolio will look like after these sales? If not, there may be some tweaking left to do.

Of course, all decision-making methods and tools enable, at best, to make **prudent** decisions, not **optimal** ones. The method outlined here, though useful, is still simpler than what a well-designed automated system could produce, but for the typical middle class household, it is probably sufficient, and certainly an improvement over less rigorous decision-making processes.

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Dealing with Multiple Post-Retirement Risks in the Middle Market

Charles S. Yanikoski

Retirees face many financial risks, some of them related to the intrinsic uncertainty of investment, others to health, economic or family issues that are largely unpredictable, still others to financial and lifestyle choices whose consequences cannot be clearly foreseen. Dealing with any one of these can be daunting, but the larger problem is that most older Americans currently lack a clear path for dealing with all of them as a totality.

Narrowing the Focus

This is not a problem for everyone. Retirees who are wealthy—or merely "affluent" but wise enough to manage their resources at all prudently—rarely need to worry about impoverishment from retirement risks. Nonetheless, many of them choose to insure against some such risks because they want to reduce the odds of substantial financial losses to themselves or their dependents or heirs, or to assure peace of mind among that circle of potential beneficiaries. But these are usually nice-to-haves, not must-haves, for the affluent/wealthy.

At the opposite end of the spectrum, low and low-middle income folks generally can't afford to insure against *any* of these risks. In that respect, sadly, their lack of options makes their strategy fairly simple: Be smart consumers and take advantage of whatever benefits or other revenue opportunities they might have. Meanwhile, they may be able to ameliorate their financial risks by other means—usually by relying on family, friends, churches, charities and/or government agencies.

The hardest decisions, therefore, generally apply to the middle and upper middle financial classes, who are the focus of this essay. They have, or could have (if they can be economical) enough resources either to insure against only *some* risks or to insure *in part* against *all* risks.

Three Ways to Address Risk

But let's take a step back before investigating that particular choice. People can address risk in three ways: by purchasing insurance products, by self-insuring and by reducing their exposure. (They can also ignore risk, but that isn't exactly "addressing" it, though it can be a rational response sometimes.)

PURCHASING INSURANCE PRODUCTS

Purchasing products such as life insurance, annuities, health insurance, long-term care insurance, investment return guarantees of various kinds, or products that offer some combination of these benefits is generally *not* a plausible stand-alone solution for people in our middle-income group, for two reasons. First, some risks are not insurable, such as, for example, the loss of pension or Social Security benefits, or financial stress caused by a divorce. Second, even where insurance or guarantees are available, middle income people generally cannot afford to buy into all of them.

Given these limitations, furthermore, it is necessarily the case that for any given risk for which they do purchase insurance, they are expending assets that could instead be used to help cover other contingencies. That is, *every choice for a middle or upper-middle income person or household to purchase a financial product to reduce a specific retirement risk entails a trade off: reducing exposure to that risk at the cost of increasing exposure to other risks.*

SELF-INSURANCE

Self-insurance is one way to eliminate that problem. This strategy involves a conscious decision to "insure" against risks by applying most or all of one's financial resources on the universal risk reducer we call "wealth." Wealth (whether in the form of cash, savings, investments, home equity or other assets), especially wealth that is fungible (liquid, or able to be liquidated without risk of significant loss), can be used to deal with, or at least help deal with, any financial adversity. Having wealth rather than individual insurance arrangements against one or more risks means that you are insured (in this case, self-insured) against all risks, not just one or a few risks. You are even "insured" against risks that you cannot buy financial products to cover.

This is a tremendous advantage, but it also comes with disadvantages: (1) it is less effective against many individual risks than financial products designed to defend specifically against those risks; and (2) for a middle income family, a particularly bad outcome in even one of the 15 risk categories could wipe out the household's wealth, and therefore leave them completely exposed to future contingencies of all kinds.

REDUCING EXPOSURE TO RISK

This approach can help defend against specific risks, and often also can increase wealth, and therefore directly or indirectly help defend against all risks. Reducing exposure is achieved in a number of ways, most prominently, by

- Being more economical in one's lifestyle, which, for example, reduces the risk of living too long because it becomes less expensive to do so, and enhances one's ability to increase or at least preserve wealth already accumulated.
- Looking for opportunities for additional income.
- Making shrewd trade-offs in forced decisions (such as Social Security claiming, or the choice of a defined benefit plan retirement option).
- Making prudent financial decisions in other areas.
- Choosing a healthier lifestyle, which can have a mixed effect: reducing medical expenses and perhaps extending one's ability to earn money, but also increasing the risk of "living too long."
- Strengthening social relationships, thereby providing personal or community networks that can provide help in times of need and reduce out-of-pocket costs when adversity does arise.
- Adjusting attitudes—mainly accepting certain "adverse" outcomes as tolerable: for example, agreeing to end up in a Medicaid-paid nursing home, if the need arises, even if it means you have to share a room with someone you don't know.

Such choices, as already noted, are often the only options for the poor or near-poor, but they can be of financial benefit to everyone. Still, on their own they can rarely reduce every risk to an acceptable level. These three strategies—insurance products, self-insurance through personal wealth and risk reduction—complement one another, and together they should be able to make a significant difference in improving the lives of people of retirement age.

Optimizing These Strategies

But how, exactly, can this work? Specifically, in any given personal or family situation, how can the combination of these strategies be optimized (or, to use a more appropriate term, managed most prudently)?

Clearly, a sophisticated decision-making model would be desirable. A model that enabled people to make the most prudent possible decisions would need to take into account both detailed financial calculations and the emotional impact of choosing to leave certain risks uncovered or only partly covered. No such tool exists.

However, we can put together a high-level template for creating such a model—or a non-automated and simplified version of such a model—by identifying the key questions to be asked and the order in which this should be done. This would give retirees a basis for better decision-making, which would not only help them financially but also improve their peace of mind (as well as that of their children, or others who worry about them).

People who are permanent living companions should, of course, pursue such a process together, or else separately but with a follow-up discussion. Where choices have financial or caregiving implications for children or other heirs, it can be sensitive and sensible to bring them into the discussion as well.

STEP 1. ASSESSMENT OF FINANCIAL RISK EXPOSURE

What risks do you *not* have to worry about because

- They don't apply to you?
- Their likelihood is negligibly small in your case?
- Their financial impact would be negligible (either very small, or offset by other financial consequences)?
- You would not care (or care much) about the consequences?

For each risk you *do* have to worry about,

- What nonfinancial steps can be taken to reduce the risk (or reduce the impact of the consequences)?

- What is the remaining range of financial or other personal consequences (best case to worst case)?
- How high is the risk of consequences at the top, middle and bottom of that range?
- How important is it for you to find a solution for each level of the range of consequences?

STEP 2. FINANCIAL RISK ABATEMENT CAPACITY

What portion of your wealth do you need to set aside to cover your normal expenses?

- Start by estimating future income from all sources other than liquidating your wealth, and subtracting the projected expenses until life expectancy, or ideally at least five years beyond that. Assume a normal conservative rate of return on savings.
- Include inflation on expenses but also expected decreases in many expenses in old age.
- Important: Consider different levels of lifestyle, and costs associated with them: ideal, current, reduced but still doable without high levels of sacrifice, and minimal acceptable.

Make a preliminary decision on how much wealth to set aside for financial risk abatement.

- At each of the four levels of lifestyle listed immediately above, how much (if any) wealth do you have left over for risk abatement?
- At each level of lifestyle, how does the level of pain (if any) suggested by that standard of living compare to the level of pain that arises from the risks still present after Step 2 above? Take into account,
  - The probability of future risks, which by definition is less than 100 percent, compared to a reduction in lifestyle, which is virtually 100 percent certain, if you opt for it.
  - The possibility of more than one risk turning into a reality.
  - What ability you have to adapt comfortably to a simpler lifestyle, or maybe even prefer it, once you get accustomed to it.
- Decide what living standard represents the best balance between reduction in lifestyle and reduced exposure to future harm. This is an important preliminary pointer to your most prudent risk strategy.

STEP 3. ASSESSING FINANCIAL PRODUCTS FOR RISK ABATEMENT

For which risks that concern you could you obtain insurance?

- For which risks does some kind of insurance exist?
- Can you qualify for it?
- What does it cost?

Is a financial risk abatement product a good choice?

- What is the most important risk you are exposed to for which you could purchase complete or partial insurance?
- If you made that purchase, how much would it cost in terms of wealth reduction (short term and long term)?
- How much would that wealth reduction reduce your ability to cover other risks?
- If reducing the exposure to this one risk is more important to you than any resulting reduction in ability to cope with other risks, then such a purchase is a sensible choice for you. Otherwise, it probably is not.
- Make a similar assessment for other risks that you care about and that you could also purchase insurance against. It might be worth paying to insure even a minor risk if the cost is small enough.
- If more than one insurance product or guarantee passes this test, then assume a commitment to the product that seems the most compelling. Then repeat Step 3 to evaluate whether any additional purchases still make sense. If so, pursue as many of these as continue to make sense.

STEP 4. REALITY TEST

- Are you comfortable with the implications of this plan, taking into account,
- The possible financial consequences of any risks you are still exposed to?
- The possibility of multiple risks turning into reality for you or your family?
- Any ongoing stress that exposure to these risks might involve?
- Any reduction in standard of living you will experience?

If not, return to the beginning and re-evaluate, taking the sources of this discomfort into account.

Advantages of This Approach

A HOLISTIC APPROACH

Most discussions of (and most tools and products for) dealing with post-retirement risks address only one risk, and rarely more than two or three. Single-risk approaches are valuable in determining how to alleviate a given risk but do not provide prudent advice about whether alleviating that risk is actually a good idea. Such an evaluation is possible only in the context of weighing the relative importance of all risks and the consumer's financial ability to cope with them.

MIND OVER MATH

Risk management has important mathematical components, but fundamentally it is about something that is not mathematical at all: an individual's happiness. Risk matters to us because, if certain events occur, we expect them to make us unhappy (or to make others whom we care about unhappy). There is no mathematical way to measure the unhappiness that future contingencies might create, or to weigh those against the present and future unhappiness created by the costs of protecting oneself against those contingencies. People's attitudes toward death, illness, financial security, uncertainty, deferred gratification, the welfare of dependents and toward money itself, are complex, amorphous, highly individual and changeable over time. Risk abatement that ignores these issues produces results that may be mathematically defensible, but that are in no way truly adequate to the problem.

PRESERVING WEALTH AS "UNIVERSAL INSURANCE"

While single-risk approaches, when competently devised and presented, do help people cope with individual risks, they also can encourage people of modest means to leave themselves overly exposed to a variety of other risks. As noted earlier, for many people, retaining assets that can be turned into cash protects against virtually all risks simultaneously. The proposed methodology respects this reality, while leaving open the possibility or even likelihood that action against certain specific risks is warranted.

Enhancing the Model

A fully developed and at least partially automated version of this model might include

- A mathematical evaluation of the magnitude (financial impact and likelihood) of each significant risk as it applies to a particular individual or family, and of the cost of ameliorating it, as well as combinations of risks that tend to offset one another (most obviously, but not exclusively, the risk of dying too young vs. the risk of living too long).
- Additional help for consumers trying to understand what the risks mean, their likelihood, their consequences and potential nonfinancial ways of ameliorating them.
- Perhaps some weighting strategy to help balance the immediate financial costs, the long-term financial costs, and the psychological plusses and minuses of each alternative—supplemented by an easy way for the consumer to override any such evaluations.

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