Quantifying Key Risks in Retirement

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Why do defined contribution (DC) plan participants save for retirement? Historically, DC plan sponsors and their participants have focused on pure wealth accumulation. Is this the right approach?

Prof. Jeffrey R. Brown of the University of Illinois frames the question clearly: ***"Do we save for retirement so that we'll have a large pot of money in our account when we stop working? Or do we save to replace the income we'll need to maintain our living standard throughout retirement, which could be 30 or more years?"***[1]

How a plan sponsor chooses to answer this question may have a significant impact on how their participants approach retirement, as seen below.

How does a DC sponsor perceive risks when they…	…want participants to have a big pot of money at retirement	…want participants to maintain their standard of living in retirement
Pre-retirement risks	▪ Market/asset allocation risk ▪ Savings risk – but there's no $ amount to shoot for, so there's no cost to waiting to save	▪ Market/asset allocation risk ▪ Savings risk – will participants save enough to maintain their lifestyles? ▪ Interest rate risk – will they have to face low bond returns? ▪ Behavioral risk – could human nature prevent them from realizing their goals?
Near- and in-retirement risks	▪ Market/asset allocation risk – don't want another 2008	▪ ***Sequential Risk*** – how will retiring into a bear market impact participants' retirement outlook? ▪ ***Inflation Risk*** – might their lifestyle quality erode? ▪ ***Longevity Risk*** – how long might they live? ▪ ***Interest rate Risk*** – will they have to face low bond returns and high annuity prices? ▪ ***Health care Risk*** – will they develop a chronic illness? ▪ ***Behavioral Risk*** – could human nature jeopardize their retirement?

[1] Brown, Jeffrey R. Statement for the U.S. Senate HELP committee on "Simplifying Security: Encouraging Better Retirement Decisions." Feb. 3, 2011.

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While a discussion of "what is the goal of a DC plan?" is beyond the scope of this paper, we hope that plan sponsors choose to focus on participant retirement income adequacy, as opposed to simply investment returns, savings rates and participation rates. Those metrics are part of what makes a successful DC plan, but DC plans are now a primary source of retirement income for millions of American workers and so the objective needs to expand. A sponsor who understands this can act accordingly, in the best interest of their plan participants – which is what being a fiduciary is all about.

In this paper, we will provide some perspective regarding the six retirement risks highlighted above. Although most plan sponsors have heard of these risks, they may not understand them well. Quantifying these key risks for sponsors is the first step to helping plan participants deal with them. For each key risk, we will give a brief description and identify some actionable steps a plan sponsor can take to help their participants mitigate them.

		Scenario 1		Scenario 2	
Year	Withdrawal	Return	Balance	Return	Balance
0			1,000,000		1,000,000
1	50,000	-17%	780,000	15%	1,100,000
2	51,500	-15%	611,500	5%	1,103,500
3	53,045	-9%	503,420	19%	1,260,120
4	54,636	16%	529,331	15%	1,394,502
5	56,275	10%	525,988	17%	1,575,291
6	57,964	12%	531,143	9%	1,659,104
7	59,703	7%	508,621	8%	1,732,130
8	61,494	-5%	421,696	-1%	1,653,315
9	63,339	7%	387,876	18%	1,887,573
10	65,239	19%	396,334	9%	1,992,216
11	67,196	9%	364,808	19%	2,303,541
12	69,212	18%	361,262	7%	2,395,577
13	71,288	-1%	286,362	-5%	2,204,510
14	73,427	8%	235,844	7%	2,285,399
15	75,629	9%	181,440	12%	2,484,018
16	77,898	17%	134,387	10%	2,654,521
17	80,235	15%	74,309	16%	2,999,009
18	82,642	19%	5,786	-9%	2,646,456
19	85,122	5%	—	-15%	2,164,366
20	87,675	15%	—	-17%	1,708,748
Arithmetic Mean (Average Return)		7.0%		7.0%	
Geometric Mean (Compound Growth Rate)		6.4%		6.4%	
Standard Deviation (Risk-Return Volatility)		11.0%		11.0%	

Source: Fan, Yuan-An and Fullmer, Richard. "Decumulation: The final frontier. How dynamic strategies add value." April 2008

Sequential Risk

What is it? Sequential risk, simply put, highlights the importance of the sequence of investment returns, particularly for a retiree making regular withdrawals to cover expenses. Poor returns early in retirement are much more harmful to one's retirement prospects than poor returns later in retirement. The above tables show the impact that different sequences of return can have on a retiree's portfolio (the sequence in Scenario 2 is the reversed sequence of Scenario 1).

What should I do about it? A retiree heavily invested in equities at retirement is exposed to excessive sequential risk. Sponsors can mitigate sequential risk for participants by encouraging them to invest more conservatively during the years approaching retirement, whether through offering education, asset allocation solutions such as target date funds, or guaranteed retirement income products that provide downside protection in the form of lifetime income.

Inflation Risk

What is it? In the context of retirement, inflation risk refers to the notion that price increases can eat away at one's standard of living. Consider a hypothetical retiree, Sarah, who retires at age 65 and buys a traditional immediate life annuity that pays her $40,000 per year. Sarah does not consider the effects of inflation on her purchasing power. Over the next 20 years, Sarah experiences annual inflation of 2.0% on her expenses. Her purchasing power has been cut by about a third – effectively, her income is now only $26,800 per year. Even if Sarah had planned for some inflation during retirement, higher than expected inflation could still erode her standard of living. For instance, if inflation had been 3.5% per year, her purchasing power would be cut further to $20,000 per year.

What should I do about it? For participants who want to maintain their standard-of-living throughout retirement, one approach is to offer retiring participants the option to take automated systematic withdrawals with a cost-of-living-adjustment (COLA) or to purchase an annuity with a COLA. However, this does not mitigate inflation risk per se; the retiree's purchasing power would only be based on expected inflation, not actual inflation. Some insurance carriers do offer annuities where the benefit is linked to the Consumer Price Index but the trade-off is lower initial annual income. A portfolio of Treasury Inflation-Protected Securities (TIPS) held to maturity would also offer a more precise hedge to inflation, but is not practical in a DC plan environment. Alternatively, certain asset classes such as commodities, real estate, and TIPS are known to be positively correlated with inflation, and may help mitigate inflation risk if introduced in the plan's investment menu. However, the participant's ability to understand how to invest in these asset classes may be limited; so an alternative would be to include these asset classes in the retirement income fund of a target date series. This allows them to be incorporated as a well-diversified asset allocation appropriate for a retiree.

Longevity Risk

What is it? Longevity risk is the risk of living well beyond one's life expectancy in retirement. This can put a great deal of strain on a retirement portfolio. Today, the median life span of a 65 year old male annuitant is about 22 years, but the 99th percentile life span is about 41 years.[2] Planning for the first life span instead of the second has significant consequences. Given a pot of money with a constant 4% annual return, a retiree who plans to take annual withdrawals with a 2.5% COLA for 22 more years would be able to withdraw up to 5.1% of the initial portfolio value. The risk here is running out of money before death. On the other hand, a retiree who planned to live 41 years would be able withdraw up to 3.15% of the initial portfolio value – nearly 40% less. The retiree mitigates longevity risk at the detriment of their retirement lifestyle. Alternatively, the table below shows that a 65 year old male retiree who lives 41 years would need to earn a very high return just to afford the same lifestyle as a 65 year old male who lives 22 more years.

Longevity percentile	Life span (65 year old male annuitant)	IRR to produce inflation-adjusted 5.1% withdrawal rate
Median	22	4.0%
99%	41	7.1%

[2] Source: Society of Actuaries Annuity 2000 Table for Males, Society of Actuaries Projection Scale AA, author's own calculations. Longevity in this example is overstated relative to a typical American, but is more accurate than period mortality tables that are often applied incorrectly. In this example, we need to use a generational mortality table that accounts for future mortality improvements in projecting longevity for a particular age group, not a period mortality table based on people of all ages in a particular year.

What should I do about it? Offering participants an immediate or deferred life annuity in the plan is the most direct way to deal with longevity risk, as it provides a steady income for life. These products not only guarantee income for life, but by pooling longevity risk, they allow the participant to obtain a larger payment stream than if she self-insured against longevity risk. The regulatory powers-that-be in the DC industry are considering ways to make it easier for plan sponsors to adopt these products.[3] Other insurance products, such as variable annuities with a guaranteed lifetime withdrawal benefit rider, can also address the longevity issue and are available to DC plans.

Interest Rate Risk

What is it? Interest rate risk is the possibility of encountering low bond returns and high annuity prices. Low interest rates depress the coupons paid out by bonds, and if interest rates rise the market value of the bonds will decline. Further, low interest rates usually lead to an increase in the price of annuities, or an investor receiving a lower payout for the same amount of principal. For instance, in the two months from November 1, 2008 to January 1, 2009 (a period of declining interest rates), the payout from an immediate life annuity for a given amount of principal decreased by 10%.

What should I do about it? Giving participants the option to invest in a short-term bond portfolio may be the best way to help them avoid locking in low interest rates for the long term. In terms of purchasing an annuity, dollar-cost-averaging into an annuity (either a fixed deferred annuity or a guaranteed lifetime withdrawal benefit) prior to retirement, or holding long duration bonds that closely track annuity prices, can mitigate interest rate risk. Either approach could be incorporated into a Qualified Default Investment Alternative (QDIA), so the participant automatically builds guaranteed lifetime retirement income, even though the market for these solutions is nascent.

Health Care Risk

What is it? Health care risk is the possibility of having unexpectedly high health care expenses in retirement. We know that health care insurance is expensive on average, but the real risk is those unexpected and large out-of-pocket expenses that can decimate a retirement portfolio. For example, the development of a chronic illness could cause a retiree to need expensive long term care, which can cost tens of thousands of dollars a year beyond what is typically covered by Medicare.

What should I do about it? Sponsors can offer access to institutionally priced long term care insurance with education. Further, improving employee health and wellness is becoming increasingly important to many organizations. We encourage sponsors to find out whether their organization has a good program, and if not they should push for their organization to develop one.

[3] In 2010, the U.S. Department of the Treasury and the Department of Labor issued a request for information and held hearings regarding lifetime income provision in DC plans. In February 2012, the Treasury and IRS released initial lifetime income guidance – see http://www.treasury.gov/press-center/press-releases/Pages/tg1407.aspx.

Behavioral Risk

What is it? Behavioral risk is the possibility of human biases getting in the way of sound decision-making about retirement. There are several ways this risk could manifest itself. A typical human error is to spend one's retirement portfolio too lavishly early on, which puts a lot of pressure on the remaining portfolio to perform well. Another example is a retiree choosing not to purchase an annuity solely because he does not like the idea of "surrendering" his hard-earned savings for a seemingly much smaller amount of money. A quote from Meir Statman, a behavioral finance expert, summarizes this well: "Yesterday, I was a millionaire. Today, I'm living on $79,700 a year."[4]

What should I do about it? This risk may be the most difficult for plan sponsors to help their participants overcome – if participants do not know how to make rational financial decisions, there's a good chance they are not aware of their human biases. One solution is to put participants on auto-pilot by offering a default investment option that helps protect participants from themselves[5] by combining liquid assets and retirement income-oriented insurance products. Next, make use of their quarterly client statements, and focus communication around the amount of guaranteed lifetime retirement income they are accruing rather than around the volatility of their account value. This should help the participant overcome their hesitancy of converting their retirement account into lifetime retirement income. Another solution is to provide advice to participants. A common approach to-date has been to offer an advice platform so that participants can seek help making important decisions. However, a more impactful solution may be to subsidize one-on-one counseling with a financial planner for near-retirees. Such meetings can provide broad hands-on assistance with managing retirement assets, understanding Medicare and Social Security, and more.

Summary

DC plan sponsors can be a valuable resource for their plan participants who are near retirement and can have a positive impact on their employee's retirement outcomes. In this paper, we have quantified many of the key risks that retirees and near-retirees face so that sponsors can better understand them. Following the description of each risk, we have given sponsors specific actionable items related to each risk. We do want to caution that many of these risks are interrelated and there will be some trade-offs to consider in addressing each risk. We hope that sponsors take advantage of these suggestions to improve their participants' outlook for retirement. After all, the goal of the DC plan is not just to accumulate wealth – it is becoming more recognizable as the primary delivery solution of post-retirement income.

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[4] "What Do Investors Think? Risk-Aversion, Loss-Aversion, and the Annuities Puzzle", Meir Statman (2007)

[5] This approach has been adopted in the DC plan marketplace, primarily by small- and mid-sized plans. At least one very large 401(k) plan has adopted this approach – see http://www.pionline.com/article/20111003/PRINTSUB/310039976&fromRSS=true.

About the Author

Rod Bare is a defined contribution consultant for Russell Investments. Rod serves as a consultant to several defined contribution plans, providing advice on plan structure, fund selection, target-date best practices and custom glide path construction. He joined Russell in 2010.

Prior to joining Russell, Rod spent six years at Morningstar where he was most recently director, asset allocation strategies responsible for asset allocation index product and business development. While in that role, Rod authored several papers on next-generation target-date methodology and benchmarking target-date funds. He also wrote the lifecycle investing chapter for the Ibbotson SBBI book. Rod has testified before the SEC and DOL on target-date funds, has spoken at several DC industry conferences and has been quoted widely in the media on various retirement investing issues.

Before joining Morningstar, Rod was an investment banker with Deutsche Bank Securities focused on repairing and optimizing corporate capital structures through a wide range of equity, equity-linked and fixed income transactions.

Institutional Retirement Income Council (IRIC)

As the burden of funding retirement has shifted from employer to employee, defined contribution plans, such as 401(k)s, have become the primary source of retirement savings for an increasing number of Americans. Yet DC plans were originally designed as supplemental retirement savings vehicles and were generally never intended to provide guaranteed lifetime income.

The mission of the Institutional Retirement Income Council (IRIC®) is to facilitate the culture shift of defined contribution plans from supplemental savings programs to programs that provide retirement security. By providing a forum for insightful, solutions-oriented thought leadership on institutional retirement income, IRIC is promoting the need for retirement income adequacy for defined contribution plan participants.

A membership-based organization, IRIC is supported by sponsors, and a panel of industry advisors, who are dedicated to sharing best practices, informing about legislative and regulatory issues, and facilitating solutions for plan sponsors and their participants.