



Making the Right Wager on Client Longevity

By Manish Malhotra

May 1, 2012

Advisor Perspectives welcomes guest contributions. The views presented here do not necessarily represent those of Advisor Perspectives.

Using annuities to fund retirement is anathema to most advisors, who view the loss of control over one's capital and impossibility of a bequest as nonstarters for their clients. But as clients reach the later stages of their retirement, those arguments no longer apply. A single-premium immediate annuity (SPIA) is superior to a TIPS ladder or a systematic-withdrawal portfolio (SWP) for funding the last phase of retirement.

Dan Moisand, a Florida-based advisor, has articulated the reasons for advisors' antipathy toward annuities comprehensively in this [article](#). While his perspective is valid, it focuses primarily on retirees in their 60s.

Purchasing an SPIA is an option not only at the beginning of the retirement, but also much later. The evidence shows that in the last phase of retirement, using a SWP is a bad wager – and the wrong advice for a fiduciary advisor to give. Indeed, the very same reasons SPIA detractors use to argue that they are wrong for new retirees in their 60s explain an SPIA's value later in life.

Let's look first at an 85-year old retiree and compare an SPIA to a TIPS ladder and a SWP strategy. We will see that the SPIA generates superior income – and *also* leads to larger bequests.

The analysis that follows came from Monte Carlo simulation using Income Discovery, the software that my firm developed for analyzing retirement income strategies.

Comparing strategies for an 85-year old retiree

Let's consider a single 65-year-old male planning a 30-year retirement. Instead of focusing on the income strategies for when he retires, we'll fast-forward 20 years and consider how he can generate income for the last 10 years of the 30-year plan, examining specifically the three strategies mentioned above: relying on an SWP, relying primarily on a TIPS ladder, or getting all of the income from an SPIA. I considered a TIPS ladder because, for time horizons as short as 10 years, the short-term volatility of the SWP makes it an inefficient strategy to fund the income need – as I explained in my last [article](#) in this publication.



The hypothetical retiree is getting \$30,000 of Social Security income and needs to generate an additional \$22,500 from his portfolio. I determined that the amount of assets required to produce \$22,500 of income using two strategies. First, I examined a SWP with a 98% probability of success using a moderate allocation (60% large-cap stocks and 40% intermediate-term government bonds). Second, I considered a TIPS ladder that provides 95% of the desired income over an eight-year period¹ and a SWP to provide the balance.

I used historical monthly inflation data and monthly asset-class real returns, based on Ibbotson data from 1926-2010.¹ Annually rebalanced SWP simulation used real returns, after withdrawing real income of \$22,500. The first year's income need was withdrawn from the SWP before the initial investment. This approach of withdrawing income up front means only nine years of returns are needed to simulate the SWP. The TIPS ladder also provided its cash flow beginning in the second year.²

The table below presents the minimum assets needed for each strategy to generate \$22,500 of income with a 98% probability of success. I also present the assets needed to generate the same income from a SPIA that adjusts its payout based on CPI-U index. The payout rate from this annuity is 13.5% for an 85-year old male.³

<i>Strategy</i>	<i>Minimum assets for 98% confidence</i>	<i>Equivalent Safe Withdrawal Rate for 10 years</i>
Moderate SWP	\$267K	8.4%
TIPS Ladder	\$242K	9.3%
Inflation-adjusted SPIA	\$167K	13.5%

These data clearly show why an SPIA is the right choice. The SWP strategy is the least efficient, requiring the maximum amount of assets as buffer to compensate for its high volatility. The TIPS ladder is somewhat more efficient at generating reliable income because it is more dependable. But both these strategies are clearly inferior to the inflation-adjusted SPIA, which requires less than 70% of the capital needed for the TIPS ladder.

The SPIA is so much more efficient because of *mortality credits*. As per Social Security [actuarial life tables](#), the life expectancy of an 85-year old male is 5.65 years. The payouts

¹ Annual inflation and real asset class returns were generated from the monthly data. Although the period of analysis is 10 years, a standard 30-year rolling period-based scenario set was used to maintain consistency with prior research that uses rolling 30 year historical windows. The last scenario path of that set begins in January 1981. If 10 year rolling windows were used, then additional scenario paths could have been generated. For the simulation, returns from the initial years of each scenario path were used for the analysis.

² For the sake of brevity, I'm not including the exhaustive details of constructing and determining cash flow from the TIPS ladder under different inflation and deflation scenarios. The Income Discovery [methodology](#) document provides those details.

³ The annuity quote was obtained from Income Solutions®, an annuity purchase program from Hueler Investment Services. INCOME SOLUTIONS® is a registered trademark of Hueler Investment Services, Inc. U.S. Patent 7,653,560



that the retiree receives after the life expectancy⁴ are the *mortality credits*. Funding his cash flow needs without taking advantage of these *mortality credits*, a self-insurance decision, is inefficient. The above table also presents the equivalent “safe withdrawal rate” for the last 10 years for each strategy – in other words, the percentage of starting assets that can be safely withdrawn and adjusted for inflation thereafter for a period of 10 years.

Based on the 13.5% payout of the SPIA, the retiree will recover his principal on inflation-adjusted basis in approximately 7.4 years, assuming he lives that long.

This analysis is not relevant *only* to an 85-year old retiree who is at risk of running out of money. All retirees, irrespective of their wealth, should fund low-probability income needs (i.e., needs occurring late in life) using the *mortality credits* of a SPIA.

Increasing one’s bequest through a SPIA

All right, you might be thinking, but why should affluent investors buy a SPIA and hand over their capital in an irreversible transaction? Doesn’t that risk reducing the bequest they can make to their heirs? Not necessarily. We’re about to see how a retiree may actually *increase* their bequest by funding the last phase of their retirement with an SPIA.

Let’s consider another hypothetical 65 year old male retiree, using the forward-looking capital market assumptions outlined in the Appendix. Specifically, let’s examine two strategies: one based on a moderate-allocation SWP (see Table 3 in the Appendix for portfolio composition), and the other based on the same moderate SWP and an inflation-adjusted SPIA, purchased by withdrawing the funds from the SWP when the retiree reaches 85 years of age. That is different from buying a deferred-income annuity (also known as a “DIA” or “longevity insurance”), where the purchase is made now and income payments begin in the future.

The current quote for an SPIA for an 85-year-old single male will approximate the expected quote in future. The annuity payout for an 85-year-old is not as sensitive to real interest rates as it is for a younger retiree, because the present value of the future cash flows over a shorter time horizon (~6 years of life expectancy for an 85 year old male) is less sensitive to interest rates than over a longer horizon (~18 years of life expectancy for a 65 year old male). I encourage those interested in the details to read Wade Pfau's [blog post](#) on this point.

In addition to the probability of success, I will also measure the average bequest left at the end of the plan, as measured by calculating the median of the amount (in today's dollars) remaining in the SWP at the end of the planning horizon.

⁴ The insurance firm will have its own actuarial table and will also account for its costs and profit.



Plan Parameters

Total Retirement Assets	\$1.1 million
Desired Income	\$78,000 of real income
Planning Horizon	35 years
Plan Start Year	2013
Capital Market Assumptions	<i>Low Returns and Moderate Inflation</i> (Tables 1 & 2 in the Appendix)

The retirement income needed is assumed to decline over the 35-year planning horizon, in three phases:

<i>Retirement Phase Name</i>	<i>Phase Length, Years</i>	<i>Phase Income as % of Desired Income</i>	<i>Phase Income, \$ (real dollars)</i>
Active	10	100%	\$78,000
Transition	10	90%	\$70,200
Slowdown	15	80%	\$62,400

And social security will commence five years hence, at age 70, again paying \$30,000 per year in today's dollars, via monthly payments of \$2,500.

I determined that the cost of the annuity to provide the income need that is not met by Social Security (at and after 85 years of age) is \$240,000 in today's dollars. Effectively, the income need beyond age 85 is funded from Social Security and the SPIA. Since an inflation-linked SPIA is being used, the desired income need can be closely matched from these two sources. Small shortages in the desired income, if any, from these two sources will be covered by making the withdrawal from the SWP. The table below presents the results of two strategies with the *same* set of scenario paths. (A scenario path is a sequence of inflation and asset class returns for future years. Two strategies can be effectively compared when simulated on the same set of scenario paths.)

	<i>Strategy 1 \$1.1 million invested in a moderate SWP</i>	<i>Strategy 2: \$1.1 million invested in a moderate SWP \$240K SPIA to be purchased in year 2033 (at 85 years of age)</i>
<i>Probability of Success</i>	74%	81%
<i>Average Legacy</i>	\$759K	\$997K

Purchasing a SPIA in the future increases the probability of success and *increases* the average bequest, because funding the last phase of income with an SPIA frees up the SWP assets to grow. This strategy also gives affluent retirees flexibility to structure their estate transfer, since the income need has been squared away.



Conclusion

Funding the last phase of retirement – during which the year-to-year survival probability is relatively low – using a SPIA is the most efficient strategy, increasing both the probability of success (or expected income for the same probability of success) and the average bequest.

Specifically, purchasing the SPIA in future is a more flexible and superior strategy than buying longevity insurance, wherein the assets are handed over to the insurance company at the time of purchase. A DIA faces inflation risk, since there are no products with perfect CPI-U-based payments. Nominal payouts 20 years in future are vulnerable to high inflation. Purchasing a SPIA at a future date, moreover, will only be necessary if the retiree is still alive in his or her 80s. And in case of couples, if only one spouse is alive, the purchase would be of a single-life SPIA with a higher payout than a joint-life SPIA.

The psychological concerns that retirees have regarding ceding control over their capital with a SPIA at that point can be easily addressed by showing that they just need to live seven additional years to get their capital back.

There is always a risk, of course, that a SWP designed to fund the annuity purchase in future will deplete in less than 20 years. In that case – if the SWP is dwindling fast in value – the advisor and the retiree retain the option to purchase the annuity any time during those 20 years, in one or more installments.

There is a practical concern, however: It can be difficult to find an underwriter for an 85-year old investor, as insurance companies fear getting sued by the family. So, from a practical perspective, the advisor may have to make a multi-installment purchase of SPIAs over several years, beginning in the retiree's late 70s.

Purchasing SPIAs in one's 60s and early 70s is still useful. In majority of the cases, that will increase the probability of success of the plan. But whatever your view of the use of SPIAs during the early- and the middle-phase of retirement, all advisors who take their fiduciary responsibilities seriously should consider funding the last phase of retirement exclusively through SPIAs.

Author Bio: Manish Malhotra is the founder and CEO of [Income Discovery](#), a firm focusing on building new approaches for generating retirement income and new tools to help planners build an appropriate income strategy for their clients. He published two papers in Advisor Perspectives: "A New Framework for Retirement Income Planning" (<http://bit.ly/beNhA4>), which introduced new thoughts on how to evaluate different retirement income strategies, and "The Random Walk Spoiled," a paper on flaws in



making the random walk assumption (<http://bitly.com/9Te8Aq>). He can be reached at manish.malhotra@incomediscovery.com.

Appendix

Capital Market Assumptions

Capital market assumptions of low returns and high inflation are outlined below. The geometric mean of the actual *real* return provided as input is converted to arithmetic mean of the *logarithmic real* return before scenario generation. Standard deviation and correlation specified are among *logarithmic real* returns and *logarithmic* inflation. One thousand scenario paths were generated for Monte Carlo simulations.

The following capital market assumptions have been built based on review of multiple sources – particularly Ibbotson’s forward looking assumptions and the Yale Endowment’s assumptions, as available in the book *Pioneering Portfolio Management* by David Swensen. Most planners believe forward-looking returns will be lower than past expectations, while volatility will be same or higher. That belief led to working with the return expectations that are around 1.5% to 2% lower than past expectations and standard deviation at the same level historically observed values.

Table 1: Inflation and asset class return assumption

Asset Classes	Abbreviation	Low Return Moderate Inflation	
		Expected Real Geometric Return	Standard deviation of returns
Inflation	Infln	2.5%	2.0%
US Aggregate Bonds	AgBnd	2.0%	10.0%
US Short term Bonds	StBnd	1.0%	6.0%
US Govt Interm Real Bonds	TIPS	1.0%	6.0%
US Large Cap Stocks	LgCap	5.0%	20.0%
US Mid Cap Stocks	MidCap	5.0%	22.0%
US Small Cap Stocks	SmlCap	7.0%	26.0%
Developed Equity	DevEqty	5.0%	20.0%



ADVISOR PERSPECTIVES

<i>Developed Bonds</i>	<i>DevBnd</i>	2.0%	10.0%
<i>Emerging Equity</i>	<i>EmgEqty</i>	7.0%	26.0%
<i>Cash</i>	<i>Cash</i>	0.0%	5.0%

Table 2: Correlation among inflation and asset classes



<i>Correlation</i>	<i>Inflation</i>	<i>AgBnd</i>	<i>StBnd</i>	<i>TIPS</i>	<i>LgCap</i>	<i>MidCap</i>	<i>SmlCap</i>	<i>DevEqty</i>	<i>DevBnd</i>	<i>EmgEqty</i>	<i>Cash</i>
<i>Inflation</i>	1										
<i>US Aggregate Bonds</i>	-0.4	1									
<i>US Short Term Bonds</i>	-0.3	0.7	1								
<i>US Govt Interm Real Bonds</i>	0.6	0.1	0.1	1							
<i>US Large Cap Stocks</i>	-0.15	0.4	0.3	0.2	1						
<i>US Mid Cap Stocks</i>	-0.15	0.4	0.3	0.2	0.9	1					
<i>US Small Cap Stocks</i>	-0.2	0.25	0.15	0.1	0.8	0.8	1				
<i>Developed Equity</i>	0.2	0.25	0.15	0.1	0.7	0.65	0.6	1			
<i>Developed Bonds</i>	0.1	0.4	0.3	0.1	0.2	0.15	0.1	0.4	1		
<i>Emerging</i>	0.2	0.2	0.2	0.1	0.6	0.6	0.6	0.5	0.2	1	



Equity											
Cash	-	0.3	0.3	-0.2	0.1	0.1	0	0	0.3	0	1
	0.25										

Table 3: Model allocations

Model Allocation	AgBnd	StBnd	TIP S	LgCa p	MidCa p	SmlCa p	DevEqty	DevBnd	EmgEqty	Cash
Moderate	15	10	5	25	15	5	10	5	5	5

www.advisorperspectives.com

For a free subscription to the Advisor Perspectives newsletter, visit:
<http://www.advisorperspectives.com/subscribers/subscribe.php>

ⁱ The TIPS ladder is constructed using actual bonds. The cash flow produced by the ladder may be approximately \$1,000 higher than desired, as it is not possible to buy a fraction of a bond. The TIPS ladder is configured to provide 95% of the cash flow to avoid the situation of generating more cash flow than desired. The length of TIPS ladder is eighth years for two reasons: (1) the first withdrawal is made at the beginning of the plan (January 2013) and hence is taken from the SWP assets and not from the ladder; (2) no TIPS are available for the 10th year disbursement in January 2022. TIPS inventory and quotes as of Apr 19, 2012 have been used.