



Why Retirees Should Choose DIAs over SPIAs

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by Wade Pfau

Retirement portfolios can be constructed from a mix of asset classes, including stocks, bonds and annuities. In the past, I've shown that retirees achieve some of the best outcomes by allocating a portion of those assets to single-premium immediate annuities (SPIAs). In this column, I extend my analysis to show that deferred-income annuities (DIAs) work even better than SPIAs, by providing more liquidity and better longevity protection at a lower cost.

This analysis is created in the context of the efficient frontier for retirement income, looking at the case of a 65-year-old couple and finding that a combination of stocks and SPIAs optimizes a retirement-income portfolio for a robust set of circumstances. That analysis, however, did not include DIAs within the universe of available investment choices. I've now remedied this.

DIAs offer longevity protection through a guaranteed income beginning at a future date, which lowers their cost relative to SPIAs. DIAs may be more attractive to clients who loath the loss of principal and liquidity implied by a SPIA purchase. When adding DIAs into the mix, the retirement income frontier expands. In my analysis, DIAs have pushed aside SPIAs as the product of choice for providing longevity protection.

Fundamentals of deferred-income annuities

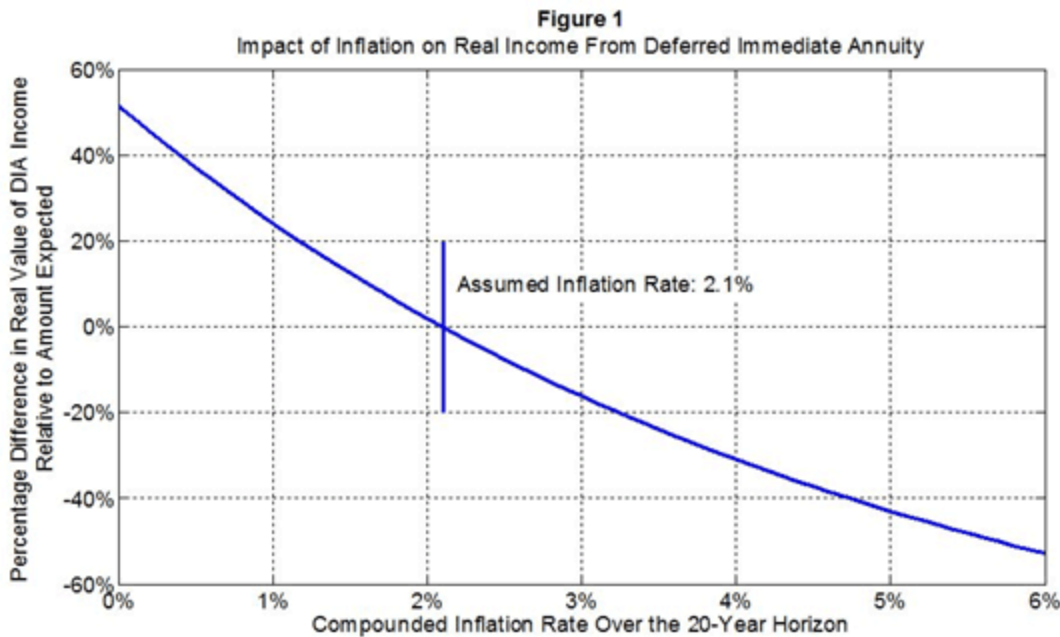
For both DIAs and SPIAs, a lump-sum premium is paid today in return for a guaranteed income for life. The difference is that for the DIA, the guaranteed income does not begin until a later date. Another way to look at this is that a SPIA is a DIA with no deferral period.

The basic idea of "longevity insurance" is that a 65-year-old might purchase a DIA for which income begins in 15 or 20 years. Because the income is deferred, total lifetime payouts will be less and the cost of the annuity is lower. This provides longevity protection at a lower cost.

Recent research articles have shown that DIAs support a higher withdrawal rate more safely by creating a 20-year Treasury inflation-protected securities ladder with a DIA that starts payments after the 20 years. S. Gowri Shankar wrote about this strategy in *A new strategy to guarantee retirement income using TIPS and longevity insurance* in a 2009 issue of *Financial Services Review*, and Stephen C. Sexauer, Michael W. Peskin and Daniel Cassidy reconfirmed the idea with an article in the January/February 2012 issue of *Financial Analysts Journal*.

An important feature about DIAs, however, is that in their current form they do not provide full inflation protection. Inflation-adjusted DIAs exist, but the inflation adjustments do not begin until the date income is received, rather than the date that the premium is paid. Advisors and their clients are forced to assume a value for the future compounded inflation rate in order to try to calibrate the real value of the income the DIA will provide. Small differences between actual inflation and what is assumed can compound into big differences over a long deferral period.

Figure 1 illustrates this with an example of a 20-year deferral to the income start date. In this example, the advisor and client try to purchase a DIA that will meet the spending goal 20 years from now in inflation-adjusted terms. They assume inflation will compound at 2.1%. If actual inflation matches this, then the real value of the income will be exactly what the client desired. If inflation is less than assumed, then the real value of the income is even greater. For instance, if inflation averages 1.6%, the DIA provides about 10% more than planned, and the client annuitizes 10% more assets than necessary. On the other hand, higher inflation reduces the real value of income. For instance, if inflation averages 3.3%, then the real value of the income provided by the DIA is about 20% less than the client's goal. Advisors must be aware of this inflation risk when planning a DIA purchase.



One other risk for a DIA is the possibility that financial assets could deplete before the date that income begins, which would leave clients with a hole in their finances midway through retirement.

The efficient frontier for retirement income

I did not incorporate DIAs into my analysis when I last wrote about the efficient frontier for retirement income. It is worth a brief refresher about how that analysis worked. A more complete explanation can be found in my article from the February 2013 issue of the *Journal of Financial Planning*, *A Broader Framework for Determining an Efficient Frontier for Retirement Income*.

The basic idea is that a client envisions a lifestyle-spending goal for the remainder of his or her lifetime and seeks to find a retirement income strategy that meets that goal while also preserving liquidity for remaining financial assets. Failure to meet spending goals is quantified in terms of the how far spending fell below what was desired. This is different from the failure rate (the probability that financial assets will deplete, which is a popular measure in safe-withdrawal-rate studies), because it accounts for income from other guaranteed sources that would continue if financial assets were depleted.

The efficient frontier does not solely focus on avoiding financial wealth depletion. Instead, there is a tradeoff between two objectives: supporting lifestyle spending goals, and maintaining a buffer of financial assets. This buffer could be for a legacy or a reserve in the case of expensive health shocks, divorce, severe economic downturns or other contingencies. Clients must determine how much they value each objective and choose the appropriate balance between them.

My analysis is based on Monte Carlo simulations, giving us a distribution of outcomes for both of the financial objectives. To measure the potential upside of a strategy, I focus on how much spending would be feasible in unlucky circumstances with poor market returns and the value of the financial assets that would remain at death in the median case. The calculations are made on a survival-weighted basis, considering the probability of survival to all subsequent ages past the retirement age.

The resulting efficient frontier shows the allocations that support the largest buffer of remaining financial assets at death while still providing a given percentage of spending needs (or, alternatively, the highest percentage of spending needs that can be satisfied for a given reserve of financial assets). Any of the product allocations on the efficient frontier represents a potentially optimal point. Clients must make the final decision about which allocation is most optimal for them.

In my previous article, I showed that combinations of stocks and SPIAs provide the best opportunity to meet spending goals while preserving liquidity, even in circumstances with unfortunate market returns. Including bonds or variable annuities with guarantee riders led to suboptimal outcomes.

Incorporating DIAs into the efficient frontier

I added DIAs with deferral periods ranging from 5 to 25 years into the product mix. Though that is a lot of choices, I simplified the analysis in other respects so as to illustrate the appropriate deferral periods. My earlier analysis showed that stocks and SPIAs provide the most efficient results, but only if remaining financial assets are invested entirely in stocks. That may not be realistic for many clients. I tried to make this aspect more realistic by assuming that whatever is not annuitized will be maintained in a portfolio of financial assets rebalanced annually to a 50/50 stock/bond allocation. Unlike the earlier mentioned research articles, I did not create bond ladders; bond investments are in mutual funds earning the underlying index returns. The only questions are how much to annuitize and what deferral length to use to best meet the retirement financial objectives when combined with withdrawals from a 50/50 portfolio.

Table 1 provides quotes obtained in early September 2013 from Cannex for a SPIA and for DIAs with deferral periods ranging from 5 to 25 years. These quotes are all joint and 100% survivor (which

means that the same guaranteed income is provided until the death of the long-living member of the couple) for a 65-year old couple and are from the same issuer. The monthly income is fixed for the SPIA and DIAs with no inflation adjustments. I show the monthly income from a \$100,000 premium along with the annual payout rate.

The final column shows the percentage of financial assets needed to meet one's lifestyle spending goal in expectation terms in the first year that income is received. For instance, with a 4% withdrawal rate needed to meet one's lifestyle goal, 68.6% of assets would be annuitized with a SPIA to meet the first year goal. In subsequent years, inflation will erode the value of the SPIA income, but withdrawals from remaining financial assets are used to make up the difference. For another example, consider a 20-year deferral period. In this case, 18% of assets could be annuitized today, and this would provide the desired income precisely in year 20 if inflation compounds at 2.1% over those 20 years. (As discussed before, if actual inflation differs, there could be a shortfall or surplus in real terms.) The remaining 82% of financial assets could then be used with a systematic withdrawal strategy to cover spending goals over the next 20 years and make any needed income adjustments to achieve the desired inflation-adjusted spending in the years after that. When sufficient financial assets remain, I assume that clients withdraw what is needed to meet their lifestyle spending goal after accounting for any annuity income. In cases when the annuity provided excess income in real terms (such as with lower realized inflation), I return any excess income to the financial portfolio.

Table 1

Deferred-Income Annuity Quotes and the Percentage of Financial Assets Needed (in Expectation) to Meet the Lifestyle Spending Goal in the Year when Annuity Income Begins

4%	Withdrawal Rate to Meet Lifestyle Goal		
2.1%	Expected Inflation		
Deferral Period	Monthly Income	Payout Rate	Assets Needed
0	\$486.00	5.83%	68.6%
5	\$669.95	8.04%	55.2%
10	\$984.91	11.82%	41.7%
15	\$1,569.41	18.83%	29.0%
20	\$2,808.18	33.70%	18.0%
25	\$6,111.92	73.34%	9.2%

Source: DIA quotes are from the same company and were obtained through Cannex on September 6, 2013. They are for a 65-year old couple with joint and 100% survivor payments for a \$100,000 premium.

I investigated the results for a scenario in which systematic withdrawals are taken from a 50/50 portfolio without any partial annuitization, as well as for the six possibilities in Table 1, in which partial annuitization is combined with systematic withdrawals from a 50/50 portfolio of remaining assets to make up any difference from the spending goal. For stock and bond holdings, I assumed investments are made in underlying indices for the S&P 500 and intermediate-term U.S. government bonds, each with a 0.2% administrative fee. Capital market expectations are aimed to better match current market conditions (including inflation-adjusted arithmetic returns for stocks and bonds of 5.7% and 0.9%, respectively, and inflation of 2.1%, with historical assumptions for volatility and cross-correlations).

Table 2						
Efficient Frontier for Deferred-Income Annuities						
4%		Withdrawal Rate to Meet Lifestyle Goal				
50 / 50		Asset Allocation for Stocks / Bonds in Financial Portfolio				
Spending Shortfall (%)		Real Financial Assets at Death (\$, initial=\$100)				
Deferral Years	Amount Annuitized	5th Percentile	10th Percentile	25th Percentile	25th Percentile	Median
No annuitization	0%	-35.82	-27.19	-12.81	9.79	32.05
0	68.6%	-12.98	-8.98	-2.08	9.71	28.51
5	55.2%	-12.31	-7.52	-1.36	10.3	28.92
10	41.7%	-12.29	-6.92	-0.84	10.55	31.52
15	29.0%	-15.08	-9.1	-0.66	9.65	33.63
20	18.0%	-20.04	-14.82	-1.11	8	35.03
25	9.2%	-25.88	-19.09	-4.54	6.42	34.83

The results are presented in Table 2. Spending shortfalls are shown as the percentage of the lifetime spending goal that could not be met, and financial assets at death are shown in inflation-adjusted terms for retirement date wealth of \$100. Compared to the no-annuitization case, partial annuitization results in less shortfall on the downside, without impacting the legacy to a substantial degree. Though partial annuitization causes financial assets to drop initially, ground is made up during one's retirement through the contributions provided by the annuity products to reduce the subsequent drawdown from financial assets. In fact, at the median of the distribution, the financial legacy is larger for DIAs with at least 15 years of deferral, compared to the no-annuitization case.

DIAs improve the results beyond what is obtained with a straightforward SPIA. To minimize the spending shortfall in the above table, the deferral sweet spot is 10 or 15 years. A shorter deferral period leaves more time for inflation to erode the value of the annuity — and with more assets devoted to annuitization, less is available to make up the difference needed to meet spending goals. With a

longer deferral, the wait for income to begin becomes too long. Clients would increasingly find that their financial assets were depleted before the stage in which they receive their DIA income. A 10-year deferral, with income starting at age 75, provides the most downside protection for spending shortfalls.

The bottom line

DIA's expand the efficient frontier, providing clients a stronger opportunity to meet their financial objectives in retirement. In the case of a 65-year old couple with a 4%-of-retirement-date-assets spending goal for their portfolios, the results show that incorporating a DIA with a 10- to 20-year deferral period is more effective than using a SPIA. Relative to the non-annuitization case, shortfalls are substantially less on the downside with only a minimal impact on the financial legacy at death. Relative to a SPIA, a DIA secures better outcomes with more liquidity and the same longevity protection at less cost.

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