A Better Systematic Withdrawal Strategy--The Actuarial Approach
Ken Steiner, Fellow, Society of Actuaries, Retired
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Retirees generally have at least two potentially conflicting financial goals**:** (i) spend enough each year to maintain a certain standard of living throughout retirement and (ii) not spend so much that accumulated savings run out prior to death. Corollaries to these two primary goals include: (i) having relatively predictable and stable inflation-adjusted spendable income from year to year (ii) having spending flexibility to meet unforeseen expenses, (iii) maximizing the general level of spendable income and (iv) not leaving too much unspent at death. An optimal retirement spending strategy should address each of these goals to some degree, depending on the preferences of the individual retiree.

There are four general sources of retirement income in the U.S: (i) Social Security, (ii) life annuity income from pension plans or insurance company products (iii) systematic withdrawals from accumulated savings and (iv) other income, including income from employment in retirement. Recent research has shown that delaying commencement of Social Security, possibly working longer and combining life annuity products with systematic withdrawals from accumulated assets may all be components of an optimal retirement spending strategy[1].

This paper focuses on alternative systematic withdrawal approaches and concludes that "The Actuarial Approach" is a better approach than alternative systematic withdrawal approaches that are commonly used. It can coordinate income from the other retirement income sources and has the potential to do a better job of balancing the potentially conflicting goals of most retirees. The following sections describe The Actuarial Approach, provide an example of its use and briefly discuss why The Actuarial Approach is a better systematic withdrawal strategy.

The Actuarial Approach

The five steps involved in The Actuarial Approach are briefly described below. It is anticipated that this process will be followed at least once a year in order to determine the retiree's total spendable amount (or "spending budget") for the year. The author recommends that the retiree's spending budget for a given calendar year be determined at or near the beginning of such year.

Step 1: Gather Data. In the first year of using The Actuarial Approach, the following data may be required: 1) the amount of the retiree's accumulated savings[2], 2) how those assets are or will be invested, 3) the retiree's health status (and that of the retiree's spouse or significant other), 4) the amount of immediate lifetime income payable from sources other than Social Security, (5) amounts payable from deferred income annuities and year(s) of commencement of such payments, and 6) the amount of accumulated assets desired to be left to heirs. In subsequent years, the data above will need to be supplemented with results from steps 3 and 4 below for the previous year and the increase in the Consumer Price Index for the year just ended. If the retiree is determining withdrawals from accumulated savings in order to "bridge" to a deferred Social Security commencement age, the retiree will need an estimate of the deferred Social Security benefit and number of years until its expected commencement.

Step 2: Make Relevant Assumptions. Next, assumptions need to be made about the expected rate of future return on accumulated assets, the expected payout period and the expected rate of future inflation.

The expected rate of future return assumption should generally be coordinated with the assumption for future inflation, as discussed below.
Some actuaries and economists believe that assumed investment return should approximate a risk-free interest rate, as the higher expected returns associated with investment in riskier assets, such as equities, also carry a higher risk of volatility, meaning the returns might vary significantly over time. Therefore, assuming a risk-free interest rate for all asset classes is more conservative and automatically adjusts for the extra risk inherent in investing in riskier assets with higher expected returns.

Assumed Investment Return Recommendation: The investment return assumption should generally reflect investment return assumptions inherent in immediate annuity contracts with perhaps some small adjustment for greater expected returns on equities. At the current time, the author recommends use of an investment return assumption of 5% per annum (nominal, not real), or slightly lower if the retiree plans to invest mostly in bonds. This recommended assumption is consistent with nominal interest rates currently used to price immediate life annuities of approximately 4% per annum.[3]

An assumption must also be made about longevity. How long will the retiree(and/or the significant other) need these payments? Life expectancies are based on average mortality experience, but people can and do outlive their life expectancy. In fact, if you experience average mortality, you have about a 50% probability of outliving your life expectancy based on standard mortality tables. If life expectancy is used for the expected payout period, experience losses will occur each year that the retiree survives, and future actuarially determined withdrawals will decrease, all things being equal. There are many sites on the Internet that can provide life expectancy estimates. The author recommends the Society of Actuaries Simple Life Expectancy calculator found at
http://www.soa.org/research/software-tools/research-simple-life-calculator.aspx

Expected Payout Period Recommendation: In order to avoid having decreasing withdrawals from year to year that result from living an additional year, the author recommends using an assumed expected payout period equal to 95 minus the retiree's current age, or the retiree's life expectancy if greater.

Generally, retirees will want to make sure that their retirement income keeps pace with rising inflation. The assumption about future inflation should be consistent with the assumption made for future investment return.

Assumed Inflation Recommendation: The author's current recommendation for an inflation assumption is 3% per annum, or the investment return assumption minus 2% if the investment return assumption is lower than 5% per annum.

Note that some retirees may want to "front-load" their real annual spendable income to some degree. For example, they may not be concerned about later year expenses, such as long-term care, and wish to travel more in their early years of retirement. In this case, they may wish to consider using an annual desired increase in withdrawal assumption that is less than expected inflation. Other retirees may wish to be more conservative in selection of assumptions used in

order to avoid decreasing spendable amounts. Of course, the retiree can also be conservative by spending less than the spending budget for the year.

Step 3: Perform Calculations to Determine Preliminary Spendable Amount[4]. The Preliminary Spendable Amount is the answer to the mathematic problem, "What total spendable amount (from accumulated savings and annuities) may be spent in the current year, to be increased each subsequent year by a constant percentage so that accumulated assets will exactly equal the amount desired to be left to heirs at the end of the expected payout period?" The author's website provides a simple spreadsheet tool for this calculation ("Excluding Social Security 2.0"). More sophisticated tools for this purpose might be available on the Internet or elsewhere. However, the specific tool the retiree uses for this calculation is generally less important than making reasonable assumptions (as described in Step 2) and diligently following the five step process which constitutes The Actuarial Approach each year.

Note that this simple tool coordinates income provided by fixed immediate annuities, fixed deferred annuities and withdrawals from the retiree's accumulated assets. It does not coordinate income from Social Security (hence the name "Excluding Social Security")or inflation-indexed annuities, as these sources of retirement income are already assumed to be inflation-adjusted and simply need to be added to the result from the spreadsheet to obtain the retiree's theoretical total spendable amount for the year. The two "Run-Out" tabs of this spreadsheet show year by year withdrawals from accumulated savings, total spendable amounts (Excluding Social Security) and accumulated assets in nominal and inflation-adjusted dollars assuming all assumptions made in the input tab are exactly realized each future year and amounts withdrawn from accumulated savings equal the budgeted amount. However, the user should note that it is likely, for many reasons, that the Preliminary Spendable amount will be different from the amount actually spent by the retiree during the year.

Step 4: Apply Smoothing Algorithm to Develop the Spending Budget For The Year. In order to provide a more stable and predictable spending budget pattern, it is advisable to smooth experience gains and losses and changes in assumptions. However, this desire to have spendable income stability needs to be balanced against the conflicting goals of not running out of money and not under spending.

Recommended Smoothing Algorithm: Calculation #1: Multiply the Preliminary Spendable Amount by both 90% and 110% to develop a 10% corridor around the Preliminary Spendable Amount for the year. Calculation #2: Increase last year's Total Spendable Amount (the spending budget for the previous year) by the increase in CPI during the previous year and add any previously deferred annuity amount that commences in the current year. Note that it is the spending budget from the previous year that is used in this calculation and not the actual amount spent by the retiree. If the result of Calculation #2 falls inside the 10% corridor, the Total Spendable Amount for the year is equal to the result of Calculation #2. If the result of Calculation #2 falls outside the 10% corridor, the Total Spendable Amount for the year will equal the applicable corridor upper or lower limit.

Step 5: Store the Results for Next Year. A critical component of "The Actuarial Approach" is to periodically adjust results to reflect actual experience and changes in assumptions, if necessary. As discussed above, the author recommends that retirees revisit their spending budget at the beginning of each year. Therefore, at a minimum, the Preliminary Spendable Amount (the result of Step 3) and Total Spendable Amount (the result of Step 4) for the current year should be placed in a file to be used in the budget determination for the next year. It may

also be desirable to print out the input tab from the website spreadsheet as well to see what assumptions and data were used in the previous year.

Example

The Actuarial Approach as described above may seem to be more complicated than it actually is. If the data required in Step 1 are relatively easy to pull together, the annual budgeting process should take no more than 10 minutes to complete.

Here is an example:

Richard retired on January 1, 2013 at age 65. At that time, he used about 20% of his accumulated savings to buy an immediate life annuity that pays him $15,000 per year. At the beginning of 2013, he had $800,000 left after his annuity purchase. He inputted the author's recommended assumptions (5% interest, 3% inflation, 30 years expected payout period (95-65)) and $10,000 as the desired amount of assets at death into the spreadsheet in the author's website, to determine a total spendable amount (excluding Social Security) for 2013 of $45,179 ($30,179 from accumulated savings and $15,000 from the annuity). He deposited $30,179 in his non-interest bearing spending account and decided to invest half of the remaining assets ($769,821) in equities and the other half in a variety of fixed income investments. During 2013, Richard spent exactly the amount in his spendable account plus the $15,000 from the annuity.

Easy Steps to Determine Richard's Spending Budget for 2014
The first step in the process is gather asset data as of the end of 2013. Richard's equity investments yielded almost 29% during 2013 and his fixed income investments yielded about 1%, so his end-of-year assets are $884,909 (compared with expected end-of-year assets from the previous year's calculation of $808,312, or an asset gain for 2013 of $76,597). Richard determined that the Consumer Price Index has increased by 1.3% during 2013. He pulls out his file containing his beginning-of-year 2013 calculations.

The second step is to review the assumptions used for 2013 and see if they are still appropriate for 2014. Richard decides to use the same assumptions for 2014 as 2013.

The third step is to determine a preliminary spending value for 2014 by inputting new data amounts into the Excluding Social Security spreadsheet on the author's website . If the same assumptions and life annuity and bequest amounts are input as for 2013, $884,909 is inputted for accumulated savings and 29 years for the expected payout period, Richard's preliminary 2014 spendable amount is $49,947 ($34,947 from accumulated savings + $15,000 from the annuity).

The fourth step in the process is to apply the recommended smoothing algorithm to the preliminary spending value. Richard determines his 2014 total spendable amount as last year's total spendable amount ($45,179) increased by 1.3% ($45,766), but not less than 90% of the preliminary 2014 total spendable amount of $49,947 (.9 X $49,947 = $44,952)and not more than 110% of $49,947 (or $54,942). Since last year's budget amount increased with inflation for the previous year falls inside the 10% corridor, Richard's total spendable amount for 2014 is $45,766 ($30,766 from accumulated savings and $15,000 from the annuity).

Richard then places the results of his 2014 calculations into his retirement file to be used next year when he determines his 2015 spending budget.

Comparison of The Actuarial Approach with Three Commonly Used Systematic Withdrawal Strategies

In September, 2013 the Stanford Center on Longevity, in collaboration with the Society of Actuaries Committee on Post-Retirement Needs and Risks, released "The Next Evolution in Defined Contribution Plan Design."[5] In that paper, three common systematic withdrawal strategies were examined: The 4% Rule, the constant 4% withdrawal approach and the Required Minimum Distribution (RMD) rule established by the Internal Revenue Service. None of these three strategies attempts to coordinate spendable income from accumulated savings with other annuity income that the retiree may have or may expect to receive in the future. This, in and of itself, is a significant deficiency, as research has shown that it is generally financially prudent to manage risks in retirement by diversifying sources of retirement income. Further, none of these strategies can be used if a retiree desires to use some or all of his accumulated savings to help defer commencement of Social Security benefits. In addition, none of these strategies anticipates payment of a specific bequest motive.

Even if the retiree has no annuity income and does not plan to defer commencement of Social Security benefits or leave specific amounts to heirs, each of these three strategic withdrawal strategies has additional shortcomings when compared with The Actuarial Approach. These shortcomings are briefly discussed below.

Under the 4% Rule (or any Safe Withdrawal approach that does not adjust for actual experience), the retiree withdraws 4% of his accumulated savings in the first year of retirement and then increases this amount by accumulated inflation in subsequent years. This "set and forget" withdrawal strategy does provide a very stable and predictable withdrawal pattern. However, it does this by ignoring the impact of actual experience. Further, this approach anticipates that the retiree will withdraw exactly the amount dictated by this strategy each year, and therefore offers no flexibility in actual withdrawals. If experience (including actual spending vs. budgeted spending) is relatively favorable, there is no adjustment in withdrawals and not enough money is spent. If experience is relatively unfavorable, too much money may be spent. Since it is generally designed to be "safe", there is theoretically more likelihood of the former occurring rather than the later. Also, each year's spendable amount depends entirely on the amount of accumulated assets in the first year of retirement, and therefore may be highly dependent on when the individual retires. Some argue that this method is preferable because it is "simple." However, adjustments are supposed to be made under this approach for different expected payout periods and investment mixes and frequently proponents of this approach indicate that specified or unspecified adjustments should be made to reflect actual experience. After factoring in all these "adjustments", the author does not find this approach to be any more simple than The Actuarial Approach.

Under the Constant 4% Withdrawal Rule, only 4% of the participant's accumulated assets are withdrawn each year. While this approach does adjust for actual experience, there is no smoothing of year to year results and while a 4% withdrawal rate may be appropriate at age 65, it is far too low at older ages, so too much money is likely to remain at death. In addition, this rule does not consider the effects of inflation on retiree purchasing power.

Under The RMD rule, specific percentages based on expected longevity are applied to accumulated savings. The Stanford/SoA paper suggested 3.5% for ages prior to 70. This approach also adjusts for actual experience, but like the Constant 4% Rule, there is no smoothing of year to year results and it too tends to understate withdrawals, particularly in the

early years of retirement. Also, like the 4% constant withdrawal approach, this rule does not consider the effects of inflation on retiree purchasing power.

The following graphs show withdrawal patterns and remaining assets under these three approaches compared with The Actuarial Approach for the period 1998 to 2014 for a person retiring at age 65 with $500,000 of assets in 1998[6].

Annual Withdrawals Under Four Alternative Systematic Withdrawal Strategies 1998-2014 (in 1998 Dollars)
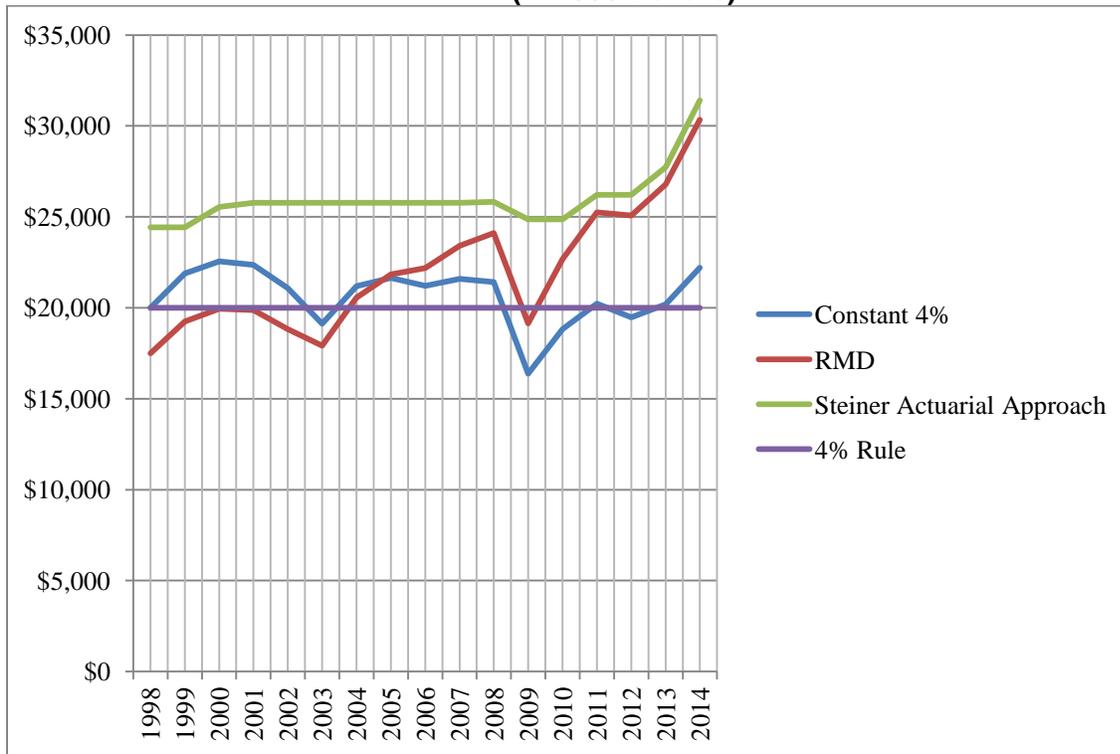
Remaining Assets Under Four Alternative Systematic Withdrawal Strategies (in Nominal Dollars)
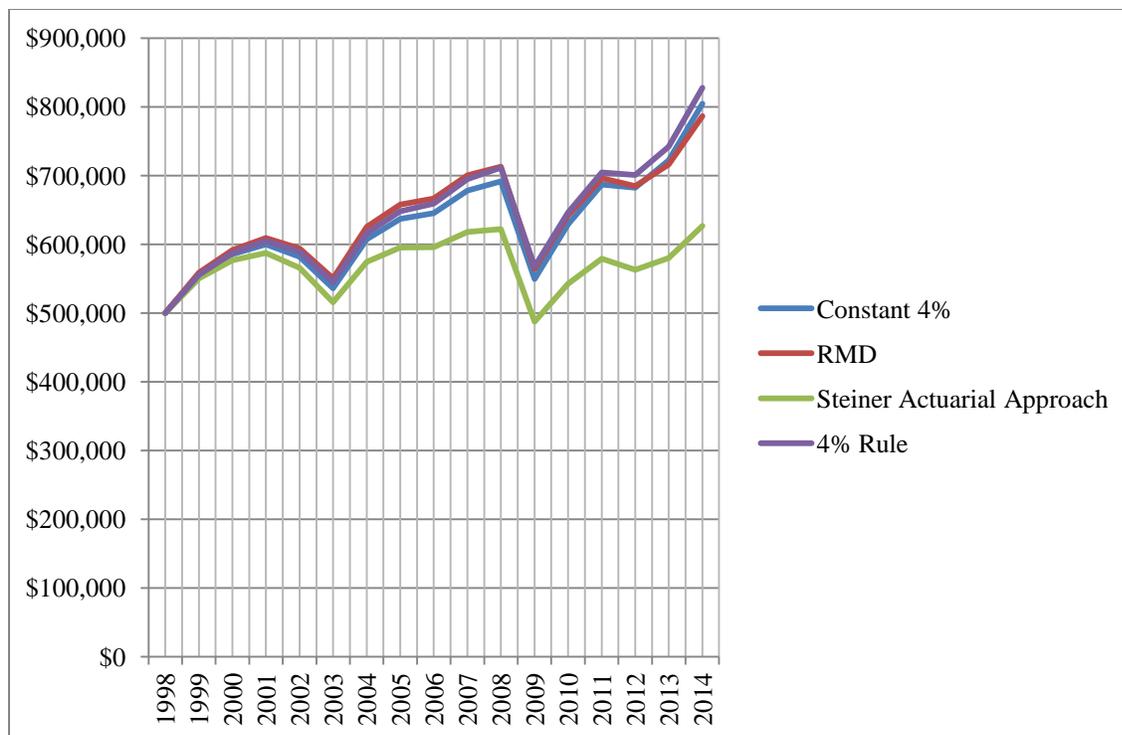
For this period, the 4% Rule produces a ruler-flat inflation adjusted withdrawal pattern, but it fails to maximize the retiree's desire to maximize spending. The other two approaches also failed to maximize spending and their withdrawal patterns were much less stable from year to year than under The Actuarial Approach.

Conclusion

It is not unreasonable for retirees to diversify their sources of retirement income. Research has shown combining life insurance annuity products with strategic withdrawals from accumulated assets to be an efficient strategy for managing risks in retirement[7]. An optimal systematic withdrawal strategy is one that can coordinate the various sources of retirement income to meet a retiree's financial goals in retirement. It is the author's belief that The Actuarial Approach is a better withdrawal strategy that can result in a better overall retirement spending strategy, provided reasonably conservative assumptions and methods are selected and the five step actuarial process is diligently followed.

For more discussion of the Actuarial Approach, a brief biography of the author and a lengthy disclaimer regarding The Actuarial Approach please visit the author's blog at http://howmuchcaniaffordtospendinretirement.blogspot.com/

 Footnotes:

[1] Research on deferring commencement of Social Security benefits: "Efficient Retirement Design--Combining Private Assets and Social Security to Maximize Retirement Resources", John B Shoven and Sita N. Slavov, Stanford Institute for Economic Policy Research. Research on Efficient Frontier for Retirement Income: Dr. Wade D. Pfau, "An Efficient Frontier for Retirement Income", Journal of Financial Planning, February, 2013 and follow-up article, "Why Retirees Should Choose DIAs over SPIAs", Advisor Perspectives, September 24, 2013

[2]Accumulated assets may include an estimate of home equity if the retiree expects to downsize, apply for a reverse mortgage or otherwise tap into home equity to fund retirement spending.

[3]Based on an annuity purchase rate for a male age 65 of approximately $600 per month for a premium of $100,000 as shown in Incomesolutions.com and assuming life expectancy of approximately 22 years from Society of Actuaries Annuity-2000 table with 1% mortality improvement, the author derived an interest rate of about 4.6% using the life expectancy annuity certain approximation method. An investment return assumption of 5% per annum would be a compounded investment return, not an arithmetic return.

[4]The simple spreadsheet tool referred to in this section (Excluding Social Security 2.0) does not anticipate the retiree having more than one deferred annuity. Adjustments would have to be made to accommodate multiple deferred annuity starting dates. Total theoretical withdraws (from withdrawals of accumulated savings and annuity payments) are designed to increase by an inputted percentage each year. Adjustments would need to be made to accommodate other desired spending patterns. The author's website does contain a separate spreadsheet (Social Security Bridge) for the purpose of coordinating total spending with a decision to delay commencement of Social Security.

[5]"The Next Evolution in Defined Contribution Plan Design", by Steve Vernon, FSA, Consulting Research Scholar, Stanford Center on Longevity in collaboration with the Society of Actuaries' Committee on Post-Retirement Needs and Risks.

[6]Graphs based on author's calculations. Consistent with interest rates inherent in immediate annuity purchase rates, 1998 initial assumptions for The Actuarial Approach were 7% investment return and 4% inflation changing to 6% investment return and 4% inflation in 2004 and 5% investment return and 3% inflation in 2009. Desired amount of bequest at death was $10,000. Investment experience based on investment mix of 25% large cap equities, 25% mid-cap equities, 25% mid-term bonds and 25% short-term bonds with annual rebalancing of investments. Source of investment returns by assets class: Investor Cookbooks Historical Asset Class Return Charts. Source of CPI data from Tab 8A Society of Actuaries--Statistics For Employee Benefits Actuaries.

[7]See footnote 1. The author makes no claim regarding the optimal mix of immediate annuities, deferred annuities and self managed assets to be included in a retirement portfolio. He leaves this project up to more well qualified retirement researchers.