In Search of the "Best" Retirement Strategy

by William Klinger, MBA

Abstract: *Adopting a strategy for withdrawing assets from a retirement portfolio is one of the most important decisions facing retirees. This paper examines eight retirement strategies proposed by researchers and pundits by simulating and evaluating the strategies according to a common set of criteria. In order to address the important concern and criterion of the trade-off between total real retirement income and real legacy, the strategies are also simulated to show the effect of purchasing immediate annuities with different percentages of the retirement portfolio. An approach is presented to help guide a retiree or planner in selecting the "best" strategy for the retiree.*

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Introduction

Picking a retirement strategy is one of the more important financial decisions a person will make. In the current economic climate with millions of baby boomers facing retirement, it seems there is no end to advice on how to make one's retirement savings last a lifetime. Many approaches sound reasonable, yet the range of advice seems to vary considerably with strategies often contradicting each other. How is one to choose?

A retirement strategy normally includes a plan for the systematic withdrawals from a retiree's portfolio over his/her lifetime. For the purposes of this research, withdrawals and annuities purchased with assets from the retirement portfolio are considered to be a person's retirement income in a given year. Other sources of income, such as Social Security, are not considered in order to focus on withdrawal strategies. The most basic of strategies and perhaps the one most often cited is the 4% Rule based upon work by Bengen and others.[1] This strategy states that a person may withdraw 4% of his/her retirement portfolio in the first year of retirement and increase the withdrawals with the rate of inflation in subsequent years. One benefit of this strategy is that it is relatively easy to understand and implement. This retirement strategy produces a uniform retirement income profile—one in which the withdrawals are constant, in real (inflation-adjusted) terms—over the retirement period.

There are other strategies one might want to employ. It is possible that a retiree would like to withdraw less early in retirement to get the ability to withdraw more later in retirement when perhaps medical costs become

an issue. A withdrawal strategy such as this is called a progressive retirement income profile. On the other hand, a retiree may desire to withdraw and spend more early in retirement and decrease the level over time—an aggressive retirement income profile. In addition, what the 4% Rule ignores is that few retirees will or should put their retirement financials on autopilot for 30 or more years. When economic conditions turn bad and their retirement may be in jeopardy, people will take action.

To address the differing needs of retirees, numerous retirement strategies have been defined. How does a person select the best strategy? What does "best" even mean in the context of a retirement strategy? This paper looks at several different retirement strategies and evaluates them according to a set of criteria in order to answer these questions.

Retirement Strategies

Eight different strategies for making withdrawals from a retirement portfolio are examined in this paper. This is obviously not an exhaustive list but represents a range of strategies that provide some insight into the expected behavior of different approaches. One characteristic of these strategies is that they are easily understood and implemented. In addition to withdrawals, some suggested retirement strategies also specify the asset allocation for the retirement portfolio. Because not all strategies specify an asset allocation, to make meaningful comparisons only the withdrawal portion of the strategies is analyzed here. The names used for the different strategies in this paper are not necessarily those used by the people who have advocated these strategies.

4% Rule

The first strategy considered is the 4% Rule described above. Stated simply, in the first year of retirement, a retiree will withdraw 4% from his/her portfolio. The withdrawal amount is adjusted for inflation in subsequent years throughout retirement. This strategy serves as a baseline for comparison with other strategies.

Floor & Ceiling Strategy

The 4% Rule was modified by Bengen to create a Floor & Ceiling Strategy where 4% of the retirement portfolio is withdrawn every year subject to a floor and ceiling.[2] The floor and ceiling are the lower bound and upper bound that a retiree will accept in terms of annual income (withdrawals). The floor and ceiling are defined in real terms based upon the initial withdrawal amount. One recommendation is to set the floor at 10% below the initial withdrawal amount and the ceiling at 25% above the initial withdrawal amount. In any retirement year, if the planned real withdrawal amount falls below the floor or exceeds the ceiling, the withdrawal amount is kept at the floor or ceiling respectively.

Modified 4% Strategy

Clyatt did away with the floor and ceiling limits and added new protection in the Modified 4% Strategy.[3] This rule specifies that the withdrawal amount in any year should be 4% of the portfolio value in that year. This will guarantee that the retiree's portfolio will never be depleted, but because the size of the portfolio will change according to returns, the annual withdrawals will also fluctuate. This strategy adds the protection that if the portfolio loses value in a particular year, the income in the next year will be cut to 95% of the prior year's level. The 95% level is used even if the drop in the portfolio would have prescribed a lower withdrawal. This helps to smooth out major swings in withdrawals. In subsequent years the assets will continue to be withdrawn at 4%.

Decision Rules Strategy

The Decision Rules Strategy proposed by Guyton and Klinger uses dynamic rules to guide withdrawals.[4] The initial withdrawal rate from the retirement portfolio is set at 5.3% and later grows with inflation subject to decision rules. The decision rules are actions a reasonable retiree might take under various economic conditions. The rules stated here are slightly modified from the original research to make them more easily implemented. During retirement, if a year's portfolio return is negative and the withdrawal rate, as adjusted, would be greater than the initial withdrawal rate, the withdrawal amount is frozen at the prior year's level. To further protect the portfolio, if the withdrawal rate exceeds 6.36% in a given year, then that year's withdrawal is reduced by 10% from the prior year. This rule is not applied after age 85. In

order to take advantage of good economic conditions, if the withdrawal rate falls below 4.24%, then the withdrawal amount is increased 10% over the prior year.

Safe Reset Strategy

This strategy from Stein and DeMuth recognizes that a retiree can safely withdraw more later in retirement than earlier because the retirement portfolio needs to last fewer years.[5] In this strategy, the withdrawal rate is a function of the retiree's age and adjusted only for inflation for five years before being reset to a new withdrawal rate determined by the expected number of years remaining in the person's retirement. The prescribed withdrawal rate is 4.7% with 40 years remaining in retirement, 5% at 35 years, 5.3% at 30 years, 5.6% at 25 years, 6.4% at 20 years, 7.9% at 15 years, and 8.6% with 10 years remaining in retirement. To protect against poor economic conditions early in retirement, if the portfolio return is negative in any of the first 10 years, the withdrawal rate is set to 4%. Although Stein and DeMuth also specified a portfolio asset allocation, all strategies in this paper will use the same asset allocation.

Aggressive Strategy

For those retirees wanting to spend more early in retirement rather than later, Klinger proposed an Aggressive Strategy where the withdrawal amount is defined in real terms and decreases over the retirement period.[6] A smooth aggressive strategy decreases real withdrawals each year by a set amount. For example, with a $1 million portfolio a smooth strategy may start with $53,375 in withdrawals, which would decrease $368 annually in real terms for a 20% drop in the annual real withdrawal over retirement. (The withdrawal amounts scale proportionately to the portfolio size.) The annual withdrawal amounts defined this way serve as the maximum allowable real withdrawal amount in each year. To protect the portfolio against losses, if the portfolio has a negative return in any year, the next year's withdrawal is reduced by 10%. The real withdrawal amount in any year is not allowed to fall more than 10% below the maximum for that year. Alternatively, if economic times are good and the withdrawal rate in any year falls below 3.8%, the next year's withdrawal is increased by 10%. Any increases in withdrawals are capped at the maximum real income prescribed for that year.

Half-Annuity Strategy

A number of strategies have been defined to take advantage of annuities. Updegrave, among others, has suggested that a retiree should consider using half of the retirement portfolio to purchase an annuity and use the other half of the assets to generate additional income through annual withdrawals.[7] The Half-Annuity Strategy, as used in this paper, will use the nonannuity assets to generate an income stream equivalent to the 4% Rule. Updegrave also specified a dynamic asset allocation scheme, which is not considered in this research.

Delayed-Annuity Strategy

A more complex strategy using annuities, the Delayed-Annuity Strategy, was suggested by Clements.[8] For this strategy, retirees divide their portfolio into two parts. In one part, 85% of a retiree's original portfolio is set aside and 1/nth of those assets are withdrawn each year for income, where n is the number of years until the retiree reaches age 85. The remaining 15% of the original portfolio is invested and at age 85 is used to purchase an annuity.

Comparison Criteria

The question many people ask is, "Which is the best strategy?" The answer, of course, depends upon what one means by "best." An obvious answer might be the strategy that allows the retiree to withdraw the most money throughout retirement. That may sound like a logical criterion, but such a strategy could result in a retiree running out of money because he/she has spent his/her portfolio.

Another criterion could be that the best strategy is the one with the lowest risk. In retirement strategy research, risk is usually defined as the probability that a retiree's portfolio goes to zero before the end of retirement. Clearly, retirees can minimize their risk by minimizing their retirement income; not a particularly satisfying strategy. In addition, using a definition based upon having a retirement portfolio does not address the situation where a retiree purchases an annuity with all of his or her assets. With a pure annuity, the portfolio is zero

but the retiree will receive an income stream throughout retirement. This paper assumes that if the retiree purchases annuities, he or she succeeds in having a retirement income stream throughout retirement, even though he or she has no portfolio assets. His or her risk is extremely low.[9] Since many strategies can be created that involve minimal income and using annuities, a meaningful comparison must include other criteria than just a simple measure of risk.

Certain retirees are interested in leaving a legacy. In this paper, the legacy is the value of the retirement portfolio at the end of retirement. Clearly one could maximize a legacy by withdrawing no money from his/her portfolio; however, the retiree would have nothing on which to live. One could also guarantee a legacy using life insurance. Again, more criteria are required.

Another characteristic of a retirement strategy that a retiree may want to consider is the retirement income profile. Annual retirement income is the annual portfolio withdrawal plus any annuity payment. A uniform profile occurs when the real annual retirement income is approximately constant throughout retirement. If real income rises during retirement, it is a progressive profile. A retiree withdrawing more early in retirement than later has an aggressive profile. Different strategies result in differing retirement income profiles.

The best strategy for a retiree will require trade-offs among the above criteria of risk, income, and legacy. Retirees will differ as to the value attached to each criterion. One might want to maximize his/her retirement income but leave a particular legacy. Another may want an aggressive retirement income profile but only up to a particular level of risk.

Methodology and Assumptions

This research uses Monte Carlo simulations to test the retirement strategies (see the Appendix for details). Each simulated retirement begins with a $1 million retirement portfolio. Withdrawals from the portfolio are made in each year according to the rules of the retirement strategy being simulated. Individuals are assumed to spend 30 years in retirement. The portfolio withdrawals and annuity payments represent the pretax retirement income of an individual and differences in tax treatment are ignored.

Key assumptions for the simulations are the asset allocation and expected returns. The asset allocation is 60% large company stocks and 40% U.S. 10-year treasuries. The simulator uses S&P 500 total returns from 1950–2009 for large company stocks with a mean lognormal return relative (i.e. 1+r) of 6.9% and a standard deviation of 15.7%. The mean lognormal return relative for treasuries is 6.6% with a standard deviation of 2.4%. Average annual inflation is assumed to be 3%. It is assumed that a simple immediate annuity can be purchased that pays 7.09% annually.[10]

The results presented here may not match the results given in the original research for each of the strategies because some of the strategies, as originally presented, use different asset assumptions and allocations. This research uses a common set of assets and allocations in order to focus on the withdrawal strategies.

Observations

Table 1 presents the eight strategies with their initial retirement incomes and the results for four of the criteria. All eight strategies have simulation success rates greater than 86%, and half of them were 99% successful. From the table, it is obvious that there is a considerable range in the total real retirement incomes produced and the legacies remaining.

Although it is difficult to see in the table, Figure 1 clearly demonstrates the intuitive implication that the more one withdraws in retirement, the smaller the real legacy. The Delayed-Annuity Strategy produces the greatest total real retirement income—$1,691,000—but leaves no legacy. At the other extreme is the Modified 4% Strategy, which produces almost 30% less in real income

TABLE 1

	Success Rate	Initial Retirement Income	Median Total Real Retirement Income	Median Real Legacy
4% Rule	88%	$40,000	$1,200,000	$904,000
Floor & Ceiling	95%	$40,000	$1,219,000	$902,000
Modified 4%	99%	$40,000	$1,201,000	$974,000
Decision Rules	99%	$53,000	$1,348,000	$589,000
Safe Reset	99%	$53,000	$1,525,000	$322,000
Aggressive	86%	$53,375	$1,317,000	$684,000
Half-Annuity	99%	$40,000	$1,200,000	$778,000
Delayed-Annuity	99%	$42,500	$1,691,000	$0

but leaves a median real legacy of $974,000. Figure 1 does not tell the whole story, however.

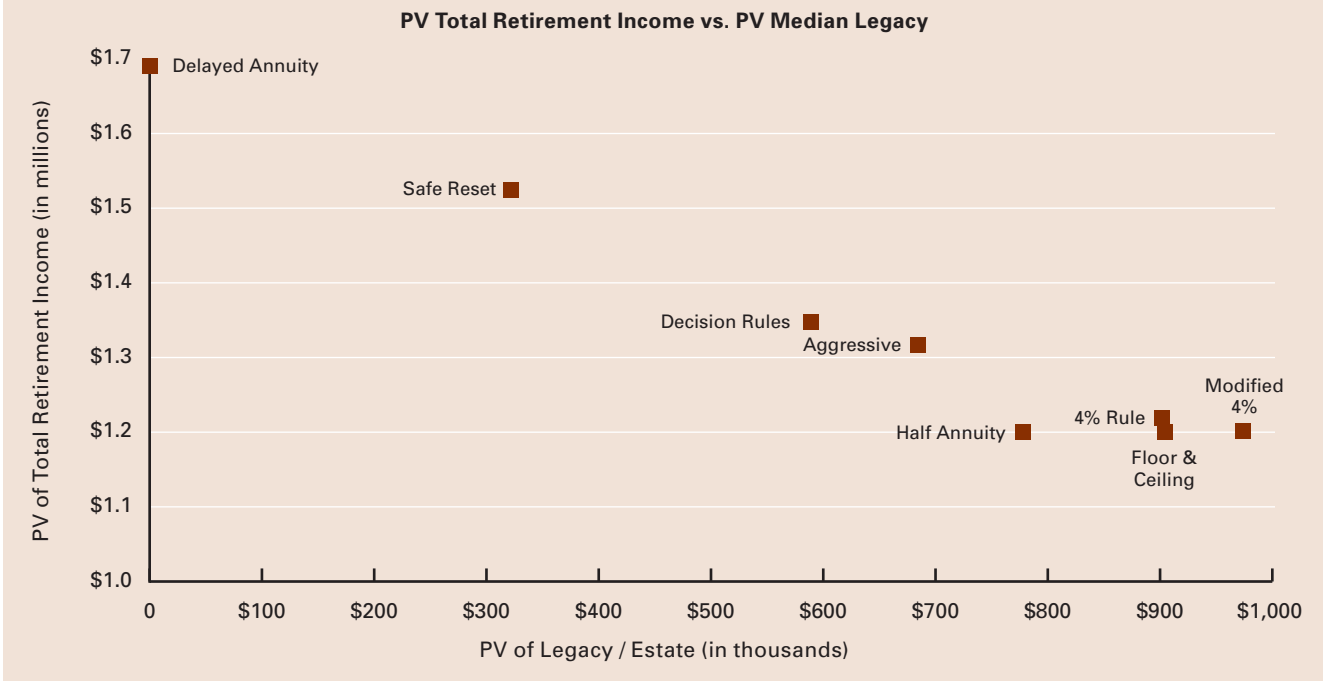
Each strategy has a distinct retirement income profile, as defined by the median withdrawals in each year of the simulation. Four of the strategies produce a real retirement income stream that is more or less flat. Figure 2 shows the four retirement strategies where the real income varies less than 5% from the beginning to the end of retirement. Notice that some variability occurs over time in the Floor & Ceiling and the Modified 4% Strategies as the rules allow the income to fluctuate within their parameters. The 4% Rule and Half-Annuity Strategies produce a constant real $40,000 retirement income stream by the nature of their definitions.

Two strategies produce aggressive retirement income profiles, ones where the real retirement income starts relatively high and then falls more than 20% throughout retirement. The Aggressive and Decision Rules strategies, shown in Figure 3, both start with incomes at approximately $53,000, or 32% greater than the uniform profile strategies. Although the income in these strategies falls during retirement, they both end with approximately the same annual real retirement income as produced by any uniform income profile strategy. The result is that these strategies produce a high total real income but leave a lower legacy than their uniform profile counterparts.

The Safe Reset and Delayed-Annuity strategies produce the complex profiles shown in Figure 4. Over the majority of retirement, the retirement income profiles are progressive, with real income increasing. In the later years, however, income falls. The reason for these profiles requires further explanation.

The Safe Reset Strategy profile moves in five-year steps as the withdrawal rate is reset. In the first 25 years, the retirement portfolio is still relatively large, and as the withdrawal rate is increased the real income also increases. From the simulations, it is apparent that there likely will be a reduction in the first five years in order to protect the portfolio. This is probably due to the relatively high initial withdrawal rate and the likelihood that the rule to cut the withdrawal rate to a safe 4% if the portfolio has a negative return in the first five years will need to be used. Also, notice that after age 90, the real income level is reduced. This is because even though the withdrawal percentage rate from the retirement port-

FIGURE 1



folio increases, the fact that the portfolio itself is smaller later in retirement means that the actual real withdrawal amount becomes less.

The Delayed-Annuity Strategy is even more complex. In this strategy, the income until age 85 is taken from 85% of the original retirement portfolio. Each year 1/nth of that 85% is withdrawn, where n is the number of years until the person reaches age 85. The profile this produces is one which geometrically increases over time. Consider that at age 82, the retiree will withdraw one-third of the remaining portfolio (n = 85 – 82 = 3). At age 83, the withdrawal will increase to half of the portfolio and the entire remainder will be withdrawn at age 84. This gives us the profile shown in Figure 4 for the first 20 years of retirement. At age 85, the retiree will take the 15% of the original retirement portfolio that wasn't spent and purchase an immediate income annuity. The income from the annuity is not able to replace the significant portfolio withdrawals that were being made and so real income drops.

It is clear that before a person implements a particular retirement strategy, he or she must understand the real income profile that strategy may produce. While a uniform retirement income profile is what one might naturally expect, it is possible to get higher initial real incomes that decline through retirement and end with the same real income level produced by a uniform profile strategy. The aggressive income profile strategies produce higher total real incomes but at the cost of lower real legacies. Figure 1 clearly shows a trade-off between total retirement income and the legacy among the different strategies.

The trade-off between retirement income and legacy shown in Figure 1 raises several questions. Must a retiree choose a completely different strategy, with a correspondingly different income profile, in order to get the desired trade-off? For example, if a person with a $1 million retirement portfolio wishes to leave a legacy of $300,000 and have a total retirement income of $1.5 million, must he/she choose the Safe Reset Strategy? Does one have to accept the rules as well as the resulting profile in order to achieve a particular trade-off?

Strategies and the Total Income/Legacy Trade-off

The simplest trade-off between total income and legacy comes from purchasing an annuity. The greater the percentage of the retirement portfolio used to pur-

FIGURE 2

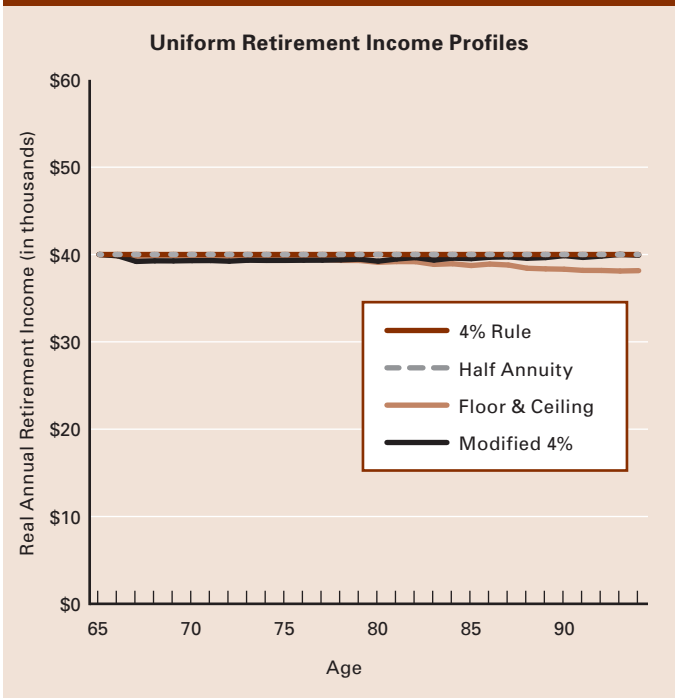
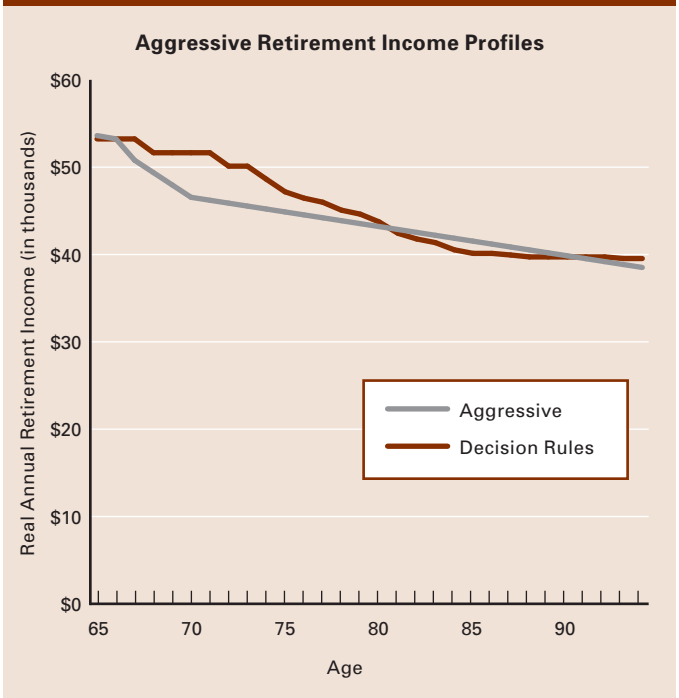


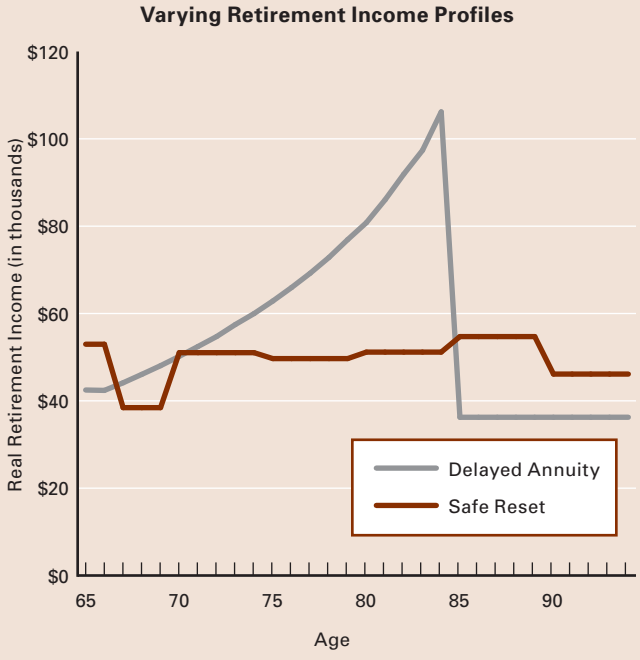
FIGURE 3



chase an annuity, the greater the income will be and the smaller the legacy. This is clearly seen in the case of the Deferred-Annuity Strategy where the retiree purchases an annuity at age 85 with all remaining retirement assets and leaves no legacy. It would seem reasonable to take any given strategy and modify it to incorporate an annuity to get the desired total income and legacy trade-off.

To investigate the effect of an annuity purchase on a retirement strategy, the strategies were simulated again, this time with an annuity purchased at the beginning of retirement. It was assumed that an immediate lifetime annuity that adjusts for inflation could be purchased at age 65 with an initial payout of 5.22%.[10] The initial payout obviously will change in practice with market conditions but the effect on each strategy should be clear from the discussion below. Each strategy was simulated with 10 different scenarios, once with no annuity purchase and then nine times with an annuity purchased with 10%, 20%, and up to 90% of the retirement assets. There is no difference among strategies if one purchases an annuity with 100% of the retirement assets. The purchase of an inflation-adjusted annuity with 100% of retirement assets will result in a total real income of $1,566,000 over the 30 year retirement (.0522 x 1,000,000 x 30).[11] In the simulations, the remainders of the assets not used to purchase an annuity at retirement were managed according to the rules of the particular strategy.

FIGURE 4



Because most of the strategies do not explicitly deal with annuity purchases, decisions had to be made as to how each strategy would be implemented if an annuity was purchased at the beginning of retirement. For the 4% Rule, this paper assumes that the intent of the rule is that the initial total retirement income level should be 4% of the retirement portfolio. Therefore, this research assumes that any annuity income is used to help meet the 4% target income level, and asset withdrawals will be used to make up any difference between the target income level and the annuity income. The Half-Annuity Strategy is a special case derived from the 4% Rule with 50% of the initial retirement portfolio used to purchase an annuity. The Floor & Ceiling and Modified 4% strategies are assumed to be based upon the idea that one can withdraw 4% of retirement assets each year with no fixed target, so the approach taken here is that when an annuity is purchased, 4% (or whatever the strategy calls for) will be withdrawn from the remaining retirement portfolio. (If one wants to interpret the 4% Rule in the same way, the results of the Floor & Ceiling simulations should closely approximate that approach.) The Safe Reset and Decision Rules strategies are handled the same way as the Modified 4% Strategy. The withdrawal rates defined by these strategies are based upon the portfolio size, and if an annuity is purchased, those withdrawal rates are applied to the remainder of the retirement portfolio and added to the annuity income to get the total retirement income. The Aggressive Strategy defines an income profile in terms of real income and is treated like the 4% Rule; the target income level for a year is fixed and withdrawals from the retirement portfolio are used to make up any shortfall in income from an annuity. The Delayed-Annuity Strategy was not simulated with different annuity amounts since, by definition, it has no legacy and therefore no trade-off.

The first strategies simulated were those with uniform income profiles. These strategies have the common characteristic of an initial retirement income target of 4% of the retirement portfolio, although the target

may change over time. The effect on these strategies of purchasing annuities at retirement is shown in Figure 5. Ten outcomes are plotted for each strategy on the graph. One plotted point represents the results for the strategy with no annuity and then nine points plot the results for each strategy with annuity purchases of 10% up to 90% of the retirement assets in increments of 10%.

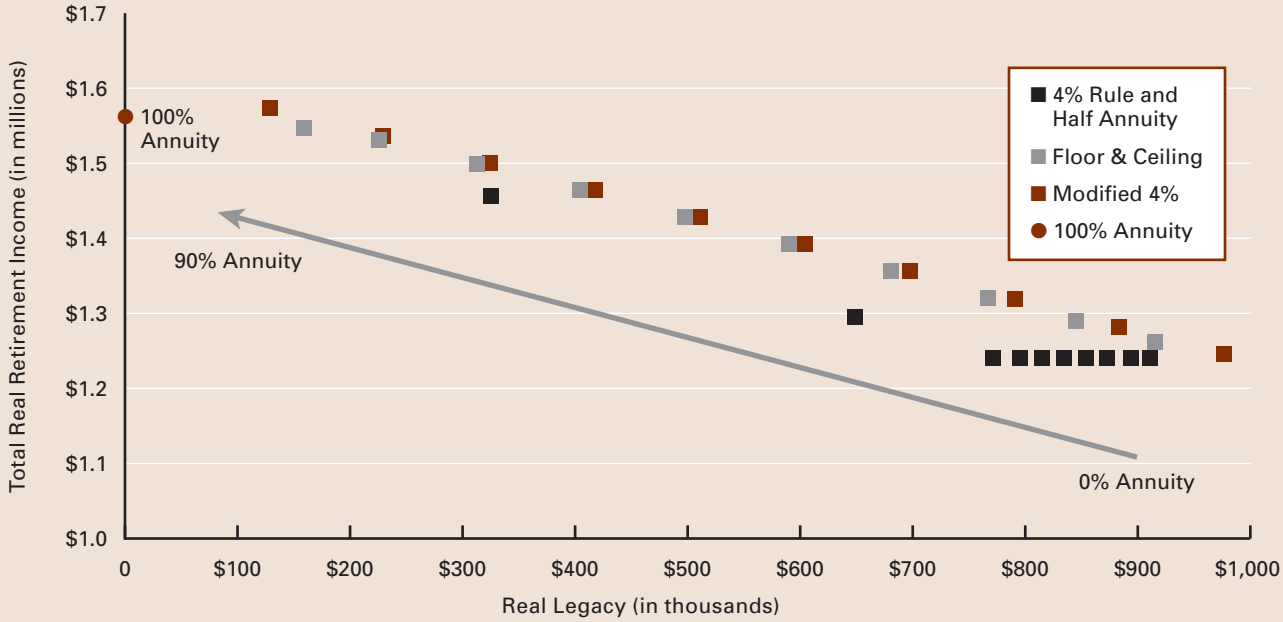
As expected, Figure 5 shows that the greater the percentage of retirement assets used to purchase an annuity, the lower the legacy. The Floor & Ceiling and Modified 4% strategies show a roughly linear trade-off between total real income and legacy, with total real income rising as legacy falls. The 4% Rule and Half-Annuity strategies result in exactly the same trade-offs because the Half-Annuity Strategy is just the case of the 4% Rule with 50% of the retirement assets used to purchase an annuity. What is perhaps unexpected is that the real total income/legacy trade-off for these two strategies does not resemble the other two uniform profile strategies. Total real income for the 4% Rule does not increase until 70% of the assets are used to purchase an annuity. This is because the rule states that the retirement income level should be 4% of the level of assets at retirement. That establishes the target income level. If some assets are used to purchase an annuity, then that annuity income is counted toward the income level, meaning that a smaller percentage of the remaining assets must be withdrawn to make up the difference between the target income level and the annuity income. It is not until 70% of the assets are used to purchase an annuity that the annuity income exceeds the target income level.

Although total real income does not increase with the purchase of annuities below 70% of the retirement assets in the 4% Rule Strategy, there is a benefit. The success rate of the simulations increases as the percentage of assets used to purchase an annuity increases. Recall that without the purchase of an annuity, the 4% Rule has a success rate of 88%. If 10% of the retirement assets are used to purchase an annuity, the success rate exceeds 90%. An annuity bought with 30% of the retirement assets results in a success rate of over 95% and the success rate climbs to 99% if 50% of the assets are used to purchase the annuity. The initial benefit of purchasing an annuity in the 4% Rule Strategy is that it reduces risk.

The Aggressive Strategy, shown in Figure 6, has a total income/legacy trade-off similar to the uniform pro-

FIGURE 5

Effect of Annuities on Uniform Profile Strategies



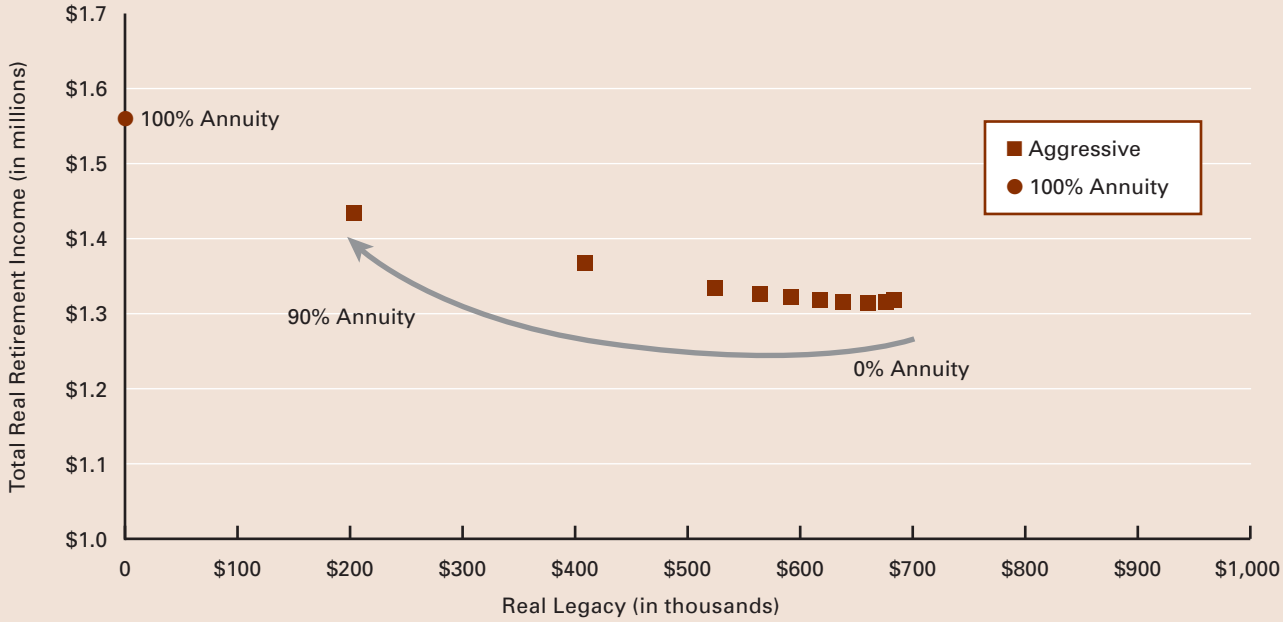
file strategies but because of its aggressive nature, it has a higher total real income than the uniform profiles with low annuity percentage purchases. As the percentage of assets used to purchase an annuity increases, there is little initial increase in total income until the percentage gets to 70%. As with the 4% Rule, there is a benefit of annuity purchases below 70% in that the success rate increases. If 30% of the retirement assets are used to purchase an annuity, the success rate for the Aggressive Strategy rises to greater than 90%. The success rate goes over 95% and 99% by using 50% and 70% respectively of the retirement assets to purchase an annuity.

The effect of annuities on the Decision Rules Strategy may be somewhat counterintuitive after looking at the previous strategies. Figure 7 shows that as one increases the percentage used to purchase annuities, the total real income drops and the legacy amount increases. It is not until more than 60% of the retirement portfolio is used to purchase an annuity that the total retirement income begins to rise and not until 90% is used does the total real income exceed the total real income with no annuity. The Decision Rules Strategy alone is a superior strategy to any that combines that strategy with an annuity purchase unless the annuity is purchased with 90% or more of retirement assets. What is happening? The withdrawal rate used in the Decision Rules Strategy is 5.3%. When assets are used to purchase an annuity, that 5.3% is forgone in order to purchase an annuity with a payout of 5.22%. On the margin, the retiree receives less income with each increase in the annuity purchase percentage and the legacy is greater because less is being withdrawn from the portfolio. When 90% of the assets are used to purchase an annuity, the total real income becomes greater than the case of no annuity because the annuity provides a uniform income profile generating more real income in the years where the simple Decision Rules Strategy would have prescribed real income reductions.

The Safe Reset Strategy displays yet a different tradeoff. Figure 8 shows that as the percentage of retirement assets used to purchase an annuity increases up to 60%, the total real income increases as the legacy decreases. However, at annuity purchase percentages above 60%, the total real income and real legacy decrease slightly as the percentage is increased. Using the Safe Reset Strategy, annuity purchases made with less than 60% of the retire-

FIGURE 6

Effect of Annuities on Aggressive Strategies



ment assets can achieve better results than with purchases using more than 60%. The reason for this lies in the relatively high asset withdrawal rates in the Safe Reset Strategy which result in a smaller portfolio later in retirement. As the percentage of the retirement portfolio used to purchase an annuity increases above 60%, the income derived from the portfolio withdrawals becomes less and is dominated by the annuity income. It doesn't help to withdraw 8% from the portfolio if the portfolio is small. Also note that the legacy value is never as great as any of the uniform profile strategies due to the relatively high withdrawal rates in this strategy.

Summary and Conclusions

The first observation that can be made is that simulations of the retirement strategies show that all the strategies can produce high success rates. Most are 99% successful with none below 86%. Those that are below 99% can be brought up to that level, if desired, with the purchase of annuities.

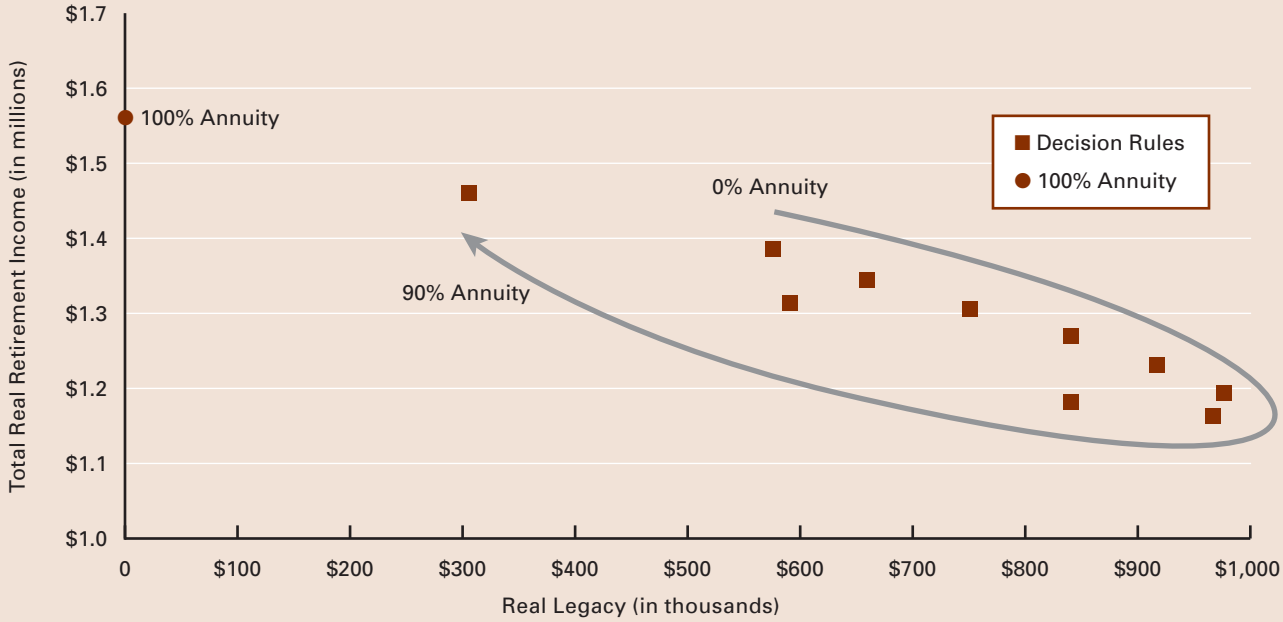
Second, the retirement income profiles produced by the strategies show marked differences. Four strategies produce incomes that are uniform and vary less than 5% throughout retirement. Two strategies produce aggressive income profiles that decrease roughly 20% over time, and two strategies produce income profiles that start progressively but then drop in real income later in retirement. In the most extreme case, the Delayed-Annuity Strategy results in an extremely progressive strategy until age 85 when it drops dramatically and remains uniform to the end of retirement.

Third, the research shows that the strategies can be combined with annuities purchased at retirement to give retirees control over their total retirement income and the legacy they leave. With most strategies, the trade-off between total retirement income and legacy is roughly linear. However, with the Safe Reset Strategy, there appears to be no benefit to purchasing an annuity with more than 60% of the retirement portfolio since greater percentages result in both a lower total retirement income and a lower legacy. With the Decision Rules, the trade-off is more complex, and the total retirement income does not increase over having no annuity until 90% of the retirement assets are used to purchase an annuity.

It may seem that the search for the "best" retirement strategy has created more confusion than there was at the beginning. Which strategy is the best for a

FIGURE 7

Effect of Annuities on Decision Rule Strategies



retiree? Since all strategies can produce high success rates, the answer depends upon the retiree's objectives.

A good starting point for a retiree is to identify the retirement income profile desired. If a retiree wants a uniform retirement income profile, then the choices are the 4% Rule, Modified 4%, and Floor & Ceiling. If one wants to spend more early in retirement than later, then the Aggressive and Decision Rules strategies are the options. It must be kept in mind that any aggressive strategy will require cuts in real income throughout retirement that the retiree must be willing and able to make. The Safe Reset Strategy provides a roughly uniform retirement income profile except for the potential drop in income in the first five years and the last five years. The income profile for the Delayed-Annuity Strategy is unique and not likely to be suitable for most retirees.

The next step is to select from among the strategies producing the desired retirement income profile. Since the profiles in each of the categories produce roughly the same amount of income, a retiree needs to assess his/her ability to follow a particular strategy. What rules do they believe they can most easily follow? The answer to that question will identify the strategy to be used.

Finally, the retiree should decide what amount he/she wants to have as a legacy. This is an important question and good to address at the beginning of retirement. The answer to this question will determine where the retiree falls in the total retirement income/legacy trade-off and how much of the retiree's retirement portfolio should be used to purchase an annuity. Other approaches to leaving a legacy, such as insurance, are not addressed in this research.

The result of this process is the identification of the amount to be spent at retirement on the purchase of an annuity and a strategy for managing the withdrawals from the remainder of the retirement portfolio. In addition, the retiree has a good indication of what his/her total real retirement income may be as well as the legacy he/she may leave. ■

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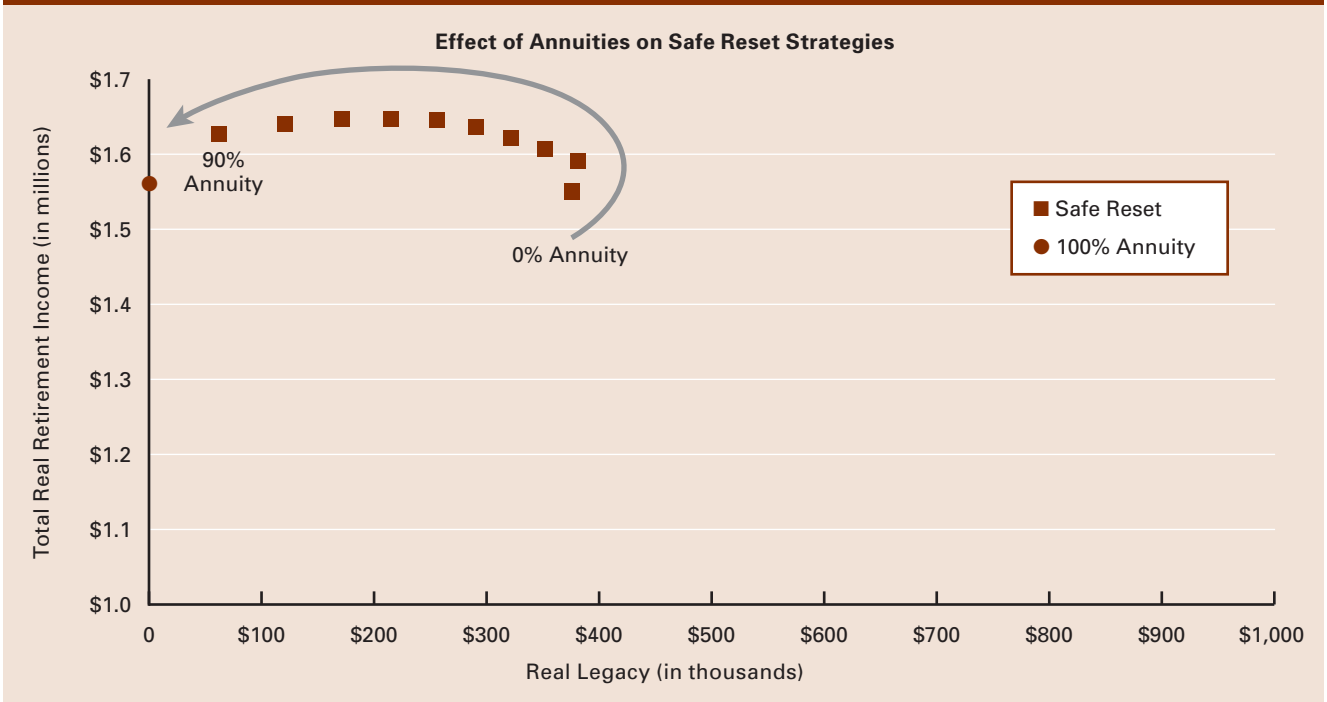
FIGURE 8



(1) William P. Bengen, "Determining Withdrawal Rates Using Historical Data," *Journal of Financial Planning* (January 1994): 14–24.
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(3) Bob Clyatt, *Work Less, Live More, The New Way to Retire Early* (Berkeley, CA: Nolo Press, 2005).
(4) W.T. Guyton and W.J. Klinger, "Decision Rules and Maximum Initial Withdrawal Rates," *Journal of Financial Planning* (March 2006): 48–58.
(5) Ben Stein and Phil DeMuth, *Yes You Can Still Retire Comfortably!* (Carlsbad, CA: New Beginnings Press, 2005).
(6) William J. Klinger, "Creating Safe, Aggressive Retirement Income Profiles," *Journal of Financial Planning* (May 2010).
(7) Walter Updegrave, "An Income Plan That's Built to Last," money.cnn.com (April 18, 2007).
(8) Jonathon Clements, "How to Survive Retirement," *Wall Street Journal* (January 17, 2007).
(9) This paper assumes that annuities are risk free. This is obviously not true, but their risk is low, and by purchasing annuities from multiple sources the risk can be further minimized.
(10)The immediate and inflation-adjusted annuity rates were quoted by AIG on 7/28/08 for a male living in New Jersey.
(11) Since inflation-adjusted annuity payments increase each year with inflation, the total real value of the payments is the simple formula: RealValue = AnnuityRate * AnnuityAmount * NumberOfPayments.

APPENDIX

Methodology

The retirement strategies in this research were tested using a Monte Carlo simulator written in C++. All simulations start with an initial retirement portfolio of $1 million. In the simulations, a retiree's income needs for a year are withdrawn from the retirement portfolio on the first day of each simulated year. At the end of each simulated year, the return on the portfolio's investments is calculated using a random draw from a lognormal distribution based upon historical returns. Asset return relatives (i.e. 1 + r, where r is the nominal rate of return) are assumed to be lognormally distributed. The values from the random draws are multiplied by a Cholesky Matrix, created from the historical correlations between stocks and bonds, to account for the correlation between stocks and bonds in each simulated year.* The simulated returns and withdrawals in each year are then discounted by the rate of inflation to calculate real withdrawals, and the portfolio is rebalanced to the target asset allocation. Transaction costs and taxes are not addressed by the simulator. The above calculations are performed each year of the simulated retirement.

Each retirement strategy is simulated 10,000 times. A simulation run is considered a success if there is a positive portfolio balance at the end of the retirement period or if the strategy called for the purchase of an annuity. Although a strategy using an annuity may be "successful" in the context used here, the amount of the annuity may be insufficient for the retiree and must be evaluated on criteria other than just having an income at the end of retirement. The *success rate* is the percentage of simulations that result in success. It should be noted that the success rate of a simulation is not the same thing as the probability of success. To help guard against possible confusion, success rates are limited to 99% as an upper bound, even if there were no simulation failures.

*Gentle, James E., *Random Number Generation and Monte Carlo Methods,* Springer-Verlag, New York, NY, 2003.