Swedroe: What If Your Plan Fails?

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Retiring without sufficient assets to maintain a minimally acceptable lifestyle (which each person defines in their unique way) is an unthinkable outcome. That's why, when investors are planning for retirement, their most important question is usually something like, how much can I plan on withdrawing from my portfolio without having a significant chance of outliving my savings?

The answer generally is expressed in terms of a safe withdrawal rate (SWR)—the percentage of the portfolio you can withdraw the first year with future annual withdrawals adjusted for inflation.

Simulating Retirement Portfolio Returns

While historical returns can provide insight, it's critical that investors not simply project the past into the future. Current valuation metrics should be used instead. Additionally, investors must address issues involving our limited ability to estimate future returns and the fact that the order of returns matters a great deal. The way to do so is to use a Monte Carlo simulator.

Monte Carlo simulations require a set of assumptions regarding time horizon, initial investment levels, asset allocation, withdrawals, rate of inflation and, very importantly, the distribution of annual returns for various asset classes.

Two numbers determine the expected final wealth distributions in Monte Carlo simulation programs: the average annual return (again, derived from current valuations/yields rather than historical ones) and the standard deviation of the average annual return. The Monte Carlo simulator then randomly selects a return for each year and calculates wealth values over the expected retirement period. This process repeats thousands of times to calculate the likelihood of possible outcomes.

Monte Carlo simulation outputs typically are presented as odds of success. For example, the simulation's result might show a 90% chance of you not outliving your assets. Said another way, the failure rate, in this case, is an estimated 10%.

Research On Failure Rates

However, while the failure rate has become an essential tool when evaluating SWRs, as Javier Estrada, author of the October 2016 paper "Refining the Failure Rate," points out: "This variable is silent about how long into the retirement period a strategy failed."

He continues: "Two strategies that sustained withdrawals for 10 and 25 years of a 30-year retirement period have both failed, but a retiree would be far from indifferent between them."

Estrada's study, which covered 21 countries over the 115-year period from 1900 through 2014, showed that two strategies could have the same failure rate but fail at very different points along the retirement horizon, with one supporting a retiree's withdrawals for a longer time.

Estrada showed that over the 86 30-year retirement periods he considered, a 4% withdrawal strategy from a global 60/40 portfolio would have failed 20 times, or in 23% of the periods. However, those 20 failures looked very different. In some cases, the plan failed with only two years remaining; in others, it failed with 14 years remaining. Those represent two very different outcomes, with very different consequences. Yet they both count the same way in informing the failure rate.

To overcome this issue, Estrada introduces shortfall years—or the average number of years a strategy fails to support withdrawals over all periods in which the strategy failed—as a complement to failure rate. While adding shortfall years is an improvement upon relying solely on failure rate, it implies the use of two independent variables, which won't necessarily always agree with each other.

For instance, strategy A could have a lower failure rate than strategy B but a higher shortfall-years metric. This suggests that strategy A will fail less often, but when it does fail, it will fail earlier on average into a retirement period than strategy B. Thus, using both failure rate and shortfall years will lead to trade-off decisions retirees will need to evaluate as opposed to a decision based on a single variable that defines a clear choice between the two strategies.

Follow-Up Research

To combat this joint optimization issue, Estrada first introduces a new metric—risk-adjusted success (RAS)—in his April 2017 paper, "From Failure to Success: Replacing the Failure Rate."

Given its important implications for evaluating retirement strategies, my colleague, Tim Jost, an institutional services advisor with my firm, Buckingham Strategic Wealth, supplied the following analysis of Estrada's more recent research.

RAS, which allows for the use of a single metric for choosing an appropriate retirement strategy, is defined as the ratio between the mean expected value of outcomes and the standard deviation of outcomes, making it similar in nature to the Sharpe ratio. Thus, like the Sharpe ratio, and all else equal, an investor should pick the retirement strategy with the highest RAS metric. A higher RAS value means either a strategy can sustain more years of expected withdrawals or there is less uncertainty about the years of withdrawals it can sustain before it fails.

While RAS provides an improvement over using the joint variables of failure rate and shortfall years, it still poses its own issues, primarily due to its use of volatility as a measure of risk (volatility doesn't distinguish between upside and downside fluctuations). This means that achieving positive outcomes far above a desired result would actually reduce the RAS value even though investors should desire these outcomes.

To improve upon this limitation of RAS, Estrada next introduces a downside risk-adjusted success (D-RAS) metric in his October 2017 paper, "Replacing the Failure Rate: A Downside Risk Perspective." Instead of defining risk using the standard deviation of years sustained, as the RAS metric does, D-RAS measures risk as the semideviation of years sustained.

Semideviation measures only downside volatility with respect to a benchmark, thus not penalizing fluctuations above a benchmark. As a result, D-RAS measures the dispersion of only failed outcomes where the years that a retirement strategy sustains withdrawals is shorter than the length of the retirement period considered. A higher D-RAS value indicates a strategy can sustain more years of expected withdrawals, or there is less uncertainty about the years of withdrawals it can sustain when it fails.

Results Cover 115 Years, 21 Countries

Using the same data from his prior work, which you'll recall covers 21 countries over the 115-year period 1900 through 2014, Estrada compares the optimal allocation suggested by both RAS and D-RAS. He looks at 11 different stock/bond allocations ranging between 100/0 (all stocks) and 0/100 (all bonds) for both metrics. Some highlights from Estrada's findings include:

- On average, D-RAS selects more aggressive allocations than RAS. This is largely due to D-RAS not penalizing aggressive strategies that leave large bequests at the end of a retirement period.
- D-RAS selects strategies with an average stock allocation of 85%; RAS selects strategies with stock allocations that average only 61%.
- Failure rate is more negatively correlated with D-RAS (-0.79) than with RAS (-0.52). This suggests that failure rate and D-RAS rank competing strategies more similarly than failure rate and RAS. Remember, selected strategies have the highest RAS and D-RAS values, so one would expect these ratios to be negatively correlated with failure rate, which investors want to be lower rather than higher.

Given D-RAS tends to select strategies with relatively low failure rates that tend to leave large bequests, Estrada suggests that D-RAS should be used as a single comprehensive metric in place of RAS and the common failure rate/shortfall years framework. Time will tell if retirement planning software providers incorporate single-variable metrics like RAS or D-RAS into their Monte Carlo software.

To address the problems Estrada highlights in his earlier research, Monte Carlo software can report not only the success/failure rate, but the median age at which a plan fails and the median amount by which it fails. Investors would be able not only to determine the estimated odds of failure, but to understand in such cases how long into retirement their portfolios could maintain their desired lifestyles, and how long a period remains.

They could also determine how large an adjustment would be required to prevent failure. This enables them to design effective Plan B's—a contingency plan that lists the actions to take if financial assets were to drop below a predetermined level. Actions might include remaining in or returning to the workforce, reducing current spending, reducing the financial goal, selling a home and/or moving to a location with a lower cost of living.

Does your financial plan consider the issues Estrada raised? Do you have a well-thought-out Plan B? If not, I hope this serves as a call for action.

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