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The State of Retirement Income: 2025

Our 'base case' for starting safe withdrawal rates is 3.9%, but retirees can withdraw up to 5.7% of their starting portfolio balance by adopting a more flexible approach.

Portfolio and Planning Research
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Contents

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Key Takeaways

- Morningstar's 2025 research suggests that 3.9% is the highest starting safe withdrawal rate for retirees seeking a consistent level of inflation-adjusted spending from year to year (assuming a 90% probability of having funds remaining at the end of an assumed 30-year retirement period). As in the past, we incorporated forward-looking asset-class return and inflation assumptions to arrive at a starting safe withdrawal rate for new retirees, excluding Social Security or other nonportfolio income sources.

- Our "base-case" safe withdrawal rate is up slightly from the starting safe withdrawal percentage of 3.7% we estimated in last year's report. (The base-case estimates for starting safe withdrawal rates for a new retiree with a 30-year horizon with a 90% probability of success were 3.3% in 2021, 3.8% in 2022, and 4.0% in 2023.) As noted in the "How to Use This Research" section, these numbers aren't meant to imply that people who are already retired should shift their spending up or down from year to year; rather, they represent our best estimate of the starting safe withdrawal rate for a person currently embarking on retirement.

- The highest starting safe withdrawal percentage for a 30-year time horizon comes from portfolios that hold between 30% and 50% in equities and the remainder in bonds and cash. More equity-heavy portfolios generally don't support the highest starting safe withdrawal rates because of their higher levels of volatility and associated sequence of return risk. Moreover, today's higher bond yields provide a stable source of cash flows for retirees who are seeking a level real income from their portfolios.

- This year's research also examines the impact of four real-world risk factors for retirees: poor market returns early in retirement, high inflation early in retirement, an early retirement date that necessitates withdrawals over a longer time frame, and high long-term care costs at the end of life. All of those scenarios reduce the success rate of the plan unless the retiree reduces spending in response.

- Using a more flexible approach to retirement withdrawals can significantly boost the starting safe withdrawal rate. We tested four additional flexible spending methods this year, two of which lifted the starting safe withdrawal rate to 5.7%. However, the right level of flexibility in a retiree's spending system will depend on the individual's tolerance for spending changes, including the extent to which fixed expenses are covered by nonportfolio income sources.

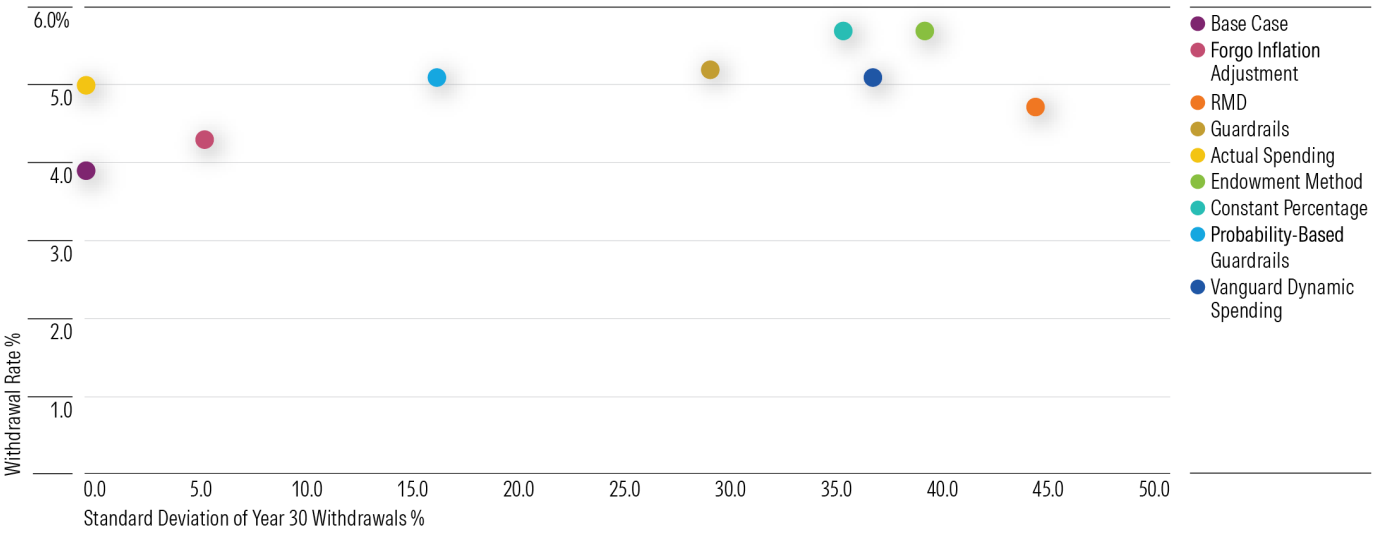
- Retirees seeking the highest level of lifetime income should consider a combination of delayed Social Security filing and a flexible withdrawal strategy such as the guardrails approach. While cash flows from the guardrails strategy look volatile on a stand-alone basis, the addition of Social Security income adds valuable stability.

- Including Treasury Inflation-Protected Securities as part of a retirement-spending plan also looks attractive today. As of Sept. 30, 2025, a 30-year TIPS ladder supported an inflation-adjusted withdrawal rate of 4.5%, compared with 3.9% for the highest base-case portfolio. However, the TIPS ladder is self-liquidating, meaning that a retiree who spends through it would exhaust funds available for heirs unless he or she maintains other assets in addition to the TIPS.

- In addition to considering delayed Social Security income, an allocation to a simple immediate or deferred annuity can also help enlarge in-retirement cash flows. But as with spending higher amounts from a portfolio to enable delayed Social Security filing, the allocation to the annuity early in retirement reduces the money in the portfolio that can compound over the retiree's drawdown period.

Exhibit 1 depicts some of the study's key findings, showing the interplay between starting safe withdrawal rates and the volatility of cash flows in year 30, which we use as a proxy to illustrate how much variation in cash flows the retiree might need to live with for each method.

Exhibit 1 Key Findings (Based on 40% Equity/60% Fixed-Income Portfolio Over a 30-Year Period, 90% Success Rate)



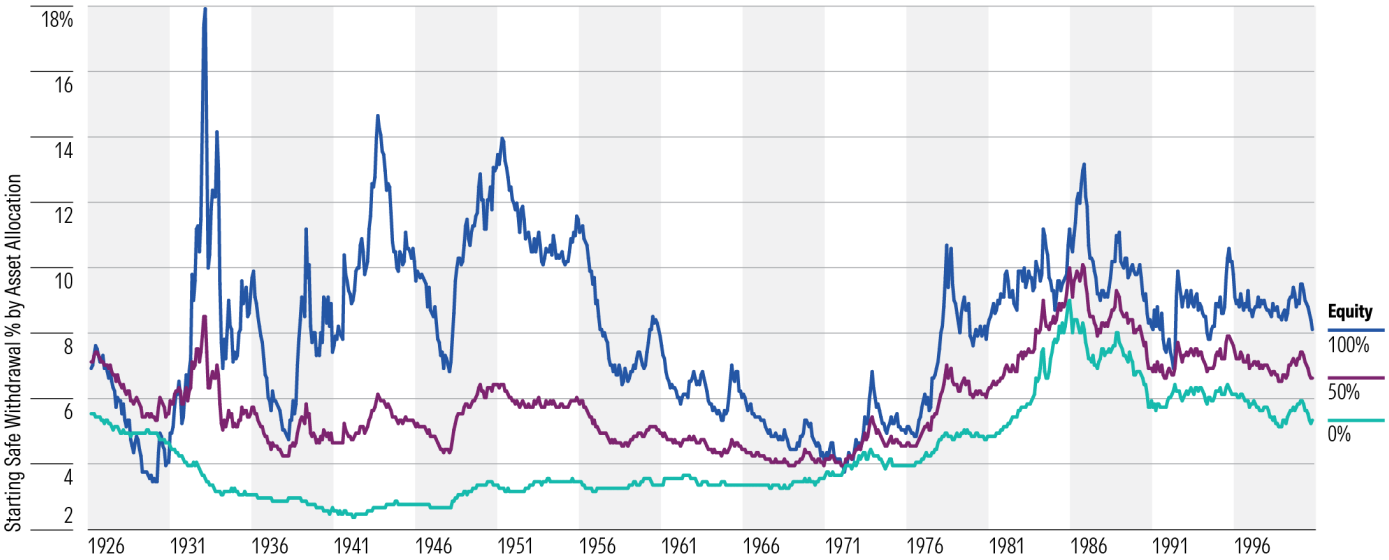
Source: Morningstar. Data as of Sept. 30, 2025.

Section I: What's a Safe Withdrawal Rate for the Future?

History and Its Limits

History demonstrates that the "right" withdrawal rate depends on a few key variables: the market environment that prevails over a retiree's drawdown period, the length of the drawdown period, the cadence of withdrawals (static, higher withdrawals earlier, and so on), and the portfolio's asset allocation. As shown in Exhibit 2, the starting safe withdrawal rate for 50% stock/50% fixed-income portfolios during rolling 30-year periods with starting periods from 1927 through mid-1995 ranged from 3.9% for the worst 30-year period to 10.5% for the best. The worst 30-year withdrawal period—corresponding with the 3.9% safe withdrawal percentage—applied to retirees who began drawing on 50% stock/50% bond portfolios in late 1968. Meanwhile, the mid-1982 retiree had the highest starting safe withdrawal rate—10.5%—for a 50% stock/50% bond portfolio over the ensuing 30 years.

Exhibit 2 Highest and Lowest Starting Safe Withdrawal % by Asset Allocation (Rolling Monthly 30-Year Periods, Starting From 1926-93, 90% Success Rate)



Safe Withdrawal Rate	Best	Worst	Average
100% Equity	18.0	3.4	8.2
50% Equity	10.5	3.9	6.3
0% Equity	9.0	2.3	4.3

Source: Morningstar. Data as of Sept. 30, 2025.

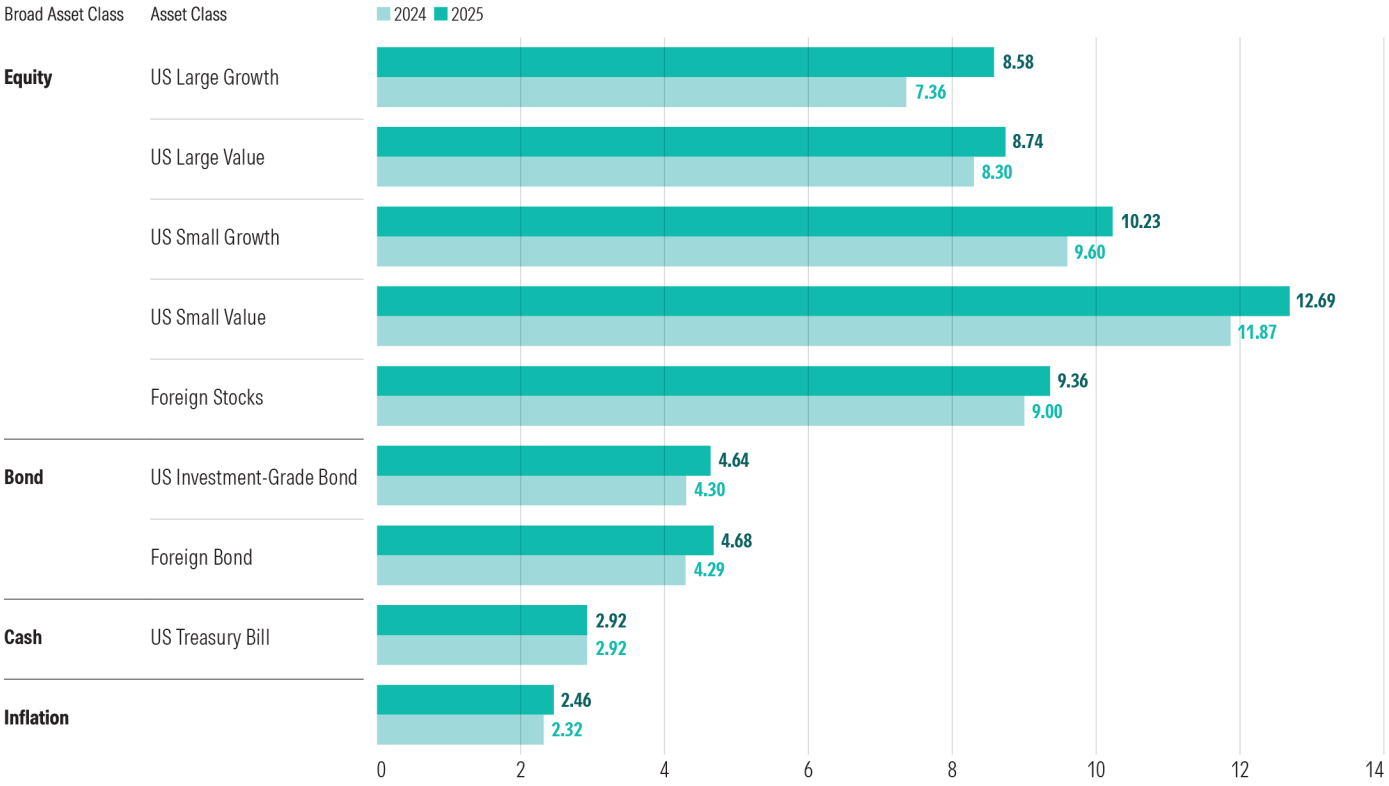
In general, portfolios with higher equity asset allocations delivered superior returns and, in turn, supported higher withdrawal rates than those with more conservative positioning. The results vary widely, though. Portfolios with 100% equity weightings delivered the highest starting safe withdrawal percentage over any 30-year period in history, at 18% for the 30-year period beginning in July 1932. But one of the lowest safe withdrawal percentages for any of the asset allocations over a 30-year period also corresponded with the 100% equity portfolio: The unlucky retiree with an all-equity portfolio in mid- to late 1929 would have to settle for a 3.4% starting safe withdrawal percentage for the portfolio to last over a 30-year horizon. In general, balanced asset allocations tended to strike the right balance: Starting safe withdrawal rates from balanced portfolios didn't drop as low as the all-equity portfolios in bad environments, but their starting safe withdrawal percentages were often nearly as high as the all-stock portfolios'.

Given that equity-heavy portfolios have generally supported the highest withdrawal rates, it's logical to ask why the highest safe withdrawal rate in our current research corresponds with a balanced or even more conservative asset allocation. The short answer is that our research looks forward rather than back, incorporating our team's outlook for stock and bond returns in the years ahead. The combination of high equity valuations, corresponding sequence risk, and today's higher fixed-income yields suggests that retirees can generally improve the odds of success by holding a healthy allocation to fixed-income assets alongside their equities.

Looking Forward

Our research takes a forward-looking view because, at the outset of retirement, it's impossible to know what starting safe withdrawal percentage will be safe over the ensuing 30-year period. Factoring in current conditions can help retirees determine if their starting percentages ought to be higher or lower, as well as the right type of asset allocation given a retiree's spending plans. To provide withdrawal-rate guidance that considers current yields, valuations, and inflation, we turned to our colleagues in Morningstar's Multi-Asset Research (MAR) team for forecasts on those variables. Like many investment research groups, the MAR team develops forward-looking asset-class return assumptions, as well as assumptions about the expected volatility of each asset class and future inflation levels. We then extrapolate 30-year forecasts based on the MAR team's assumptions.

Exhibit 3 Projected 30-Year Asset-Class Return % and Inflation % Assumptions, 2024 Versus 2025



Source: Morningstar. Data as of Sept. 30, 2025.

The capital markets assumptions (which are expressed as arithmetic means) employed in this paper have changed modestly since 2024, and all in a positive direction. That stems from a methodology change the MAR team recently implemented. Whereas the capital markets assumptions we used in the past were derived from top-down measures like expectations of future earnings growth and valuation contraction or expansion for various market segments, this year's capital markets assumptions blend those top-down inputs with Morningstar equity analysts' bottom-up assessments of the companies they cover. While the expected inflation rate increased slightly from 2.29% in 2024 to 2.46% in 2025, expected returns are a bit higher across nearly every asset class, thanks to the methodology change. Those increases result in a slightly higher starting safe withdrawal rate for our base case in 2025: 3.9% versus 3.7% last year. Under the former, top-down-only methodology for capital markets assumptions, the starting safe withdrawal rate for a 50% stock/50% bond portfolio would be 3.6%.

Now for the details. All portfolios are formed with varying combinations of stocks and bonds, in 10% increments. That is, the most aggressive portfolio comprises 100% equities, the next most aggressive holds 90% in equities, and so forth, until the final portfolio, which possesses no equities. We assume a diversified basket of investments within each asset class, holding those suballocations constant regardless of the broad asset-class exposures. For example, the stock portion of each portfolio comprises 30% in US large-growth stocks, 30% in US large-value stocks, 20% in foreign stocks, 10% in

US small-growth stocks, and 10% in US small-value stocks. The fixed-income portion comprises 80% in US bonds and 20% in non-US bonds. Each portfolio holds a 10% cash position, except for the 100% stock portfolio.

Exhibit 4 provides the 30-year annual return and standard deviation estimates for each of the asset classes, along with their weightings within each subportfolio.

Exhibit 4 Projected 30-Year Asset-Class Return % and Standard Deviation %

Broad Asset Class	Asset Class	Portfolio Weighting %	Expected 30-Year Return % (Arithmetic)	Expected 30-Year Standard Deviation % (Annual)
Equity	US Large Growth	30	8.58	18.93
	US Large Value	30	8.74	15.84
	US Small Growth	10	10.23	24.36
	US Small Value	10	12.69	21.13
	Foreign Stocks	20	9.36	18.33
Bond	US Investment-Grade Bond	80	4.64	5.61
	Foreign Bond	20	4.68	8.99
Cash	US Treasury Bill	100	2.92	1.71
Inflation			2.46	

Source: Morningstar. Data as of Sept. 30, 2025.

Exhibit 5 depicts the forecast 30-year annual return and standard deviations for each of the portfolio mixes, ranging from 100% equity to 0% equity.

Exhibit 5 Projected 30-Year Portfolio Return % and Standard Deviation %

Portfolio Weighting %				
Equity	Bond	Cash	Expected 30-Year Return % *(Arithmetic)*	Expected 30-Year Standard Deviation % *(Annual)*
100	0	0	9.36	16.90
90	0	10	8.72	15.21
80	10	10	8.25	13.67
70	20	10	7.77	12.16
60	30	10	7.30	10.70
50	40	10	6.83	9.29
40	50	10	6.36	7.98
30	60	10	5.89	6.82
20	70	10	5.42	5.90
10	80	10	4.95	5.34
0	90	10	4.48	5.26

Source: Morningstar. Data as of Sept. 30, 2025.

The Methodology

After estimating the expected returns and volatility of various asset mixes, we used Monte Carlo simulations to vary the sequence of potential investment returns. We selected a 30-year time horizon for the base case but also tested withdrawal rates over shorter and longer time horizons. With each asset-class combination, Morningstar's model created 1,000 hypothetical return patterns, calculated from the portfolio's expected annual returns and standard deviation. These return patterns were then used to seek the highest possible withdrawal rate, with a 90% success rate defined as when at least 900 of the 1,000 trials ended with a positive balance at the end of the 30-year period.

In addition, we assumed the following:

- A total return approach to spending: Rather than invest solely for income, thereby not spending the portfolio's capital, the retiree funds withdrawals through a combination of income and capital consumption. That is, if the portfolio's income equals or exceeds the planned withdrawal amount, then the retiree uses only the income, placing any excess back into the portfolio. If, however, income alone cannot fund the withdrawal amount, then the shortfall is covered by selling the requisite amount of portfolio principal.

- A fixed real withdrawal strategy for the base case (this assumption was altered for the variable spending scenarios discussed in Section III): The annual portfolio withdrawals are adjusted for inflation to maintain a constant real income. That is, assuming a $1 million initial investment, a 3.9% initial withdrawal rate, and a 2.46% inflation rate, the retiree would withdraw $39,000 from the portfolio in year 1, $39,959 in year 2, $40,942 in year 3, and so forth.

- A 90% success rate: If, at the conclusion of the scheduled period (30 years for the base case), at least 900 of the 1,000 trials are able to fund every year's scheduled withdrawal without creating a negative portfolio balance, then the assessed withdrawal rate is deemed to have passed the test. The final "safe withdrawal" rate for each allocation is, therefore, the highest withdrawal rate that achieves a 90% success rate.

- Note: As is standard with retirement-income research, this approach considers only whether a portfolio can fund its scheduled withdrawals, not its final value. If at least a penny remains in the portfolio at the end of year 30, then the trial is considered successful. As we shall see, though, this is rarely the case. By definition, the trials near the 90th percentile create low final values. However, the ending balance for the median trial is often quite high.

- Taxes and fees will reduce actual withdrawals: Our research factors in inflation, but it doesn't incorporate the impact of expenses or taxes, both of which can further curtail starting safe withdrawal rates. In contrast with inflation, which is generally experienced by all consumers with more modest variations, taxes and portfolio expenses can vary significantly by retiree. But they're an important component of take-home returns.

The (admittedly rare) retiree with all of his or her portfolio in a Roth IRA invested in ultra-inexpensive exchange-traded funds, for example, will face a limited expense and tax drag. Not only are Roth withdrawals tax-free, provided the investor fulfilled the holding-period requirements, but the all-index-fund investor's investment costs are also quite low. In other words, that situation is close to our "base case," which assumes no levies for investment expenses or taxes.

- At the other extreme, the retiree with 100% of his or her portfolio in a traditional IRA parked in expensive actively managed funds will see his or her withdrawals dwindle more significantly, and the tax costs are amplified if he or she is in a high tax bracket. That's because traditional IRAs are taxed as ordinary income. Fund expenses further reduce take-home returns and, in turn, starting safe withdrawal rates.

For example, let's assume that a retiree's average expenses are 1% on a 60% stock/40% bond/cash portfolio, and he or she is pulling all withdrawals from a tax-deferred account. In that instance, the base-case starting safe withdrawal rate goes down to 3.4% to account for lower portfolio return assumptions. That withdrawal is further docked for taxes. On a $2 million portfolio with 1% in annual expenses, the starting safe withdrawal amount would be $68,000 on a pretax basis and $61,200, factoring in a 10% withholding rate. (The investor's actual tax bill would depend on his/her tax rate.) Note that this example understates the drag of higher expenses because it only factors in the higher-expense drag on returns in the preretirement years, not in the accumulation period.

The preceding example underscores the importance of limiting both investment costs and tax costs wherever possible. Morningstar has long discussed the relationship between low expenses and higher returns, and that has real-world consequences for retiree spending. Limiting in-retirement taxes is more complex, in that many of today's retirees have spent their working careers accumulating assets inside of traditional tax-deferred accounts like 401(k)s that will be taxable in retirement. (People with low taxable incomes may be able to skirt taxes on tax-deferred account distributions, but most will owe at least some tax on their withdrawals.) All else equal, the retiree with traditional tax-deferred accounts will need to withdraw more from his or her portfolio to match the same withdrawal from a portfolio that has more favorable tax treatment, such as Roth assets or taxable assets eligible for long-term capital gains treatment. A qualified financial advisor or tax professional should be able to help strategize so that a retiree pays less in taxes over his or her retirement. Strategies like Roth conversions in the postwork, pre-required minimum distribution period, when taxes are typically lower for most retirees, and charitable giving can come into play to reduce a retiree's lifetime tax bill.

The Findings

The starting safe withdrawal rate for a balanced portfolio over a 30-year time horizon was slightly higher than our finding in the 2024 research: 3.9% for portfolios with between 30% and 50% in equities. (In our 2024 research, the highest safe withdrawal rate for our base case with a 30-year time horizon was 3.7%, corresponding with equity weightings between 20% and 50%.)

Exhibit 6 shows the starting safe withdrawal rates over varying time horizons and with varying amounts of equity exposure in each portfolio.

Exhibit 6 Starting Safe Withdrawal Rate %, by Asset Allocation and Time Horizon, 90% Success Rate

Equity Weighting %	10 Years	15 Years	20 Years	25 Years	30 Years	35 Years	40 Years
100	8.4	5.8	4.6	3.8	3.4	3.2	3.0
90	8.6	6.0	4.7	3.9	3.5	3.2	3.0
80	8.8	6.1	4.9	4.1	3.6	3.3	3.1
70	9.1	6.3	5.0	4.2	3.7	3.4	3.2
60	9.3	6.5	5.2	4.3	3.8	3.4	3.2
50	9.5	6.6	5.3	4.4	3.9	3.5	3.3
40	9.7	6.7	5.3	4.4	3.9	3.5	3.2
30	9.8	6.8	5.3	4.4	3.9	3.5	3.2
20	9.8	6.8	5.3	4.4	3.8	3.4	3.1
10	9.7	6.7	5.2	4.3	3.7	3.3	3.0
0	9.6	6.5	5.0	4.1	3.5	3.0	2.7

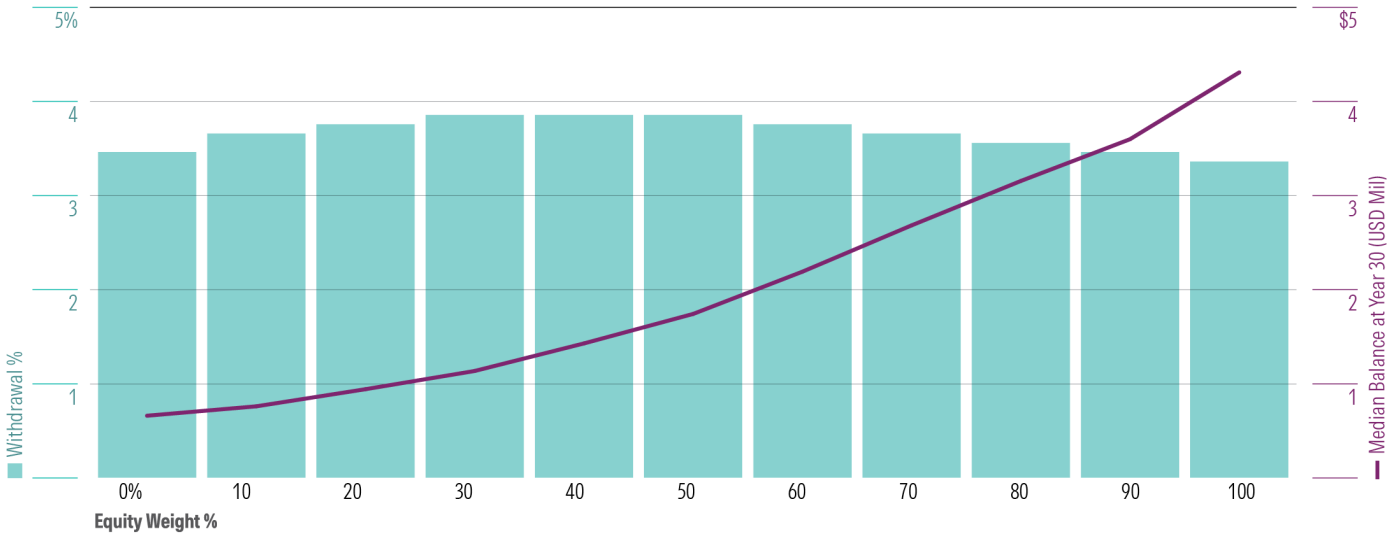
Source: Morningstar. Data as of Sept. 30, 2025.

Why the Asset Allocation Is Conservative

The highest available starting safe withdrawal rate in Morningstar's model, 3.9%, came from portfolios with modest equity weightings between 30% and 50%. This result underscores the point that the model's "base case" is conservative in a few key ways. Our capital markets assumptions assume some mean reversion in equity returns over the next decade, especially in categories like large-cap growth. Our base-case spending system also takes an inflexible approach to spending, and it targets a high success rate of 90%. Those factors tilt the model toward conservative investments that have a smaller range of returns rather than equities, which have higher return potential but also higher volatility.

However, while conservative portfolios modestly improve the starting safe withdrawal rates, they do so at the cost of potential future wealth. Portfolios with equity weights between 30% and 50% supported the highest starting safe withdrawal percentage, but they also recorded lower median balances at year 30 than did portfolios with more equity exposure. Exhibit 7 depicts the interplay between asset allocation, starting safe withdrawal rates, and the possibility for "leftovers" for heirs and/or charitable bequests at year 30.

Exhibit 7 30-Year Starting Safe Withdrawal Rate % and Median Ending Balance at Year 30, by Asset Allocation, 90% Success Rate

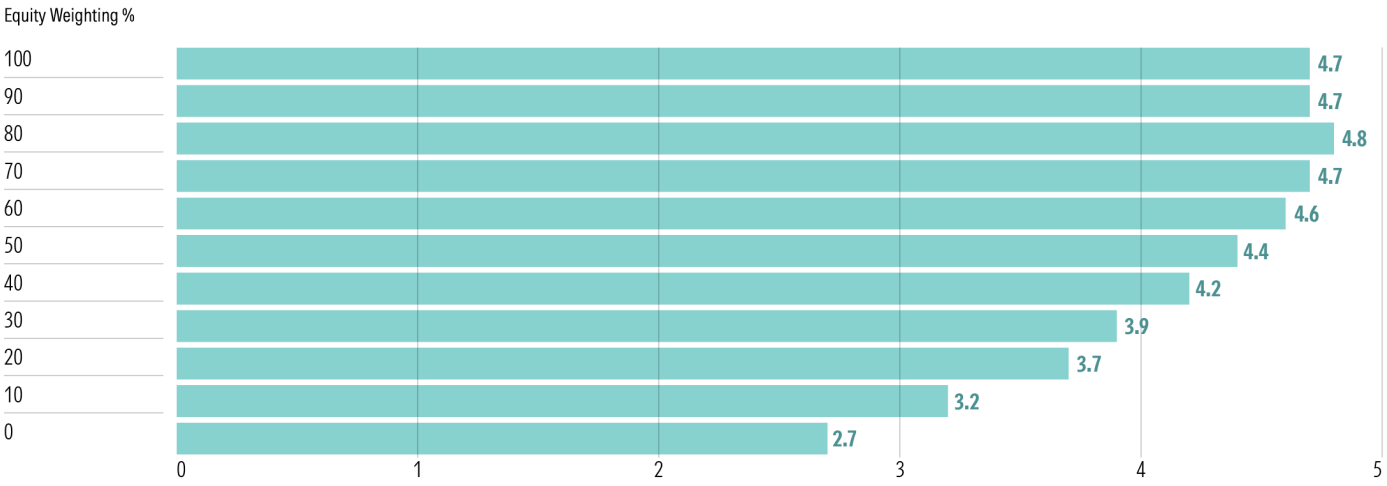


Source: Morningstar. Data as of Sept. 30, 2025.

Adjusting Return Assumptions

As noted above, we use forward-looking outlooks for stock and bond returns and inflation to generate our base-case starting safe withdrawal percentage; those forecasts assume some reversion to the mean in equity prices, especially over the next decade. Employing return assumptions in line with historical norms, rather than assuming some reversion to the mean for US growth stocks over the next decade as the MAR group's return forecasts do, enlarges starting safe withdrawal percentages, especially for equity-heavy portfolios. For example, using the long-term historical return for investment assets, rather than the MAR team's forward-looking projections, increases the starting safe withdrawal rate to 4.4% for a 50% stock/50% bond portfolio and 4.7% for a portfolio with 90% in equities. Exhibit 8 depicts 30-year starting safe withdrawal percentages based on historical returns across varying asset mixes. Using historical data, the highest withdrawal rates that would have been supported over 30-year horizons generally correspond with the highest equity allocations.

Exhibit 8 Historical Safe Withdrawal Rate %, Using Asset-Class Returns Based on 1926-2024 Data (30-Year Time Horizon, 90% Success Rate)



Source: Morningstar. Data as of Sept. 30, 2025.

Adjusting Spending Patterns

In addition to employing conservative return assumptions, our research also adopts an inflexible strategy for portfolio withdrawals. Specifically, we assume that retirees seek a "paycheck equivalent" in retirement and therefore aim to withdraw the same amount, adjusted upward to account for inflation, for 30 years. That is the convention used in William Bengen's original research[1] on safe withdrawal rates.

In reality, the retiree may not spend that way. Spending may level off or decline in the middle to later years of retirement, for example—a pattern depicted in retirement researcher David Blanchett's survey

1 Bengen, W.P. 2007. "Determining Withdrawal Rates Using Historical Data." *Journal of Financial Planning,* Vol. 7, No. 4, P. 171.

of actual retiree spending patterns[2], as well as other research from the Employee Benefit Research Institute. We incorporated the latter findings in a series of tests labeled "actual spending" in Section III. Using spending patterns that match empirical data allows for a starting safe withdrawal rate of 5%, substantially higher than our base case, which assumes fixed real spending across a 30-year horizon.

Adjusting Success Rates

Finally, our base-case research is conservative in that it sets 90% as the target success rate for our base case. That means, for a given withdrawal percentage to be deemed a success, it must have funded each year's scheduled withdrawal in 900 of 1,000 trials. At first blush, retirees might be inclined to gravitate to a 100% success rate, but doing so reduces starting safe withdrawal percentages significantly. In the same way, reducing the target success rate by even 5 or 10 percentage points—to 85% or 80%—has meaningful implications for starting safe withdrawals. Exhibit 9 depicts starting safe withdrawal percentages for varying asset allocations with success-rate targets ranging from 50% to 100%.

Exhibit 9 30-Year Starting Safe Withdrawal Rate % by Asset Allocation With Varying Success Rates

Equity Weighting %	50%	60%	70%	80%	85%	90%	100%
100	6.1	5.6	5.0	4.3	3.9	3.4	0.9
90	5.9	5.5	4.9	4.3	4.0	3.5	1.1
80	5.8	5.4	4.9	4.4	4.0	3.6	1.4
70	5.7	5.3	4.9	4.4	4.1	3.7	1.6
60	5.5	5.2	4.8	4.4	4.1	3.8	1.9
50	5.3	5.0	4.7	4.4	4.2	3.9	2.1
40	5.1	4.9	4.6	4.4	4.1	3.9	2.3
30	4.9	4.7	4.5	4.3	4.1	3.9	2.5
20	4.7	4.5	4.4	4.1	4.0	3.8	2.6
10	4.5	4.3	4.2	4.0	3.8	3.7	2.6
0	4.2	4.1	3.9	3.7	3.6	3.5	2.5

Source: Morningstar. Data as of Sept. 30, 2025.

Targeting a success rate lower than 90% or 100% might seem too risky. However, retirees and their advisors have a valuable tool in their toolkits: the ability to ratchet down withdrawals if they encounter a poor market environment. Research from Derek Tharp[3] explores the relationship between starting safe withdrawal percentages, success rates, and flexibility in spending. It concludes that retirees could reasonably start with a success rate as low as 50%—and a correspondingly higher starting safe withdrawal percentage—as long as they are prepared to make downward adjustments in weak market environments. We explore the pros and cons of a probability-based approach that revisits withdrawals annually based on the probability of success, as well as other systems that tether portfolio withdrawals to portfolio performance—in Section III of this paper.

2 Blanchett, D. 2014. "Exploring the Retirement Consumption Puzzle." *Journal of Financial Planning,* Vol. 27, No. 5, P. 34.

3 Tharp, D. 2021. "Why 50% Probability of Success Is Actually a Viable Monte Carlo Retirement Projection." Kitces.com. Jan. 6, 2021. https://www.kitces.com/blog/monte-carlo-retirement-projection-probability-success-adjustment-minimum-odds/

Section II: The Impact of Market and Spending Shocks

The previous sections of this paper focus on strategies retirees and their financial advisors can use to maximize their odds of success during retirement. Different retirees often have diverse definitions of success, be it maximizing lifetime spending during retirement, maintaining a stable "paycheck equivalent" in inflation-adjusted terms, minimizing the chance of running out of money, or leaving behind a large portfolio balance for charity or loved ones.

This section takes the opposite view by examining spending shocks that can cause things to go wrong. Our goal is to provide a realistic view of some of the potential dangers that could lurk under the surface of even the most well-thought-out retirement plan. Being aware of these dangers can help people implement specific strategies to avoid them. And having a mental picture of the worst-case scenario can help retirees clarify their approach to mitigating these risks.

Market Shock: Sequence-of-Returns Risk

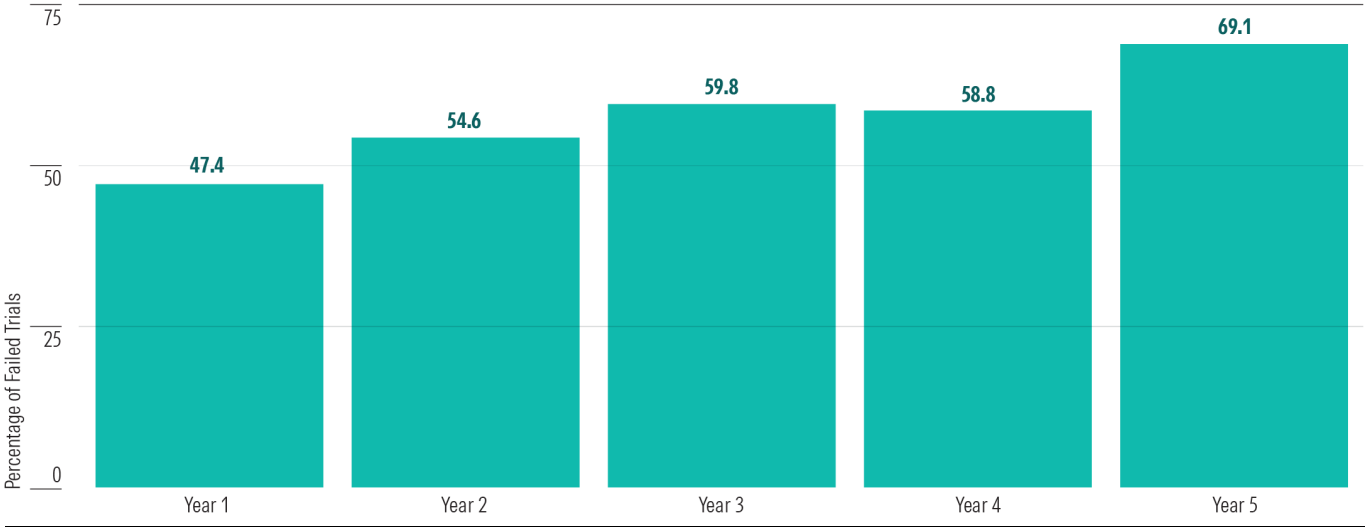
One of the bigger pitfalls new retirees face is sequence-of-returns risk, which is the risk that losses early in one's retirement years will jeopardize their savings' ability to sustain their spending through the end of their years.

As part of our research for the previous sections, we examined scenarios that are most exposed to sequence-of-returns risk: when a retiree invests entirely in stocks. Because stocks are more volatile than bonds, the risks of early-retirement losses are more acute when a retiree invests only in equities.

As discussed in Section I, we found that an all-equity portfolio could support a 3.4% starting spending rate for retirees making fixed real withdrawals each year, assuming a 90% probability of having funds remaining at the end of an assumed 30-year retirement period.

For this section, we focused on the 10% of simulated random trials in which the retiree exhausted their savings before the end of retirement to see how many of those "failures" involved early-in-retirement investment losses. We found that nearly 70% of these "failures" involved trials in which the retiree's investments had lost value by the end of year 5 of retirement.

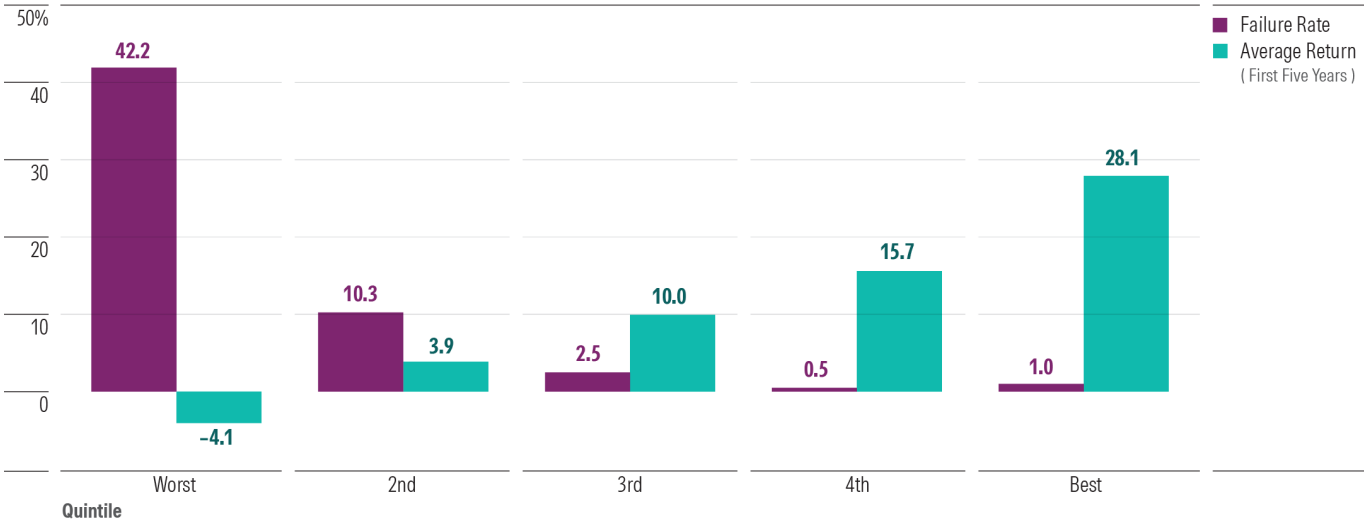
Exhibit 10 Percentage of Failed Trials That Experienced Losses Early in the Retirement Period



Source: Morningstar. Data as of Sept. 30, 2025.

We also looked at it the opposite way—by ranking trials based on their simulated returns in the first five years of retirement and seeing how the failure rate varied. We assigned the 20% of trials that had the lowest returns to the "Bottom" quintile and tallied up the number of trials that failed and made the same calculation for the other groupings. There was a far higher risk of exhausting retirement savings when returns were poor in the first five years.

Exhibit 11 Failure Rate by Return Quintile



Source: Morningstar. Data as of Sept. 30, 2025.

For the portfolios that made it through the first five years of retirement with investment gains, there was only about a 4% chance a retiree would subsequently deplete the portfolio before reaching the end of retirement, assuming the retiree stuck with the system of fixed real withdrawals. Even after one year of retirement, a gain cut the risk of failure in half.

Portfolio diversification plays a critical role in helping retirees avoid losses in the initial years of retirement. That's part of the reason portfolio allocations that include a healthy allocation to bonds (in the range of 50% to 70% of assets) ended up supporting the highest starting safe withdrawal rates in our study. Bond exposure usually acts as a shock absorber, tamping down volatility and the risk of losses in earlier years, which in turn helps support a higher spending rate.

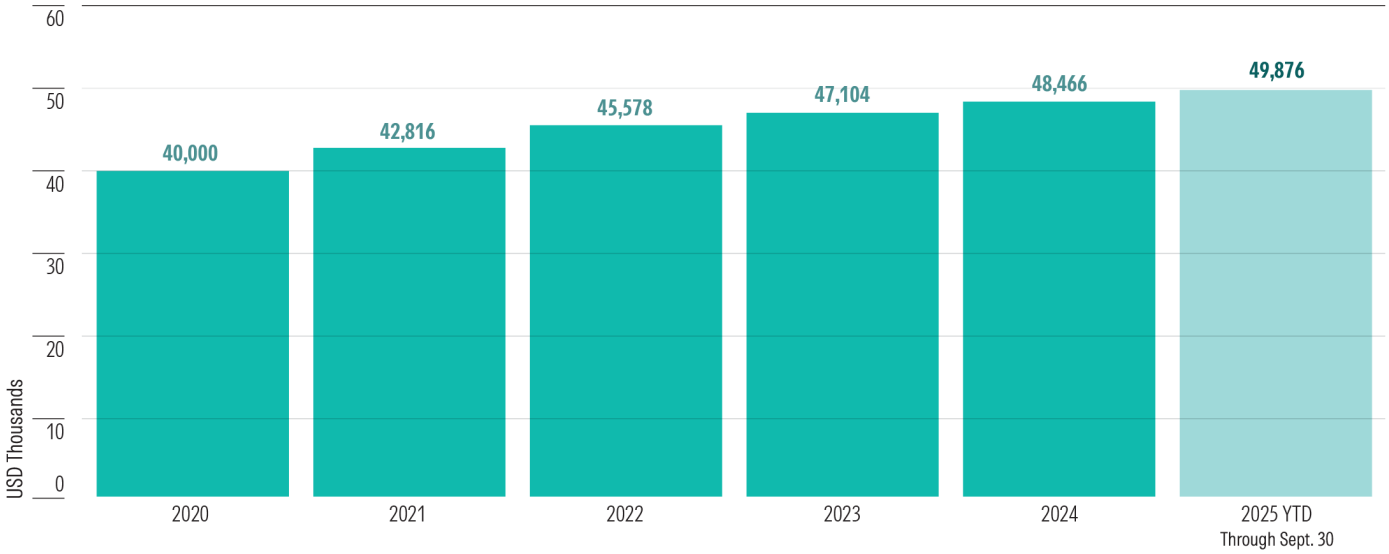
Spending Shock: High Inflation Early in Retirement

As of this writing in the fourth quarter of 2025, inflation appears to be moderating. The most recent inflation report showed a year-over-year increase of 3.0%, which is still above the Federal Reserve's 2.0% target but well below the 9.1% peak in June 2022.

However, even if inflation continues to ease, it still creates significant challenges for recent retirees. This is because past inflation typically creates a permanent increase in the baseline cost of required spending. The rate of inflation may slow (disinflation), but price declines (deflation) are rare. In fact, the US has not experienced a sustained period of price deflation since 1954, when high inflation amid the post-Korean War recession led the Federal Reserve to raise interest rates, resulting in weaker demand for products and services.

Thanks to elevated inflation rates in recent years, the cost of essential goods such as food, clothing, shelter, and gasoline is now significantly higher than it was a few years ago. An annual "consumption basket" priced at $40,000 as of the end of 2020 would cost about $49,900 by Sept. 30, 2025.

Exhibit 12 Growth in Cost of $40,000 Consumption Basket Since 2020



Source: Morningstar. Data as of Sept. 30, 2025.

This upward price trend does not present a problem for retirees who rely on Social Security as their sole source of retirement funding; their paychecks include an annual cost-of-living adjustment to keep pace with inflation. But for individuals who use portfolio withdrawals to cover additional expenses, it can create a significant challenge.

A spike in inflation early in retirement can be particularly dangerous, given that the cost impact ripples through over a longer period. Inflation that arrives early in the retirement period elevates futures spending for all of the years that follow (assuming retirees want their spending to keep pace with inflation), whereas inflation further along in retirement has a more muted impact.

Indeed, retirees who started retirement at the beginning of a period with unusually high inflation would have a more difficult time sustaining spending for a full 30-year period. To test this, we looked at actual results over previous 30-year periods, assuming a 60/40 portfolio and a starting safe withdrawal rate of 5% (with subsequent amounts adjusted for inflation). The three cases when the portfolio didn't sustain spending for the full 30-year period all coincided with periods of high inflation toward the beginning of retirement.

Exhibit 13 Historical Periods Where Early Inflation Led to Failure

Starting Retirement Year	Cumulative Inflation % (First Five Years)	Years Until Portfolio Depletion
1966	25.2	19
1969	30.1	19
1973	46.1	20

Source: Morningstar. Data as of Sept. 30, 2025.

For example, a person who retired at the beginning of 1966 would have been hit with a cumulative inflation rate of more than 25% in the first five years of retirement and would have depleted the portfolio after a period of 19 years. Retirement periods starting in 1969 and 1973 faced similar challenges, although the portfolio with a 1973 start date would have lasted a year longer, thanks to a string of strong market returns in the 1980s.

To be fair, high inflation in itself isn't always a problem. Retirement periods starting in 1977 and 1978 faced even higher cumulative inflation rates during the first five years (61.5% and 57.2%, respectively) but still ended up with positive portfolio balances by the end of the 30-year period, assuming a 60/40 portfolio and a 5% spending rate. The bull market of the 1980s and 1990s was a strong enough tailwind to more than offset the negative impact of inflation. Similarly, retirement periods starting in 1941 and 1946 also started out with above-average inflation but still managed to last for a full 30 years with a positive portfolio balance at the end.

Because retirees can't predict how well their portfolio balances will recover over time, however, the most prudent approach would be to cut back on spending following a spate of high inflation, especially if it occurs early in retirement. Incorporating one of the flexible spending approaches we discussed in Section III can also improve the odds of success.

Spending Shock: Early Retirement

We also assessed the implications of early retirement for safe withdrawals, as it's an increasingly common scenario. While Social Security's full retirement age is currently between 66 and 67, depending on one's age, the average retirement age is 62, according to a MassMutual survey of 2,000 retirees. That's corroborated by Social Security filing data, which shows that roughly 25% of retirees take Social Security when it's first available at age 62, and another 13% of retirees file at 63 or 64. Nearly half of the retirees surveyed by MassMutual said they had retired earlier than planned; commonly cited reasons included layoffs, being able to retire sooner than expected, or illness or injury.

Early retirement has significant implications for retirement spending, with longer drawdown periods necessitating lower spending to maintain a high likelihood of not running out later on. In our base-case spending simulation, for example, expanding the drawdown period from 30 to 35 years reduces the starting safe withdrawal rate from 3.9% to 3.5%.

Keeping withdrawals low in early retirement may be challenging on a few levels, however. First, individuals aren't eligible for Medicare coverage until age 65, so bridging healthcare coverage in the intervening years has the potential to increase spending. Insurance coverage for 62- to 65-year-olds from the ACA marketplace averaged between $800 and $1,200 a month in 2025, according to data from Boldin. Meanwhile, Cobra coverage (extending workplace-provided coverage) for people aged 62 to 65 averaged $700 to $1,500 a month. For the 62-year-old taking a safe withdrawal rate of 3.5% ($35,000) from her $1 million portfolio, healthcare costs would consume roughly a third of those withdrawals.

Further complicating matters for young retirees is that many individuals wish to delay Social Security to enlarge their eventual benefits. At the same time, delaying Social Security can necessitate higher withdrawals in the early part of retirement, thereby imperiling the portfolio's ability to last over the whole longer time horizon.

Spending Shock: Long-Term Care Spending

Just as early retirement can cause a spending shock at the front end of retirement, so can long-term care costs prompt a spending shock later in life. A 2025 report authored by Spencer Look and Jack VanDerhei of the Morningstar Center for Retirement & Policy Studies[4] found that 43% of baby boomers will incur long-term care costs, with the average cost of that care $242,373. The likelihood of needing care correlates with longevity: While just 24% of men and 27% of women who die at age 75 will require long-term care, 52% of men and 60% of women who die at age 95 will require long-term care. Incurring sizable long-term care costs can have catastrophic effects for a financial plan: A Morningstar study found that when long-term care costs are included in the analysis of the viability of retirement assets, 41% of older-adult households that incur long-term care costs are likely to run out of funds.

Older adults can take different approaches to address this risk. They might set aside a separate long-term care "bucket," taking care to segregate it from their spending portfolios, using the average cost and duration of care to determine the right size for that bucket. Others may plan to use home equity, either by selling the home or employing a reverse mortgage, to cover long-term care expenses. Alternatively, those with very tight finances might create a spending plan to cover their costs during their healthy years, then rely on government resources if they require long-term care after that. The challenge with that plan is that Medicaid imposes strict limits on the income and assets that an older adult can retain while also qualifying for government-funded long-term care; this can create a particular challenge for married couples with a "well" spouse. Additionally, those who rely on government-provided care may have little choice in terms of where they receive care; home-based care may not be an option.

The final option for handling the cost of long-term care is to build it into the spending plan, spending less throughout retirement to account for the possibility of a spike in spending later in life. To help model a long-term care shock, we assumed spending in years 29 and 30 to be twice what spending was in year 28. Factoring in that type of shock, the starting safe withdrawal percentage for the person retiring and claiming Social Security at age 67 is 3.5%, versus 3.9% for our base case without the long-term care shock.

4 Look, Spencer and VanDerhei, Jack. 2025. "WISH Granted: How a National Long-Term Care Services and Supports Insurance Program Could Boost Retirement Outcomes." Morningstar.com. August 2025. https://www.morningstar.com/business/insights/research/wish-act-national-ltss-insurance-program

Section III: How Dynamic Withdrawal Strategies Can Help

Section I demonstrates that retirees who require a fixed real withdrawal amount from year to year will need to keep their starting safe withdrawals at 3.9% or lower if they want to lock in a 90% probability of success over a 30-year time horizon.

As in previous years' research, we also explore the impact of more-flexible withdrawal strategies. An approach that involves changing withdrawal amounts from year to year—taking lower withdrawals in weak market environments and perhaps higher paydays in very strong ones—typically allows for higher withdrawal rates. Flexible strategies are effective because they help to prevent retirees from overspending in periods of market weakness while giving them a raise in stronger market environments.

Adjusting withdrawal rates based on portfolio performance can also help ensure that retirees consume their portfolios efficiently. For retirees who aim to maximize consumption (which may encompass charitable giving and lifetime gifts to loved ones) during their own lifetimes, flexible strategies provide opportunities for spending increases when market performance is strong. Moreover, it is worth noting that, for nearly all retirees, portfolio withdrawals will comprise just a portion of the household's cash flow needs: Income from Social Security, a pension, and/or an annuity will supply some or even most of the household's spending. As a result, changes in portfolio spending imposed by a flexible system will affect only a portion of the retiree's cash flows.

Variable strategies do entail trade-offs—specifically, the tension between a higher lifetime withdrawal rate afforded by periodic withdrawal adjustments and the volatility those adjustments create in the retiree's cash flows, which may also subject retirees to swings in their standards of living. Consequently, some retirees may find flexible schemes unacceptable.

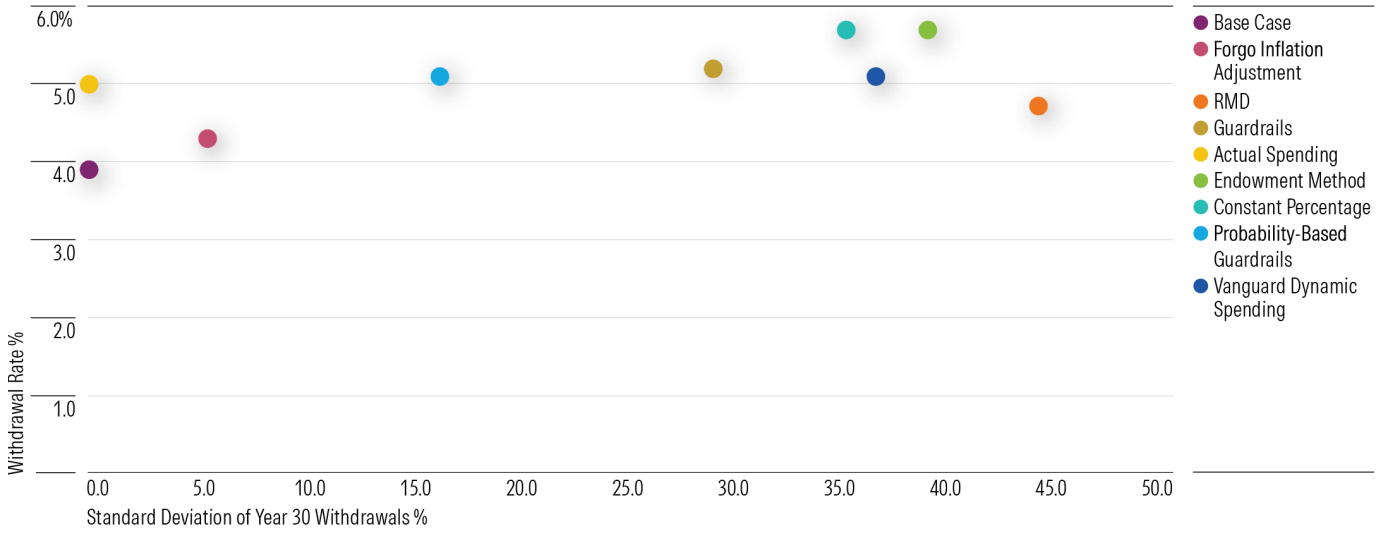
For example, taking a fixed percentage withdrawal (for example, 4% of the portfolio balance per year) entirely solves the problem of running out of money, but it does so at the expense of the retiree's standard of living being buffeted by changes in the value of the portfolio. Also, should the markets perform badly, the withdrawal amount could end up being trivially low.

At the opposite extreme, the fixed real withdrawal system that serves as this paper's base case nicely addresses a retiree's desire to have stable portfolio cash flows, much like a paycheck in retirement or Social Security income. But taking fixed real withdrawals can be inefficient because it does not link consumption to portfolio values. If the starting safe withdrawal is too low and the portfolio outperforms

expectations, the retiree will leave behind a large sum, which may not be the goal. If, on the other hand, the initial withdrawal is too high, the retiree will consume too much too early and risk running out prematurely or having to engage in dramatic belt-tightening later in life.

Exhibit 14 depicts how flexible withdrawal strategies compare with the base-case spending system (fixed real withdrawals) on two key metrics: the starting safe withdrawal rate associated with each of the systems and the volatility of cash flows. The data clearly show that there's no free lunch: The spending strategies that allow for higher initial spending rates generally entail more volatility in cash flows. We use the standard deviation of year 30 withdrawals as a proxy for measuring how much spending variation retirees might need to live with from year to year.

Exhibit 14 Key Findings (Based on 40% Equity/60% Fixed-Income Portfolio Over a 30-Year Period, 90% Success Rate)



Source: Morningstar. Data as of Sept. 30, 2025.

To help identify how flexible strategies balance lifetime income with considerations of the volatility of cash flows and ending balances at year 30, we tested some of the most widely used flexible strategies, benchmarking them against a system of fixed real withdrawals. The eight methods are described below.

Method 1: Forgoing Inflation Adjustments Following Annual Portfolio Loss

This method, advocated by (among others) T. Rowe Price, begins with the base case of fixed real withdrawals throughout a 30-year time horizon. However, to preserve assets following down markets, the retiree skips the inflation adjustment for the year following a year in which the portfolio has declined in value. This might seem like a modest step, but the cuts in real spending, while small, are cumulative. That is, the effects of such cuts ripple into the future, as these changes permanently reduce the retiree's spending pattern.

Method 2: Required Minimum Distributions

This is the same framework that underpins required minimum distributions from tax-deferred accounts like IRAs. In its simplest form, the RMD method is portfolio value divided by life expectancy. For life expectancy, we used the IRS' Single Life Expectancy Table and assumed a 30-year retirement time horizon, from ages 67 to 97. (We employed the updated RMD calculations using the IRS Single Life Expectancy Table that went into effect in 2022.)

This method is inherently "safe" and designed to ensure that a retiree will never deplete the portfolio because the withdrawal amount is always a percentage of the remaining balance. However, an RMD system incorporates two key variables for retirement-spending plans: remaining life expectancy and remaining portfolio value. While changes in life expectancy are gradual, the fact that the remaining portfolio value can change significantly from year to year adds substantial volatility to cash flows.

Method 3: Guardrails

Originally developed by financial planner Jonathan Guyton and computer scientist William Klinger, the guardrails method sets an initial withdrawal percentage, then adjusts subsequent withdrawals annually based on portfolio performance and the previous withdrawal percentage. The guardrails attempt to deliver sufficient—but not overly high—raises in upward-trending markets while adjusting downward after market losses. In upward-trending markets, in which the portfolio performs well and the new withdrawal percentage (adjusted for inflation) falls below 20% of its initial level, the withdrawal increases by the inflation adjustment plus another 10%.

To use a simple example, let's say the starting safe withdrawal percentage is 4% of $1 million, or $40,000. If the portfolio increases to $1.4 million at the beginning of year 2, the retiree could automatically take $40,000 plus an inflation adjustment—$41,840, based on a 2.46% inflation rate. Dividing that amount by the current balance—$1.4 million—tests for the percentage. The amount of $40,928 is just 3.0% of $1.4 million. As that 3% figure is about 25% less than the starting percentage of 4%, the retiree qualifies for an upward adjustment of 10%. The new withdrawal amount becomes $46,024—the scheduled amount of $41,840 plus the additional 10% of $4,184.

The guardrails apply during down markets, too. Specifically, the retiree cuts spending by 10% if the new withdrawal rate (adjusted for inflation) is 20% above its initial level. For example, let's say the retiree withdrawing 4% ($40,000) of the $1 million portfolio in year 1 immediately strikes an investment iceberg, losing 30% of the portfolio value in year 1. The portfolio drops to just $672,000 at the beginning of year 2. The year 2 withdrawal would be $40,928 on a pretest basis. But because $40,928 from $672,000 is a 6.1% withdrawal rate—far above the initial 4.0%—the retiree would need to reduce the scheduled $40,928 amount by 10.0%, to $36,835.

The Guyton-Klinger method scraps the cutback rules (following portfolio declines) during the final 15 years of retirement, in acknowledgment of the fact that weak returns are especially dangerous early in retirement but less so later. Guyton-Klinger also includes some portfolio-management rules related to the spending of various assets—for example, if the equity allocation exceeds its target allocation

because of strong performance, the excess equity exposure is sold and added to cash. However, for this exercise, we focused exclusively on changes to the withdrawal rate rather than including the portfolio management rules.

Method 4: Spending Declines in Line With Historical Retiree Spending Data

We also tested a strategy that incorporates the average decline in spending that occurs over the retirement lifecycle. Research from the Employee Benefit Research Institute[5] has found that inflation-adjusted household spending has historically fallen by 19% from age 65 to 75, 34% from age 65 to 85, and 52% from age 65 to 95. For the purpose of this paper, we streamlined these assumptions to reflect a steady decline in inflation-adjusted household spending of 2% per year throughout retirement. This number is in line with 2021 research from T. Rowe Price.[6]

Method 5 (New): Withdraw Constant Percentage of Portfolio Balance

This approach is the most straightforward of any of the methods we tested. It simply applies a static percentage withdrawal to each year's portfolio balance. While the percentage applied to the portfolio never changes, the amount withdrawn changes based on the shifts in the portfolio balance each year. To prevent drastic reductions in the withdrawal amount, we apply a floor so that the spending in a given year doesn't drop below 90% of the initial withdrawal amount.

Like the RMD method, this method is inherently conservative. A retiree applying this approach will never deplete the portfolio because the withdrawal amount is always a percentage of the remaining balance. This method is also self-correcting, in that a portfolio decline will result in lower withdrawals in dollar terms, while an increase in the portfolio value leads to a higher withdrawal amount. Importantly, this method does not incorporate any type of inflation adjustment. Any increase in the withdrawal amount to help cover a higher cost of living is completely contingent on the portfolio value increasing and would only be temporary if a positive year for portfolio performance after withdrawals was followed by a lean one.

Method 6 (New): Endowment Method Based on Average Portfolio Values Over Time

While the constant-percentage method described above can lead to highly variable spending from year to year, university endowments often manage their budgets by using an average portfolio value over time, which has the effect of smoothing spending variations.

In our tests, we used a 10-year average portfolio value, which is an approach recommended by noted investment writer and academic Charley Ellis. At the beginning of the retirement period, we used the previous year's ending value as the base for portfolio withdrawals. As each year passed, we added one additional year of portfolio values to calculate the average. After 10 years have passed, we use an average of the previous 10 years' worth of portfolio values as the base for calculating withdrawals. As

5 Banerjee, S. "Expenditure Patterns of Older Americans, 2001–2009," EBRI Issue Brief, No. 368, February 2012.

6 Banerjee, S. "Decoding Retiree Spending," T. Rowe Price Insights on Retirement, March 2021.

with the constant percentage method, we apply a floor so that the spending in a given year doesn't drop below 90% of the initial withdrawal amount.

Method 7 (New): Probability-Based Guardrails

As mentioned in the previous section, Tharp has conducted research focusing on the interplay between success rates and flexibility in spending. He concludes that retirees can significantly increase starting safe withdrawal rates as long as they commit to reassessing the spending plan's probability of success on a regular basis and making adjustments as needed.

We tested a simplified version of this approach (which retirement software provider Income Lab applies in a more detailed and systematic way) by recalculating the probability of success after each year of the test period. If the probability of success dropped to 75%, we reduced the proposed spending amount for the year by 10%. If a strong market environment boosted the probability of success to 95%, we increased the proposed spending amount for the year by 10%. Because this method sometimes led to extremely high spending amounts following a period of above-average portfolio returns, we capped the annual spending amounts at 120% of initial spending, adjusted for inflation.

This method is similar to Method 3 (guardrails) but uses probability-based guardrails instead of setting guardrails around each year's withdrawal percentage.

Method 8 (New): Vanguard Floor and Ceiling

This approach, which is discussed by Vanguard in a 2023 white paper[7], is another variation on the guardrails method. Like guardrails, it sets an initial withdrawal percentage and then adjusts subsequent inflation-adjusted withdrawals if they end up being too high or too low. It sets a 5.0% ceiling on the percentage increase in the withdrawal amount from the previous year and a 2.5% floor on the percentage decrease in the withdrawal amount from the previous year. The goal is to avoid drawing down assets too aggressively when the portfolio value is down and being overly conservative after a period of positive performance.

For example, let's say the starting safe withdrawal percentage is 4.0% of $1 million, or $40,000, and inflation during the first year of retirement is 2.5%. The inflation-adjusted withdrawal amount at the beginning of year 2 would be $41,000. A 5% increase from that figure would be $43,050, which becomes the ceiling on withdrawals. A 2.5% decrease would be $39,975, which becomes the floor. If the portfolio value increased to $1,060,000 by the end of the first year, a 4% withdrawal amount would be $42,400. Because that amount is between the floor and the ceiling, that amount passes the test and becomes the final withdrawal amount.

Assuming inflation is 2.5% again in year 2, the inflation-adjusted withdrawal amount for the next year is $42,400 times 1.025, or $43,460. The ceiling on year 3 withdrawals is $45,633 (43,460 times 1.05), and the

7 https://advisors.vanguard.com/content/dam/fas/pdfs/FAIARCAI.pdf

floor is $42,374 ($43,460 times 0.975). By the end of year 2, the portfolio value decreases to $985,000. The base spending percentage of 4% times that amount is $39,400. Because that amount is below the floor, the withdrawal amount becomes $42,374 instead.

Assessing Variable Withdrawal Strategies

For each strategy, we used stochastic (Monte Carlo) modeling to test how successful withdrawal systems—which we defined as a system that ensured a retiree did not run out of money over a 30-year time horizon—fared on a few key metrics. As with the base case, we defined success as not running out of money in 90% of the random trials. (We employed a 40% equity/60% fixed-income portfolio as the baseline case but also looked at other asset allocations.)

The metrics were as follows.

Starting Safe Withdrawal Rate: What starting safe withdrawal rate would have been supported for 30-year periods with a 90% probability of success (with "success" defined as a positive account balance at the end of the 30-year horizon)?

Year 30 Cash Flow Standard Deviation: To what extent did withdrawals vary on a year-to-year basis? To approximate this variance, we examine the standard deviation of the withdrawals that take place in year 30 across the simulated trials that were successful. The higher the standard deviation, the greater the potential variation in spending across the retirement horizon.

Lifetime Spending: What was the median lifetime withdrawal amount, factoring in any upward or downward adjustments that flexible strategies entail, that would have been supported for 30-year periods with a 90% probability of success? We assume a $1 million balance in year 1 of retirement and calculate the median lifetime withdrawal amount by totaling the annual withdrawals (discounted by the 2.46% inflation rate) for the 1,000 simulated trials.

Median Balance at Year 30: What is the median portfolio balance that remains at the end of the 30-year period, assuming a $1 million starting portfolio? To arrive at this figure, we find the median (nominal) balance for the 1,000 trials remaining at the end of the 30-year periods. This metric is critical for those who wish to maintain (or even grow) their assets to leave something behind for heirs or charity.

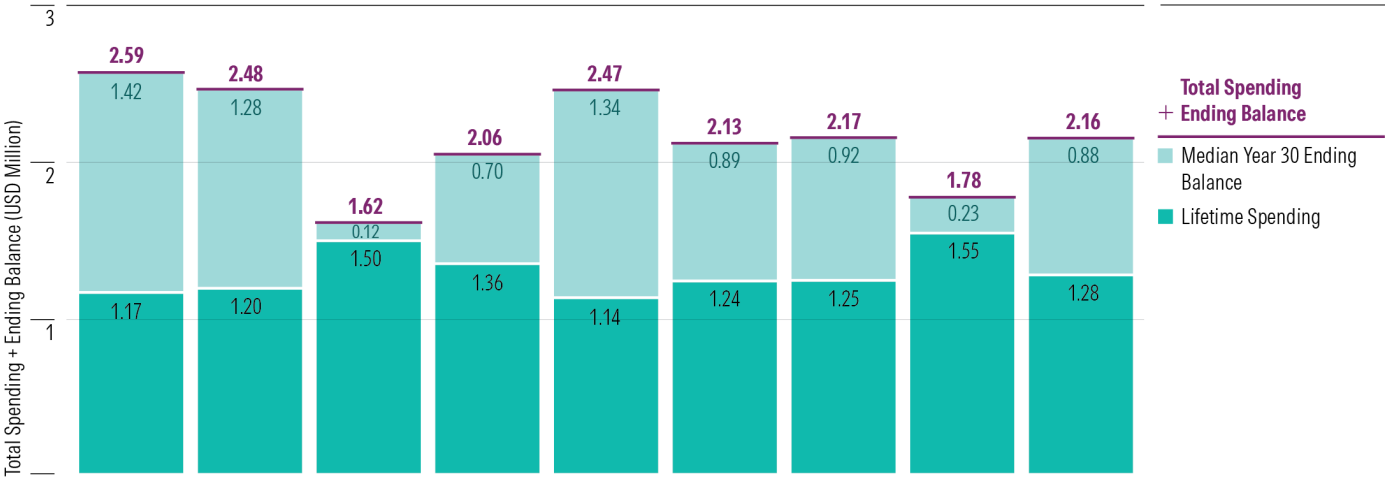
Total Spending + Ending Value: This is the sum of the median lifetime spending amount and the median balance after 30 years.

Spending/Ending Ratio: This measure is simply the ratio of lifetime spending relative to portfolio leftovers at year 30. In other words, does the spending system encourage the retiree to live it up during their lifetime, or does it encourage them to hold back to leave a larger nest egg for heirs and/or charity?

Comparing the Methods

Each method entails its own set of trade-offs. Below, we compare each method based on the six analyzed metrics: starting safe withdrawal rate, year 30 cash flow standard deviation, lifetime spending, median balance at year 30, total spending + ending value, and spending/ending ratio. Exhibit 15 depicts how each method fared on each metric, assuming 40% stock/60% bond portfolios, a 30-year spending horizon, and a 90% success rate.

Exhibit 15 Spending Methods Summary, 40% Equity/60% Bond Portfolio, 30 Years, and 90% Success Rates



Source: Morningstar. Data as of Sept. 30, 2025.

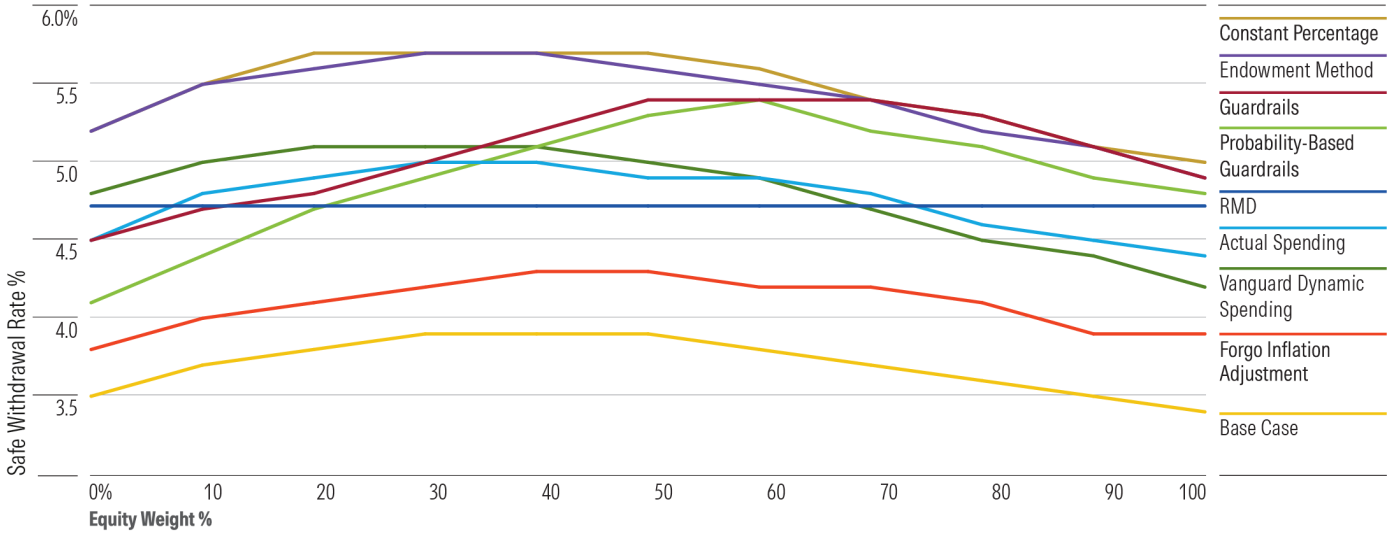
Starting Safe Withdrawal Rate

Each flexible spending method supports a higher initial safe withdrawal rate than the base case (fixed real withdrawal method), as shown in Exhibit 14. The constant percentage and endowment methods support the highest starting safe withdrawal rates across most asset allocations. This reflects the nature of the two approaches, which can support higher initial withdrawals by making potentially significant year-to-year adjustments to dollar withdrawals, by ratcheting down spending when the portfolio value is down.

The starting safe withdrawal percentage for the constant percentage method was the highest for portfolios with equity allocations of 20% to 50%, while the starting safe withdrawal rate for the endowment method was the highest for equity allocations of 30% or 40%. For the other methods, the starting safe withdrawal rates were generally the highest, with equity allocations ranging from 20% to 50%, although the guardrails and probability-based guardrails methods worked best with somewhat

higher equity allocations. Across all methods, the starting safe withdrawal rates were the lowest at the extremes of 100% stocks or 0% stocks, highlighting the value of diversified asset-class exposure.

Exhibit 16 30-Year Starting Safe Withdrawal Rate % by Withdrawal Method and Asset Allocation, 90% Success Rate

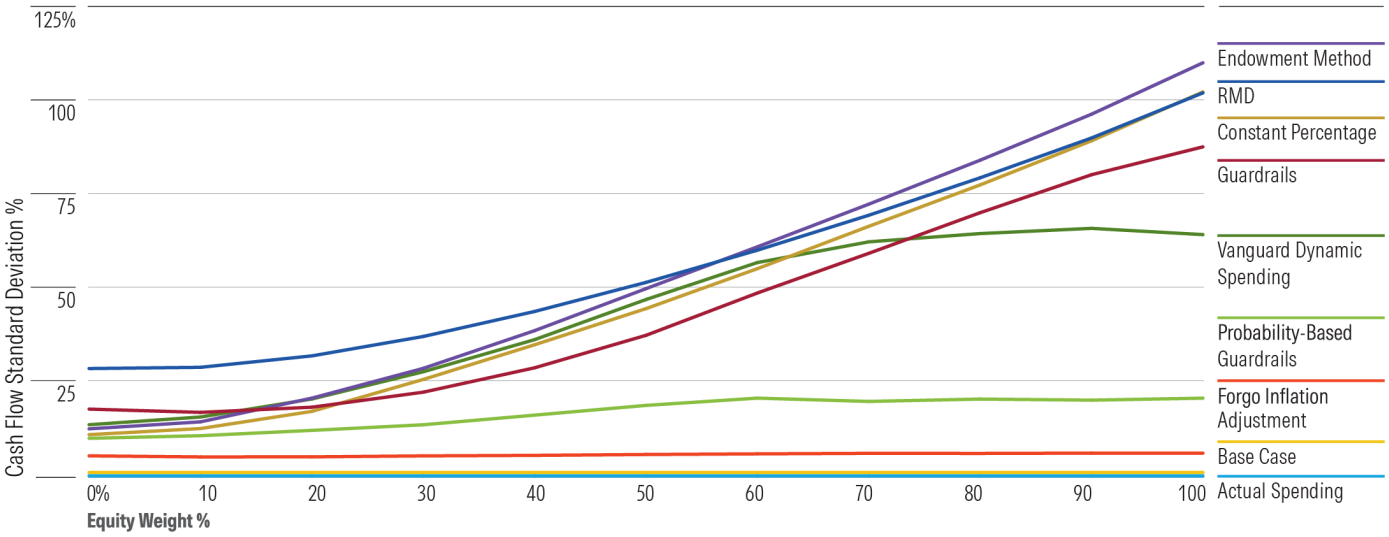


Source: Morningstar. Data as of Sept. 30, 2025.

Year 30 Cash Flow Standard Deviation

With this measure, the trade-offs demanded by several flexible spending methods become apparent. The RMD, endowment, and constant percentage methods, in particular, had far greater variability in their annual withdrawal amounts. Such unpredictability is a natural byproduct of their rules, which dictate the withdrawal amount based on the portfolio balance as of the end of the previous year (or in the case of the endowment method, an average of the previous 10 years' balances). Thus, retirees who are attracted to these methods' high withdrawal rates must also reckon with the substantial uncertainty they can impose. By contrast, the forgo inflation and actual spending methods, as well as the base case, entail relatively little year-to-year spending change, making them more useful to retirees who prize stability and predictability.

Exhibit 17 Year 30 Cash Flow Standard Deviation % by Withdrawal Method and Asset Allocation, 90% Success Rate



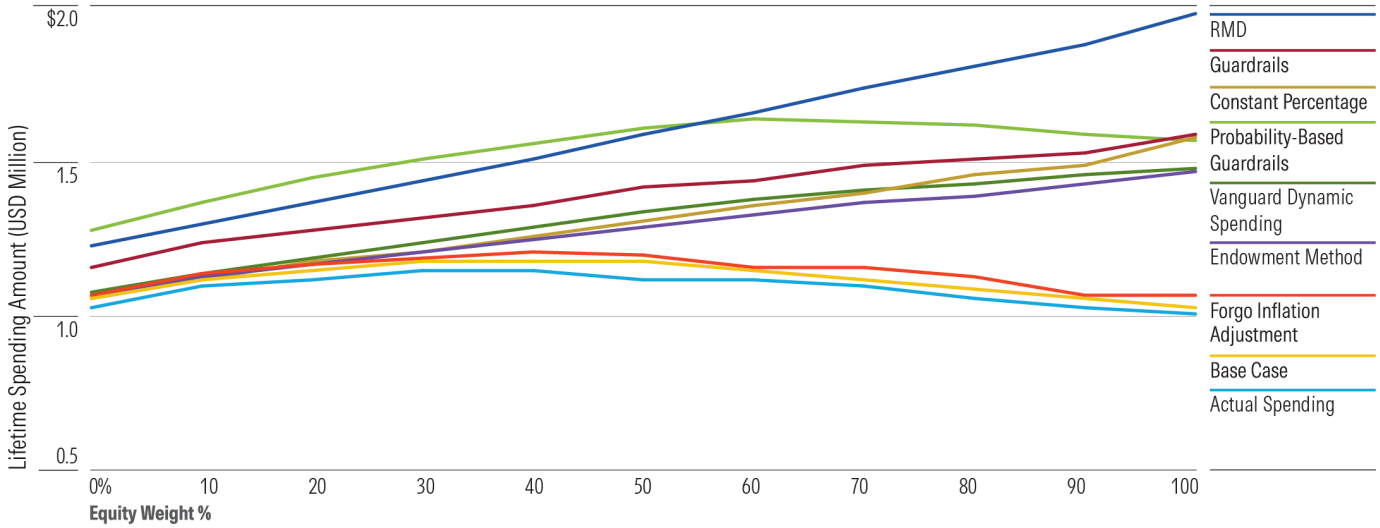
Source: Morningstar. Data as of Sept. 30, 2025.

Lifetime Spending

Most flexible spending systems allow for higher lifetime withdrawals than the base case, and that was true across the asset-allocation spectrum. The probability-based guardrails and RMD methods supported the highest median lifetime withdrawal amounts, while forgoing an inflation adjustment in the year following a portfolio loss also offers slightly higher levels of lifetime income for most equity allocations than the baseline fixed real withdrawal approach.

Notably, equity-heavy allocations across the majority of the spending methods support higher lifetime spending amounts than bond-heavy allocations. That is because the portfolios with higher equity allocations provided larger “raises” in annual withdrawals following good years, thereby enlarging lifetime withdrawal amounts. As always, though, there are trade-offs, as the increases in portfolio spending reduce the portfolios’ ending values. The actual spending method delivered the lowest lifetime spending amount of any method—even compared with the base case of fixed real withdrawals. That's because it assumes a decline in real spending over the retirement lifecycle.

Exhibit 18 30-Year Lifetime Spending Amount (USD Mil) by Withdrawal Method and Asset Allocation, 90% Success Rate, $1 Million Starting Portfolio

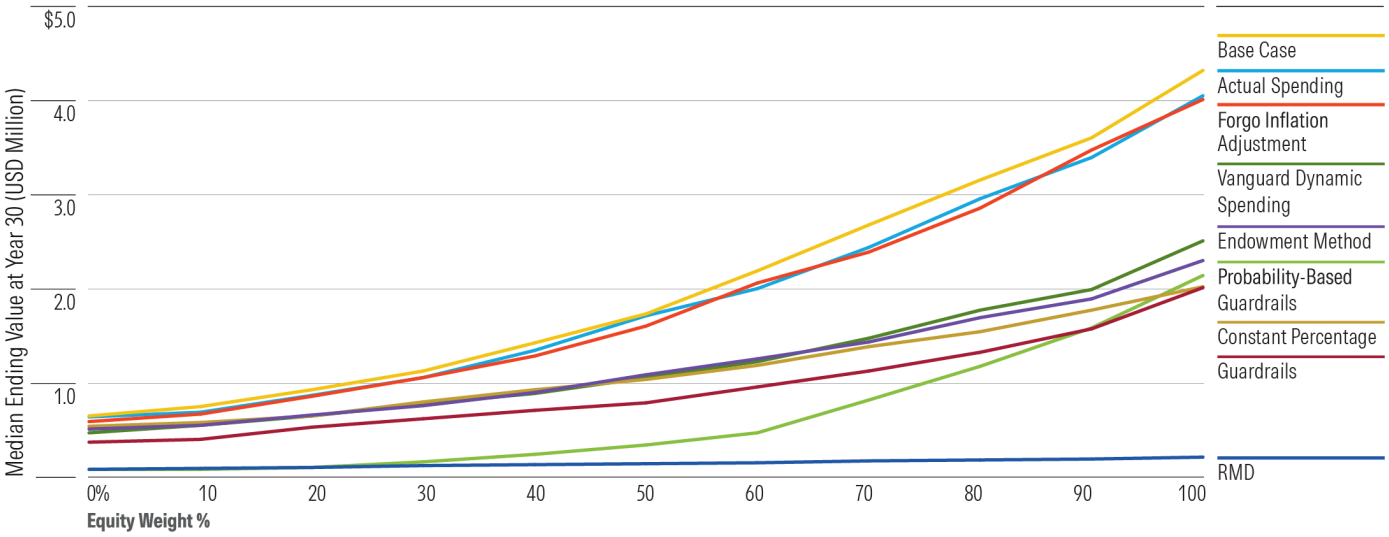


Source: Morningstar. Data as of Sept. 30, 2025.

Median Ending Balance

The base case of taking fixed real withdrawals creates the highest median balances at year 30. In other words, retirees using such a strategy may well underspend during their lifetimes. That attribute depresses potential spending but may appeal to bequest-minded retirees. Among other withdrawal methods, the actual spending and forgo inflation methods produced the highest median year 30 values. At the other extreme, the RMD method resulted in the lowest ending values. This result is because it spends down most of the retirement capital by design. The endowment, constant percentage, Vanguard Dynamic Spending, and guardrails methods split the difference between a more aggressive, freer-spending method like RMD and thriftier methods that curtail, but never increase, spending.

Exhibit 19 Median Ending Balance at Year 30 (USD Mil) by Withdrawal Method and Asset Allocation, 90% Success Rate

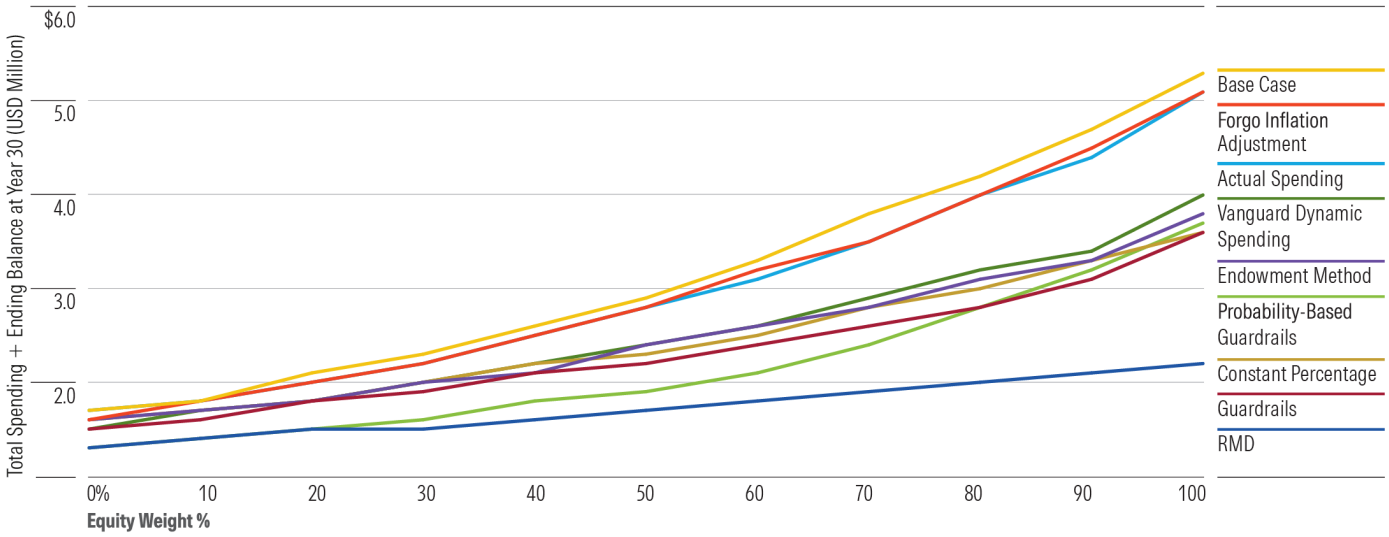


Source: Morningstar. Data as of Sept. 30, 2025.

Total Spending + Ending Value

More equity-heavy portfolio mixes generally support higher combined lifetime spending and ending balances over a 30-year period. Equity-heavy portfolios prevail on this measure across all of the withdrawal strategies. Note that the guardrails, probability-based guardrails, and RMD strategies generally lead to lower combined lifetime spending plus ending values than the other methods, and that's true regardless of equity allocation. That's largely because both approaches encourage lifetime spending, leaving less money in the portfolio to compound across a 30-year horizon.

Exhibit 20 Total Spending+ Ending Value at Year 30 (USD Mil) by Withdrawal Method and Asset Allocation, 90% Success Rate



Source: Morningstar. Data as of Sept. 30, 2025.

Spending/Ending Ratio

Because of their muted long-term return potential, conservatively positioned portfolios tend to short-shrift long-term portfolio growth and the potential for leftover assets, even as they deliver retirees' lifetime spending needs. The opposite is true for more equity-heavy portfolio mixes. Across spending methods, retirees employing equity-heavy portfolios have the potential for significant leftover assets after 30 years, particularly for the base-case, forgo inflation, and actual spending methods.

Exhibit 21 Spending/Ending Ratio by Withdrawal Method and Asset Allocation, 90% Success Rate

Equity Weighting %	Base Case	Forgo Inflation Adjustment	RMD	Guardrails	Actual Spending	Endowment Method	Constant Percentage	Probability-Based Guardrails	Vanguard Dynamic Spending
100	19 / 81	21 / 79	91 / 9	44 / 56	20 / 80	39 / 61	44 / 56	40 / 60	37 / 63
90	23 / 77	23 / 77	91 / 9	49 / 51	23 / 77	43 / 57	46 / 54	45 / 55	42 / 58
80	25 / 75	28 / 72	91 / 9	53 / 47	26 / 74	45 / 55	49 / 51	54 / 46	45 / 55
70	29 / 71	32 / 68	92 / 8	57 / 43	31 / 69	49 / 51	50 / 50	65 / 35	49 / 51
60	34 / 66	36 / 64	92 / 8	60 / 40	36 / 64	51 / 49	53 / 47	71 / 29	53 / 47
50	40 / 60	43 / 57	92 / 8	64 / 36	39 / 61	54 / 46	56 / 44	81 / 19	56 / 44
40	45 / 55	48 / 52	93 / 7	66 / 34	46 / 54	58 / 42	58 / 42	87 / 13	59 / 41
30	51 / 49	53 / 47	93 / 7	68 / 32	52 / 48	62 / 38	60 / 40	88 / 12	61 / 39
20	55 / 45	58 / 42	94 / 6	71 / 29	56 / 44	64 / 36	65 / 35	88 / 12	65 / 35
10	60 / 40	63 / 37	94 / 6	76 / 24	62 / 38	68 / 32	66 / 34	91 / 9	67 / 33
0	62 / 38	65 / 35	94 / 6	76 / 24	62 / 38	68 / 32	66 / 34	90 / 10	70 / 30

Source: Morningstar. Data as of Sept. 30, 2025.

Dynamic Spending Methods: Key Takeaways

The preceding section detailed how each of the dynamic spending methods fared on each of the six metrics: starting safe withdrawal rate, year 30 cash flow standard deviation, lifetime withdrawal amount, median ending balance at year 30, total spending plus ending value, and spending/ending ratio. The table below summarizes the pros and cons of each approach, as well as the type of retiree for whom they would be most suitable.

Exhibit 22 Pros and Cons of Dynamic Spending Methods

Approach	Pros	Cons	Best For
Fixed Real (Base Case)	▸ Delivers steady "paycheck equivalent" throughout retirement ▸ Lowest cash flow volatility of any method, along with actual spending ▸ Highest ending portfolio value	▸ Doesn't maximize lifetime withdrawal rates ▸ May leave too much money on the table for retirees who don't want to leave a legacy to heirs	Retirees who value a predictable income stream and want to maximize the ending portfolio value as a bequest
Forgo Inflation Adjustment	▸ Cuts in real spending, while modest, are cumulative and allow for meaningfully higher starting withdrawal rates ▸ Typically results in healthy ending portfolio value	▸ Delivers lower lifetime withdrawal rates than most other methods	Retirees who seek a "paycheck equivalent" approach that allows for slightly higher starting withdrawal percentage than the basic system of fixed real withdrawals
RMD	▸ Supports the highest lifetime withdrawal rate of any method ▸ May save time since retirees still need to calculate RMD amounts and take distributions for RMDs even if they follow another method	▸ Leads to the highest cash flow volatility of any method ▸ Ending portfolio values are lowest of any method	Retirees with shorter-than-average life expectancies and/or those who can cover most of their fixed living expenses from nonportfolio income sources such as Social Security or a pension
Guardrails	▸ Supports an above-average safe withdrawal rates across most allocations ▸ Lifetime withdrawal rates are also higher than most other methods	▸ More complicated than other methods ▸ Results in some cash flow volatility ▸ Typically leads to lower ending portfolio value than most other methods	Retirees who prioritize maximizing spending over leaving a bequest to family or charity
Actual Spending	▸ Results in third-highest ending portfolio value ▸ Delivers higher paychecks early in retirement when retirees are likely to spend the most ▸ Very low cash flow volatility	▸ Doesn't maximize lifetime withdrawal rates	Retirees who want to spend more in the early years of retirement and are looking for a high degree of cash flow predictability
Endowment Method	▸ Along with the constant percentage method, the endowment method results significantly higher starting safe withdrawal rates across most allocations	▸ Can lead to significant variation in cash flows from year to year, including decreases in inflation-adjusted spending if the portfolio value declines over time ▸ Doesn't maximize lifetime spending or ending portfolio value	Retirees who want to spend more in the early years of retirement and are looking for a simple, rules-based approach to spending
Constant Percentage	▸ Similar to the endowment method, but allows for slight higher starting safe withdrawal rate for some allocations	▸ Can lead to significant variation in cash flows from year to year, including decreases in inflation-adjusted spending if the portfolio value declines in a given year ▸ Doesn't maximize lifetime spending or ending portfolio value	Retirees who want to spend more in the early years of retirement and are looking for a very simple approach to spending

Source: Morningstar. Data as of Sept. 30, 2025.

Exhibit 22 Pros and Cons of Dynamic Spending Methods (Continued)

Probability-Based Guardrails	▸ Supports higher lifetime spending than any other approach we tested ▸ Allows for above-average starting safe withdrawal rate with lower cash flow volatility than most other flexible spending methods ▸ A sensible approach that approximates how a financial advisor would advise clients on spending decisions	▸ Doesn't maximize portfolio value for bequests; typically leads to a relatively low portfolio value at the end of the 30-year period	Retirees who want to spend more in the early years of retirement and are looking for a high degree of cash flow predictability
Vanguard Dynamic Spending	▸ Supports higher starting safe withdrawal rate than base case ▸ Provides a decent balance between lifetime spending and ending portfolio value ▸ Similar to guardrails method but may be easier to calculate	▸ Doesn't excel on any key metrics. ▸ Can lead to significant variations in spending from year to year	Retirees looking for a middle-of-the road approach that still allows for a higher starting safe withdrawal rate than the base case

Source: Morningstar. Data as of Sept. 30, 2025.

Two of the new flexible spending methods we tested this year—the endowment and constant percentage methods—significantly boosted the starting safe withdrawal rate, but at the cost of more variation in cash flows from year to year. The guardrails system of flexible withdrawals with parameters, or guardrails, which prevent withdrawals from being either too high or too low, didn't increase the starting safe withdrawal rate as dramatically but does a nice job of enlarging payouts in a safe and livable way. For those seeking a simpler approach that provides more predictable withdrawal amounts, a fixed real withdrawal system that forgoes inflation adjustments after a losing year moderately increases lifetime withdrawals without greatly increasing cash flow volatility. It is also straightforward to implement. Alternatively, retirees who believe that their spending needs will not keep up with inflation over their drawdown period—an assumption borne out by the data on how retirees actually spend—might consider the simple system of making slight reductions to their annual spending over time.

Section IV: The Role of Social Security

The previous sections consider portfolio spending strategies without incorporating nonportfolio retirement income. That approach aligns with the previous versions of this paper and reflects much of the academic literature on portfolio-based retirement spending. However, almost all retirees receive at least some form of guaranteed lifetime income, most commonly Social Security, and for many households, it represents the largest cash flow source in retirement.

This section examines how Social Security interacts with the portfolio spending strategies discussed earlier and how incorporating this income can raise lifetime spending potential. Retirees who plan to stop working before claiming Social Security may also consider bridging strategies, in which they spend more or less from the portfolio in the early years of retirement to delay claiming benefits. Delayed claiming increases guaranteed, inflation-adjusted benefits for life, but we find it requires a willingness to either accept lower ending balances or some belt-tightening in the first few years of retirement, which may be a nonstarter for some retirees.

Exhibit 23 summarizes the key findings for strategies that integrate Social Security. Each scenario starts with the same $1 million 40% equity/60% bond portfolio used throughout the paper and assumes a 30-year time horizon. We further assume that the retiree who claims Social Security at age 67 receives a hypothetical full benefit of $36,000 a year, indexed to inflation at 2.46%, and $44,640 if they delay filing until age 70. (Actual benefits vary based on an individual's earnings record, and future adjustments will track the Consumer Price Index.)

To highlight the role of guaranteed income, we replace the “safe withdrawal rate” framing used earlier with first-year total spending, which combines the year 1 portfolio withdrawal with the Social Security amount. For example, in the base case (Line 1), the year 1 portfolio withdrawal is $39,000 (a 3.9% starting safe withdrawal percentage) and the year 1 Social Security benefit is $36,000, for the total first-year spending of $75,000.

Unsurprisingly, adding Social Security to the base case 40% equity/60% fixed-income spending system meaningfully increases the total lifetime spending and improves outcomes. Dynamic systems such as the guardrails method in Section III become more efficient when paired with a substantial, predictable income floor.

Exhibit 23 Key Findings When Including Guaranteed Income

Method	First-Year Spending (USD)	Lifetime Spending (USD Mil)	Median Year 30 Ending Balance (USD Mil)	Total Spending + Ending Balance (USD Mil)	Spending / Ending Ratio
Social Security at 67 (Base Case)	75,000	2.25	1.42	3.67	61 / 39
Social Security at 62	64,000	1.92	1.44	3.36	57 / 43
Social Security at 70 w/o Bridge	78,000	2.34	1.30	3.64	64 / 36
Social Security at 70 w/Bridge	83,000	2.49	1.49	3.98	63 / 37
Social Security at 70 w/ 3-Yr TIPS Ladder	78,000	2.34	1.28	3.62	65 / 35
Guardrails and Social Security at 67	88,000	2.44	0.70	3.14	78 / 22

Source: Morningstar. Data as of Sept. 30, 2025.

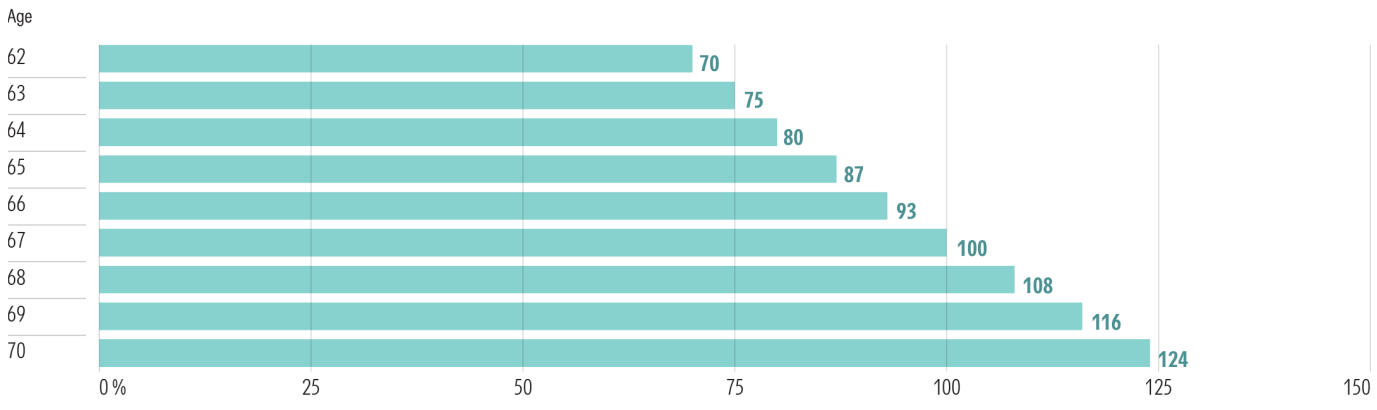
The Benefits of Delayed Social Security Filing

Retirees in the US may receive guaranteed income through Social Security, a traditional defined-benefit pension, or both. However, this section focuses exclusively on Social Security, as most future retirees, particularly those who spent their careers in the private sector, will not have access to pension benefits.

The US Social Security Administration encourages individuals to delay claiming their benefits. Retirees who file before reaching their designated "full retirement age" (currently 67 for those born in 1960 or later) face reduced monthly payments. Conversely, those who postpone claiming beyond full retirement age are rewarded with significantly higher benefits. After 67, the benefits increase by 8 percentage points a year until reaching a maximum of 124% at age 70.

The chart below illustrates the current benefit-payment schedule, highlighting how the timing of a claim can impact the size of monthly Social Security income.

Exhibit 24 Social Security Benefit % by Claiming Age, Birth Year 1960 or Later



Source: Morningstar. Data as of Sept. 30, 2025.

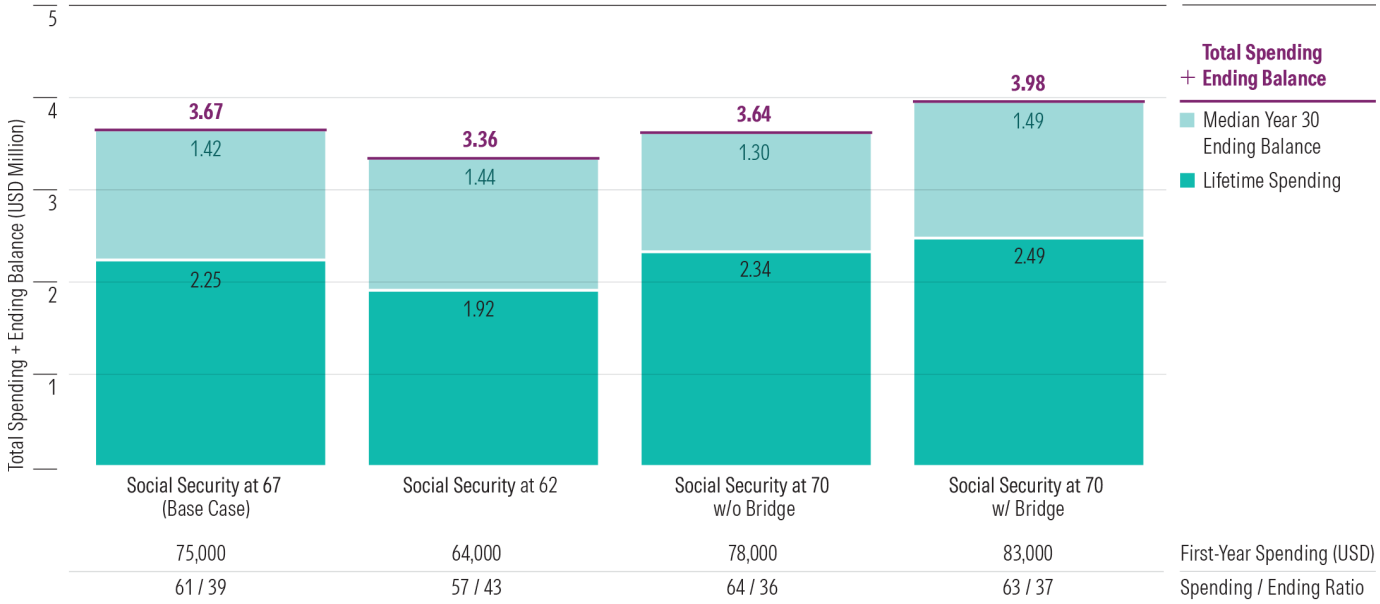
Claiming Social Security early provides an initial advantage. Retirees begin receiving income, while others who delay do not. However, the benefit schedule increases steeply enough that, for those with

average or longer lifespans, delaying ultimately results in higher cumulative payouts. For instance, by age 79, individuals who claim at their full retirement age of 67 will have received more total benefits than those who started at 62.

Delaying until age 70 pushes the breakeven point further out. Retirees must live until age 84 to surpass the cumulative benefits of those who claimed at 67. Still, for those who view Social Security primarily as longevity insurance rather than an investment, waiting may be the preferred strategy. The longer the delay, the higher the monthly benefit, which is an important consideration for those expecting a long retirement. Delaying can also benefit married couples. If the higher-earning spouse postpones claiming, their increased benefit becomes available as a spousal benefit, potentially boosting household income in later years.

Of course, delaying isn't always feasible. Some retirees may need immediate income to cover essential expenses, making early claiming a necessity rather than a strategic choice. Others may face health challenges that shorten their expected lifespan, in which case, claiming earlier may be more prudent. Retirees who stop working at 67 but delay claiming until 70 may need to bridge the gap with portfolio withdrawals. This section examines how such bridging strategies affect the overall benefit of delaying and compares them with alternatives like continuing to work, which can preserve portfolio assets and maximize lifetime spending.

Exhibit 25 Base-Case Lifetime Spending and Ending Value by Social Security Claiming Age



Source: Morningstar. Data as of Sept. 30, 2025.

Delaying Social Security and portfolio withdrawals until age 70 is the ideal strategy (for example, using working income to meet cash flow needs), though many may not be fortunate enough to do so. Delaying the first year of portfolio withdrawals until age 70, when Social Security is also claimed, leads to first-year spending of about $83,000 ($39,000 from portfolio withdrawal plus the $44,640 from Social Security), up from $75,000 for those who claim their benefit at age 67 and start taking portfolio withdrawals the same year. It also results in the highest lifetime spending amount and total spending + median ending balance.

Retirees who delay and must use portfolio withdrawals from age 67 to 70 still see a boost in lifetime spending relative to those who begin taking benefits at 67. However, to maintain the same standard of living as someone who took Social Security at age 67, the age 70 Social Security filer may need to take higher withdrawals from the portfolio to bridge the gap between ages 67 and 70. In our baseline scenario, the retiree who takes Social Security at 67 has about $75,000 in total income in the first year of retirement (the $36,000 from Social Security plus the $39,000 withdrawn from the $1 million investment portfolio in year 1). To match that, the retiree delaying Social Security would have to withdraw the full $75,000 from the investment portfolio for the first year. Adjusted for inflation, the withdrawal becomes $76,845 in year 2 and $78,735 in the final year before claiming Social Security at age 70.

Lifetime spending is still higher over the full 30-year period than it is for the base case with Social Security starting at age 67, but the steeper withdrawals early in retirement lead to a median ending balance of the portfolio that's about $120,000 lower for retirees who delay taking Social Security in our analysis. This may counter conventional wisdom that it's always better to delay Social Security if the

retiree can afford to do so and has average or above-average life expectancy, but that's probably because it assumes the retiree has an alternative form of income, as described above.

Taking Social Security early at age 62 might be a necessity for some, but the drawbacks are clear, even when paired with portfolio withdrawals. The early claiming penalty reduces Social Security to $25,200 in the first year, assuming the baseline amount available at 67 is $36,000. Over 30 years, that lower starting point results in the lowest lifetime spending and median ending balances of the Social Security strategies we tested. This corroborates the conventional wisdom that it's usually better to delay Social Security, if possible.

Finally, it's worth pointing out that our analysis doesn't adequately capture another valuable trait of Social Security: its ability to track the inflation rate directly. That, in turn, provides valuable purchasing power protection. If inflation runs higher than the 2.46% inflation rate assumed in our research, the benefit of delaying Social Security and, in turn, enlarging eventual payments would be even greater.

An Exercise in Bridge Building

There are investment and dynamic withdrawal strategies designed to help bridge the gap between retirement and claiming Social Security later. Given how important having a bridge strategy could be to increasing lifetime spending and median ending balances, we tested three options for someone retiring at 67 and delaying Social Security until age 70.

The three bridging strategies we tested are: a three-year bond ladder using TIPS, forgoing inflation adjustments, and spending less.

3-Year TIPS Ladder

In this scenario, the retiree withdraws three years' worth of planned spending from the portfolio to purchase a TIPS ladder maturing at ages 68, 69, and 70. This amounts to roughly $234,000 withdrawn from the $1 million starting portfolio to cover annual spending of $78,000. That's higher than our base-case first-year spending of $75,000, because the remaining assets stay invested in the base case portfolio with a 40% equity and 60% fixed-income allocation. Because TIPS adjusts with inflation, these bonds preserve the purchasing power over the three-year period, ensuring that spending keeps pace with rising prices. This approach offers two key advantages. First, it protects against unexpectedly high inflation—something the base case, which assumes a steady 2.46% inflation rate, could underestimate. Second, it reduces the sequence-of-returns risk by funding near-term spending without having to sell assets if markets decline, giving the portfolio time to recover before withdrawals resume. However, estimating exactly how much spending to set aside can be challenging, since actual expenses in the first few years of retirement often differ from projections as retirees adjust to new routines and lifestyles. The next section of this report covers TIPS ladders in more detail.

Forgo Inflation Adjustment

This scenario mirrors the one described in Section III, but it applies only to the first three years of retirement. The retiree begins by withdrawing the same amount they would in the first year as if they

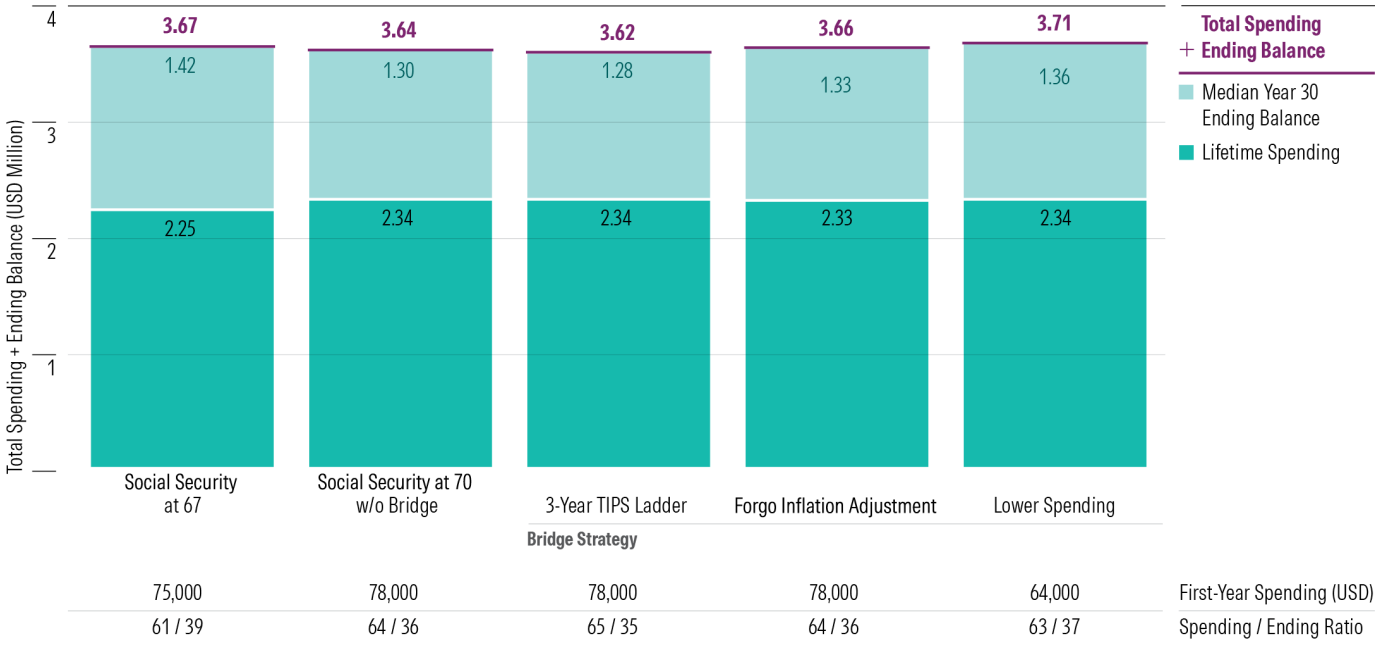
had no bridging strategy ($78,000), but if the portfolio experiences a negative return that year, withdrawals in the second year are not increased for inflation. The same adjustment applies in year 3, leading to claiming Social Security at age 70. Once Social Security begins, the retiree begins adjusting withdrawals for inflation each year thereafter. The goal of this bridging strategy is to limit withdrawals during down markets, preserving more of the portfolio to grow over time.

Lower Spending

This is the most aggressive bridging strategy we examined, and likely the least appealing, because of how much spending must be cut in the first three years of retirement before Social Security begins. It combines the "Forgo Inflation Adjustment" method with an additional reduction in spending to 80% of the target amount. Cutting spending increases the probability of having funds remaining at the end of the assumed 30-year period above our 90% target so counterintuitively, this strategy supports a higher first-year spending than our base case, but after the 80% haircut, it's still smaller. That means first-year spending drops to $64,000 (equivalent to supporting $80,000 in year 1 spending if no cuts were made). While this early frugality does lead to higher lifetime spending and a higher median ending balance over a full 30-year period, the trade-off is significant: The most active and anticipated years of retirement are spent under tight constraints, and there is no guarantee the retiree will live long enough to realize the long-term benefits. For many, sacrificing early-retirement experiences for potentially better outcomes decades later may simply not be worth it.

Exhibit 26 shows the results of the bridging strategies relative to the base-case scenario of retiring and claiming Social Security at age 67. In all three scenarios, we started with the base-case $1 million portfolio, retirement at 67, and claiming Social Security at 70.

Exhibit 26 Delaying Social Security Until 70 Using Bridge Strategies



Source: Morningstar. Data as of Sept. 30, 2025.

Overall, all three bridging strategies deliver higher lifetime spending than claiming Social Security at 67, but they come at the cost of lower median ending balances. More importantly, the level of sacrifice required during the three-year bridge varies by strategy and that trade-off may feel significant for many new retirees. Early retirement is often the most active and expensive phase, when people want to travel or pursue long-postponed hobbies. For some, the idea of cutting back during those high-energy years to improve long-term outcomes may simply not be worth giving up those early joys.

Dynamic Spending With Social Security

In Section III of this paper, we explored a series of dynamic spending strategies. The guardrails strategy had a higher starting safe withdrawal rate (5.2% for a 40% equity/60% bond portfolio) than our base case, but including Social Security benefits can make this withdrawal strategy even more efficient.

The investment portfolio-only guardrails approach reacts to market performance. When the portfolio's performance does well, it may allow slightly higher withdrawals, and when the portfolio suffers losses, it may scale back the withdrawals. By including Social Security, using the $36,000 starting benefit from the previous examples, the strategy becomes more resilient during periods when the portfolio loses money.

For example, a retiree using the guardrails strategy and taking Social Security at age 67 would have $88,000 of total income in year 1 using the 40% equity/60% fixed-income portfolio. That comprises $52,000—the 5.2% starting safe withdrawal amount that corresponds with the guardrails approach—

plus the $36,000 from Social Security. An unlucky retiree could see their portfolio plummet 30%, leaving $663,000 at the start of year 2. The portfolio withdrawal in year 2 would be $53,280 using the 2.46% inflation adjustment, but that would translate into 8% of the remaining portfolio, so a 10% haircut would be needed to lower it to $47,950. The Social Security payment doesn't get a haircut, though. It would increase to $36,885 after the inflation adjustment. That makes the overall income in year 2 equal to $84,835. It's still a dip from year 1, but it's only a 3.5% change instead of 10.0%.

The buffer provided by Social Security in those down-market scenarios creates much more stable cash flows than is evident by looking at portfolio spending alone, as we did in Section III. The investment portfolio-only guardrails approach had a cash flow standard deviation of about 30% on a 40% stock/60% bond portfolio, but the version of the strategy that includes Social Security has a cash flow standard deviation of half of that. It also leads to increased lifetime spending versus the base case plus Social Security at 67 strategy, as shown in Exhibit 27.

Similar to the portfolio-only guardrails approach, the combined guardrails plus Social Security strategies leave behind a lower median ending balance than does the base case, suggesting this, like other strategies involving guaranteed income, flexible withdrawals, or both, is most useful for retirement spenders who wish to maximize their lifetime consumption.

Exhibit 27 Guardrails Plus Social Security

Source: Morningstar. Data as of Sept. 30, 2025.

Section V: The Role of TIPS and Annuities

In addition to Social Security, retirees may obtain guaranteed or near-guaranteed retirement income through several sources.

Among investment-based options, TIPS stand out as one of the closest portfolio analogs to guaranteed lifetime income. TIPS provide inflation-adjusted interest and principal payments backed by the full faith and credit of the US government, offering a high-quality, predictable stream of real cash flows that can be structured to support spending needs over time. While they do not provide lifetime income by themselves, retirees can build a ladder of TIPS to cover a predetermined horizon, like the 30-year retirement horizon used throughout this paper.

Beyond TIPS, retirees can also secure guaranteed income through pensions or insurance products such as annuities. Annuities come in a wide variety, but this paper focuses on the two most straightforward types: immediate income annuities and deferred income annuities. These annuities convert a portion of the portfolio into a lifetime income stream, effectively transferring longevity and market risk to an insurer. Immediate annuities begin payments right away, while deferred annuities start later in life and serve as an effective hedge against longevity risk. Their appeal varies: Immediate annuities look comparatively attractive today, given the outlook for fixed-income returns, but they require surrendering a portion of the portfolio. Deferred annuities also strengthen longevity protection but also require surrendering a part of the portfolio and typically result in lower median ending balances, making them less suitable for retirees prioritizing legacy goals.

This section evaluates how TIPS-based strategies and annuity products interact with the portfolio-based spending systems described in Sections I and III and Social Security. The goal is to identify combinations that deliver the highest total lifetime payout while maintaining competitive median ending balances over a 30-year horizon. It is important to note that retirees who do not live the full period may not fully benefit from guaranteed-income products with long payout structures.

Exhibit 28 shows the key findings from this section.

Exhibit 28 Key Findings When Incorporating TIPS and Annuities

Method	First-Year Spending (USD)	Lifetime Spending (USD Mil)	Median Year 30 Ending Balance (USD Mil)	Total Spending + Ending Balance (USD Mil)	Spending / Ending Ratio
Social Security at 67 (Base Case)	75,000	2.25	1.42	3.67	61 / 39
Social Security at 67 and TIPS Ladder	81,000	2.43	0.00	2.43	100 / 0
Social Security at 67, TIPS Ladder, 15% Equity Kicker	74,250	2.23	1.48	3.71	60 / 40
Immediate Annuity					
10% and Social Security	75,000	2.25	1.34	3.59	63 / 37
30% and Social Security	76,000	2.28	1.59	3.87	59 / 41
50% and Social Security	76,000	2.28	1.73	4.01	57 / 43
Deferred Annuity					
10% 18 Yrs and Social Security	78,000	2.34	1.24	3.58	65 / 35
20% 18 Yrs and Social Security	82,000	2.46	0.95	3.41	72 / 28

Source: Morningstar. Data as of Sept. 30, 2025.

TIPS Ladders

Retirees who aren't comfortable leaving their retirement spending to the whims of the capital markets can generate consistent income by using their investment portfolio to buy bonds. These can be nominal bonds, such as conventional Treasuries, or bonds providing yields that are adjusted for changes in inflation. As the former are already incorporated in this paper via the various portfolio allocations tested, this subsection will address only the latter option: TIPS. Unlike the short-term TIPS ladder we highlighted in Section IV as a bridging strategy, this section focuses on longer-term TIPS ladders.

One way for retirees to use TIPS is as substitutes for nominal bonds in their investment portfolios. Because Morningstar's forecast for long-term TIPS' returns matches its forecast for long-term real returns on high-quality nominal bonds, adopting that approach does not alter this paper's previous conclusions. The suggested safe withdrawal rates remain the same, regardless of what version of Treasuries the retiree purchases.

However, retirees can achieve meaningfully different results by building a TIPS ladder. A TIPS ladder is a self-liquidating portfolio, existing during a specific time horizon. For this paper, we will consider a 30-year ladder, which matches the assumed retirement period. A 30-year TIPS ladder buys TIPS of various maturities, from one year through 30 years, then achieves a consistent real withdrawal rate by combining the yield paid by those TIPS with principal payments as each rung of the ladder matures. When the 30-year period expires, so does the portfolio. TIPS ladders are designed to liquidate at the end of the investment period.

By self-liquidating, TIPS ladders differ from the other withdrawal strategies covered in this paper, save for the RMD method, which also (nearly) exhausts the retiree's investment. This feature, of course, is not appealing. But TIPS ladders deliver two major offsetting benefits. First, they provide a 100% success rate. While the withdrawal rates for every other strategy cited in this paper are calculated to succeed in 90% of occasions, per the simulation model, payments from TIPS ladders are fully secured. They are not

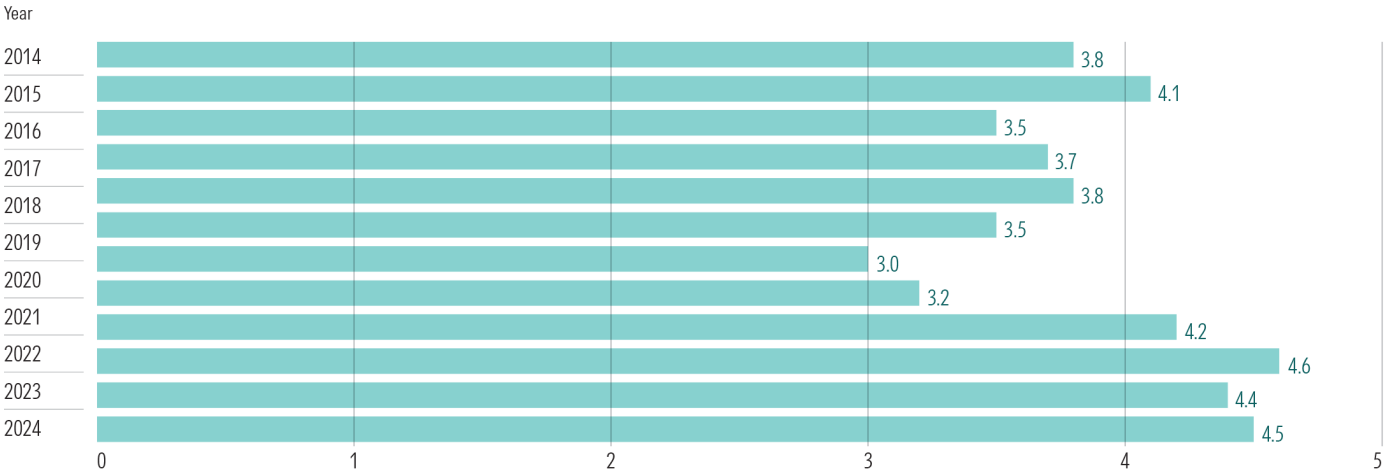
only guaranteed by the US government but are also immune to inflation's ravages, as their payments are structured in real terms.

To be sure, the prices of TIPS bonds can fluctuate sharply in response to inflation, as demonstrated in 2022, when long-term TIPS suffered steep capital losses and short-term TIPS suffered minor losses. But changes in market prices are irrelevant for holders of TIPS ladders, because they own all their investments until their maturity dates.

A second benefit is that, when TIPS yields are sufficiently attractive, their safe withdrawal rates can exceed those of other portfolios. As of Sept. 30, 2025, that was the case: A 30-year TIPS ladder supported an inflation-adjusted withdrawal rate of 4.5%, compared with 3.9% for the highest base-case portfolio.

The current 30-year TIPS ladder rate is near the high end of the past 10 years as inflation expectations have ticked slightly upward over the past year.

Exhibit 29 Historic 30-Year TIPS Ladder Safe Withdrawal Rate, Calculated on Sept. 30 of Each Year



Source: Morningstar. Data as of Sept. 30, 2025.

When the benefits of claiming Social Security at age 67 are added to the TIPS ladder, the lifetime spending rate and spending amount both appear attractive compared with our base case of a 3.9% initial withdrawal rate combined with claiming Social Security at age 67, as shown in Exhibit 30.

Exhibit 30 TIPS Ladder Plus Social Security, Lifetime Spending and Median Ending Balance

Source: Morningstar. Data as of Sept. 30, 2025.

Having $2.43 million of lifetime spending with 100% safety certainly appears better than the $2.25 million of spending with a 90% success rate that arises from this paper's base case plus Social Security. There are, however, some catches. One drawback has already been mentioned: Whereas the TIPS ladder possesses no ending value, by definition, the base-case strategy with Social Security finishes year 30 with a positive balance in 90% of the simulations. The median ending balance for the 40% equity portfolio with a Social Security start date at age 67, in fact, is $1.4 million. The base-case strategy plus Social Security is therefore much better suited for retirees who want their investments to last more than 30 years, either for their own use, should they outlive that period, or to leave as a bequest.

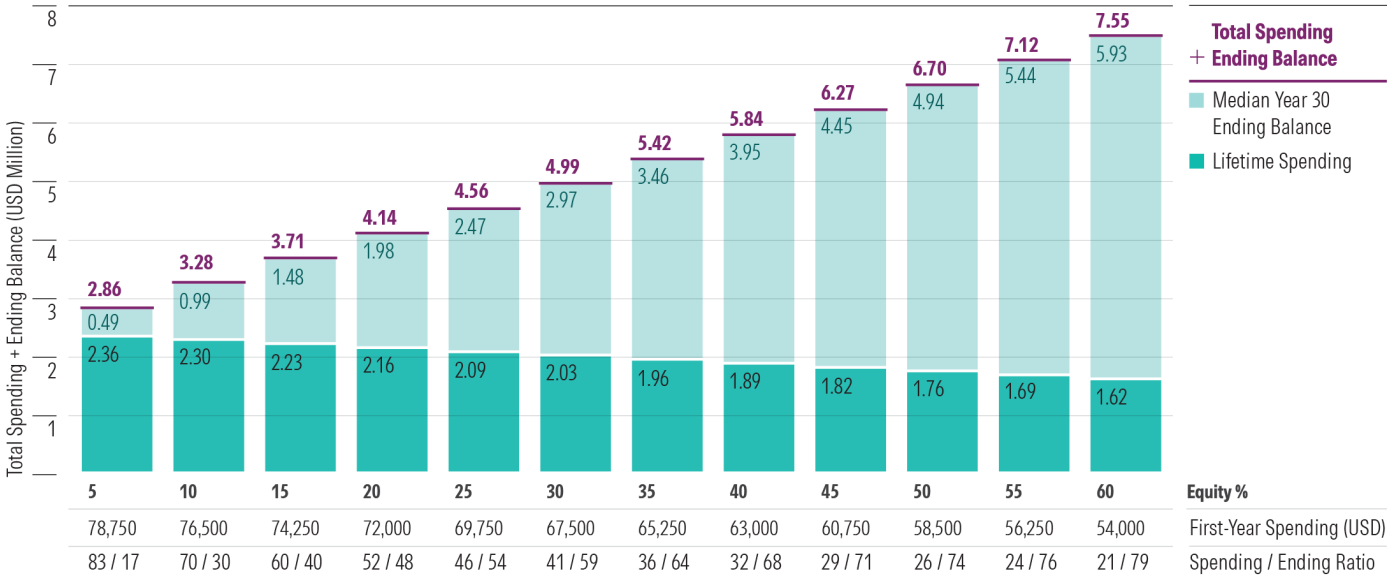
Another drawback of TIPS ladders is that they are entirely inflexible. Although the base-case scenario is modeled as being inflexible, under the assumption that retirees will not adjust their spending strategies along the way, it can, in practice, be altered. Not so with TIPS ladders. Retirees who start down that path must either finish it, as planned, or accept that changes they make along the way, like selling off portions of the ladder prematurely, which will irrevocably ripple for the rest of the retirement period.

One way to alleviate these concerns is to supplement a TIPS ladder with an equity kicker. With that strategy, retirees would place a portion of the portfolio into a TIPS ladder, investing the remaining assets into equities. They would spend down the TIPS ladder through annual withdrawals while leaving the equity position undisturbed. When the 30 years conclude, the equity position may have substantially appreciated, thereby replacing some or perhaps even all the assets that were spent on the TIPS ladder.

Exhibit 31 shows lifetime spending and median ending balance after year 30 for this TIPS-ladder-plus-equities strategy with Social Security, assuming various effective withdrawal rates and the same long-term equity return assumption that is employed throughout this paper. The exhibit shows equity ranges in 5 percentage point increments up to 60% equity.

The purpose of including equity allocations as high as 60% is to provide a complete view of potential outcomes, even those that fall outside typical recommendations. In practice, 40% equity is likely the upper limit for this strategy, unless the retiree has a very large starting portfolio or minimal lifetime spending needs.

Exhibit 31 TIPS Ladders, Plus Social Security, Plus Equities, First-Year Spending, Lifetime Spending, and Median Ending Balances at Year 30 (USD Mil)



Source: Morningstar. Data as of Sept. 30, 2025.

Based on current TIPS yields and expected equity returns, the ladder with a 15% equity kicker stands out as being the most competitive with the base case plus Social Security. Ladders with larger equity kickers tend to produce lower lifetime spending but higher median ending balances. In the 15% example, lifetime spending totals $2.23 million, nearly matching the base case's $2.25 million with a 100% chance of success, and the untouched equity portion compounds over the full 30 years, resulting in a higher median ending balance of $1.48 million versus $1.42 million for the base case. However, this approach still offers far less flexibility later in retirement than the base case or a dynamic withdrawal strategy.

Annuities

Investors can also add guaranteed income by purchasing an annuity with a portion of their investment portfolios. Annuity contracts sold by insurance companies come in many forms. The most straightforward annuity version for retirees seeking guaranteed income comprises either (1) immediate lifetime annuities, which distribute monthly payouts for the remainder of the retiree's life or some predetermined period, starting when they are purchased, or (2) deferred income annuities, which begin their payments at a specified later date. This subsection will focus on how allocating different amounts to both types of annuities from the base-case portfolio, plus claiming Social Security at age 67, affects retirement spending.

Effectively, these annuities are the opposite of TIPS ladders. Whereas TIPS ladders fully protect against inflation risk but are vulnerable to longevity risk because of their scheduled termination dates, the features for annuities are reversed. Their payouts are customarily nominal, making them vulnerable to high inflation. That's particularly true for deferred income annuities whose payouts may start as late as age 85. Inflation protection can be added at the cost of a lower payout rate. The inflation adjustment is set at a fixed rate when the contract is purchased, making it less valuable as a means of hedging against future cost increases than the inflation adjustments that Social Security recipients receive. For the examples in this section, we included annuities with a 3% fixed cost of living adjustment in an effort to stay consistent with the scenarios in the rest of the paper, which also adjust for inflation over time.

Moreover, while annuities are backed by the insurance company and state guaranty funds, they're not backed by the full faith and credit of the US government as TIPS are. On the positive side, as annuity payouts persist throughout the retiree's life, they protect against longevity risk. And the longer a retiree's life is, the more value there is in an evergreen source of income.

The converse is also true, though. If the owner of a life-only annuity dies early in retirement, the money stays with the insurance company and isn't left behind for a spouse or heirs. In reality, life-only annuities are quite rare; most annuity buyers choose an annuity with survivor benefits or a guaranteed benefit period. Like cost-of-living adjustments, however, those features come at an additional cost.

Immediate Annuities

Immediate annuities, often called single-premium immediate annuities, are the simplest type of annuity. In exchange for a lump-sum payment, an insurer provides a fixed monthly income for life (or for a set period). For example, a 67-year-old woman purchasing an immediate annuity in October 2025 with $100,000 would receive about $7,700 annually for life, according to an estimate from annuity pricing research firm Cannex Financial Exchanges. (Men typically receive slightly higher payouts because of shorter life expectancies.)

This "life-only" option delivers the highest possible payout because payments stop when the owner dies. However, most retirees prefer additional features, such as joint benefits for a surviving spouse, refund provisions, or guaranteed payment periods, to ensure some value remains for heirs. Each of these protections reduces the payout rate because they shift more risk back to the insurer.

Adding inflation protection changes the math. A fixed 3% cost-of-living adjustment lowers the initial payout rate from 7.7% to 5.8%, or $5,800 in the first year. That amount would rise to $5,975 in year 2, $6,163 in year 3, and so on. It takes about 10 years for these inflation-adjusted payments to match the original nonadjusted payout. After that point, the inflation-protected annuity becomes a stronger hedge against longevity risk. As with delaying Social Security, the longer you live, the greater the benefit, and vice versa.

Immediate annuities can simplify financial planning if their payouts, combined with Social Security, cover basic living expenses. In general, allocating part of a portfolio to an immediate annuity increases lifetime spending when paired with Social Security. However, it usually results in a lower ending balance after 30 years because the annuity purchase is effectively a withdrawal—those funds no longer grow, even though they provide steady income.

Exhibit 32 shows how different funding levels for an immediate annuity affect lifetime spending and median ending balances over a 30-year retirement. Each scenario starts with the same $1 million 40% equity/60% fixed-income portfolio as the base case. In the examples, $100,000 (10%), $300,000 (30%), or $500,000 (50%) is used to purchase an immediate annuity. Because annuities behave more like bonds than stocks, the annuity is funded from the fixed-income portion of the portfolio. The equity allocation remains constant at 40%, with the remainder invested in fixed income. The result is effectively a higher equity allocation in the remaining portfolio. For example, in the scenario where we allocated 30% of the bond portfolio to an immediate annuity, the remaining portfolio was 40% equity and 30% fixed income, which equals a 58% allocation to stocks, which has an impact on the median ending balances.

Exhibit 32 Base Case Plus Social Security and Immediate Annuity: Lifetime Spending and Median Ending Balances at Year 30 (USD Mil)

Source: Morningstar. Data as of Sept. 30, 2025.

Since the immediate annuities have a higher rate of income (5.7%) than the base-case bond portfolio's projected total returns (4.7%) and they get a 3% cost-of-living adjustment each year, the more of the fixed-income they replace the better the results for lifetime spending. The remaining portfolio's higher allocation to equities helps drive higher median 30-year ending balances for the 30% and 50% annuity examples, both of which have higher total spending + ending balances.

Although immediate income annuities may look very attractive relative to traditional fixed-income investments today, there are important caveats that call for prudence. Purchasing an immediate annuity locks up your principal, reducing liquidity and eliminating flexibility to respond to emergencies or changing financial needs. While it guarantees income for life, the trade-off is that if you die earlier than expected, you're not getting your capital back, unless you added extra provisions that would reduce your income. Bonds, by contrast, allow you to retain control over liquidity and, if interest rates do rise, allow for reinvestment at higher interest rates.

For retirees seeking a measure of guaranteed income, allocating a portion of the portfolio to an annuity can make sense today, but it should be done in moderation.

Deferred Income Annuities

Deferred income annuities can be an attractive longevity hedge, provided the retiree lives long enough to reap the benefits.

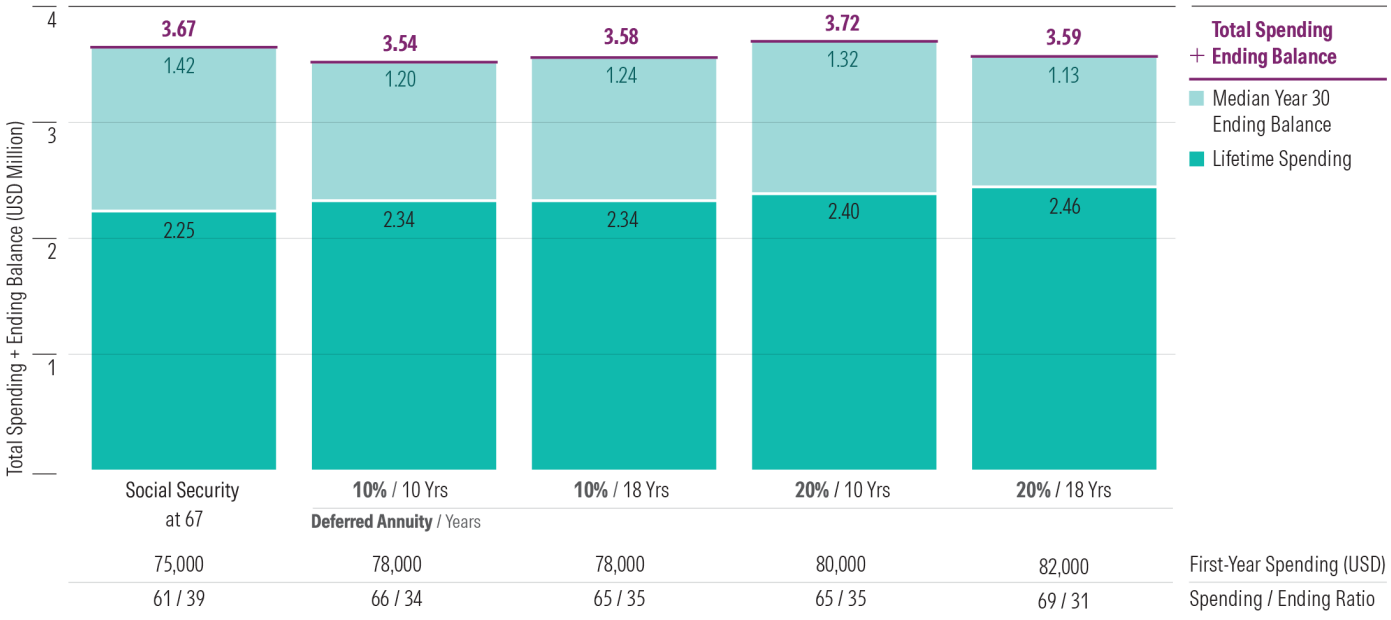
Deferred income annuities begin paying income at a future date, often 10 to 20 years after retirement. The odds of living long enough to collect many payments decrease as the start date moves further out, so the insurer can afford to offer a much larger annual benefit. The longer the delay, the higher the income. For example, a 67-year-old woman who buys a $100,000 deferred annuity with a 3% fixed cost-of-living adjustment in October 2025 and starts payments 10 years later would receive about $13,780 annually beginning in October 2035. That amount would rise to $14,193 in the second year and continue increasing with inflation. If payments don't start until age 85, the first year's payout would more than double to $34,756. Both figures are far higher than the $5,800 annual income from an immediate annuity, though deferred annuities provide income for a shorter period by design.

Because the payouts don't start until a future date, the long-term health of the insurer is arguably a greater risk than it is with immediate income annuities. That makes it important for retirees to assess the financial strength of the insurance company before purchasing a deferred annuity. And inflation is still a risk, even with a cost-of-living-adjustment rider added to the policy. Any cost-of-living adjustments won't start until the payments begin 10 to 20 years after the annuity is purchased. Over that period, inflation will reduce the value of the high payout rates stated above. Using the 2.46% inflation assumption employed throughout this paper, the $34,756 annual payments that would start at age 85 in the example above would be reduced to about $22,470 in today's value. And there's no

guarantee that the future cost-of-living adjustments conferred by the addition of a rider will keep up with actual inflation.

Another drawback of using a deferred annuity is having to take withdrawals from the investment portfolio until it kicks in, which translates into lower median ending balances after 30 years. To illustrate the trade-off, Exhibit 33 shows the results of using 10% and 20% of the starting $1 million portfolio to purchase deferred income annuities that start 10 and 18 years after someone retires at age 67 (the latest a deferred annuity payment can begin is age 85). The remaining portfolio is invested in our base case 40% equity/60% fixed-income portfolio. Lifetime spending is funded by the combination of the starting safe withdrawal rate of 3.9% from the remaining portfolio assets and Social Security until the annuity payouts begin.

Exhibit 33 Base Case Plus Social Security and Deferred Income Annuity, Lifetime Spending and Median Ending Balances (USD Mil)



Source: Morningstar. Data as of Sept. 30, 2025.

Deferred annuities give spending a modest boost compared with just living off the portfolio and Social Security. But there's a trade-off: Because the retiree must tap their portfolio for 10 to 20 years before those annuity payments kick in, the ending balances tend to be lower. Buying the annuities right at retirement also shrinks the starting portfolio, by $100,000 in the 10% case and $200,000 in the 20% case, leaving less money to grow over the next 30 years. And remember, those benefits only show up if the retiree lives long enough to collect them. In short, deferred annuities trade near-term growth potential for longevity protection later on.

Section VI: How to Use This Research

How should investors and their advisors use this research?

Let's start with how they should not use it: as a guide for each year's withdrawals once retirement has commenced. While we've been revisiting this research annually, we're not suggesting that the retiree who followed our 2021 research would take a 3.3% withdrawal in 2022, 3.8% in 2023, 4.0% in 2024, 3.7% in 2025, and 3.9% in the year ahead to reflect each edition's findings. Ratcheting spending up or down in line with Morningstar's latest recommendations is apt to introduce more volatility into retirees' cash flows than they're likely to find acceptable. Rather, our base case assumes that the retiree withdraws a given percentage at the outset of retirement—say, $33,000 on a $1 million portfolio at the beginning of 2022—and then inflation-adjusts that dollar amount or uses some other method to adjust subsequent expenditures thereafter. A $33,000 withdrawal at the beginning of 2022, for example, would be $35,145 at the beginning of 2023, factoring in 6.5% annualized inflation in 2022; $36,340 at the beginning of 2024, incorporating 2023's 3.4% inflation rate; and $37,394 at the start of 2025, incorporating 2024's 2.9% inflation rate.

This research shouldn't be construed as a market call. While it does embed Morningstar's Multi-Asset Research team's capital markets assumptions, the team's forecast is long-term, and we use an even longer, 30-year horizon for our spending simulations. Even though the highest safe spending rate for our base case corresponds with a portfolio with just 30% to 50% in stocks, that's an outgrowth of the very conservative spending system that underpins the base case.

Instead, the research might be the most valuable to investors and their advisors in the following situations.

Use Case 1: As a Temperature Check

Because our research employs forward-looking inputs for stock and bond market returns and inflation, it can help provide a temperature check on how aggressive or conservative retirees might be with their withdrawals in the near future, When our base-case starting safe withdrawal percentage was just 3.3% in late 2021, for example, that was a signal to retirees to be prepared to tap on the brakes with withdrawals; bond yields were ultralow, and equity valuations were high. And indeed, caution on portfolio withdrawals was valuable in 2022 as both the stock and bond markets sold off. Retirees who could get by on less benefited by leaving more assets in place to rebound when stocks and bonds recovered in 2023. Our 2023 research, by contrast, pointed to a more normal starting safe withdrawal

percentage of 4% as sustainable over a 30-year period, thanks in large part to higher fixed-income yields/return prospects and moderating inflation. Our 2024 and 2025 research points to a starting safe withdrawal rate in that same ballpark: Equity valuations aren't inexpensive, but bond yields are a plus for balanced portfolios.

As retirees and their advisors consider more cautious or generous withdrawal percentages, it's also valuable to remember the interplay between actual portfolio values and withdrawal amounts. Balanced stock/bond portfolios dropped by about 17.0% in 2022, so our 3.8% safe withdrawal recommendation in late 2022, while a higher percentage than the year before, corresponded with a lower portfolio balance, and in turn withdrawal amount, for most investors.

Use Case 2: To Depict the Interplay Between Age and Spending

Additionally, the research illustrates how age influences safe spending rates. All else being equal, safe spending rates may increase with age. While our base-case simulation assumes a 30-year spending horizon and therefore is best suited to new, traditional-age retirees, the research can also provide a valuable spending check for people who have been retired for several years or more. While many retirees anchor on the "4% rule," our research shows that older retirees with shorter time horizons can reasonably spend more as they age. As depicted in Exhibit 34, a retiree with a 20-year anticipated time horizon/life expectancy (rather than 30) can reasonably spend more than 5% of a balanced portfolio, with that dollar amount inflation-adjusted thereafter. Meanwhile, the retiree with a 15-year spending horizon could reasonably spend nearly 7% of their portfolio, with that dollar amount inflation-adjusted thereafter. By contrast, early retirees will want to keep caution in mind when calculating a starting safe withdrawal percentage, assuming our "base-case" spending system. For example, in our base case, the highest starting safe withdrawal percentage for a 40-year horizon is just 3.3%.

Exhibit 34 Starting Safe Withdrawal Rate %, by Asset Allocation and Time Horizon, 90% Success Rate

Equity Weighting %	10 Years	15 Years	20 Years	25 Years	30 Years	35 Years	40 Years
100	8.4	5.8	4.6	3.8	3.4	3.2	3.0
90	8.6	6.0	4.7	3.9	3.5	3.2	3.0
80	8.8	6.1	4.9	4.1	3.6	3.3	3.1
70	9.1	6.3	5.0	4.2	3.7	3.4	3.2
60	9.3	6.5	5.2	4.3	3.8	3.4	3.2
50	9.5	6.6	5.3	4.4	3.9	3.5	3.3
40	9.7	6.7	5.3	4.4	3.9	3.5	3.2
30	9.8	6.8	5.3	4.4	3.9	3.5	3.2
20	9.8	6.8	5.3	4.4	3.8	3.4	3.1
10	9.7	6.7	5.2	4.3	3.7	3.3	3.0
0	9.6	6.5	5.0	4.1	3.5	3.0	2.7

Source: Morningstar. Data as of Sept. 30, 2025.

Use Case 3: To Illustrate the Trade-Offs That Accompany Various Spending Strategies and Asset Allocations

Another potential use for this research is to illustrate the trade-offs that accompany various spending strategies, from more rigid, paycheck-equivalent spending strategies like the base case to ones that entail more variability. The findings of this research can help advisors and individual investors home in on the right withdrawal system, given the retiree's preferences on four key variables as follows.

Starting Safe Withdrawal Percentage: Do new retirees have expensive plans for the early years of retirement, for example, heavy travel or providing help to adult children for weddings and home down payments? Every one of the variable strategies that we tested produced a higher starting safe withdrawal rate than the base case. For retirees who want to make sure that they don't short-shrift their standards of living in the early years of retirement, one of those variable strategies will likely be more appealing than the base case of fixed real withdrawals, which is a rigid spending system built for a worst-case scenario.

Lifetime Spending Amounts: All the flexible spending strategies in Section III enlarge lifetime spending relative to the base case, save for the actual spending method. The fact that flexible spending approaches deliver higher lifetime withdrawals is an outgrowth of the fact that such strategies reduce spending following portfolio losses, while most allow for raises following strong gains. For retirees who aim to wring the highest possible cash flow from their portfolios during their lifetimes and are comfortable adjusting spending up or down based on market conditions, pairing a flexible strategy such as guardrails or the RMD approach with an equity-heavy portfolio can help deliver on that aim. It also stands to reason that dynamic strategies will be most agreeable for retirees who have a healthy share of their necessary living expenses coming from nonportfolio sources of income like Social Security and a pension. Periodic portfolio spending adjustments, especially downward ones, won't cut into the household's basic needs.

Cash Flow Consistency: For retirees who prize cash flow consistency that’s similar to their paychecks from work, employing a highly variable withdrawal strategy, especially with an equity-heavy portfolio, likely won't be suitable. A spending strategy like the base case, or a strategy that modestly adjusts spending, such as the actual spending or forgo inflation adjustment methods, will tend to be the best fit.

Bequests: Do retirees wish to maximize consumption during their own lifetimes, including lifetime giving, or is leaving a healthy bequest to family or charity after death an equally important goal? Strategies that limit ongoing portfolio adjustments, especially the base case, will tend to lead to the highest end-of-life balances. That's because the starting safe withdrawal amount, which is adjusted only for inflation thereafter, is modeled around a worst-case scenario that often doesn't materialize.

That said, there are other, more straightforward ways to achieve similar aims. One would be to simply segregate a separate bequest portfolio from the spendable portfolio at the outset of retirement. The retirees could then spend from the remaining portfolio with any approach that suits them. This

approach has a salutary benefit, in that the separate portfolio can be invested with heirs' time horizons in mind rather than the retirees' own, likely shorter, time horizons.

Use Case 4: To Arrive at a Holistic Retirement Income Plan

Finally, portfolio spending is just one piece of the retirement income puzzle. Most retirees will be able to rely on Social Security in addition to their portfolio withdrawals; a smaller subset will be able to rely on a pension. Still, other retirees may wish to generate income from an annuity, working in some fashion, or through real estate rental income. Those types of nonportfolio income sources can go hand in hand with portfolio withdrawals.

Sections IV and V of this paper discuss the interplay between some common nonportfolio income sources—specifically Social Security and annuities—and portfolio cash flows. Delaying Social Security and/or purchasing some type of basic annuity helps enlarge lifetime spending and, importantly, provides a predictability in cash flows that portfolio withdrawals cannot. Moreover, that additional income will cover a retiree for life, providing a valuable longevity hedge for the retiree and spouse. Such strategies can work particularly well alongside a flexible approach to portfolio withdrawals, such as the guardrails strategy. They boost lifetime spending appreciably relative to our "base case," which assumes Social Security filing at age 67, static real portfolio withdrawals, and no annuity purchase.

At the same time, the benefits of these strategies have the potential to shrink the amount of a portfolio that is available for heirs or charity at year 30. That's because delaying Social Security may necessitate higher early-retirement withdrawals, for example, while steering a percentage of the portfolio into an annuity takes a chunk out of the portfolio early on. Both decisions reduce the opportunities for portfolio compounding even as they enlarge lifetime cash flows. For that reason, such strategies tend to be most valuable for retirees who wish to maximize their own consumption, which may include lifetime giving, rather than bequests at the end of life. Delaying Social Security will tend to be particularly attractive for retirees who can rely on nonportfolio income (for example, from continuing to work); that way, the decision to delay has no impact on portfolio spending. Strategies with a higher spending/ending ratio would be most appropriate for a consumption-minded retiree (for example, one with a tight financial plan), whereas those with lower spending/ending ratios are more appropriate for those with a strong bequest motive.

Careful readers will note that the "base case"—taking a fixed real withdrawal rate plus Social Security at age 67—leads to the highest spending plus ending value at the end of 30 years. An important caveat is that it only "wins" because of the median balance left over at year 30; lifetime spending is notably lower than the other strategies, leaving more of the portfolio in place to benefit from compounding for a longer period of time. Such a strategy might be appropriate for the retiree who wishes to play it safe and enhance the odds of leaving a big bequest, but retirees who want to enjoy the highest possible standard of living in retirement will want to explore other strategies.

About Morningstar Portfolio and Planning Research

Morningstar Portfolio and Planning Research provides independent, fundamental analysis on portfolio construction, retirement planning, personal finance, and investment strategy. The analysis seeks to frame the critical choices that investors face in designing and implementing a financial plan and offers practical solutions covering areas such as setting goals, allocating assets, selecting investments, and withdrawing retirement income. The research takes various forms, including articles on Morningstar's flagship research platforms as well as in-depth studies of topics that are particularly relevant to investors seeking to build cohesive portfolios or achieve other financial goals like retirement security.

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