The State of Retirement Income: 2024

To maximize in-retirement income, consider a combination of flexible portfolio withdrawals and delayed Social Security filing.

Contents

Amy C. Arnott
Portfolio Strategist
amy.arnott@morningstar.com

Christine Benz
Director of Personal Finance and
Retirement Planning
christine.benz@morningstar.com

Jason Kephart
Director, Multi-Asset Ratings
jason.kephart@morningstar.com

Tao Guo
Director, Retirement Research
tao.guo@morningstar.com

Key Takeaways

► In-retirement spending strategies typically balance two competing priorities: maximizing the retiree's own consumption or leaving a bequest for loved ones or charity. In this year's research, we introduce a new metric—spending/ending ratio—to help retirees assess how various retirement spending strategies balance those competing priorities. Flexible portfolio-spending strategies, delaying Social Security, and purchasing annuities can all help lift lifetime income while shrinking the amount available as a bequest.

► 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, according to our latest research. While cash flows from the guardrails strategy look volatile on a stand-alone basis, the addition of Social Security income adds valuable stability.

► For people with average or above-average life expectancies, the benefits of delaying Social Security are well acknowledged. However, the benefit of delayed filing is the most pronounced if the retiree can use nonportfolio income, such as a part-time job or rental income, to provide cash flows until Social Security benefits begin. If higher early portfolio withdrawals are the retiree's only source of cash flow until Social Security commences, that reduces the benefits of delayed filing because it leaves less of the portfolio in place to compound over the 30-year horizon.

► 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.

► 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. Morningstar's 2024 research suggests that 3.7% is the highest safe starting withdrawal rate for retirees spending from an investment portfolio (assuming a 90% probability of having funds remaining at the end of an assumed 30-year retirement period).

▶ Our "base case" safe withdrawal rate is down slightly from the starting safe withdrawal percentage of 4.0% we estimated in last year's report. (The highest starting safe withdrawal rate for a 30-year horizon with a 90% probability of success was 3.3% in 2021 and 3.8% in 2022.)

▶ The decrease in the withdrawal percentage compared with 2023 owes largely to higher equity valuations and lower fixed-income yields, which result in lower return assumptions for stocks, bonds, and cash over the next 30 years.

▶ As in 2023, the highest starting safe withdrawal percentage for a 30-year time horizon comes from portfolios that hold between 20% and 50% in equities and the remainder in bonds and cash.

▶ One simple approach for achieving a higher withdrawal rate is to build a ladder of Treasury Inflation-Protected Securities. Doing so provided a 4.4% withdrawal rate, with a 100% probability of success, at the time of this paper's publication. However, using that strategy also liquidates the portfolio by Year 30, under all conditions.

▶ Based on studies of actual spending during retirement, retirees often decrease their inflation-adjusted spending over time, a pattern that can also lead to considerably higher safe withdrawal rates. Incorporating actual spending patterns over retirees' lifecycles leads to a safe starting withdrawal percentage of 4.8%, assuming a 30-year horizon and a 90% probability of success.

▶ The right level of flexibility in a retiree's spending system will depend on the individual's situation, including the extent to which fixed expenses are covered by nonportfolio income sources.

Exhibit 1 depicts some of the study's key findings, showing the interplay between lifetime spending, the median balance left over after 30 years, the combined amount of lifetime spending and ending balances, and the ratio between lifetime spending and ending balances. For this exercise, discussed in depth in Section III, the starting portfolio balance is USD 1 million, and we assume a USD 36,000 Social Security benefit at age 67. Our base case scenario is on the top line; it assumes a 3.7% fixed real withdrawal (for example, a USD 37,000 initial withdrawal, with a 2.3% annual inflation adjustment thereafter) combined with Social Security filing (USD 36,000) at age 67, also adjusted by 2.3% annually. (In reality, Social Security payments depend on an individual's own earnings, and future adjustments are linked to the Consumer Price Index.)

Because our base case assumes fixed real spending, and such static spending strategies are geared toward a worst-case scenario, this approach leaves more in the portfolio to compound and leads to the highest ending balance at Year 30. Meanwhile, strategies such as delaying Social Security or purchasing an annuity help enlarge lifetime spending at the expense of Year 30 balances.

Exhibit 1 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)	73,000	2.19	1.33	3.52	62/38
Social Security at 62	63,000	1.89	1.25	3.14	60/40
Social Security at 70 w/o Bridge	77,000	2.31	1.15	3.46	67/33
Social Security at 70 w/ Bridge	82,000	2.46	1.30	3.76	65/35
Guardrails and Social Security at 67	87,000	2.40	0.62	3.02	80/20
TIPS Ladder and Social Security	80,000	2.40	0.00	2.40	100/0
Immediate Annuity					
10% and Social Security	74,000	2.22	1.17	3.39	66/34
30% and Social Security	75,000	2.25	0.95	3.20	70/30
50% and Social Security	76,000	2.28	0.73	3.01	76/24
Deferred Annuity					
10%, 18 Yrs and Social Security	79,000	2.37	1.03	3.40	70/30
20%, 18 Yrs and Social Security	84,000	2.52	0.80	3.32	76/24

Source: Morningstar. Data as of Sept. 30, 2024.

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 from 1926 through 1993 ranged from 3.9% for the worst 30-year period to 11.4% 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 mid- to late 1929. Meanwhile, the mid-1982 retiree had the highest starting safe withdrawal rate— 11.4%—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)
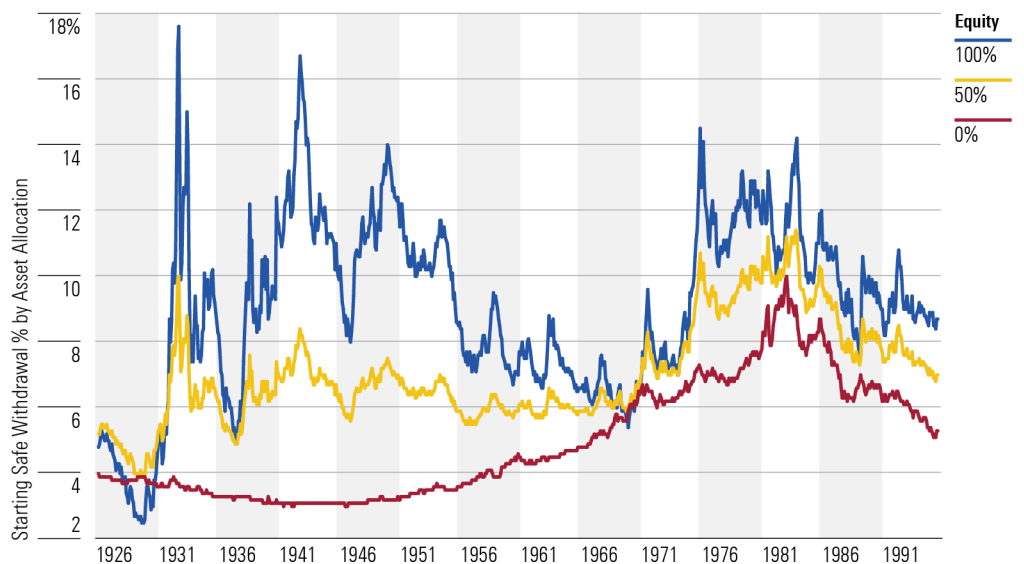
| Safe Withdrawal Rate	Best	Worst	Average
100% Equity	17.60	2.50	9.09
50% Equity	11.40	3.90	7.08
0% Equity	10.00	3.00	4.94

Source: Morningstar. Data as of Sept. 30, 2024.

In general, portfolios with higher equity asset allocations delivered superior returns and, in turn, 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 17.6% for the 30-year period beginning in July 1932. But the lowest safe withdrawal percentage 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 2.5% starting withdrawal percentage for the portfolio to last over a 30-year horizon. In general, balanced asset allocations have 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 in many environments were nearly as high as the all-stock portfolio's.

Looking Forward

Of course, at the outset of retirement, it's impossible to know what starting withdrawal percentage will be safe over the ensuing 30-year period. However, factoring in current conditions can help retirees determine if their starting percentages ought to be higher or lower. To provide withdrawal-rate guidance that considers current yields, valuations, and inflation, we turned to our colleagues in Morningstar Investment Management for forecasts on those variables. Like many investment-research groups, the MIM 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 MIM's assumptions.

Exhibit 3 Projected 30-Year Asset-Class Return % and Inflation % Assumptions, 2024 vs. 2023
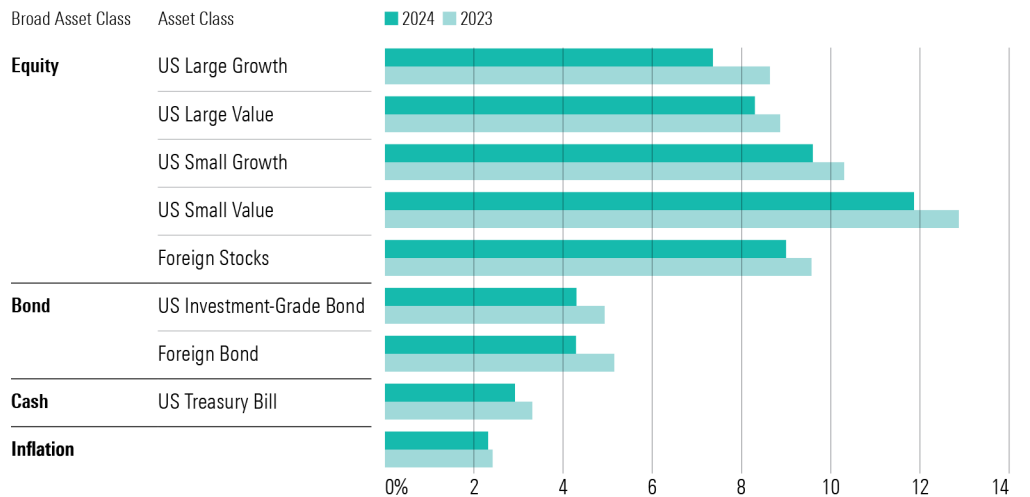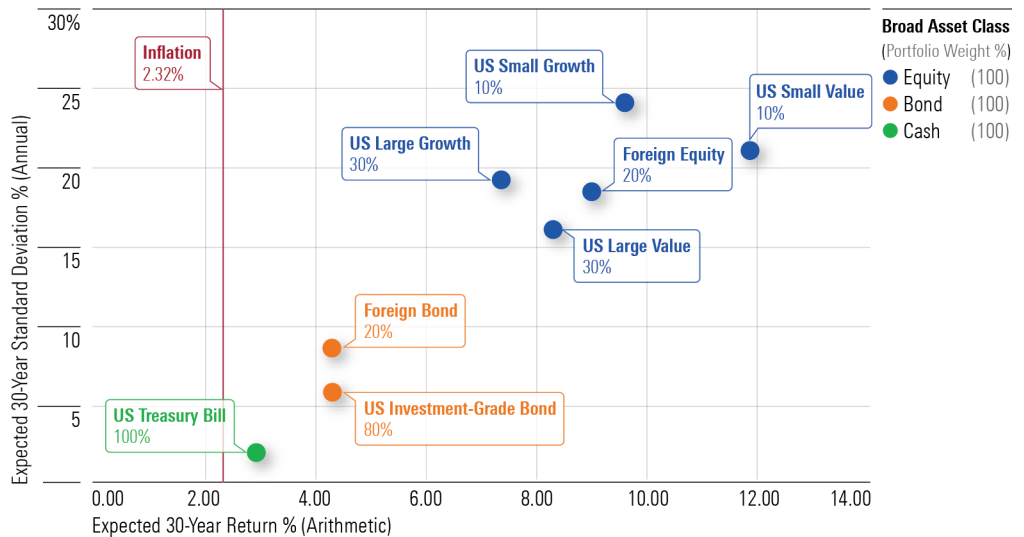

Source: Morningstar. Data as of Sept. 30, 2024.

The capital markets assumptions (which are expressed as arithmetic means) employed in this paper have changed modestly since 2023. While the 30-year inflation forecast has dropped to 2.32% from 2.42%, lower return expectations for stocks, bonds, and cash — a function of higher equity valuations and lower yields — more than offset the positive direction of the inflation forecast. That explains the reduction in the starting safe withdrawal percentage for our base case from 4% in 2023 to 3.7% today.

Now for the details. All portfolios are formed with varying combinations of stocks and bonds, in 10% increments. That is, the most aggressive portfolio consists of 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 consists of 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 consists of 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.
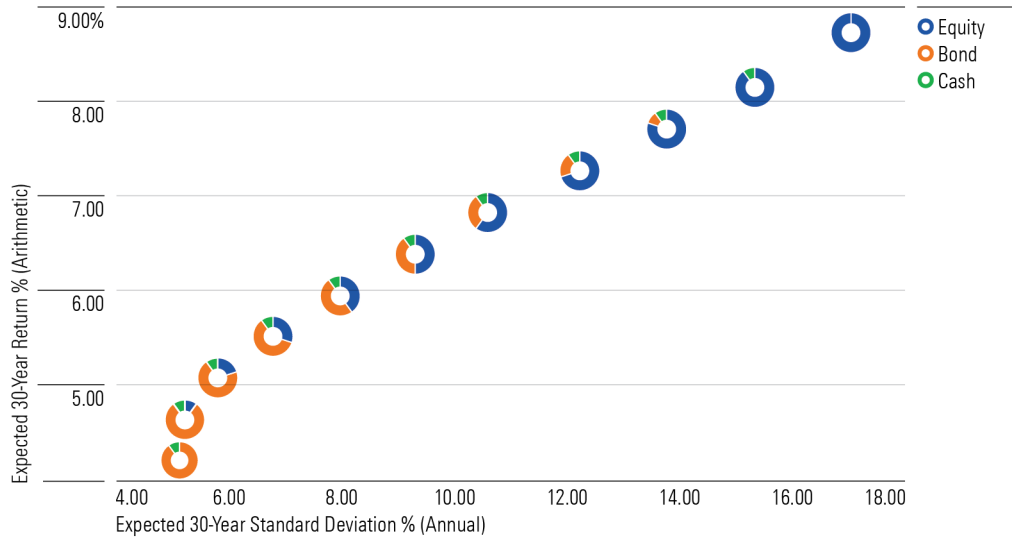
Exhibit 4 Projected 30-Year Asset-Class Return % and Standard Deviation %

Source: Morningstar. Data as of Sept. 30, 2024.

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 %

Source: Morningstar. Data as of Sept. 30, 2024.

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 funded the specified spending amounts, throughout the 30-year period.

In addition, we assumed the following:

▶ A total return approach to cash flow sourcing: 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 II): The annual portfolio withdrawals are adjusted for inflation to maintain a constant real income. That is, assuming a USD 1 million initial investment, a 3.7% initial withdrawal

rate, and a 2.32% inflation rate, the retiree would withdraw USD 37,000 from the portfolio in Year 1, USD 37,858 in Year 2, USD 38,737 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 at least 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 a portfolio spends its last dollar during Year 30 to meet its withdrawal, with not a penny remaining, 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.

The Findings
The starting safe withdrawal rate for a balanced portfolio over a 30-year time horizon was slightly lower than our finding in the 2023 research: 3.7% for portfolios with between 20% and 50% in equities. (In our 2023 research, we arrived at a 4% starting safe withdrawal rate for the 40% equity/60% bond portfolio and 3.9% for the 50% stock/50% bond portfolio.) As in 2023, the highest safe withdrawal rate corresponded with light equity allocations—20% to 50% in this year's research and 20% to 40% in 2023.

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	8.1	5.6	4.3	3.6	3.1	2.9	2.7
90	8.4	5.8	4.5	3.7	3.2	3.0	2.8
80	8.6	5.9	4.7	3.8	3.4	3.1	2.9
70	8.9	6.1	4.8	4.0	3.5	3.2	2.9
60	9.2	6.3	5.0	4.1	3.6	3.3	3.0
50	9.4	6.5	5.1	4.2	3.7	3.3	3.1
40	9.5	6.6	5.2	4.3	3.7	3.4	3.1
30	9.7	6.7	5.2	4.3	3.7	3.4	3.1
20	9.7	6.7	5.2	4.3	3.7	3.3	3.0
10	9.7	6.6	5.1	4.2	3.6	3.2	2.9
0	9.5	6.5	4.9	4.0	3.4	3.0	2.7

Source: Morningstar. Data as of Sept. 30, 2024.

Why the Asset Allocation Is Conservative

The highest available starting safe withdrawal rate in Morningstar's model, 3.7%, came from portfolios with modest equity weightings of between 20% and 50%. This result underscores that point that the model's "base case" is conservatively generated in three key ways. It employs conservative equity-return assumptions relative to market history, it takes a conservative approach to spending, and it targets a high success rate of 90%. All those attributes tilt the model toward conservative investments that generate the bulk of their cash flows from income distributions rather than equities, which have higher return potential but also higher volatility.

Moreover, 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 20% 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
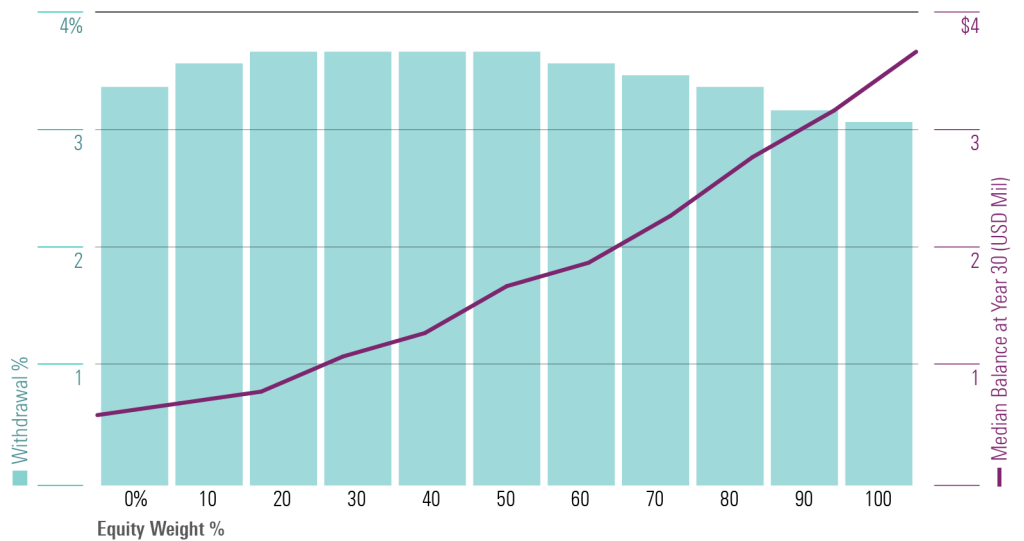
Source: Morningstar. Data as of Sept. 30, 2024.

Adjusting Return Assumptions

The highest safe withdrawal rates for our base case over most time horizons correspond with light to balanced equity weightings. That's because, as noted above, our base case simulation employs conservative return assumptions, especially for stocks. Employing return assumptions in line with historical norms, rather than assuming some reversion to the mean for US growth stocks over the next two decades as MIM's return forecasts do, enlarges starting withdrawal percentages. For example,

using the same type of Monte Carlo simulations based on long-term historical returns for each asset class, rather than MIM's forward-looking projections, increases the starting safe withdrawal rate to 5.5% for a 50% stock/50% bond portfolio and 5.7% for a 60% stock/40% bond mix. 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 correspond with the highest equity allocations.

Exhibit 8 Historical Safe Withdrawal Rate %, Using Actual Asset-Class Returns Based on 1926-2023 Data
(30-Year Time Horizon, 90% Success Rate)

Equity Weighting %	Withdrawal Rate %
100	5.9
90	5.9
80	5.9
70	5.9
60	5.7
50	5.5
40	5.2
30	4.8
20	4.4
10	3.8
0	3.2
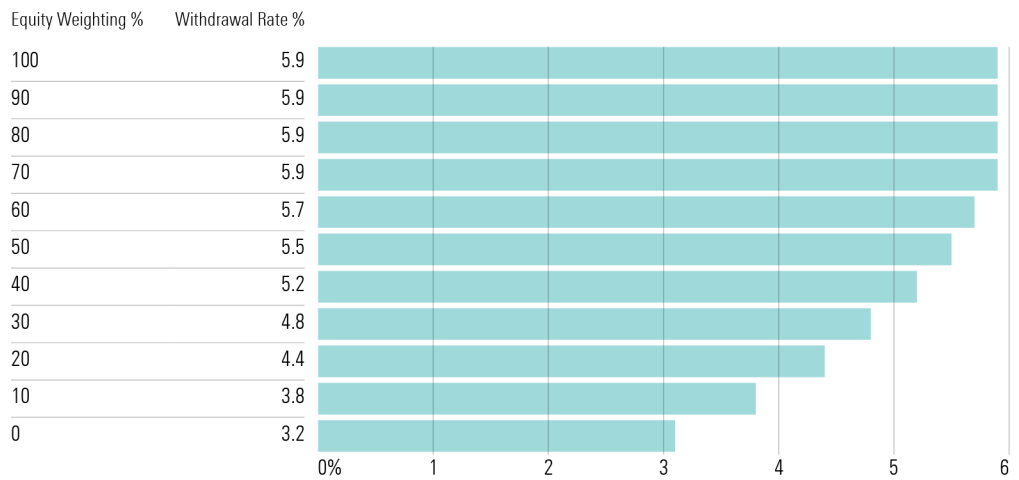
Source: Morningstar. Data as of Sept. 30, 2024.

Adjusting Spending Patterns

In addition to employing conservative return assumptions, our research also adopts a conservative 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 in the middle to later years of retirement, for example—a pattern depicted in retirement researcher David Blanchett's survey 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 II. Using spending patterns that match empirical data allows for a starting safe withdrawal rate of 4.8%, the second-highest of any method we tested.

---

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

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

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 that 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 withdrawal percentages significantly. Correspondingly, reducing the target success rate by even 5 or 10 percentage points—to 85% or 80%— has meaningful implications for starting 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	5.8	5.2	4.7	4.0	3.6	3.1	0.8
90	5.6	5.1	4.6	4.1	3.7	3.2	1.0
80	5.5	5.1	4.6	4.2	3.8	3.4	1.2
70	5.4	5.0	4.7	4.2	3.9	3.5	1.5
60	5.3	4.9	4.6	4.2	3.9	3.6	1.7
50	5.1	4.8	4.6	4.2	4.0	3.7	2.0
40	5.0	4.7	4.5	4.2	4.0	3.7	2.2
30	4.8	4.6	4.4	4.1	4.0	3.7	2.4
20	4.6	4.4	4.2	4.0	3.9	3.7	2.6
10	4.4	4.2	4.1	3.9	3.8	3.6	2.6
0	4.1	4.0	3.8	3.7	3.6	3.4	2.4

Source: Morningstar. Data as of Sept. 30, 2024.

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 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 withdrawal percentage—as long as they are prepared to make downward adjustments in weak market environments. Systems that tether portfolio withdrawals to portfolio performance—and the implications for starting and lifetime withdrawals, residual balances in Year 30, and cash flow volatility—are the subject of Section II of this paper.

---

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: 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 withdrawals at 3.7% 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 compose 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 withdrawal is too low and the portfolio outperforms

expectations, the retiree will leave behind a large sum, which may not be a 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 10 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.

Exhibit 10 Key Findings (Based on 40% Equity/60% Fixed-Income Portfolio Over a 30-Year Period, 90% Success Rate)
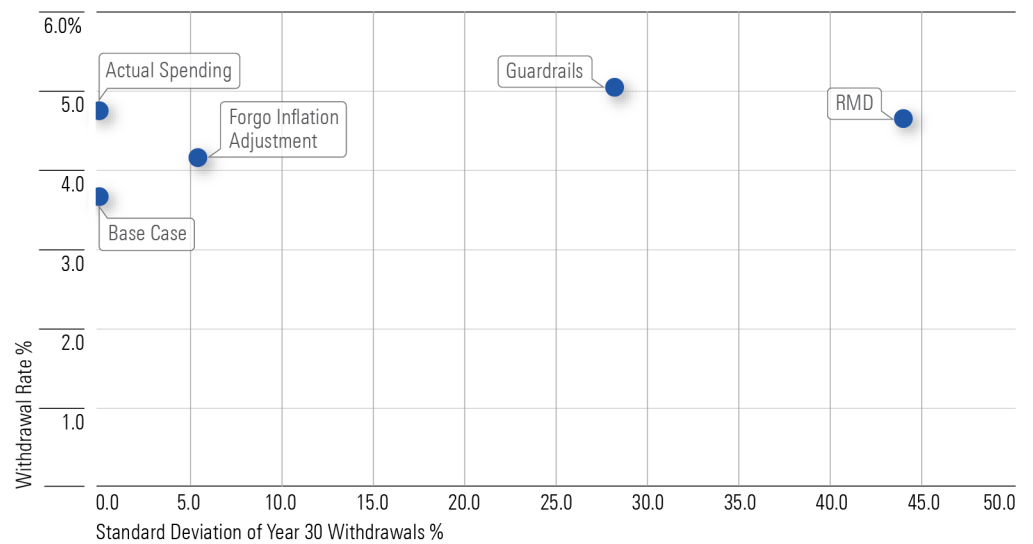
Source: Morningstar. Data as of Sept. 30, 2024.

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 four 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 withdrawal percentage is 4% of USD 1 million, or USD 40,000. If the portfolio increases to USD 1.4 million at the beginning of Year 2, the retiree could automatically take USD 40,000 plus an inflation adjustment — USD 40,928, based on a 2.32% inflation rate. Dividing that amount by the current balance — USD 1.4 million — tests for the percentage. The amount of USD 40,928 is just 2.9% of USD 1.4 million. As that 2.9% figure is 28% less than the starting percentage of 4%, the retiree qualifies for an upward adjustment of 10%. The new withdrawal amount becomes USD 45,021 — the scheduled amount of USD 40,928 plus the additional 10% of USD 4,093.

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% (USD 40,000) of the USD 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 USD 672,000 at the beginning of Year 2. The Year 2 withdrawal would be USD 40,928 on a pretest basis. But because USD 40,928 from USD 672,000 is a 6.1% withdrawal rate — far above the initial 4% — the retiree would need to reduce the scheduled USD 40,928 amount by 10%, to USD 36,835.

The Guyton-Klinger method scraps the cutback rules (following portfolio declines) during the final 15 years of retirement, in acknowledgement 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. In last year's study, we incorporated research from the Employee Benefit Research Institute[4] demonstrating 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. We adjusted the annual spending numbers to match up with these longer-term declines, assuming real retirement spending declined by 1.9 percentage points per year between age 65 and 75; 1.5 percentage points per year between 75 and 85; and 1.8 percentage points per year between 85 and 95.

This year, 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.[5]

Assessing Variable Withdrawal Strategies
For each strategy, we used stochastic (Monte Carlo) modeling to test how successful withdrawal systems—meaning that a given system ensured that 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 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 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 USD 1 million balance in Year 1 of retirement and calculate the median lifetime withdrawal amount by totaling the annual withdrawals (discounted by the 2.32% inflation rate) for the 1,000 simulated trials.

4 Banerjee, S. "Expenditure Patterns of Older Americans, 2001–2009," EBRI Issue Brief, No. 368, February 2012.
5 Banerjee, S. "Decoding Retiree Spending," T. Rowe Price Insights on Retirement, March 2021.

Median Balance at Year 30: What is the median portfolio balance that remains at the end of the 30-year period, assuming a USD 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.
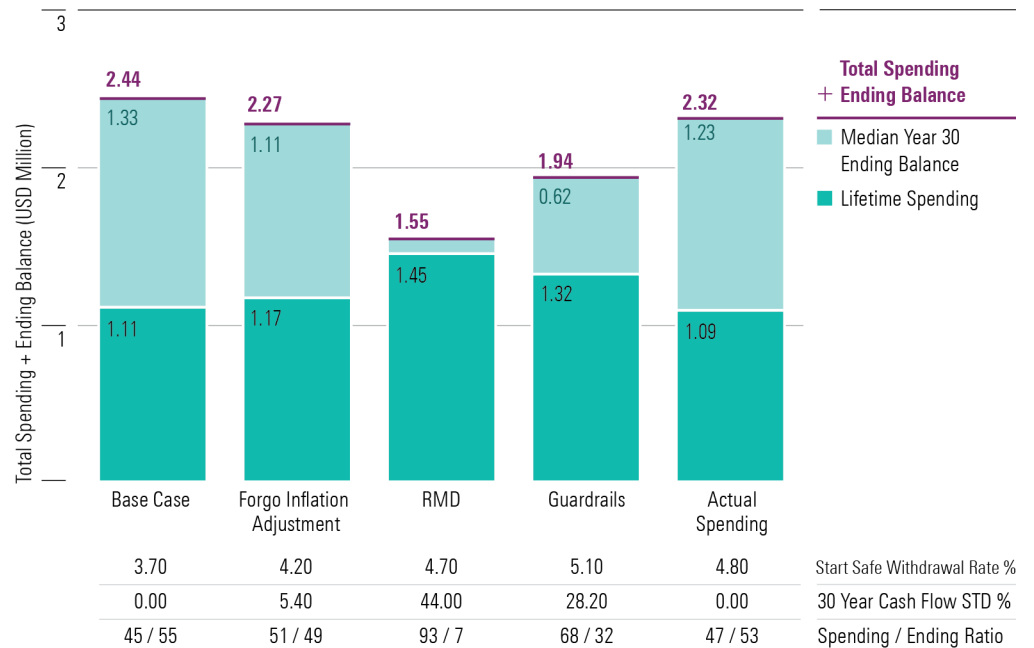
Total Spending + Ending Balance: This is the sum of the median lifetime spending amount and the median balance after 30 years.

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 in order 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 11 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 11   Spending Methods Summary, 40% Equity/60% Bond Portfolio, 30 Years, and 90% Success Rates

|	Base Case	Forgo Inflation Adjustment	RMD	Guardrails	Actual Spending	
	3.70	4.20	4.70	5.10	4.80	Start Safe Withdrawal Rate %
	0.00	5.40	44.00	28.20	0.00	30 Year Cash Flow STD %
	45 / 55	51 / 49	93 / 7	68 / 32	47 / 53	Spending / Ending Ratio

Source: Morningstar. Data as of Sept. 30, 2024.

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 12. The guardrails method supports the highest starting safe withdrawal rates across most asset allocations. This reflects the nature of the approach, 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 guardrails method was highest for portfolios with equity allocations of 50% or 60%. For the other methods, starting safe withdrawal rates are generally highest with equity allocations ranging from 20%-50% and tended to be lowest in less-diversified allocations like 100% stocks.

Exhibit 12 30-Year Starting Safe Withdrawal Rate % by Withdrawal Method and Asset Allocation, 90% Success Rate
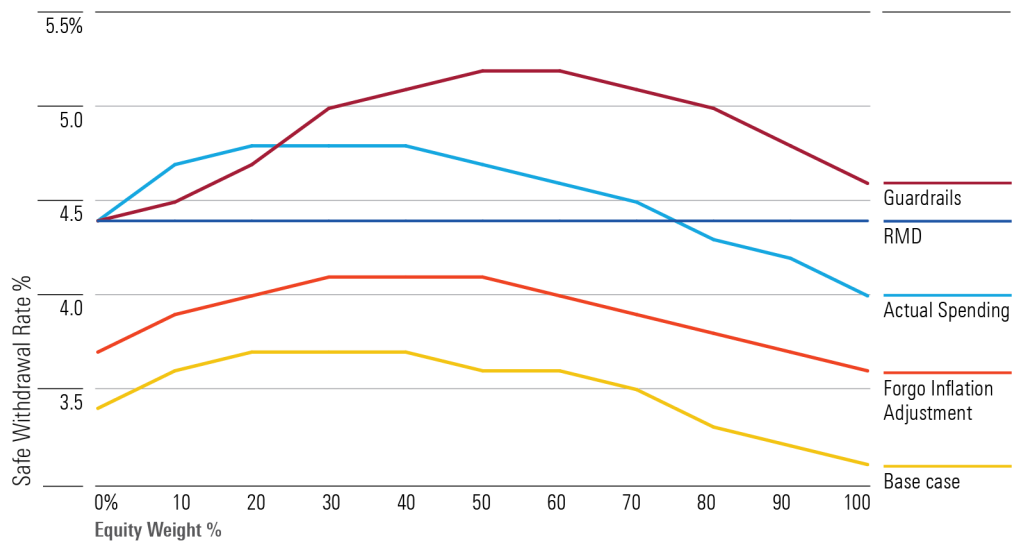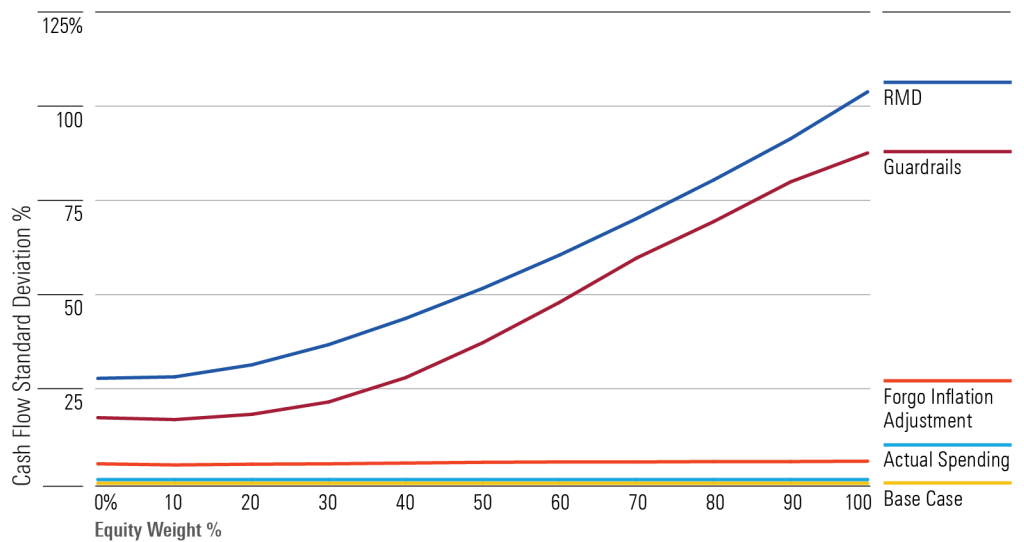

Source: Morningstar. Data as of Sept. 30, 2024.

Year 30 Cash Flow Standard Deviation

With this measure, the trade-offs demanded by the RMD and guardrails methods become apparent. Both approaches have far greater variability in their annual withdrawal amounts. Such unpredictability is a natural byproduct of their rules, which can dictate higher or lower spending under certain circumstances. 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 13 Year 30 Cash Flow Standard Deviation % by Withdrawal Method and Asset Allocation, 90% Success Rate
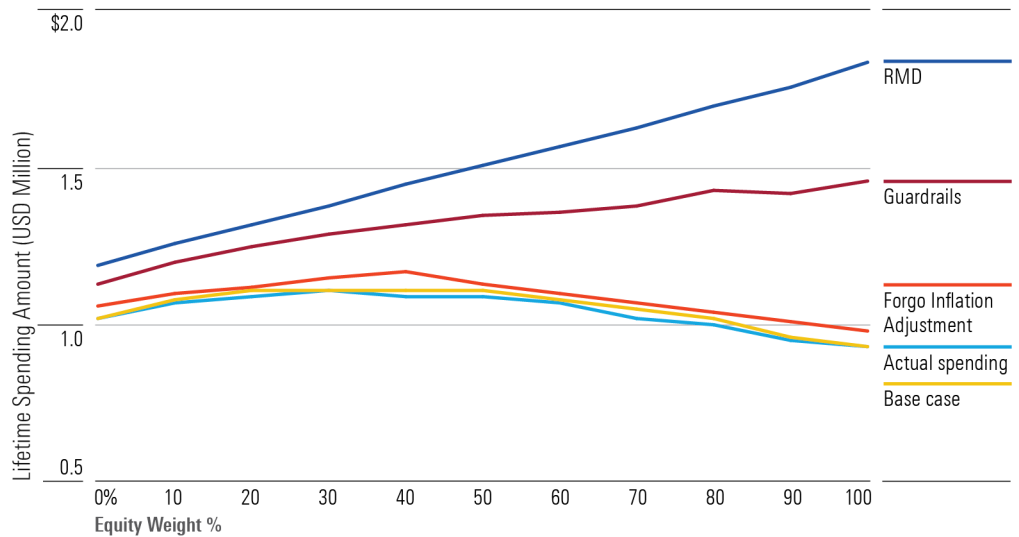

Source: Morningstar. Data as of Sept. 30, 2024.

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 guardrails and RMD methods support 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 under the guardrails and RMD 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. That's because it assumes a decline in real spending over the retirement life cycle.

Exhibit 14 30-Year Lifetime Spending Amount (USD Mil) by Withdrawal Method and Asset Allocation, 90% Success Rate, USD 1 Million Starting Portfolio
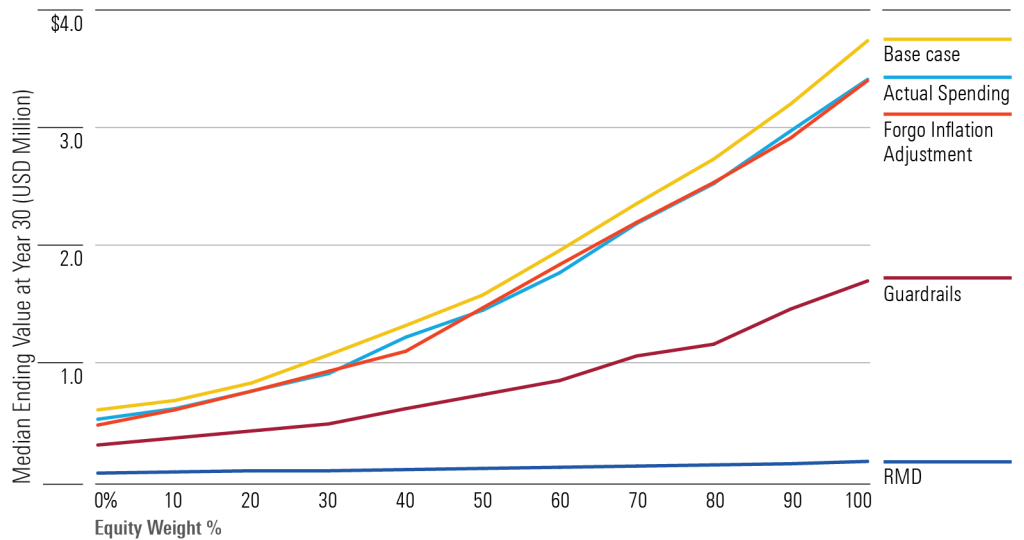

Source: Morningstar. Data as of Sept. 30, 2024.

Median Ending Balance at Year 30

The base case of taking fixed real withdrawals creates some of 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 the other withdrawal methods, the forgo inflation and actual spending 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 guardrails approach splits the difference between a more aggressive, freer-spending method like RMD and thriftier methods that curtail, but never increase, spending.

Exhibit 15 Median Ending Balance at Year 30 (USD Mil) by Withdrawal Method and Asset Allocation, 90% Success Rate

Source: Morningstar. Data as of Sept. 30, 2024.

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 and RMD strategies generally lead to lower combined lifetime spending plus ending balances 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 16 Total Spending + Ending Balance by Withdrawal Method and Asset Allocation, 90% Success Rate
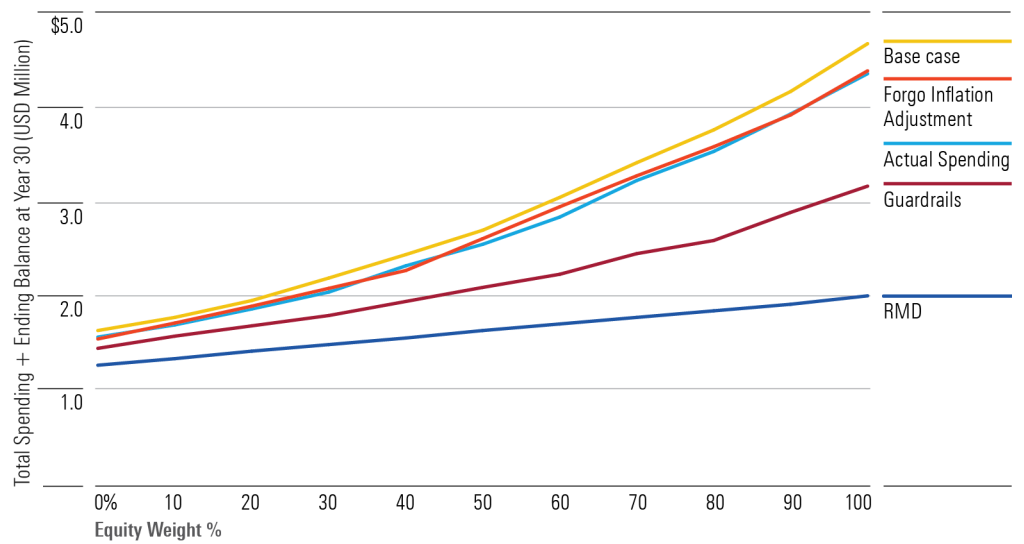
Source: Morningstar. Data as of Sept. 30, 2024.

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. While the guardrails approach is well suited to retirees who want to maximize their own lifetime spending, retirees employing equity-heavy or even balanced portfolios along with the guardrails strategy also have the potential for significant leftover assets at Year 30.

Exhibit 17 Spending/Ending Ratio by Withdrawal Method and Asset Allocation, 90% Success Rate

Equity Weighting %	Base case	Forgo inflation adjustment	RMD	Guardrails	Actual spending
100	20 / 80	22 / 78	92 / 8	46 / 54	21 / 79
90	23 / 77	26 / 74	92 / 8	49 / 51	24 / 76
80	27 / 73	29 / 71	92 / 8	55 / 45	28 / 72
70	31 / 69	33 / 67	92 / 8	56 / 44	32 / 68
60	35 / 65	37 / 63	93 / 7	61 / 39	38 / 62
50	41 / 59	43 / 57	93 / 7	65 / 35	43 / 57
40	45 / 55	51 / 49	93 / 7	68 / 32	47 / 53
30	51 / 49	55 / 45	94 / 6	72 / 28	55 / 45
20	57 / 43	59 / 41	94 / 6	74 / 26	59 / 41
10	61 / 39	64 / 36	94 / 6	76 / 24	63 / 37
0	62 / 38	69 / 31	95 / 5	79 / 21	66 / 34

Source: Morningstar. Data as of Sept. 30, 2024.

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 18   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 ▶ 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 lower than most other methods	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 the highest starting safe withdrawal rates across most allocations ▶ Lifetime withdrawal rates are also substantially higher than other methods	▶ More complicated than other methods ▶ Results in far higher cash flow volatility than most other methods ▶ 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 second-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

Source: Morningstar. Data as of Sept. 30, 2024.

The guardrails system—flexible withdrawals with parameters, or guardrails, that prevent withdrawals from being either too high or too low—does the best 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 III: The Role of Guaranteed Lifetime Income

Sections I and II consider portfolio spending strategies without consideration of nonportfolio retirement income. That's to be consistent with previous versions of this paper, as well as with other research on the topic of retirement spending. However, almost all retirees receive at least some type of nonportfolio lifetime income, often Social Security, and in many cases that income is their largest source of cash flows in retirement. This section discusses how those sources of income might be combined with portfolio-based strategies to increase lifetime spending rates.

Retirees may obtain guaranteed lifetime income through Social Security, pensions, or insurance contracts. Opportunities for guaranteed lifetime income through investments are limited, but Treasury Inflation-Protected Securities, which promise inflation-adjusted interest payments that are backed by the full faith and credit of the US government, come as close to fitting the description of a guaranteed income source as any investment product.

In this section, we assess the interplay between portfolio spending (discussed in Sections I and II) and strategies involving guaranteed income from Social Security, Treasury Inflation-Protected Securities, and annuities. The goal is to ascertain which combination of strategies helps deliver the highest combined lifetime payout and median ending balance (any leftover balances at the end of 30 years).

Exhibit 19 depicts this section's key findings for strategies that include guaranteed income. These strategies start with the same USD 1 million 40% equity/60% bond portfolio used throughout the paper and assume the retiree claimed Social Security at age 67, when they receive a hypothetical full benefit of USD 36,000 a year that is adjusted annually for inflation at a rate of 2.3%. (Actual Social Security income at age 67 will vary based on an individual's earnings history, and future inflation increases will be linked to CPI.) We also replace the starting safe withdrawal rate with the first-year spending amount to better reflect the impact of the guaranteed income.

Needless to say, including Social Security and other forms of guaranteed income alongside the base case spending system with a 40% equity and 60% fixed-income portfolio raises the amount of lifetime spending. It can also make dynamic withdrawal strategies, like the guardrails approach outlined in Section II, more efficient. The trade-off of allocating a portion of the portfolio to guaranteed income is generally lower median ending balances. For retirees who prefer maximizing lifetime spending over leaving behind large bequests, these strategies may be more appealing. But retirees who don't live at

least as long as the full 30 years the strategies were measured won't benefit as much from guaranteed income.

Exhibit 19 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)	73,000	2.19	1.33	3.52	62/38
Social Security at 62	63,000	1.89	1.25	3.14	60/40
Social Security at 70 w/o Bridge	77,000	2.31	1.15	3.46	67/33
Social Security at 70 w/ Bridge	82,000	2.46	1.30	3.76	65/35
Guardrails and Social Security at 67	87,000	2.40	0.62	3.02	80/20
TIPS Ladder and Social Security	80,000	2.40	0.00	2.40	100/0
Immediate Annuity					
10% and Social Security	74,000	2.22	1.17	3.39	66/34
30% and Social Security	75,000	2.25	0.95	3.20	70/30
50% and Social Security	76,000	2.28	0.73	3.01	76/24
Deferred Annuity					
10%, 18 Yrs and Social Security	79,000	2.37	1.03	3.40	70/30
20%, 18 Yrs and Social Security	84,000	2.52	0.80	3.32	76/24

Source: Morningstar. Data as of Sept. 30, 2024.

Social Security

Retirees who live in the US may receive guaranteed income through Social Security payments, through a traditional defined-benefit program, or both. This section will address only Social Security, as most prospective retirees, especially those who had careers in the private sector, will not be retiring with pensions.

The US Social Security Administration encourages retirees to postpone the date at which they claim their benefits. Not only does the administration penalize retirees who file before the official "full" retirement age (currently 67 for people born in 1960 and after), but it rewards those who delay by substantially increasing their benefits. The chart below shows the current benefit-payment schedule.

Exhibit 20 Social Security Benefit % by Claiming Age, Birth Year 1960 or Later

Age	Percentage
62	70
63	75
64	80
65	87
66	93
67	100
68	108
69	116
70	124
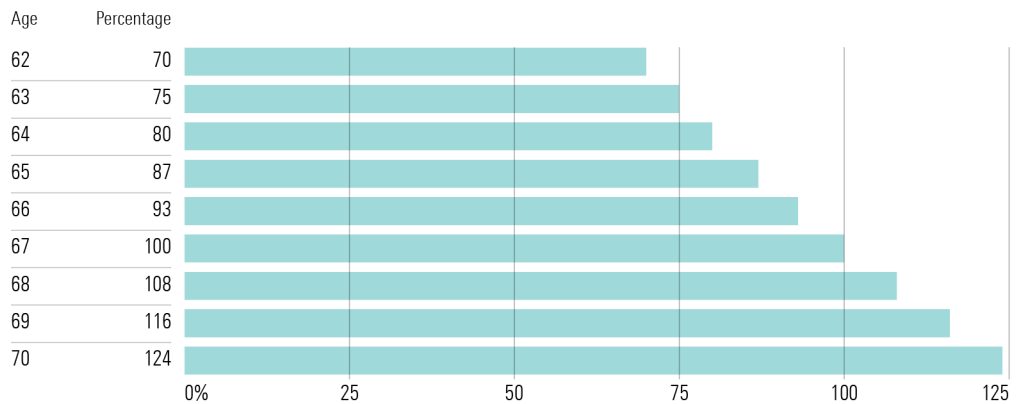
Source: Morningstar. Data as of Sept. 30, 2024.

Those who file early for Social Security enjoy an initial advantage because they receive income while others do not. However, the payment schedule's increase is aggressive enough to overcome that gap, for those with average-or-longer lifespans. For example, by the time retirees reach age 79, those who filed for Social Security at their full benefit age of 67 will have collected more money than those who started at age 62.

Postponing filing until age 70 means retirees must wait until they are 84 to collect more than those who started at age 67. That said, retirees who view Social Security primarily as insurance against the possibility of outliving one's money, rather than as an investment opportunity, will probably decide to wait. After all, the longer that retirees postpone their claim, the higher their payout, should they have an extended lifespan. The benefit of delaying can also be important for married couples, in that a younger, lower-earning spouse will be able to take the higher-earning spouse's larger benefit as their own benefit if the higher-earning spouse dies first.

Those who retire at age 67 but still wish to delay claiming Social Security until age 70 may need to take withdrawals from their portfolio to bridge the three-year gap between when they stop working and start getting their benefits. In this section, we look at how that could affect the overall benefit of delaying as

well as how delaying without using the portfolio as a bridging strategy (for example, continuing to use income from work) maximizes lifetime spending.

There are times when retirees will not wish to delay filing for Social Security—most commonly, if the retiree needs the money immediately. In that instance, Social Security payments are not part of a broader retirement-spending strategy but are instead essential for paying for basic living expenses. Such investors cannot afford delay. Another consideration is if the retiree has unusually poor health, in which case it's usually wiser to collect the bird at hand rather than wait for the two in the bush.

To assess the synergies between Social Security filing and lifetime spending, we added Social Security to the base case scenario used throughout the paper. For each of these scenarios, we assumed a USD 1 million starting 40% equity/60% bond portfolio and a 30-year time horizon. We used the starting safe withdrawal rate of 3.7% for portfolio withdrawals. Our baseline further assumed the Social Security starting amount at age 67 was USD 36,000 a year and USD 44,640 for people who delay filing until age 70. We assumed an inflation adjustment in line with Morningstar Investment Management's assumption that we embedded throughout the paper: 2.32%. In practice, inflation adjustments to Social Security benefits will track actual changes in the inflation rate.

Exhibit 21 Base Case Lifetime Spending and Ending Balance by Social Security Claiming Age

	Social Security at 67 (Base Case)	Social Security at 62	Social Security at 70 w/o Bridge	Social Security at 70 w/ Bridge	
First-Year Spending (USD)	73,000	63,000	77,000	82,000	
Spending / Ending Ratio	62 / 38	60 / 40	67 / 33	65 / 35	

Source: Morningstar. Data as of Sept. 30, 2024.

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 both leads to first-year spending of about USD 82,000 (USD 37,000 from portfolio withdrawal plus the USD 44,640 from Social Security), up from USD 73,000 for those that 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.

Someone could work until age 70 or choose to retire at age 67 and delay claiming their benefit and withdrawing from the portfolio, but they would need some other form of income for three years (typically referred to as a *bridge strategy*). That could potentially come from a younger spouse who is still working or income from a nonportfolio source like a rental property.

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 USD 73,000 in total income the first year of retirement (the USD 36,000 from Social Security plus the USD 37,000 withdrawn from the USD 1 million investment portfolio in Year 1). To match that, the retiree delaying Social Security would have to withdraw the full USD 73,000 from the investment portfolio for the first year. Adjusted for inflation, the withdrawal becomes USD 74,693 in Year 2 and USD 76,426 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 USD 100,000 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 USD 25,200 in the first year, assuming the baseline amount available at 67 is USD 36,000. Over 30 years, that lower starting point results in the lowest lifetime spending and median ending balances of the four 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 2.3% inflation rate assumed in our research, the benefit of delaying Social Security and in turn enlarging eventual payments would be even greater.
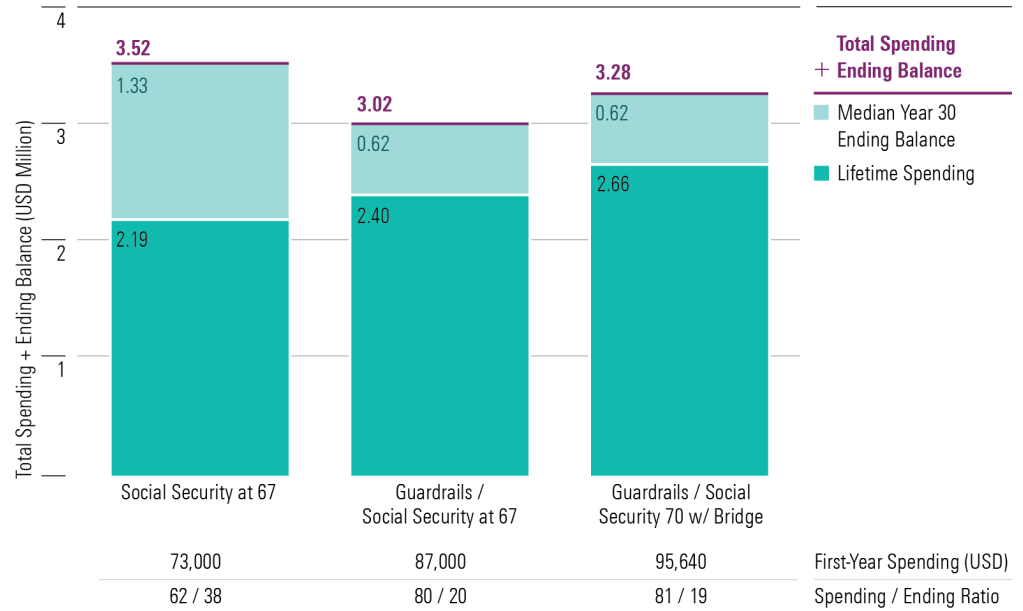
Guardrails With Social Security

In Section II of this paper, we explored a series of dynamic spending strategies. The guardrails strategy had the highest starting safe withdrawal rate (5.1% for a 40% equity/60% bond portfolio), 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 USD 36,000 starting benefit from the previous examples, the strategy becomes more resilient during periods of portfolio losses.

To build on the previous guardrails example of a 4% withdrawal rate for a USD 1 million portfolio with 40% equities and 60% bonds: A retiree using the guardrails strategy and taking Social Security would have USD 76,000 of total income in Year 1. That consists of USD 40,000—the 4% starting withdrawal amount that corresponds with the guardrails approach—plus the USD 36,000 from Social Security. An unlucky retiree could see their portfolio plummet 30%, leaving USD 672,000 at the start of Year 2. The portfolio withdrawal in Year 2 would be USD 40,920 using the 2.32% inflation adjustment, but that would translate into 6.1% of the remaining portfolio, so a 10% haircut would be needed to lower it to USD 36,835. The Social Security payment doesn't get a haircut, though. It would increase to USD 36,835 after the inflation adjustment. That makes the overall income in Year 2 equal USD 73,670. It's still a dip from Year 1, but it's only a 3% change instead of 10%.

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 II. The investment portfolio-only guardrails approach had a cash flow standard deviation of 40% 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 22. Similar to the portfolio-only guardrails approach, it does leave behind a lower median ending balance. That suggests that 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 22 Guardrails Plus Social Security Lifetime Spending and Ending Balance

	Social Security at 67	Guardrails / Social Security at 67	Guardrails / Social Security 70 w/ Bridge	
First-Year Spending (USD)	73,000	87,000	95,640	
Spending / Ending Ratio	62 / 38	80 / 20	81 / 19	

Source: Morningstar. Data as of Sept. 30, 2024.

Investments: 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 discussion will address only the latter option: Treasury Inflation-Protected Securities.

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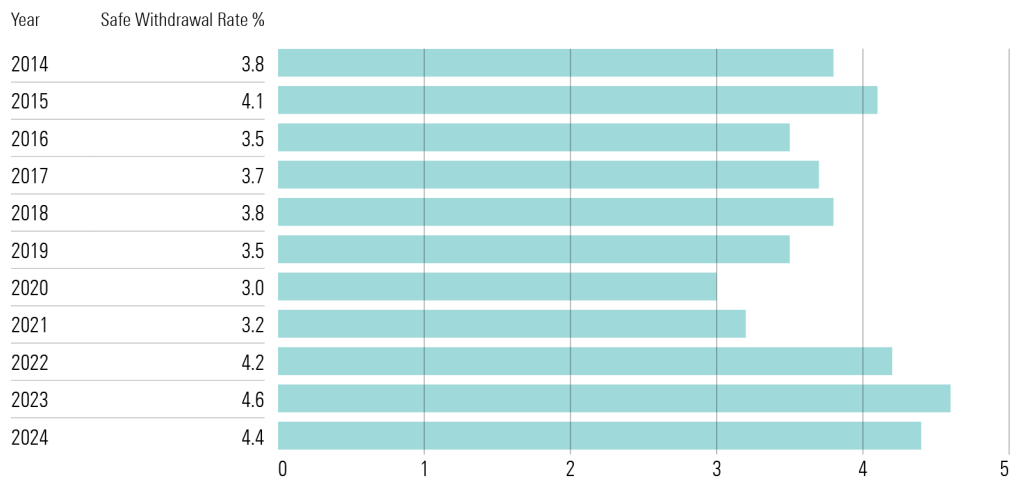
By self-liquidating, TIPS ladders differ from the other withdrawal strategies covered in this paper, save for the RMD method, which also (nearly) exhausts the retiree's investment. This feature, of course, is not appealing. But TIPS ladders deliver two major offsetting benefits. First, they provide a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

The other benefit offered by TIPS ladders is that, if the yields on TIPS are sufficiently attractive, their safe withdrawal rates can exceed those provided by other investment portfolios. As of Sept. 30, 2024, the date from which this paper's data was derived, that was the case: A 30-year TIPS ladder delivered an annual withdrawal rate of 4.4%, in inflation-adjusted terms. Meanwhile, the highest withdrawal rate available for the base case portfolios was 3.7%.

The current 30-year TIPS ladder rate has dipped a little since last year, but it remains relatively high compared with the previous decade.

Exhibit 23 Historic 30-Year TIPS Ladder Safe Withdrawal Rate, Calculated on Sept. 30 of Each Year

Year	Safe Withdrawal Rate %
2014	3.8
2015	4.1
2016	3.5
2017	3.7
2018	3.8
2019	3.5
2020	3.0
2021	3.2
2022	4.2
2023	4.6
2024	4.4

Source: Morningstar. Data as of Sept. 30, 2024.

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 much more attractive than our base case of a 3.7% initial portfolio withdrawal combined with Social Security filing at age 67.

Exhibit 24 Base Case (Social Security at 67) vs. TIPS Ladder Plus Social Security, Lifetime Spending and Median Ending Balance
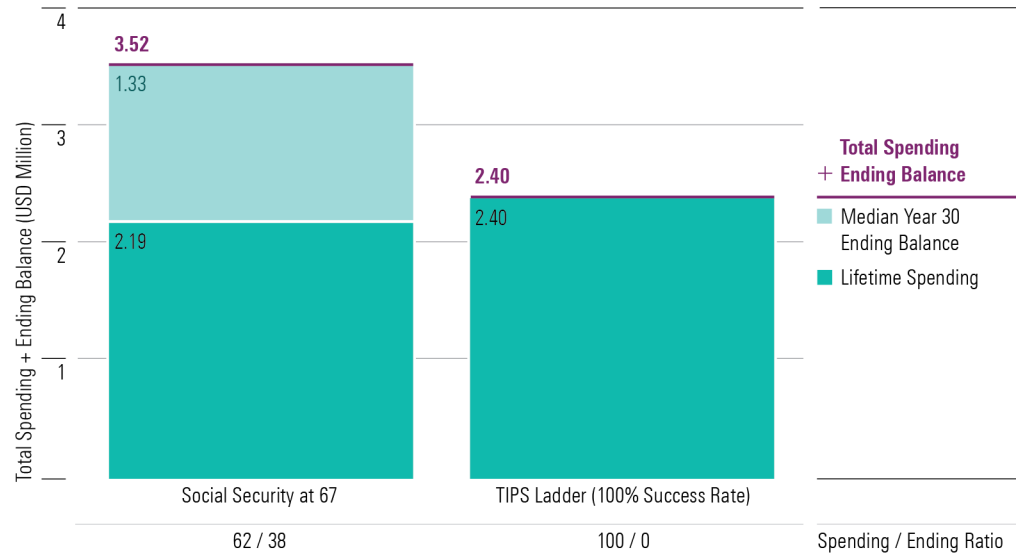
Source: Morningstar. Data as of Sept. 30, 2024.

Having USD 2.40 million of lifetime spending with 100% safety certainly appears better than the USD 2.19 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 USD 1.3 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.
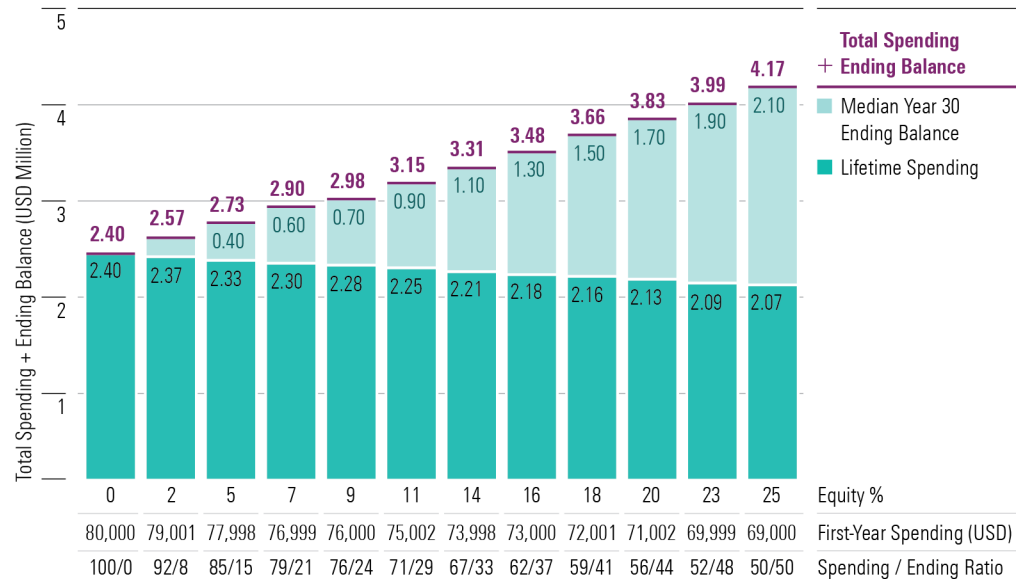
The other drawback with TIPS ladders is that they are entirely inflexible. Although the base case scenario is modeled as being inflexible, under the assumption that retirees will not adjust their spending strategies along the way, they can in practice be altered. Not so with TIPS ladders. Retirees who start down that path must either finish it, as planned, or accept that changes they make along the way 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 less than the entire 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 25 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 starting equity weightings for the portfolios range from 25% for the portfolio that provides USD 69,000 of spending in Year 1, to 2.6% for the portfolio with USD 79,000 of spending in Year 1.

Exhibit 25 TIPS Ladder, Plus Social Security, Plus Equities, First Year Spending, Lifetime Spending, and Median Ending Balance

Equity %	0	2	5	7	9	11	14	16	18	20	23	25
Total	2.40	2.57	2.73	2.90	2.98	3.15	3.31	3.48	3.66	3.83	3.99	4.17
Median Year 30 Ending Balance		0.40	0.60	0.70	0.90	1.10	1.30	1.50	1.70	1.90	2.10	
Lifetime Spending	2.40	2.37	2.33	2.30	2.28	2.25	2.21	2.18	2.16	2.13	2.09	2.07
First-Year Spending (USD)	80,000	79,001	77,998	76,999	76,000	75,002	73,998	73,000	72,001	71,002	69,999	69,000
Spending / Ending Ratio	100/0	92/8	85/15	79/21	76/24	71/29	67/33	62/37	59/41	56/44	52/48	50/50

Source: Morningstar. Data as of Sept. 30, 2024.

Annuities

Investors can also add guaranteed income by purchasing an annuity with a portion of their investment portfolio. Annuity contracts sold by insurance companies come in many forms. The most appropriate annuity version for retirees seeking guaranteed income consists either of 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 annuities, which begin their payments at a specified later date. This discussion 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, 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 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. 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, typically referred to as single premium immediate annuities, are the most basic type of annuity. For a lump-sum payment, an insurer will provide a fixed amount of income per month for the rest of the owner's life (or for a predetermined amount of time). For example, a 67-year-old female who bought an immediate annuity in October 2024 with USD 100,000 would receive about USD 7,400 a year for the rest of her life, according to Immmediateannuities.com. (Payouts for males are typically a bit higher because of their shorter average life expectancies.) Individuals who purchase an immediate annuity for their lifetime receive the highest payouts, whereas joint benefits for a couple, whereby a surviving spouse still receives payments after the beneficiary dies, reduce the benefit.
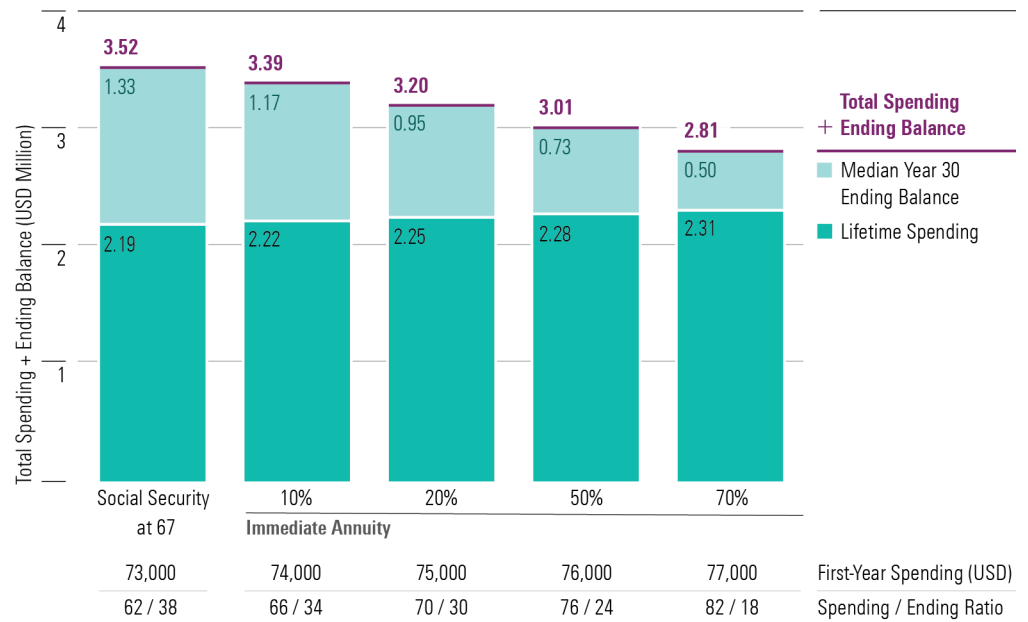
Adding a fixed 3% cost-of-living adjustment to the scenario above drops the payout rate from 7.4% to 5.56%, or USD 5,560 for the first year. That annual payout would adjust to USD 5,689 after the first year, USD 5,820 after the second year, and so on, because of the additional benefit. At that rate, it would take 10 years for the monthly payouts to catch up to the noninflation adjusted payout in the first example. After that, the inflation adjustment provides a better longevity hedge compared with the traditional immediate annuity. Similar to delaying Social Security, the longer the annuity owner lives, the greater the benefit and vice versa.

These annuities can help with financial planning if the combination of their payouts plus Social Security covers some, or all, of the retiree's basic living expenses. In general, investing a portion of a portfolio in an immediate annuity does boost lifetime spending when it's paired with Social Security, although it likely means a lower ending balance after 30 years. That's because the money used to purchase the

annuity counts as a portfolio withdrawal and won't experience any capital appreciation even though it will supply income on an ongoing basis.

The exhibit below shows how different funding levels for an immediate annuity change the available lifetime spending amount and median ending balance for a retiree over 30 years. For this example, we used the starting portfolio value of USD 1 million and used various portions of it to purchase immediate annuities with fixed cost-of-living adjustments of 3%. We assumed the remaining cash was invested in the base case portfolio and withdrawals were made using the starting safe withdrawal rate of 3.7% for the first year and inflation-adjusted in subsequent years.

Exhibit 26 Base Case Plus Social Security and Immediate Annuity: Lifetime Spending and Ending Balance

	Social Security at 67	10%	20%	50%	70%	
						Immediate Annuity
First-Year Spending (USD)	73,000	74,000	75,000	76,000	77,000	
Spending / Ending Ratio	62 / 38	66 / 34	70 / 30	76 / 24	82 / 18	

Source: Morningstar. Data as of Sept. 30, 2024.

Immediate annuities do amplify the ability to spend in retirement as shown in the exhibit, though the extra income relative isn't proportionate to the lower median ending balances. Using 10%, or USD 100,000, of the initial USD 1 million portfolio to buy an immediate annuity with a 3% fixed cost-of-living adjustment results in an average lifetime spending increase of only USD 30,000 relative to the base case, which assumes that all cash flows come from a combination of Social Security and portfolio withdrawals. (An annuity with a lower fixed cost-of-living adjustment of 2%, for example, would boost lifetime spending by even more because starting payments are so much higher than the starting payments for the annuity with the 3% rider.) In addition, the median ending balance falls by about USD 230,000 for the 10% allocation to the immediate annuity with a 3% inflation rider. That's because that USD 100,000 initial payment didn't get to appreciate along with the rest of the portfolio.

However, enlarging nonportfolio cash flows with a combination of a modest annuity purchase and Social Security can help protect against *sequence of returns risk* — the risk of encountering poor market conditions early in retirement and in turn withdrawing too much from a depressed portfolio. Enlarging nonportfolio cash flows might also serve to quell anxiety over outliving the portfolio in a worst-case scenario. However, larger annuity allocations would appear to be a poor fit for retirees planning to leave behind a hefty sum for their spouse, heirs, and/or charity of choice.
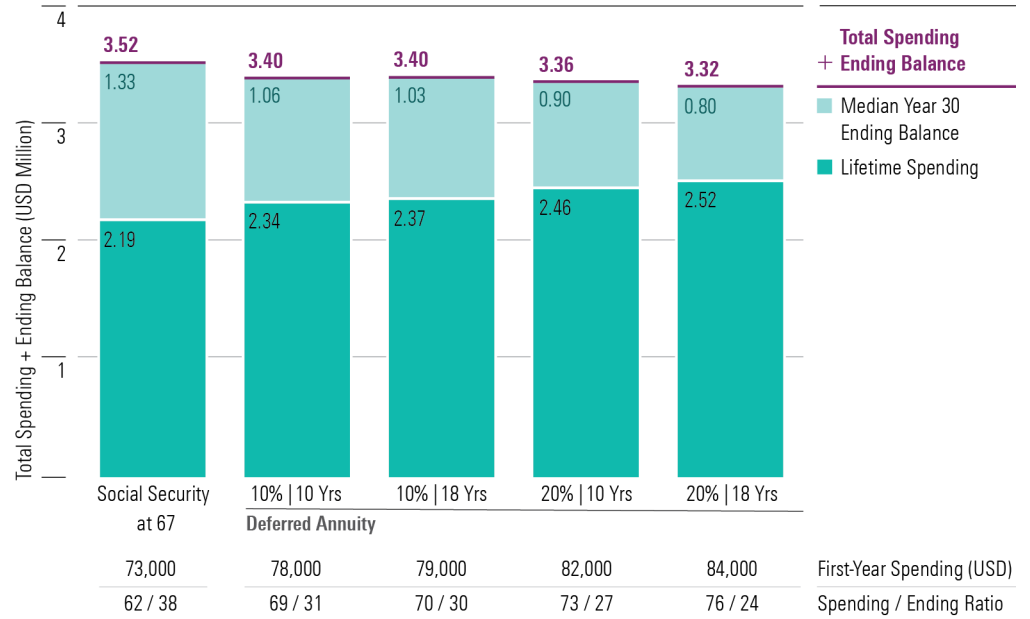
Deferred Annuities

Deferred annuities start their payments at a predetermined future date, typically between 10 and 20 years after someone retires. Since the payments are deferred, the payouts are higher than those from immediate annuities. The longer the delay, the higher the payout. For example, a 67-year-old woman who purchased a USD 100,000 deferred annuity with a 3% fixed cost-of-living adjustment in October 2024 that starts making payments 10 years from the purchase date would get about USD 15,600 a year starting in October 2034 (which would grow to USD 16,068 in 2035 after the inflation adjustment, and so on). If payments don't start until she turns age 85, the first year's annual payment would more than double to USD 39,600. Both are significantly higher than the USD 5,560 annual payments the same person would receive from an immediate annuity, though by definition the retiree would receive income from a deferred annuity over a shorter time frame.

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 2.32% inflation assumption employed throughout this paper, the USD 3,300 monthly payments that would start at age 85 in the example above would be reduced to about USD 2,200 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.

The other 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 26 shows the results of using 10% and 20% of the starting USD 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). Spending is funded by the combination of the starting safe withdrawal rate of 3.7% from the remaining portfolio assets and Social Security until the annuity payouts begin.

Exhibit 27 Base Case Plus Social Security and Deferred Income Annuity, Lifetime Spending and Ending Balance

	Social Security at 67	10% | 10 Yrs	10% | 18 Yrs	20% | 10 Yrs	20% | 18 Yrs	
		Deferred Annuity				
First-Year Spending (USD)	73,000	78,000	79,000	82,000	84,000	
Spending / Ending Ratio	62 / 38	69 / 31	70 / 30	73 / 27	76 / 24	

Source: Morningstar. Data as of Sept. 30, 2024.

The deferred annuities increase spending significantly more than immediate annuities, but because the individual must live off their portfolio and Social Security alone for longer, the median ending balances are lower. In the least restrictive scenario, the 10% allocation to a deferred annuity that starts in 10 years, the USD 2.34 million average lifetime spending is higher than the scenario in the previous example where 70% of the initial portfolio was used to purchase an immediate annuity. The median ending balance was also much higher since 90% of the initial portfolio was left over after the annuity was purchased instead of 30%. Keep in mind this scenario assumes the retiree lives the full 30 years. Still, deferred annuities can be an attractive longevity hedge, provided the retiree lives long enough to reap the benefits.

Section IV: 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% in 2024, and 3.7% for the year ahead to reflect each edition's finding. 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, USD 33,000 on a USD 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 USD 33,000 withdrawal at the beginning of 2022, for example, would be USD 35,145 at the beginning of 2023, factoring in 6.5% annualized inflation in 2022, and USD 36,340 at the beginning of 2024, incorporating 2023's 3.4% inflation rate.

Nor should this research be construed as a market call. While it does embed Morningstar Investment Management'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 20% 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 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 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 research points to the value of caution once again, as bond yields have dropped a bit and equity valuations look a bit high, depressing expected returns for fixed-income assets and equities.

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% in 2022, so our 3.8% safe withdrawal recommendation in late 2022, while a higher percentage than the year prior, corresponded with a lower portfolio balance, and in turn withdrawal amount, for most investors. By contrast, this year's 3.7% withdrawal percentage is apt to look better on a dollar basis given that portfolio values have generally increased for two years running. In other words, it's not the percentage that matters to retirees; it's the dollar amount.

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 or more years. 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 28, 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 safe starting 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 3.1%.

Exhibit 28   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	8.1	5.6	4.3	3.6	3.1	2.9	2.7
90	8.4	5.8	4.5	3.7	3.2	3.0	2.8
80	8.6	5.9	4.7	3.8	3.4	3.1	2.9
70	8.9	6.1	4.8	4.0	3.5	3.2	2.9
60	9.2	6.3	5.0	4.1	3.6	3.3	3.0
50	9.4	6.5	5.1	4.2	3.7	3.3	3.1
40	9.5	6.6	5.2	4.3	3.7	3.4	3.1
30	9.7	6.7	5.2	4.3	3.7	3.4	3.1
20	9.7	6.7	5.2	4.3	3.7	3.3	3.0
10	9.7	6.6	5.1	4.2	3.6	3.2	2.9
0	9.5	6.5	4.9	4.0	3.4	3.0	2.7

Source: Morningstar. Data as of Sept. 30, 2024.

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 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 II 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 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.

Section III of this paper discusses 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. 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. **M**

About Morningstar Portfolio and Planning Research

Morningstar Portfolio and Planning Research provides independent, fundamental analysis on topics like 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 like 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.

MORNINGSTAR®

22 West Washington Street
Chicago, IL 60602 USA