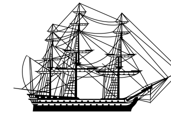
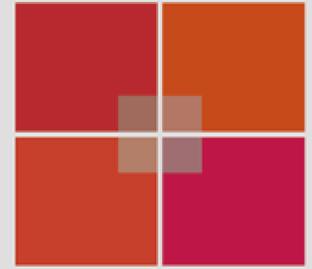


Vanguard®

Vanguard's dynamic approach to retirement spending



Vanguard Research Brief

May 2017

Key points

- Global trends have led to an increase in personal accountability for funding retirement, resulting in an increased reliance on retirees' personal portfolios.
- Retirees must choose a portfolio spending strategy that balances two, often competing, goals: maintaining a desired level of current spending and increasing or preserving portfolios to support future spending and bequests.
- Trade-offs exist amid the two most common spending rules as well as Vanguard's "dynamic spending" strategy, which is a hybrid of those two rules.
- Although adopting an appropriate strategy is important, flexibility is the key ingredient in a long-term spending plan.

Great progress has been made in helping investors in the accumulation phase of the investor life cycle, but much work remains to be done on the decumulation phase of retirement planning.

This brief, based on research by The Vanguard Group, Inc.,[1] focuses on the need to develop a spending plan for one's personal portfolio and introduces a framework by which retirees can examine the trade-offs involved in implementing strategies that balance their goals with their unique constraints.

Our research finds that the rewards of careful decision-making and the consequences of missteps put a premium on skilful analysis and, for many investors, the insight of a knowledgeable advisor.

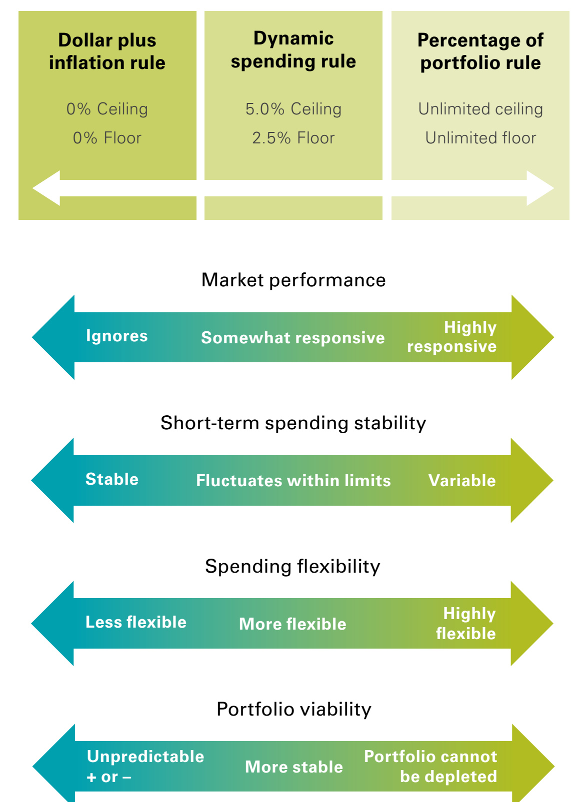
A framework for retirement spending

While each country's retirement system is unique, the trend globally is turning from the traditional private or public pension system toward individually funded and managed retirement accounts. Given expectations of muted returns and possibly volatile markets for the foreseeable future, helping retirees develop a prudent spending strategy is likely to be more important than ever.

As a general guideline, an initial withdrawal rate for those entering retirement (with a time horizon of approximately 30 to 40 years) is 3% to 5% of their portfolio balance. Typically, 3% would apply to more conservative portfolios and 4% to 5% to more moderate or aggressive portfolios.

This general range can be a starting point, but various rules have been developed for putting this guideline into practice—some of which offer more flexibility to help retirees deal with changes in individual circumstances and the markets. The most popular are the "dollar plus inflation" rule, where, at retirement, a retiree chooses the initial dollar amount to spend and then increases that sum by inflation each

Figure 1. Spectrum of spending rules

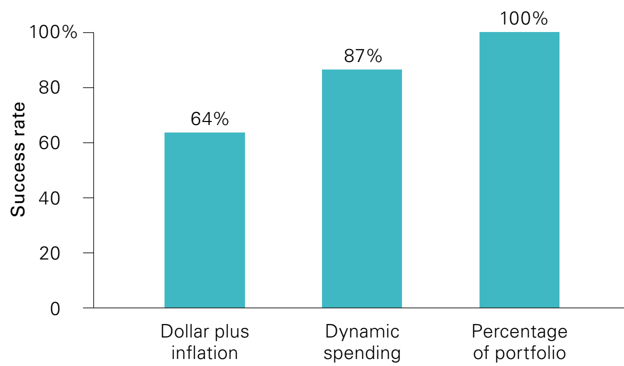


Source: The Vanguard Group, Inc.

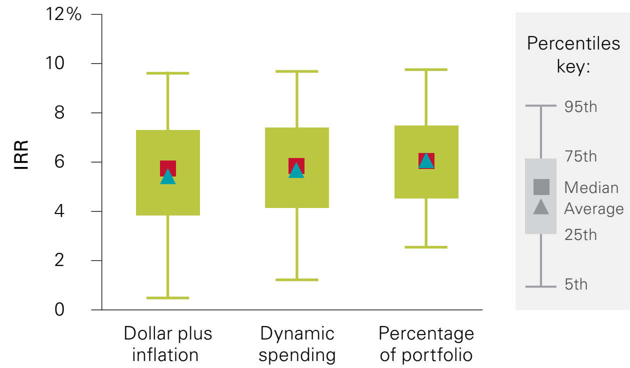
1 *A rule for all seasons: Vanguard's dynamic approach to retirement spending.* Michael A. DiJoseph, CFA; Colleen M. Jaconetti, CPA, CFP®; Zoe B. Odenwalder; and Francis M. Kinniry Jr., CFA; May 2017.

Figure 2. Comparison of various spending rules

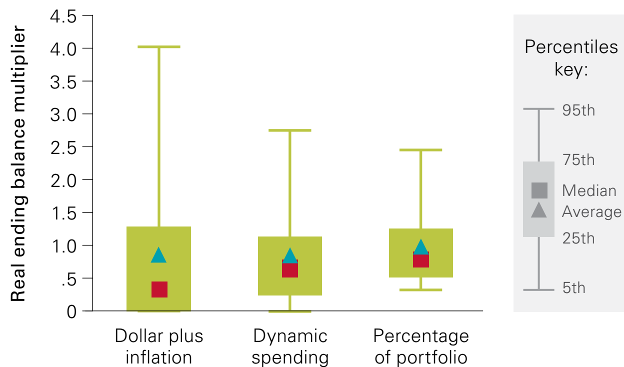
a. Portfolio success rates across spending rules



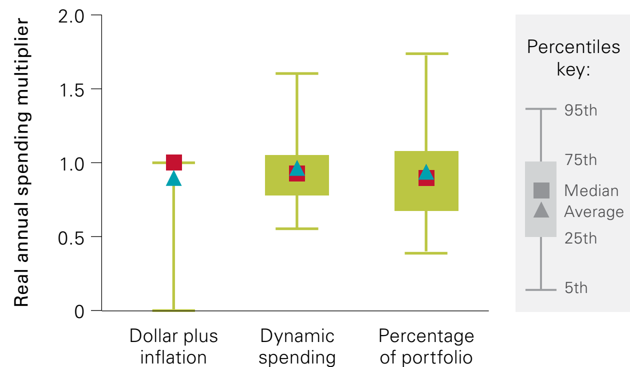
b. Portfolio IRRs across spending rules



c. Real ending balance multipliers across spending rules



d. Real annual spending multipliers across spending rules



Notes: This hypothetical illustration does not represent the investment results of any particular portfolio. All results are based on 10,000 VCMM simulations using each specified spending rule. This analysis assumes portfolios with a starting balance at retirement of $1 million, with a moderate allocation of 50% global stocks and 50% global bonds, a time horizon of 30 years and an initial portfolio withdrawal rate of 5%. For a further description of the VCMM, see Appendix II of our paper *A rule for all seasons: Vanguard's dynamic approach to retirement spending*. In part 2a, "success rate" is defined as the likelihood that the portfolio will last for the investor's entire time horizon. In Part 2b, "IRR" is internal rate of return.

Source: Vanguard.

subsequent year; and the "percentage of portfolio" rule, where a retiree spends a fixed percentage of their portfolio balance each year. While many use these rules of thumb, they may not be flexible enough for all retirees.

Vanguard views spending rules as a spectrum of choices based on the relative importance a retiree places on each goal, as shown in **Figure 1**. Thus, at one end of the spectrum is the dollar plus inflation rule. At the other is the percentage of portfolio rule. In the middle is a customized solution Vanguard has developed, which we call the "dynamic spending" strategy. With this strategy, annual spending is allowed to fluctuate based on the performance of the markets while remaining sensitive to significant spending fluctuations from year to year. This is accomplished by overlaying an annual ceiling and floor to each year's spending amount.

Vanguard's hybrid strategy

With our dynamic spending rule, withdrawals are kept within a maximum percentage increase and decrease in real (inflation-adjusted) spending. The rule allows retirees to benefit from good markets by spending a portion of their gains, while weathering bad markets without a significant reduction in spending.

To implement this strategy, a retiree would first select a spending rate (the percentage of the portfolio that will be withdrawn in the first year) as well as a ceiling and a floor. The ceiling is the maximum amount that a retiree is willing to allow real spending to increase by in any given year, while the floor is the maximum decrease they can tolerate.

After determining these values, a retiree calculates each year's spending by taking the stated percentage of the prior year-end's real portfolio balance. The retiree then calculates a ceiling and a floor by applying the chosen percentages to the previous year's real spending amount, such as a +5% ceiling (increase) and a –2.5% floor (decrease). If the newly calculated spending amount exceeds the ceiling, spending will be limited to the ceiling amount; if the calculated spending falls below the floor, spending can be increased to the floor amount. Depending on the ceiling and floor selected, spending can be made relatively consistent while remaining responsive to the financial markets' performance, thereby helping to sustain the portfolio to meet future goals.

Quantitative analysis of spending rules

We used our proprietary Vanguard Capital Markets Model® (VCMM) to run simulations on several key metrics for retirement spending success. As **Figure 2** illustrates, although the percentage of portfolio rule (essentially the dynamic spending rule with an unlimited ceiling and an unlimited floor) may have the highest rate of portfolio success and the highest internal rate of return (Figure 2a and 2b), those come with a cost—namely, higher volatility in annual real spending (see Figure 2d). However, by implementing a hybrid strategy, a retiree can capture many benefits of the percentage of portfolio approach while significantly reducing the variation in annual spending that could occur.

We examined the trade-offs in a multiplier framework (Figure 2c and 2d). For example, the dollar plus inflation rule (essentially the dynamic spending rule with a 0% ceiling and a 0% floor) produced real ending balances ranging from 0.0 times the initial amount at the 5th percentile to 4.0 times the initial amount at the 95th percentile (see Figure 2c). In practical terms, this could, for example, correspond to an investor with a starting portfolio balance of $1 million and a 5% withdrawal rate ending with an account balance somewhere between $0 and $4 million 90% of the time. As Figure 2c shows, the two other approaches produced results in a much narrower range.

The most important trade-off, however, is spending volatility. Our analysis shows that the dollar plus inflation rule produces a real annual spending multiplier of 1.0, unless the portfolio depletes, in which case it falls to zero (see Figure 2d). Continuing the example from the previous paragraph, in theory, this simply means real annual spending of $50,000 or $0. In reality, an investor would not let their portfolio drop to zero, but might have to make some uncomfortable adjustments.

On the other hand, the percentage of portfolio rule produces real annual spending multipliers ranging from 0.4 to 1.7 at the 5th and 95th percentiles and 0.9 on average, while the dynamic spending rule's multiples range from 0.5 to 1.6 at the 5th and 95th percentiles and average 1.0. Using the dynamic spending approach, real spending for the retiree in our example would never decrease by more than 2.5% or increase by more than 5% in any given year. Use of the percentage of portfolio approach, however, could result in real spending decreasing or increasing by a theoretically unlimited amount.

Figure 3. Portfolio initial withdrawal rates (%) for various asset allocations and time horizons

	Dollar plus inflation				5.0% ceiling/2.5% floor			
	Time horizon (years)				Time horizon (years)			
Asset allocation	**10.0**	**20.0**	**30.0**	**40.0**	**10.0**	**20.0**	**30.0**	**40.0**
Conservative	9.8	5.1	3.7	3.1	11.0	6.4	5.0	4.4
Moderate	9.7	5.3	4.0	3.4	10.8	6.4	5.1	4.5
Aggressive	9.4	5.3	4.0	3.5	10.4	6.2	4.8	4.3

Notes: Rates are gross of taxes. Any tax is assumed to be paid from the withdrawn amount. Portfolio allocations are: conservative—20% stocks/80% bonds; moderate—50% stocks/50% bonds; aggressive—80% stocks/20% bonds. Withdrawal rates were determined using data from the VCMM.

Source: Vanguard.

Tailoring the ceiling and floor percentages

Our analysis found that the more flexibility retirees have in their floor—meaning, the more they can reduce spending when markets are performing poorly—the higher their success rate—meaning, the less likely they are to deplete their portfolio or be required to significantly reduce spending. In fact, retirees' ability to accept changes in their floor helps their portfolio more than increasing their ceiling hurts it. For example, a ceiling/floor combination of 0% and –1% is about 12 percentage points more successful than a ceiling/floor combination of 0% and 0% (i.e. dollars plus inflation). On the other hand, a ceiling/floor combination of 1% and 0% is about 4 percentage points less successful than a ceiling/floor combination of 0% and 0%.

Figure 3 charts portfolio withdrawal rates for both a dollar plus inflation rule and a +5.0%/–2.5% ceiling/floor rule using different time horizons and asset allocations, assuming an 85% success rate. As the figure shows, retirees who can incorporate flexibility into their annual spending needs are able to set higher initial portfolio withdrawal rates, which may put them in a better position to meet their near-term financial goals.

A final thought

Vanguard's dynamic spending framework can help retirees understand where they fall on the spectrum of balancing competing goals. The combination of complexity and consequences underscores the need for, and the value of, skilful guidance from a knowledgeable advisor.

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