

# Target-date strategies and advice

Behavioral and portfolio considerations

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The financial resources, risk aversions, constraints, and objectives of participants in defined contribution plans are as varied as the people themselves. Because there is no uniform path to financial wellness for such a diverse population, plan sponsors should offer their participants a spectrum of solutions.

Vanguard believes that financial advice is the most comprehensive and customizable solution. Advice has built-in flexibility, which is a reason we recommend that plan sponsors offer an advice program as part of a competitive retirement plan offer. At the same time, we recognize that not every participant is willing or able to engage in an advised relationship. For these participants, an intuitive and personalized self-directed experience is essential.

In this paper, the first in our research-note series on advice and self-directed paths for defined contribution participants, we focus on two aspects of the participant's decision about whether to engage in advice: personalization and behavioral coaching.

### **Beginning the journey: Self-directed DIY or advice?**

Many retirement plans offer general guidance and financial wellness programs designed to address a variety of financial matters throughout all stages of a participant's life.<sup>1</sup> While our research shows an increase in plan sponsors offering managed account advice services, there's still room for improvement, with only 41% of Vanguard defined contribution plans offering advice in 2022.<sup>2</sup> Advice combined with effective plan design and access to financial tools and education can help ensure that participants make well-informed decisions they can feel confident about.

Although we believe all participants should have access to advice, the proliferation of professionally managed allocations via target-date products, alongside robust educational tools, can meet the investment, savings, and income needs for less-engaged participants or those with a more DIY mentality. Some participants may even prefer that approach over engaging with an advice service. Perhaps

they believe that their retirement needs are very straightforward, or they simply prefer to manage their investments on their own. Whatever the reason, a self-directed wealth-planning journey with a target-date investment strategy remains an effective option for many.

And remember, a participant's choice of either advice or a self-directed journey isn't a one-time, irrevocable decision. A participant's best-fit approach will likely vary over time and with changing circumstances. View our [framework](#) to evaluate the key considerations.

### **Self-directed—A good path for less-engaged participants**

Over the past decade, we've observed reassuring trends in retirement plan design that are leading to improved participant behavior and retirement outcomes. Automatic solutions help employees save more, and participant portfolio construction continues to improve with more age-appropriate asset mixes and fewer extreme allocations. Much of this can be attributed to the increased availability and use of target-date funds (TDFs). Ninety-six percent of plans offered TDFs as of the end of 2022, with most of these funds being designated as qualified default investment alternatives (QDIAs). The result is an increase in participants' use of TDFs, with 83% holding one as of the end of 2022.<sup>3</sup>

For participants on a self-directed financial journey, target-date strategies are a compelling option. They are designed to deliver a diversified, professionally managed portfolio designed to meet retirement income goals and simplify the investment process. With a single, low-cost TDF, investors can outsource their lifetime

<sup>1</sup> Callan. [Defined Contribution \(DC\) Trends Survey](#). March 2023.

<sup>2,3</sup> [How America Saves 2023](#). Vanguard, 2023.

asset allocations, fund selections, and portfolio rebalancing decisions to a professional management team. We can further evaluate the benefits of TDFs in terms of investors' expected outcomes, measured as their probability of success, or the likelihood of the TDF meeting or exceeding the desired retirement spending amount. Vanguard Target Retirement Funds, for example, are constructed to meet the spending needs of less-engaged participants<sup>4</sup> throughout retirement, with an expected success rate of 99% at age 80 and 92% at age 95 (see Figure 1).<sup>5</sup>

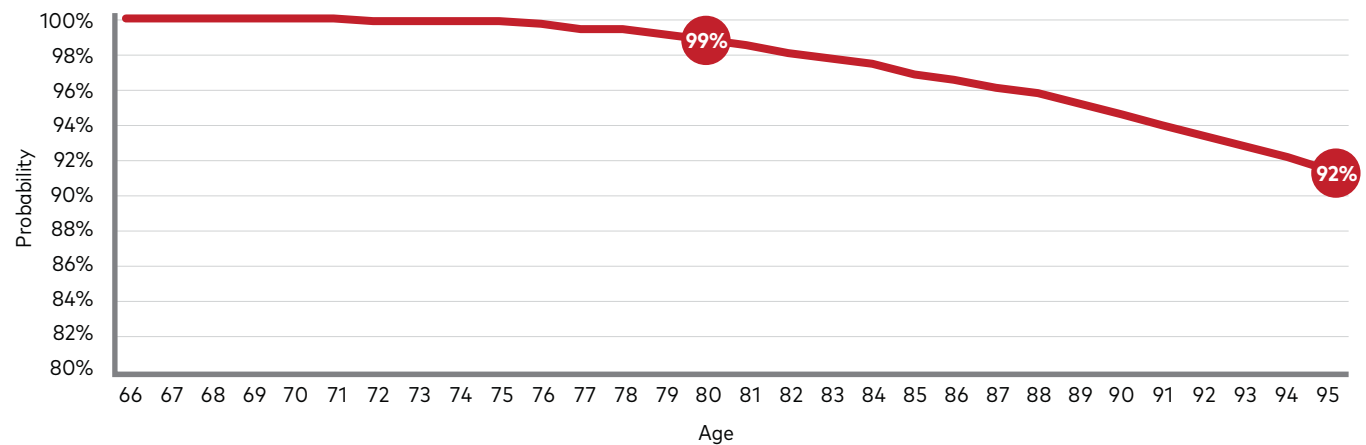
### Personalize the glide path for participant-aligned outcomes

With respect to the investment portfolio, target-date products are designed to reflect the characteristics of the broad U.S. retirement plan population. This is accomplished through target-date portfolio construction and glide-path design that reflect participant demographics, risk preferences, saving rates, and expected retirement age and spending needs, along with additional retirement income sources such as expected Social Security or defined benefit plans.

However, while these investments can meet the broad needs of a diverse population, they aren't tailored to the unique needs or preferences of individual participants. For these participants who fall outside of this "one-size-fits-all" categorization, advice offers a more bespoke solution. For example, those with risk aversions, wages, and retirement income needs that differ significantly from a typical participant profile may benefit from a personalized investment portfolio or differentiated glide path with an advisor managing risk as the participant moves through the life cycle.

As with other target-date providers, Vanguard incorporates assumptions about its investor base to determine an appropriate glide path for its target-date products. In constructing our target-date retirement strategies, we apply these assumptions using our proprietary Vanguard Life-Cycle Investing Model (VLCM). The VLCM is a utility-based framework that accounts for investor characteristics, preferences, and constraints to find an optimal glide path that best balances lifetime spending goals with the

**FIGURE 1. Probability of Vanguard Target Retirement Funds meeting retirement spending needs**



Source: Vanguard.

Notes: This analysis is based on the Vanguard Life-Cycle Investing Model (VLCM) using the Vanguard Capital Markets Model® (VCMM) asset class simulations as of December 2022. Retirement spending sufficiency is based on a 79% replacement ratio of pre-retirement ending salary. Ending salary is assumed to be \$75,000. **IMPORTANT: The projections and other information generated by the VCMM regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Distribution of return outcomes from VCMM are derived from 10,000 simulations for each modeled asset class. Simulations as of December 31, 2022. Results from the model may vary with each use and over time. For more information, please see Appendix II.**

<sup>4</sup> See Appendix I for additional details about the Vanguard Target Retirement Fund investor profile.

<sup>5</sup> Note that participants with more-complex financial circumstances or assumptions different from those used in this analysis may not experience these outcomes.

uncertainty of market risk ([Vanguard's approach to target-date funds](#)). Ultimately, the model seeks to find a glide path that brings investors the greatest utility (analogous to the value, benefit, or satisfaction that one receives) over their lifetime after considering and balancing different—and sometimes competing—factors.

This utility framework can be extended to an advice setting, in which the advice provider gathers additional insights about the participant to implement a highly personalized glide path. In the scenarios that follow, we use our VLCM to illustrate the potential benefits of a personalized glide path (via advice) relative to the baseline Vanguard target-date glide path. We quantify the estimated benefit of personalization through the concept of a certainty fee equivalent (CFE). A CFE is the amount (an annual fee in basis points of the assets) that an investor would be willing to pay for the optimized glide path versus the baseline path. The higher the CFE, the greater the potential excess value or benefit of personalization.

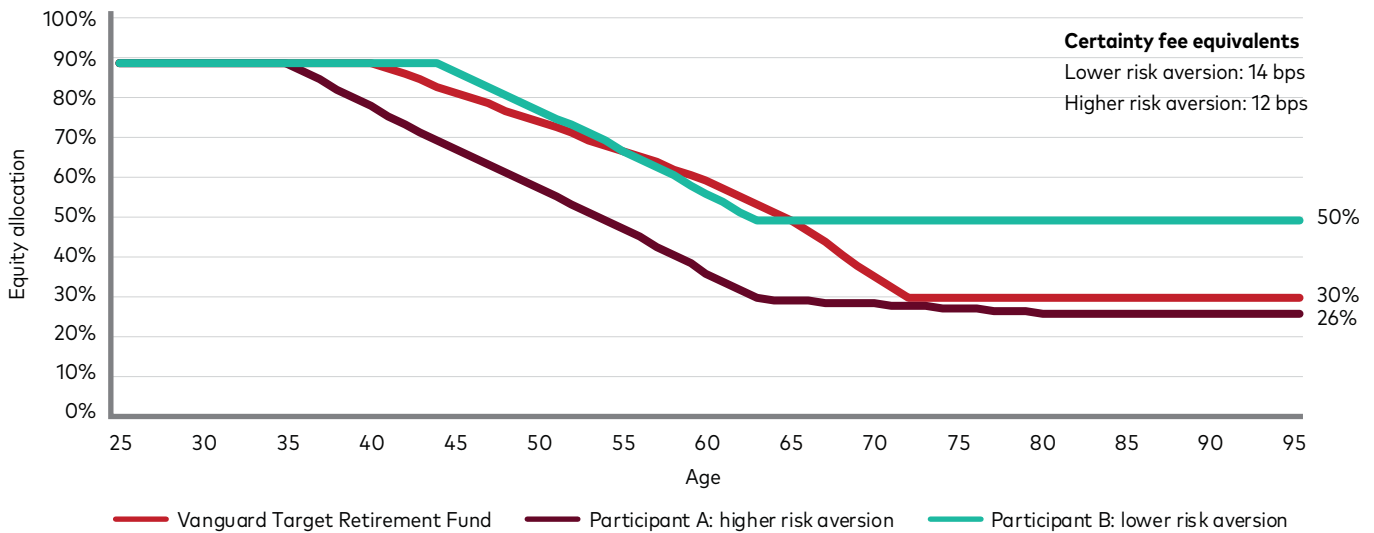
### Impact of participant risk aversion on glide path

Risk aversion defines an investor's attitude toward the short-term volatility of their

retirement portfolio. The degree of risk aversion has a significant impact on the investor's preferred level of equity exposure in a personalized glide path. Consider the following hypothetical people—Participant A, who's more risk-averse than the average target-date investor, and Participant B, who's less risk-averse.

An engagement with an advice provider shows that Participant A has a considerably higher risk aversion (or lower risk tolerance) than the typical target-date participant.<sup>6</sup> Our analysis reflects the glide-path asset allocation that captures not only expected returns and wealth, but also this participant's preference for lower risk. When modeled with a higher risk aversion,<sup>7</sup> we see that this participant has the potential to derive significant utility (value, benefit, or satisfaction) from a glide path with lower overall equity risk. The CFE is a positive 12 basis points relative to a target-date glide path illustrated in Figure 2a. For those with a higher risk aversion, our optimization reflects a preference for lower expected portfolio volatility and lower downside risk relative to the higher expected returns or wealth that might be achieved with a higher equity glide path. In Figures 2b–2d, we illustrate these trade-offs for Participant A. Even though

**FIGURE 2a. Personalized glide paths for different risk aversions**



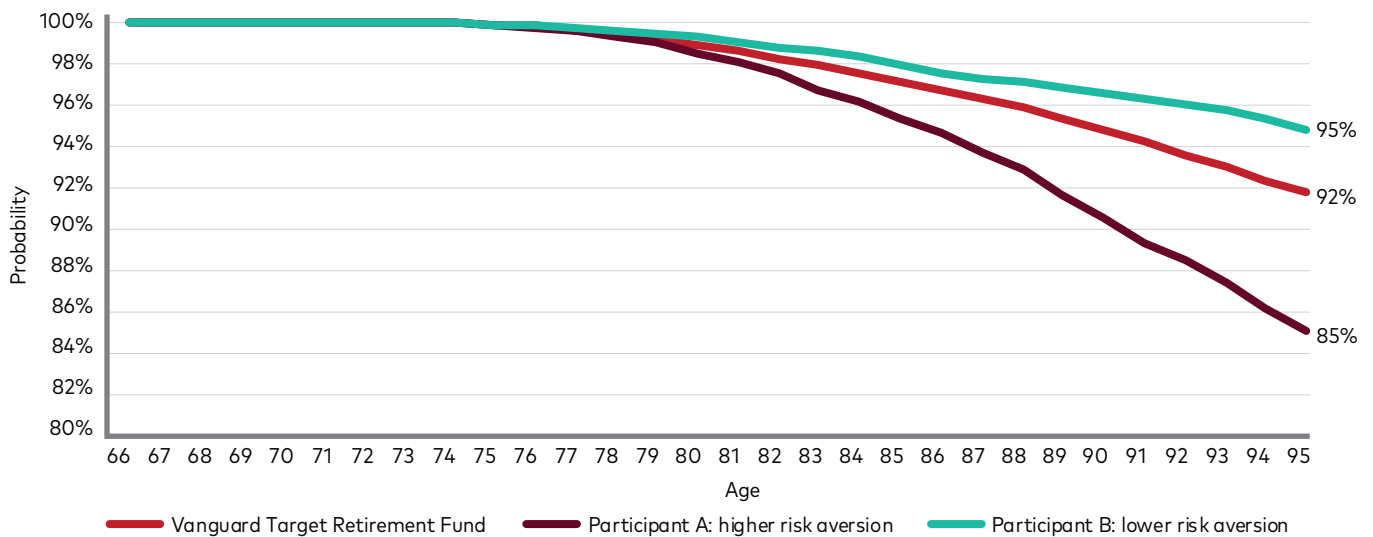
<sup>6</sup> Vanguard assumes a moderately conservative risk tolerance when constructing its Target Retirement Funds.

<sup>7</sup> The remainder of the assumptions used for this analysis are shown in Appendix I. These assumptions reflect the characteristics of a typical investor and are used to construct Vanguard Target Retirement Funds.

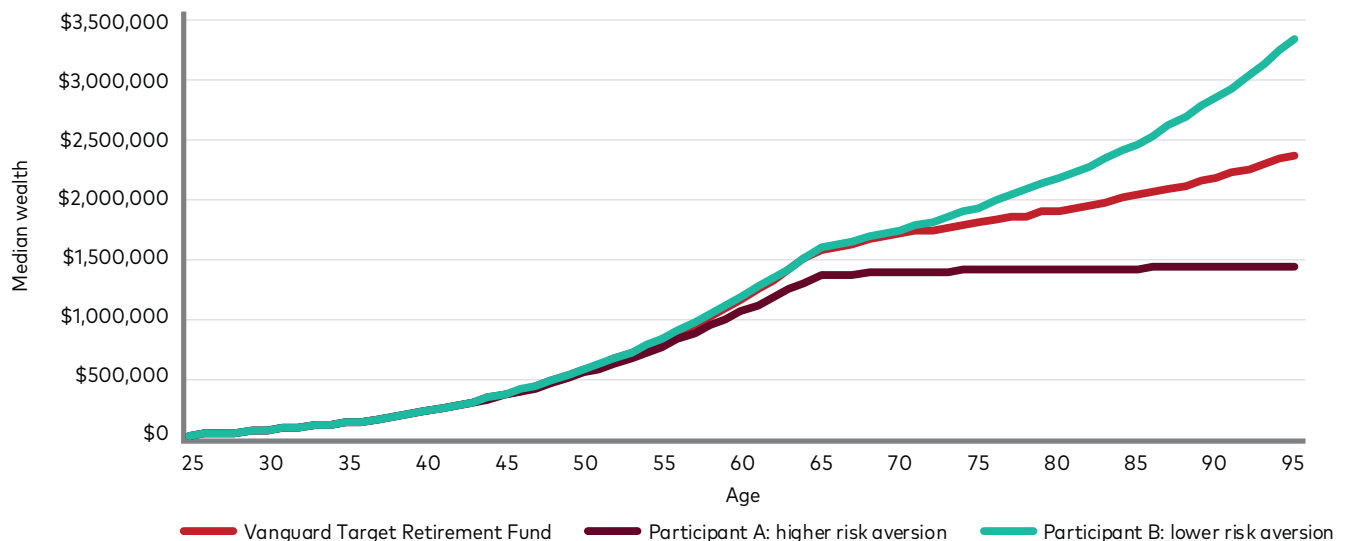
Participant A's glide path results in a lower probability of meeting retirement spending needs (2b) and lower expected median wealth (2c), it's also able to lower expected volatility and expected portfolio drawdown (2d). Ultimately, retirement success may be more likely with an asset mix that is aligned to this participant's risk profile, as they may be less inclined to alter their allocation or panic sell in search of lower volatility during inevitable periods of market turmoil. Such market-timing decisions carry downside risk, which we'll explore in the next section.

In contrast to Participant A, Participant B has a materially lower risk aversion than the typical target-date investor, meaning they can tolerate more uncertainty in exchange for potentially higher returns and wealth. Consequently, we see in Figure 2a that the optimized glide path here carries a higher level of overall equity exposure and a CFE value of 14 basis points over the target-date glide path. Participant B values the higher median wealth and success outcomes resulting from the optimized, higher-risk glide path more than they value the relative stability

**FIGURE 2b. Probability of personalized glide paths meeting retirement spending**



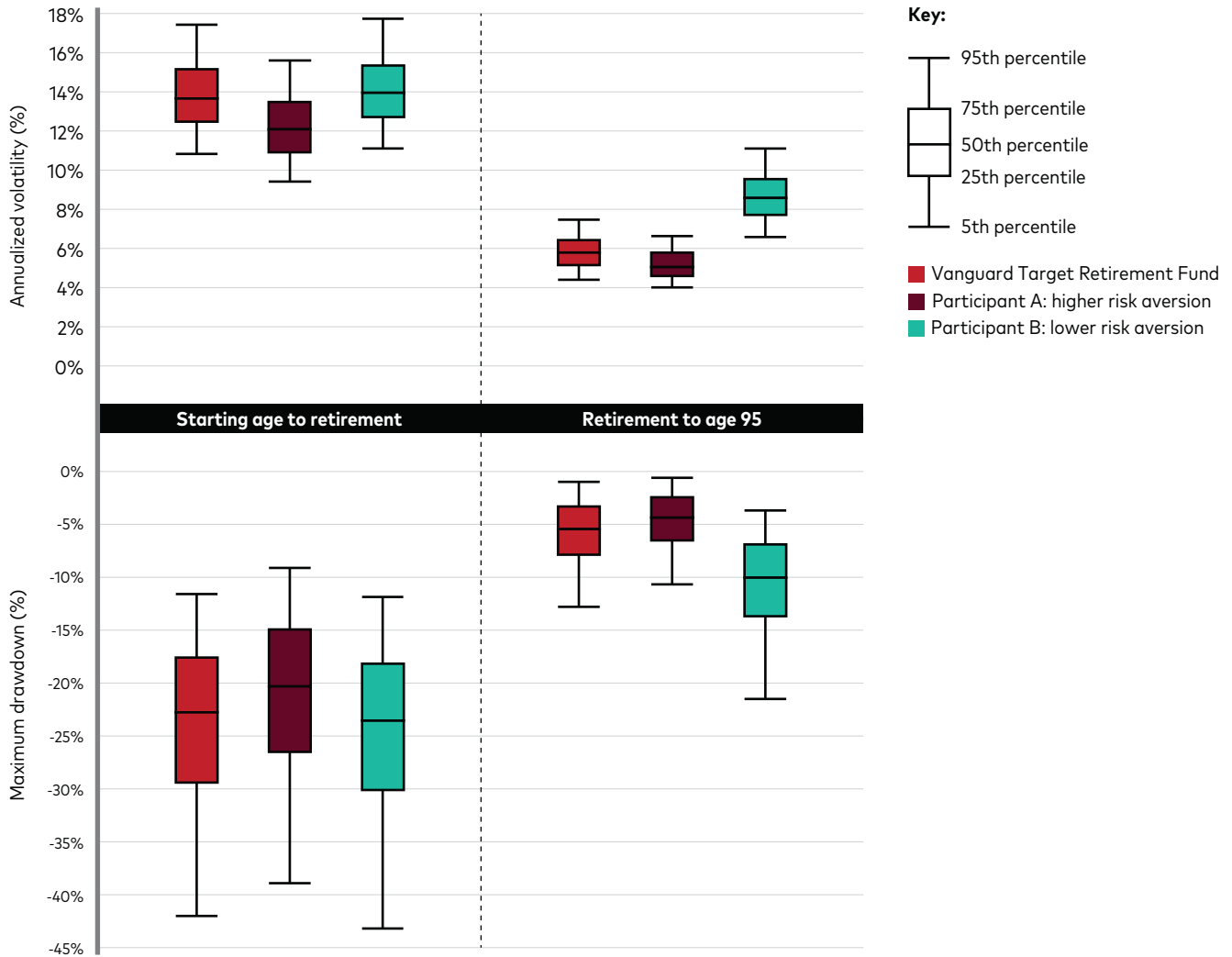
**FIGURE 2c. Growth of median real wealth**



that may come with the more conservative target-date glide-path asset allocation. These investors are more willing to tolerate higher portfolio fluctuations in exchange for higher potential wealth or the higher probability of meeting retirement spending needs. In Figures 2b–2d, we illustrate these trade-offs for Participant B. Participant B's glide path achieves a higher

probability of meeting retirement spending needs (2b) and higher expected median wealth (2c) despite higher expected volatility and expected portfolio drawdown (2d). As with Participant A, glide path and risk preference alignment may help Participant B avoid temptations to abandon their strategic asset allocation.

**FIGURE 2d. Portfolio volatility and maximum drawdown before and after retirement**



Source: Vanguard.

Notes: Analysis for Figures 2a–2d is based on the VLCM using VCMM asset class simulations as of December 2022. The asset-return distributions included in these results are drawn from 10,000 VCMM simulations based on market data and other information available as of December 31, 2022. Retirement spending sufficiency is based on a 79% replacement ratio of pre-retirement ending salary. Ending salary is assumed to be \$75,000. Real wealth is 50th percentile of distribution of cumulative inflation-adjusted portfolio wealth across 10,000 simulations that accounts for portfolio returns, pre-retirement contributions, and postretirement spending. Maximum drawdown is distribution of largest peak-to-trough cumulative portfolio return-decline in the stated period across 10,000 simulations. Portfolio volatility is the distribution of standard deviation of portfolio returns in the stated period across 10,000 simulations.

## Help participants stay on track with behavioral coaching help

As demonstrated in the examples above, participants can benefit from being on a glide path that is suitable for their unique goals and preferences. While this doesn't always translate to portfolio outperformance or greater wealth accumulation, it may provide a smoother ride and thus reduce the temptation for the participant to make abrupt changes to their investment plan—or even abandon the plan altogether. While a great deal of research has focused on the direct financial and portfolio value of advice, research by Vanguard and others demonstrates that emotions play a large role in investors' perception of the benefits of advice.<sup>8</sup>

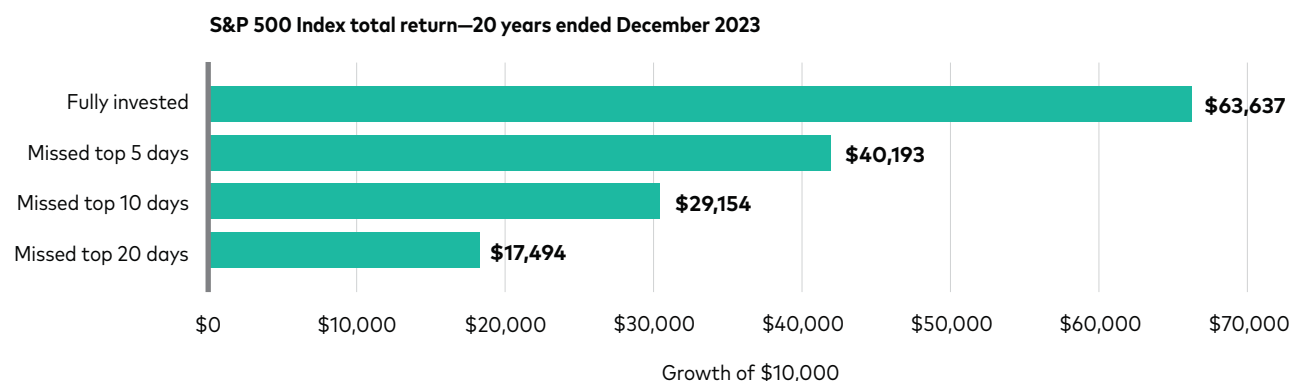
While these emotional benefits may be more subjective and qualitative in nature compared with other more tangible outcomes such as generating retirement income, reducing debt, or producing superior returns, they nevertheless have real-world implications for a participant's long-term probability of success. Some investors simply don't want to manage their finances themselves, or they may lack the confidence to do so. For these investors, handing the keys to a trusted professional or institution provides comfort knowing that their plan is actively monitored.

Vanguard research and other academic studies have found that behavioral coaching (the advisor's act of providing discipline and guidance) can be another substantial source of potential value.<sup>9</sup>

Additionally, all investors are subject to certain behavioral biases that can negatively affect an otherwise sound investment strategy. Biases such as regret aversion (avoiding financial decisions out of fear) can throw investors off the path to retirement income sufficiency. It's not uncommon for investors to be influenced by market headlines or the opinions of so-called experts regularly recommending change or the next "hot" investment. Advisors can act as an emotional circuitbreaker by circumventing participants' temptations to time markets or abandon their plan. In the absence of such guidance, participants may make knee-jerk decisions that can have devastating long-term implications for their retirement plans.

History has shown that market corrections and bear markets are common.<sup>10</sup> Reactively selling into falling markets in these scenarios ensures that one locks in losses from which they may never fully recover if they wait too long to get back in. It's also important to note that markets themselves tend to recover quite quickly, with

**FIGURE 3. Being out of the market for only a few days can be costly**



Sources: Vanguard calculations using data from Morningstar.

Notes: The chart shows hypothetical performance based on the daily returns of the S&P 500 Index. **Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.**

<sup>8</sup> Anna Madamba, Ph.D.; Cynthia A. Pagliaro; Stephen P. Utkus. [The value of advice: Assessing the role of emotions](#). Vanguard. March 2020. Danielle Labotka, Samantha Lamas. [Why people hire financial advisors](#). Morningstar. June 2023.

<sup>9</sup> Francis M. Kinniry Jr., CFA; Colleen M. Jaconetti, CPA, CFP®; Michael A. DiJoseph, CFA; David J. Walker, CFA; Maria Quinn. [Putting a value on your value: Quantifying Vanguard Advisor's Alpha®](#). Vanguard. July 2022.

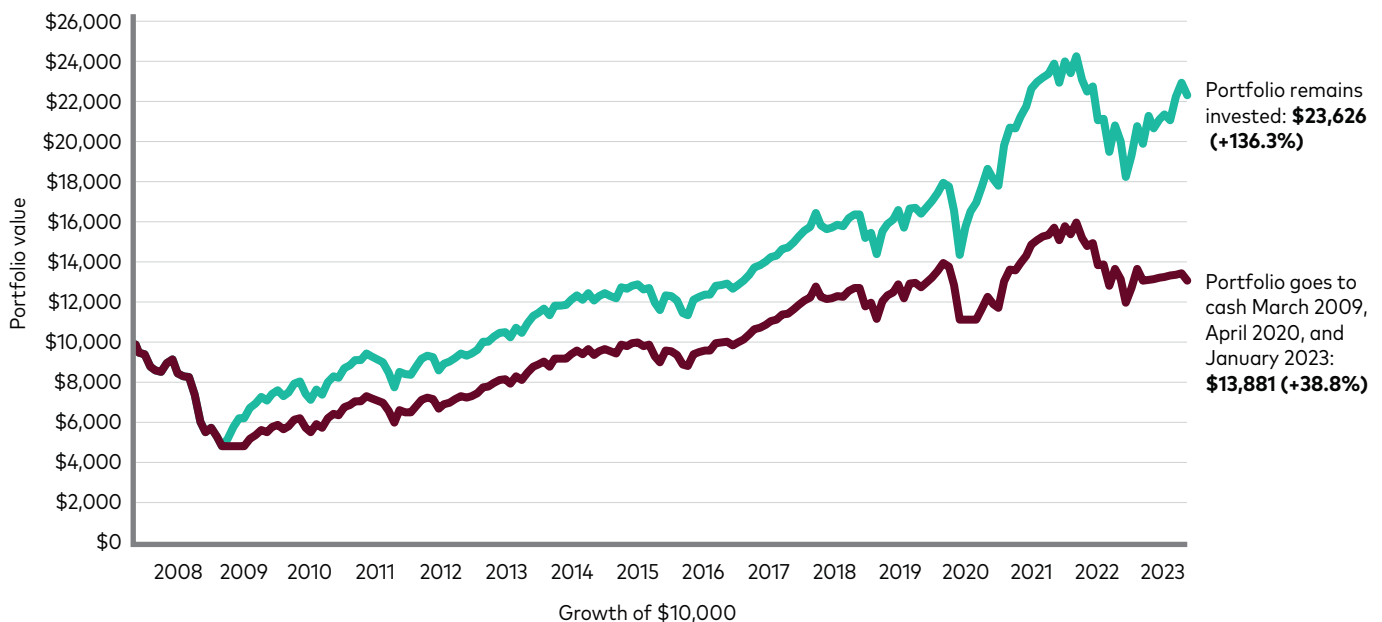
<sup>10</sup> [Navigating a down market](#). Vanguard. June 2023.

the best days often coming during or closely following the worst ones. If one panic sells and subsequently misses only a few of these “best” days, there can be significant consequences for the portfolio. In fact, missing just the market’s best five days over the past 20 years would’ve reduced total returns by more than one-third. Missing the top 20 days would’ve cut returns by almost three-quarters, as shown in Figure 3.

We can use past events to illustrate what may have happened if a hypothetical participant, like the more risk-averse Participant A above, responded to the severe market drawdowns we experienced over the past 16 years by reactively selling out of their target-date investment and attempting to time reentry after markets rebounded. Figure 4 shows that an investor who

rode out the rocky periods and stuck with their plan would’ve experienced a total cumulative return of 136.3% from November 2007 through December 2023. This compares with a cumulative return of only 38.8% for the investor who succumbed to regret aversion, panicked, and moved to cash for a period during the 2008 global financial crisis, COVID-19 pandemic, and 2022 market drawdown. While attempting to time their market reentry point, the investor missed some of the best trading days and a sizable portion of the eventual rebound. This underscores one of the many benefits of an advisory relationship, where effective behavioral coaching can set realistic expectations, instill a long-term perspective, and prepare the investor to plan for and tolerate eventual market downturns.

**FIGURE 4. Reacting to market volatility can harm returns**



Sources: Vanguard calculations using data from Morningstar. Target-date fund performance is represented by the Morningstar Category US Fund Target-Date 2050 between November 2007 and December 2023. Morningstar Category averages are designed to represent the average return of funds within their category over time. It will be structurally different from the mean return of the current constituents of the category as it will take into account funds that have changed categories over time and share classes/funds that have subsequently liquidated. This ensures that the category averages are free of survivorship bias. Results will vary for other time periods. The included funds do not have a minimum time requirement for performance history. Cash is represented by the Bloomberg US Treasury Bellwethers 3-Month Index. **The performance data shown represent past performance, which is not a guarantee of future results. Investment returns and principal value will fluctuate, so investors’ shares, when sold, may be worth more or less than their original cost. Current performance may be lower or higher than the performance data cited. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.**

Notes: This chart shows the growth of \$10,000 and compares the performance of two hypothetical investments in a target-date 2050 fund during and after three large market downturns. This hypothetical illustration does not represent the return on any particular investment. The buy-and-hold investor remains fully invested the entire period from November 2007 through December 2023. The market-timing investor sells to cash during each downturn and subsequently reinvests in the target-date fund after equity markets—as measured by the S&P 500 Index—have risen more than 20% from the date of last sale. The periods when the market-timing investor is out of the target-date fund and in cash are March 2009 through May 2009; April 2020 through June 2020; and January 2023 through July 2023.



## Providing a customizable approach to retirement income

Participants need a range of options, from robust self-directed tools and investments to more personalized wealth-planning and advice solutions, to help them along their retirement journey. Additionally, many investors lack the interest or time to appropriately plan for their retirement.

The growth of intelligent plan-design features and financial wellness programs, along with an expanded offering of professionally managed allocations (via target-date products), has positively affected participant behaviors and

outcomes. We demonstrate that a self-directed path with a target-date investment strategy can provide a high probability of meeting retirement income needs for participants not willing to engage in an advice relationship. As we've also shown, participants who do choose to take advantage of a plan sponsor's advice offer can find added value through personalization and behavioral coaching.

Each investor has their own vision for a financially successful retirement, and a personalized glide path, along with behavioral coaching through advice, can help that vision come to life.

## Appendix I

### Life-cycle assumptions for Vanguard Target Retirement Funds

Input	Assumption	Notes
Starting age	25	—
Horizon age	111	—
Retirement age	65	—
Social Security withdrawal age	65	—
Risk tolerance	Conservative	—
Saving rate (as % of salary)	8.8–12.0%	Saving rate increases over time because of the expectation of savings escalation for retirement plan enrollees as the investor approaches their retirement date.
Starting real salary	\$52,000	For investor in workforce at age 25.
Ending real salary	\$75,000	For investor starting at age 25 and retiring at age 65. We add productivity growth and inflation to this over time.
Wage scale	Social Security Administration Average Wage Index	—
Total replacement ratio	79%	For ending salary of \$75,000 and saving rate of 15%. Single earner - replacement ratio = 79%.*
Social Security replacement ratio	37%	Based on real monthly Social Security benefit estimates for ending salary of about \$75,000 and saving rate of 15%. Single earner - SS replacement ratio = 37%.
DB replacement ratio	None (0%)	—
TDF replacement ratio	42%	Total replacement ratio - Social Security replacement ratio - DB replacement ratio.
Spending rule	Fixed real dollar with sustainability adjustment	Withdrawal amounts bounded on higher end by replacement ratio and on lower end by determining sustainable withdrawal amount given years of spending the portfolio is expected to support.

\*Source: Lobel, Jaconetti, and Cuff. [Vanguard's approach to target-date funds](#). Vanguard. 2022.

## Appendix II

### Asset returns: Vanguard Capital Markets Model

**IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model (VCMM) regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. VCMM results will vary with each use and over time.**

The VCMM projections are based on a statistical analysis of historical data. Future returns may behave differently from the historical patterns captured in the VCMM. More important, the VCMM may be underestimating extreme negative scenarios unobserved in the historical period on which the model estimation is based.

The VCMM is a proprietary financial simulation tool developed and maintained by Vanguard's Investment Strategy Group. The model forecasts distributions of future returns for a wide array of broad asset classes. Those asset classes include U.S. and international equity markets, several maturities of the U.S. Treasury and corporate fixed income markets, international fixed income markets, U.S. money markets, commodities, and certain alternative investment strategies. The theoretical and empirical foundation for the VCMM is that the returns of various asset classes reflect the compensation investors require for bearing different types of systematic risk (beta).

At the core of the model are estimates of the dynamic statistical relationship between risk factors and asset returns, obtained from statistical analysis based on available monthly financial and economic data. Using a system of estimated equations, the model then applies Monte Carlo simulation method to project the estimated interrelationships among risk factors and asset classes as well as uncertainty and randomness over time. The model generates a large set of simulated outcomes for each asset class over several time horizons. Forecasts are obtained by computing measures of central tendency in these simulations. Results produced by the tool will vary with each use and over time.

The Vanguard Life-Cycle Investing Model (VLCM) is designed to identify the product design that represents the best investment solution for a theoretical, representative investor who uses the target-date funds to accumulate wealth for retirement. The VLCM generates an optimal custom glide path for a participant population by assessing the trade-offs between the expected (median) wealth accumulation and the uncertainty about that wealth outcome, for thousands of potential glide paths. The VLCM does this by combining two set of inputs: the asset class return projections from the VCMM and the average characteristics of the participant population. Along with the optimal custom glide path, the VLCM generates a wide range of portfolio metrics such as a distribution of potential wealth accumulation outcomes, risk and return distributions for the asset allocation, and probability of ruin, such as the odds of participants depleting their wealth by age 95.

The VLCM inherits the distributional forecasting framework of the VCMM and applies to it the calculation of wealth outcomes from any given portfolio. The most impactful drivers of glide path changes within the VLCM tend to be risk aversion, the presence of a defined benefit plan, retirement age, saving rate and starting compensation. The VLCM chooses among glide paths by scoring them according to the utility function described and choosing the one with the highest score. The VLCM does not optimize the levels of spending and contribution rates. Rather, the VLCM optimizes the glide path for a given customizable level of spending, growth rate of contributions, and other plan sponsor characteristics.

A full dynamic stochastic life-cycle model, including optimization of a savings strategy and dynamic spending in retirement, is beyond the scope of this framework.

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All investing is subject to risk, including the possible loss of the money you invest. Diversification does not ensure a profit or protect against a loss. There is no guarantee that any particular asset allocation or mix of funds will meet your investment objectives or provide you with a given level of income.

Investments in target-date funds are subject to the risks of their underlying funds. The year in the fund name refers to the approximate year (the target date) when an investor in the fund would retire and leave the workforce. The fund will gradually shift its emphasis from more aggressive investments to more conservative ones based on its target date. An investment in target-date funds is not guaranteed at any time, including on or after the target date.

Vanguard is responsible only for selecting the underlying funds and periodically rebalancing the holdings of target-date investments. The asset allocations Vanguard has selected for the Target Retirement Funds are based on our investment experience and are geared to the average investor. Investors should regularly check the asset mix of the option they choose to ensure it is appropriate for their current situation.

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