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TDF strategies for retirement income:

Adding a new equity landing point for more diverse participant spending goals

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- An increasing number of plan sponsors are seeking ways to support their participants not only *to* retirement but also *through* retirement as a key aspect of participants' financial well-being.
- Target-date funds (TDFs) are constructed to meet a broad array of objectives based on a participant's retirement age. They serve a diverse population saving for retirement. But given every participant arrives at retirement with different goals, resources, and risks, there is no one-size-fits-all solution for the drawdown phase in retirement.
- The default glide path for Vanguard Target Retirement programs, with its final 30% equity allocation at age 72, helps meet the retirement spending goals for the vast majority of investors. However, a higher final equity allocation may be appropriate for some investors who have differing retirement income objectives and have the ability and willingness to take on additional equity risk.
- This paper explores how adding a second post-retirement option with a higher final equity allocation landing point can better serve select participants and help plan sponsors meet fiduciary responsibilities.

Introduction

Successful plan sponsorship does more than enable participants to accumulate savings. True retirement success, a critical component of participants' financial well-being, enables participants to draw on their savings in a way that supports the type of retirement they want. To meet that goal, an increasing number of plan sponsors are seeking ways to support their participants not only *to* retirement but also *through* retirement. This interest is being driven by several trends in the defined contribution (DC) landscape:

1. **More participants are retiring.** 10,000 baby boomers will enter retirement every day through 2029, when the youngest boomers reach 65.[1]

2. **People are living longer.** Global life expectancies increased by more than 6 years between 2000 and 2019—from 66.8 years in 2000 to 73.4 years in 2019.[2]

3. **Most individuals in private industry are retiring without traditional pensions.** Longevity and shortfall risks are now falling on participants.

4. **Participants are asking for help.** The 2020 Retirement Confidence Survey found that 8 in 10 participants are asking for help converting their assets into an income stream in retirement.

The growth of TDFs has meaningfully improved retirement readiness for millions of participants (Alling and Clark, 2021). In the past 10 years through 2020, assets grew from $290 billion to $2.6 trillion as TDFs gained significant traction as a qualified default investment alternative (QDIA).[3] Among Vanguard's DC record-kept clients as of year-end 2020, 98% of plans offered a TDF, 80% of all participants allocated funds to a TDF, and the funds accounted for 37% of plans' assets and 60% of total plan contributions.

These positive trends are not surprising given that TDFs distill the complex tasks of portfolio construction and management into one key decision: the date that the participant expects to retire. Based on the expected retirement year, a participant can select an appropriate TDF that is a professionally managed, diversified portfolio following an asset allocation glide path over time.

TDFs typically take more equity risk when an investor is far from retirement, and reduce the equity risk exposure as retirement approaches. This enhances the likelihood that the TDF portfolio, combined with Social Security benefits, will help the investor replace a reasonable portion of pre-retirement income in most market environments.

An analysis of Vanguard's defined contribution recordkeeping data finds that 54% of participants hold a single TDF (Alling et al., 2021). Among these participants 65 and older, a majority hold either an income fund that is the final post-retirement asset allocation or year-based funds that are fast converging on that final allocation.

These investors share a diversity of retirement goals and resources, which raises the following questions: Do some of these investors have the willingness and ability to take on more equity risk, and could their retirement objectives be met with a higher equity allocation? We use a retirement planning framework to answer these questions and guide plan sponsors on additional ways they can support participants through retirement.

1 Pew Research Center.
2 World Health Organization.
3 TDFs are a QDIA under the Pension Protection Act of 2006.

Begin with Vanguard's retirement plan framework

Vanguard developed a conceptual framework to assess how different goals, risks, and resources can lead to different portfolio allocations and spending strategies in retirement (Jaconetti et al., 2021). The framework consists of four steps:

1. Determine goals.
2. Understand risks.
3. Assess available financial resources and tools.
4. Develop a plan to achieve goals and mitigate risks.

Within this framework, we found that the majority of retiree goals fall into four broad categories: basic living expenses, contingency reserves, discretionary spending, and legacy. Each participant's prioritization of these goals, risk tolerance around meeting each goal, and resources available at retirement are different—and can vary quite dramatically across a participant population. Combine this with the unique health, longevity, and tax situation of each participant, and it's easy to understand why there is no one-size-fits-all retirement income solution. For many participants, advice can provide the most holistic and flexible retirement income solution; however, not every participant will want to engage with an advisor. As a result, Vanguard's retirement income solutions, as illustrated in **Figure 1**, range from a self-directed offer, to a one-time engagement with an advisor, to an all-digital advice offer, to an ongoing relationship with an advisor. Our self-directed offer[4] comprises three primary components:

1. **Investment strategies** that include Target Retirement strategies aligned to retiree spending goals.
2. **Spending services** that include personalized annual spending recommendations.
3. **Participant guidance** on investment strategies and annual spending amounts, as well as access to Hueler's annuity platform.[5]

This spectrum provides every participant the retirement income support they need with the level of engagement they prefer.

Figure 1: Vanguard's multifaceted approach to retirement income

Vanguard retirement income solutions

Self-directed offer

Advice offers

4 Our self-directed offer is best suited for participants who hold the majority of their assets in one bucket type (taxable, tax-deferred, or tax-free accounts) and/or have limited flexibility on when to claim their Social Security benefits.

5 The Income Solutions® Annuity Platform, administered by Hueler Investment Services, Inc., enables individuals to obtain institutionally priced income annuity quotes from multiple insurance companies.

TDFs are well suited as the investment solution for retiree spending goals, which include both basic living expenses and discretionary spending. Contingency reserves and legacy goals are considered capital preservation goals. Contingency reserves are better suited outside the qualified plan so participants can access their money without taxes or penalties. Advice is a better solution for participants with legacy goals, as these participants are likely to have more complex financial situations. They may have a meaningful portion of their assets outside their qualified plan and invested across taxable, tax-deferred, and tax-free accounts. For these participants, asset location and a tax-efficient withdrawal strategy can minimize the total taxes paid over the course of a participant's retirement. This tax savings can increase spending and/or increase the length of time their portfolio lasts.

Spending goals		Capital preservation goals	
Basic living expenses	Stable inflation-adjusted income Risk level 2	**Contingency reserve**	Liquidity Risk level 1
Discretionary spending	Capital appreciation to fund higher spending levels Risk level 3	**Legacy**	Long-term capital appreciation and/or capital preservation depending on the retiree; advice best suited for this goal

Aligning TDFs with retiree spending goals

Vanguard regularly analyzes wealth accumulation, retirement income sufficiency, and, importantly, the risk assumed in meeting those goals for its existing Target Retirement programs. Our research has shown—not surprisingly—that there are trade-offs. Ultimately, the decision to take on more or less risk is neither right nor wrong. It is dependent upon the investor's and plan sponsor's objectives. Because investor preferences and demographics are extremely heterogeneous, we believe that the 30% equity landing point in Vanguard's current Target Retirement programs provides a reasonable balance of market, longevity, and inflationary risks for the majority of investors (Donaldson et al., 2019).

A key underlying assumption for the 30% equity landing point is a 78% replacement ratio.[6] For participants seeking to replace a higher percentage of their pre-retirement income, we took a qualitative and quantitative approach to evaluate whether a second post-retirement allocation in a target-date series could enhance outcomes for participants with the willingness and means to pursue higher spending goals. We modeled different asset allocations, withdrawal rates, income levels, and wealth at retirement.

Our analysis concluded that for some participants—those with higher income or wealth and a higher risk tolerance—a landing point of 50% equity struck a prudent balance between higher spending rates throughout retirement and the potential downside risk that comes with a higher allocation to equities.

We use the Vanguard Life-Cycle Investing Model (VLCM) (Aliaga-Diaz et al., 2021) and the Vanguard Capital Markets Model® (VCMM) to illustrate our forecasted risk-reward trade-off for Vanguard's Target Retirement glide paths with a 30% equity landing point and with a 50% equity landing point. As shown in **Figure 2**, after considering retirement spending, the 50% equity landing point results in higher median expected wealth accumulation outcomes than those of the 30% equity landing point, and the difference increases over time. By age 95, wealth accumulated for investors with the 50% equity

6 Replacement ratio is the amount of pre-retirement income maintained in retirement, after taxes and savings.

portfolio is almost 50% higher than those in the 30% equity glide path. That means total retirement spending can increase from a 78% replacement ratio to 88%, while still maintaining nearly the same level of post-consumption accumulated wealth.

Figure 2: Ending median wealth with 30% equity vs. 50% equity

$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$0

At retirement | Age 85 | Age 95

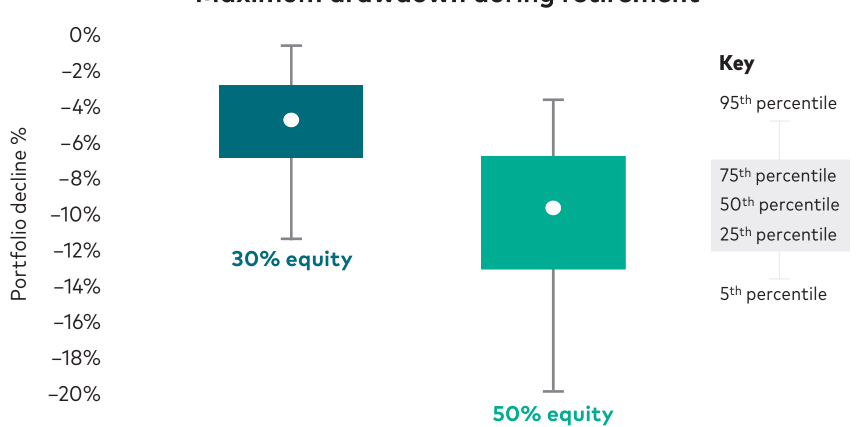
30% equity/78% replacement ratio
50% equity/78% replacement ratio
50% equity/88% replacement ratio

Notes: This analysis is based on the VLCM and VCMM simulations. It assumes retirement at age 67. Total post-consumption wealth is calculated using a replacement ratio for the glide paths landing at 30% equity and 50% equity. The glide paths have allocations across the following asset classes: U.S. equities, non-U.S. equities, U.S. bonds, non-U.S. bonds, and short-term Treasury inflation-protected securities (TIPS). **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, 2020. Results from the model may vary with each use and over time. For more information, please see the important information section on pages 12-13.**

Source: Vanguard.

To achieve the higher wealth accumulation or higher replacement ratio shown in Figure 2, investors must assume higher market risk. We highlight the risk side of the trade-off in **Figure 3**, which shows the forecasted maximum drawdowns for the two strategies during retirement. As illustrated, the distribution of potential downside returns is wider for the 50% equity landing point, indicating more uncertainty of potential outcomes, resulting in higher risk to future income. Also the entire distribution of results shifts downward, indicating higher drawdown risk across the distribution for this path. Based on median results, the 50% equity landing point has a maximum drawdown approximately 8 percentage points worse than the 30% equity landing point path based on median expected results as well as a potential drawdown of 20% or more during retirement.[7] Participants opting for the higher equity path should be able to withstand a decline in their account balance of 20% or more as well as the short-term implications for income and spending stability.

Figure 3: Potential downside risk in retirement with 30% equity vs. 50% equity



Notes: This analysis is based on the VLCM and VCMM. Maximum peak-to-trough decline of accumulated wealth starting from retirement until age 95 for the glide paths landing at 30% equity and 50% equity respectively, which have allocations across the following asset classes: U.S. equities, non-U.S. equities, U.S. bonds, non-U.S. bonds, and short-term TIPS. Accumulated wealth for each glide path does not account for retirement consumption and is based on VCMM return simulations as of December 31, 2020. See pages 12–13 for more details.

Source: Vanguard

7 Fifth percentile results are approximately 20% drawdown for the 50% equity landing point glide path in retirement. Fifth percentile represents the worst 5% of potential outcomes and not the worst possible outcome.

In **Figure 4**, we illustrate the relationship between spending and portfolio risk. As shown, higher spending, all else equal, does reduce the probability of success, as measured by the likelihood of maintaining a positive balance 30 years into retirement. However, with the same level of spending, investors with a higher equity allocation improve their likelihood of success. Among investors spending 4% of their portfolio annually, those with a 50% equity allocation would have an 86% probability of not depleting their account balance by year 30. For investors with a 30% equity allocation spending 4%, this probability drops to 74%. Likewise, a larger equity allocation in retirement does facilitate potentially higher spending. For example, investors with a 50% equity allocation in retirement have approximately the same probability of success spending 4% of their portfolio annually as those with a 30% equity allocation in retirement spending 3.8%.

Figure 4: Probability of success 30 years after retirement

	Spending as a percentage of initial portfolio										
Equity allocation	**3.50%**	**3.60%**	**3.70%**	**3.80%**	**3.90%**	**4.00%**	**4.10%**	**4.20%**	**4.30%**	**4.40%**	**4.50%**
30%	95%	93%	90%	85%	80%	74%	68%	61%	54%	47%	40%
40%	97%	95%	93%	90%	86%	82%	77%	72%	66%	60%	53%
50%	97%	96%	94%	92%	89%	86%	82%	78%	73%	68%	63%
60%	97%	96%	94%	93%	91%	88%	85%	81%	78%	73%	68%

Notes: This analysis assumes spending as a percentage of the initial portfolio balance but adjusted for inflation annually. Vanguard calculations are based on VCMM simulations as of June 30, 2021, for the following asset classes: U.S. equities, non-U.S. equities, U.S. bonds, and non-U.S. bonds. The portfolio allocations noted above are static across a 30-year time horizon rebalanced annually. The probability of success is defined by the portfolio having a positive balance at year 30. See pages 12–13 for more details.

Source: Vanguard.

Enhancing the Target Retirement programs with an additional landing point

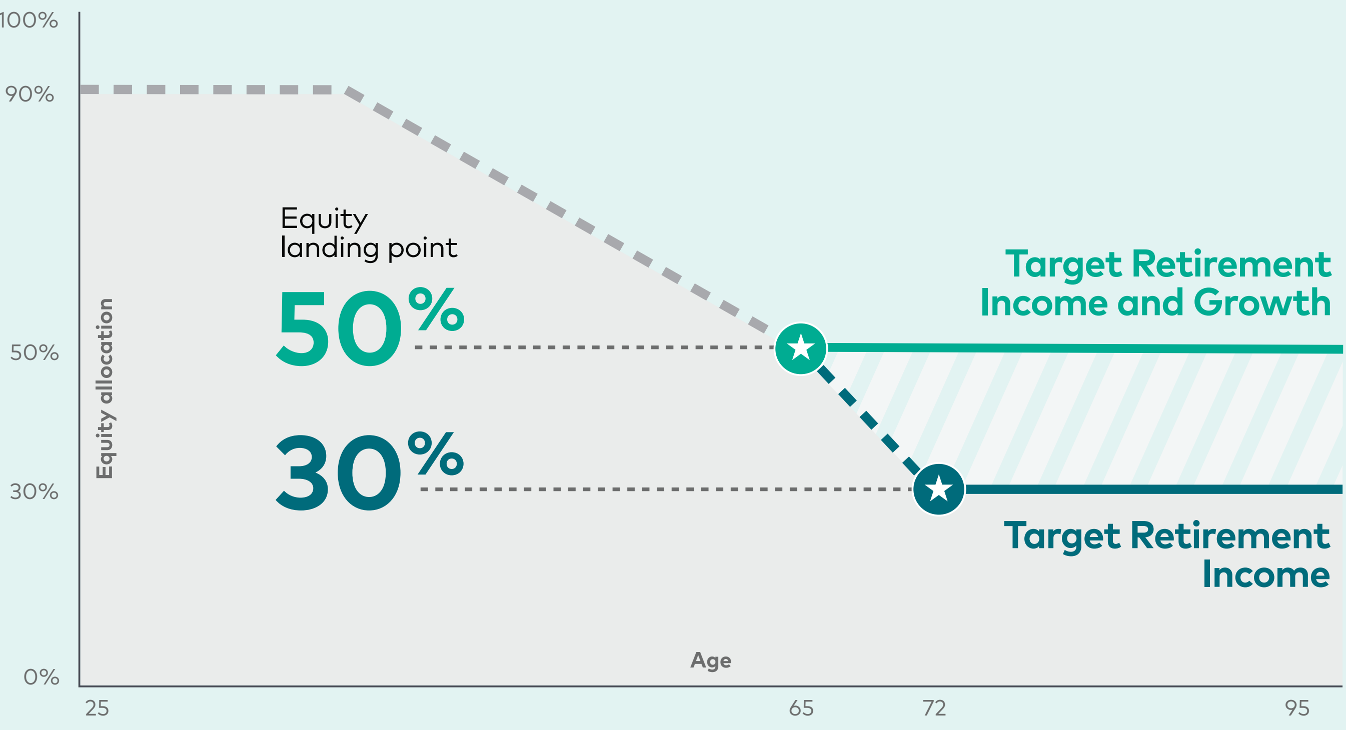
Vanguard's default Target Retirement glide path starts with a 90% equity allocation at age 25, gradually decreases to 50% equity at age 65, and ultimately lands at 30% equity around age 72 when the assets transition to the existing Vanguard Target Retirement Income. That allocation is well suited for those seeking a relatively stable inflation-adjusted income.

For participants seeking to replace a higher percentage of their pre-retirement income than Vanguard's current default strategy provides, we suggest Vanguard Target Retirement Income and Growth as an additional option to the current Vanguard Target Retirement programs.

The Target Retirement Income strategy would remain the default landing point if it is currently designated as such. Participants would be given the option to stop de-risking around age 65 when their equity allocation is 50%. Vanguard has researched and developed three brief questions designed to effectively gauge participant retirement income objectives, resources, and risk tolerance. Based on their responses, participants would be guided on whether to opt in to the new strategy. Those who do not opt in would remain on the default Target Retirement glide path, eventually automatically transitioning to Vanguard Target Retirement Income strategy.

The two Target Retirement strategies are identical in their expense ratio, underlying funds, and management approach. The only divergence is in asset allocation starting around age 65, as illustrated in **Figure 5**.

Figure 5: Participants opt in to new strategy



Source: Vanguard.

Considerations for plan sponsors

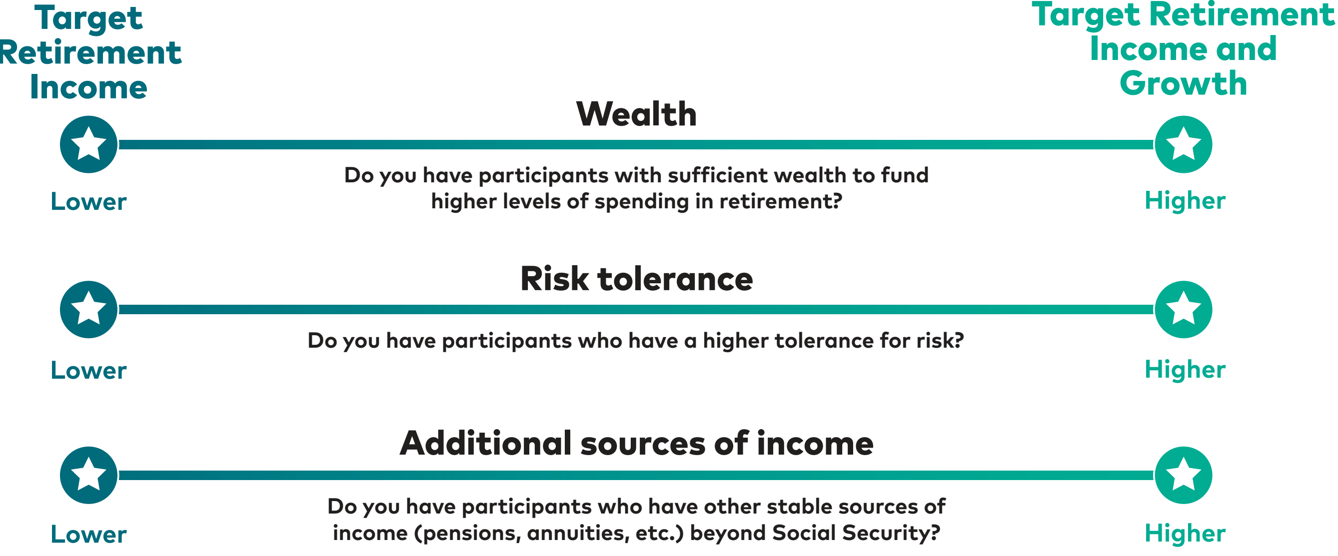
Vanguard's decision framework can help plan sponsors evaluate the trade-offs and determine the applicability of the 30% equity and 50% equity landing points for their participant population.

After spending objectives, several specific factors should be considered. As illustrated in **Figure 6**, plan sponsors should consider adding this strategy to their lineups if they have:

1. Participants with sufficient retirement savings to allow for higher spending levels than can be currently supported by the Target Retirement Income strategy.
2. Participants who are comfortable with the higher risk needed to provide higher levels of spending or continued asset growth.
3. Participants who have additional stable income sources (such as a pension or an annuity) beyond Social Security to cover basic living expenses in the event of equity market underperformance.

For most plans, especially plans with diverse employee populations, there is a high likelihood that both equity landing points would be suitable for different subsets of the participant population. As a fiduciary, providing an additional retirement income option can add value by providing a more tailored and customized experience at no additional cost .

Figure 6: Factors to consider for the participant population



Source: Vanguard.

Considerations for participants

Vanguard has developed a questionnaire to gauge each participant's retirement income objectives, risk tolerance, and resources based on the following considerations:

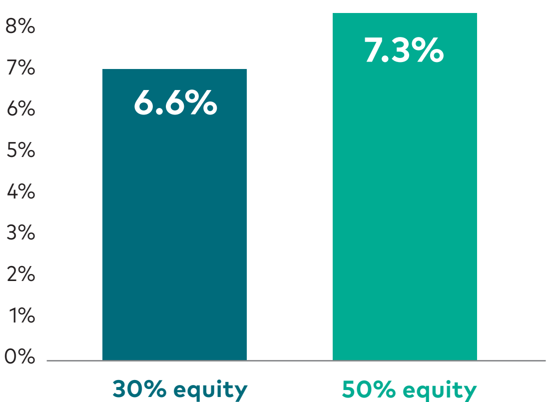
Retirement income objectives. Participants should consider their primary investment objective for the assets in this retirement account. If this account is their main pool of assets to fund their pre-retirement spending level (after accounting for savings and taxes), then stable inflation-adjusted income would likely be their primary objective. However, if this account is to provide for higher levels of spending in retirement, then capital appreciation would likely be their primary objective.

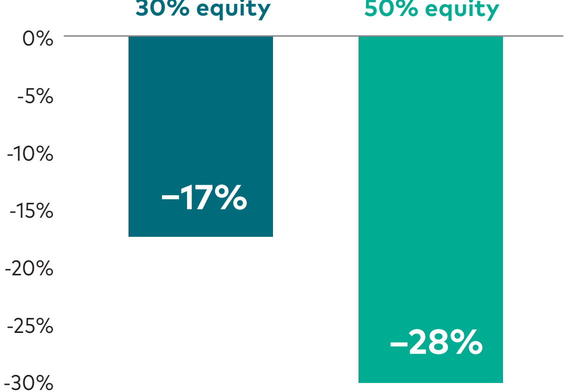
Risk tolerance. Participants should understand the trade-offs and associated risks of these two investment objectives. For example, higher potential growth to fund higher spending levels comes with higher risk—and potentially higher spending volatility or even premature portfolio depletion—because of the increased exposure to equities.

Figure 7 shows a hypothetical $1 million retirement portfolio using historical returns over the past 30 years. As you can see, the higher equity allocation of 50% would have had an annualized return of approximately 7.3% versus 6.6% for the 30% equity allocation. While a difference of 70 basis points may not sound significant, it equates to an extra $7,000 per year of additional spending based on a $1 million portfolio. This increased spending does come with additional risk. Over the same 30-year timeframe, the steepest observed 12-month decline for the 50% equity allocation was 28% versus 17% for the 30% equity allocation. This equates to an additional $110,000 loss of that $1 million portfolio's value—or about a 15% decline in spending from $33,200 to $28,000. It is important that participants have both the resources and the risk tolerance to withstand such a decline.

Stable income from other sources. Participants should take into account the impact of higher volatility on their ability to meet their basic living expenses in the event of a period of equity market underperformance. Participants with stable income sources beyond Social Security, such as a traditional pension or annuity, are in a better position to assume a higher equity allocation in retirement, as long as their Social Security plus their other stable income sources cover a meaningful portion of their basic living expenses. These investors could weather the higher volatility and downside risk of a higher equity allocation. A down year in the equity markets would not jeopardize their ability to afford food, housing, and medical care in retirement. As a result, they are more likely able to assume the higher risk.

Figure 7: A higher equity allocation could provide additional spending but with higher downside risk potential





This strategy would have provided, on average,

~$7,000 more a year

in spending for a $1 million portfolio . . .

. . . only if the participant stayed invested during an

extra ~$110,000 decline

in portfolio value during the worst 12-month period.

Notes: Annualized returns are for the period from the start of 1990 through September 2020. The returns of the target benchmarks of the underlying index portfolios were used: for U.S. stocks, the Spliced Total Stock Market Index (the Dow Jones Wilshire 5000 Index through April 22, 2005, the MSCI US Broad Market Index through June 2, 2013, and the CRSP US Total Market Index thereafter); for non-U.S. equity, the MSCI AC World Index ex US Gross through April 30, 1996, and the Spliced Total International Index (Total International Composite Index through August 31, 2006; MSCI EAFE + Emerging Markets Index through December 15, 2010; MSCI ACWI ex USA IMI Index through June 2, 2013, FTSE Global All Cap ex US Index thereafter); for U.S. bonds, Bloomberg Barclays US Aggregate Bond Index through July 31, 2009, and the Bloomberg Barclays US Aggregate Float-Adjusted Index thereafter; for non-U.S. bonds, Bloomberg Barclays Global Aggregate ex-USD Index through January 31, 2013, and the Bloomberg Barclays Global Aggregate ex-USD Index Float Adjusted RIC Capped Index Hedged thereafter; for short-term TIPS, Bloomberg Barclays US Treasury 1–5 Year Total Return Index Value Unhedged as a proxy through September 30, 2002, and the Bloomberg Barclays US Treasury Inflation-Protected Securities 0–5 Year Index thereafter. *Past performance is no guarantee of future returns. The performance of an index is not reflective of any particular investment, as you cannot invest directly in an index.*

Sources: Vanguard and respective index providers, as of September 30, 2020.

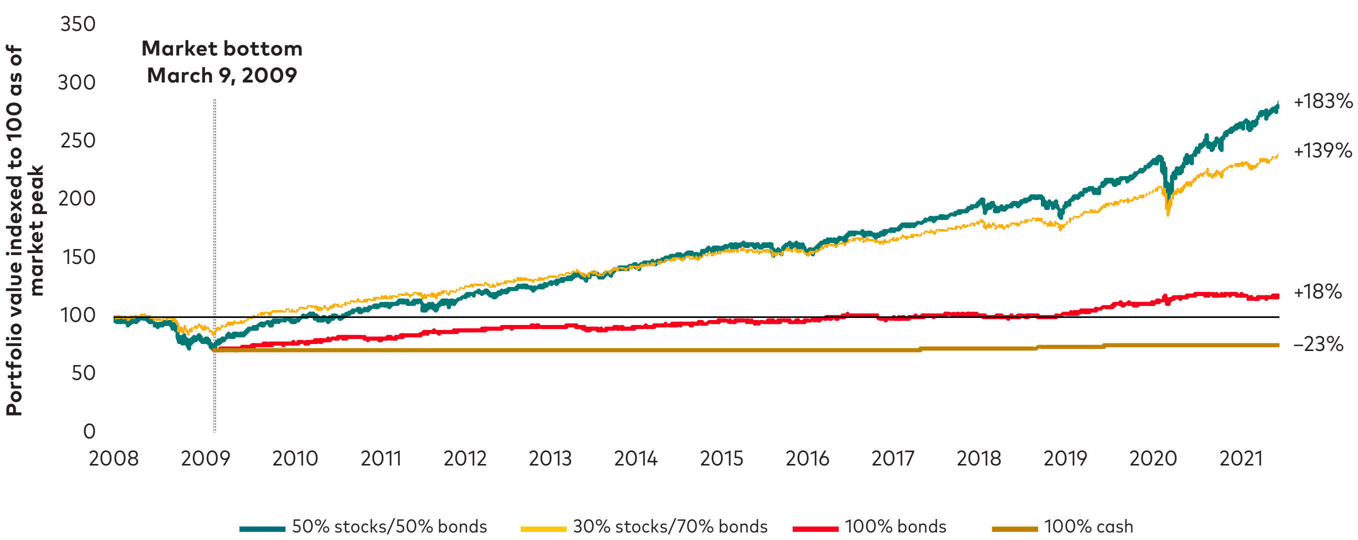
In other words, participants should only consider opting into the 50% equity allocation if they can bear the additional downside risk associated with periods of significant market decline.

One example is illustrated in **Figure 8,** covering the period from the market peak of October 2007 through the market bottom of March 2009 and ending August 2021. The dark blue line represents a 50% stocks/50% bonds investor who rebalanced throughout the entire period; the return on that portfolio would have been +183%.

If this same participant panicked and instead decided to sell out of their 50/50 portfolio at the market bottom and moved into a 100% bond portfolio, the portfolio's return over the entire period would have been +18%. And if the same participant decided to go into cash at the market bottom, their portfolio would still be down by −23%.

The participant in these scenarios would have been better off staying in the 30% stocks/70% bonds portfolio if that meant they did not panic at the market bottom; that portfolio return over the entire period was +139%. Market downturns highlight the importance of other income sources outside the TDF for those on the 50% equity ending allocation path.

Figure 8: Maintaining an asset allocation during times of market distress can be challenging



Sources: Vanguard calculations using data from FactSet. Indexes used: S&P 500 Index, Bloomberg Barclays Capital US Aggregate Bond Index, and 3-month Treasury bill for cash. Data from pre-crisis peak on October 8, 2007, through August 6, 2021.

Conclusion

Vanguard continually strives to support plan sponsors and participants in achieving better financial outcomes. Using our retirement planning framework, we determined that adding a second post-retirement allocation in a target-date series with a higher final equity allocation can better serve select participants. Vanguard Target Retirement Income and Growth is not a change from our current glide-path stance but rather a recognition that investors have different goals and that there is no one-size-fits-all solution to retirement income. An elegant opt-in extension of our world-class Target Retirement programs, this new product is designed to work in concert with existing tools and resources to help a more diverse range of participants achieve financial well-being and meet their specific retirement income needs.

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Important information

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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 long-term returns of our hypothetical portfolios are based on data for the appropriate market indexes through time periods stated earlier. We chose these benchmarks to provide the most complete history possible, and we apportioned the global allocations to align with Vanguard's guidance in constructing diversified portfolios. Asset classes and their representative forecast indexes are as follows:

- U.S. equities: MSCI US Broad Market Index
- Global ex-U.S. equities: MSCI All Country World ex-USA Index
- U.S. bonds: Bloomberg Barclays U.S. Aggregate Bond Index

- Global ex-U.S. bonds: Bloomberg Barclays Global Aggregate ex-USD Index
- U.S. short-term TIPS: Bloomberg Barclays U.S. 1–5 Year Treasury Inflation Protected Securities Index
- U.S. cash: U.S. 3-Month Treasury—constant maturity

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 Vanguard Capital Markets Model® is a proprietary financial simulation tool developed and maintained by Vanguard's primary investment research and advice teams. 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 Vanguard Capital Markets Model 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 from as early as 1960. Using a system of estimated equations, the model then applies a 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, savings 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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