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Choice of equity landing points can benefit target-date investors

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Introduction

At Vanguard, we suggest a comprehensive approach to retirement income for defined contribution plans, including investment strategies, financial wellness tools, and access to guaranteed income and advice, to provide options for participants to customize their retirement income journey. Target Retirement investments are an important piece of the retirement income puzzle.

With a 30% final equity allocation at age 72, the Vanguard Target Retirement glide path is constructed to help a broad range of participants meet their retirement spending needs. And for those participants whose circumstances and risk tolerance allow, the higher-equity final landing point (50%) of Vanguard Target Retirement Income and Growth Trust (TRIGT) may be more appropriate.

In this paper, we use the Vanguard Life-Cycle Investing Model (VLCM)[1] to analyze how the TRIGT strategy may be better suited for certain participants with the ability and willingness to assume higher levels of risk for potentially higher wealth or spending in retirement. We've developed three personas—the income booster, the exceptional saver, and the aspirational spender—to help illustrate instances in which the potential for higher wealth or spending may be worth the increased risk posed by TRIGT's higher-equity final landing point.

A tale of two glide paths

Most target-date funds (TDFs) follow a downward-sloping equity glide path over the participant life cycle, beginning with a higher allocation to equities when participants are younger and gradually reducing equity exposure as they approach retirement. Vanguard's 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 Vanguard Target Retirement Income.[2]

To be broadly applicable for self-directed participants sharing limited personal information, the investment strategy assumes just enough equity risk in the glide path to meet a retirement income goal of maintaining their lifestyle. Vanguard constructed this suggested default glide path using VLCM's utility optimization framework for a generalized baseline participant[3] who is moderately conservative, saves between 8.8% and 12.0%, and plans to replace 79% of their ending salary to meet their goal of maintaining their lifestyle. For this participant, the probability of meeting their 79% retirement income goal is around 92% at age 95 (Figure 1).

TRIGT is an additional option to Target Retirement Income for participants who prefer to stop de-risking around age 65 and opt in to a 50% final equity allocation after completing a questionnaire designed to help with their decision (Figure 2). Those who choose not to opt in remain on the Vanguard Target Retirement glide path. Other than the asset allocation divergence at age 65, the two options are identical in their management approach, underlying funds, and expense ratios.

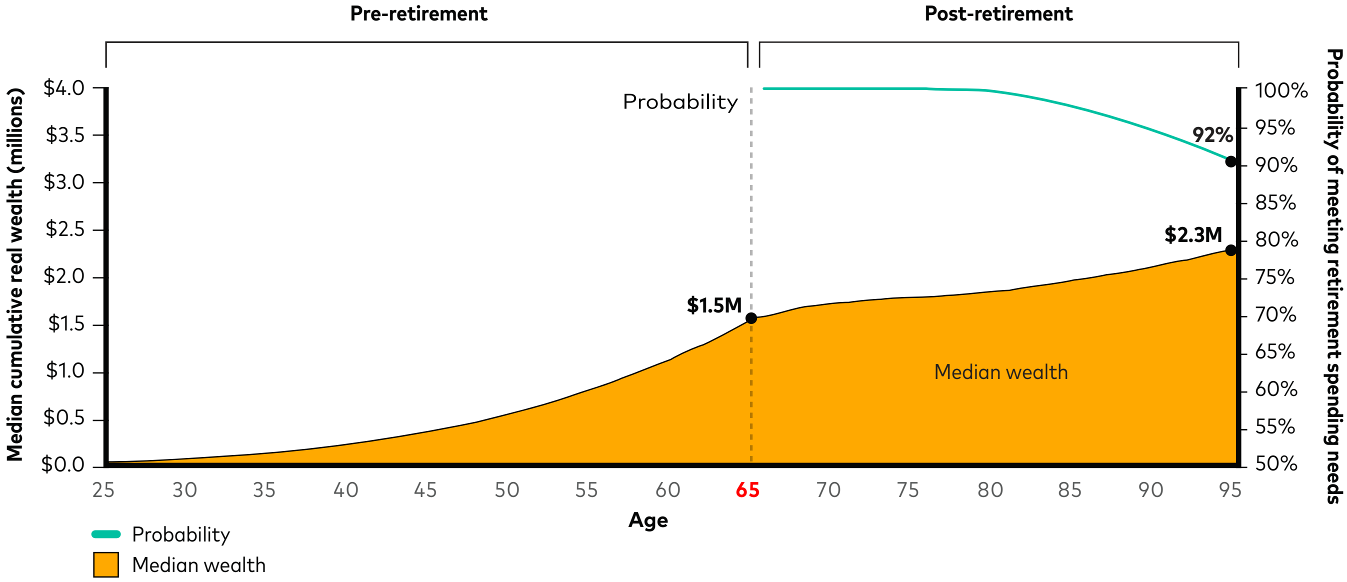
1 The Vanguard Life-Cycle Investing Model (VLCM) is a utility-based framework that accounts for investor characteristics, preferences, and constraints and incorporates market return projections from the Vanguard Capital Markets Model® (VCMM). It seeks to find an optimal glide path from a pool of potential thousands that best balances portfolio volatility due to market risk with maximizing the probability of achieving retirement spending and wealth goals over the investor's lifetime.

2 Target Retirement Income is available as both a collective investment trust (CIT) and a 1940 Act mutual fund.

3 Please see Appendix I for additional details about the Vanguard Target Retirement participant profile.

FIGURE 1

Baseline participant's median cumulative real wealth and probability of meeting retirement spending needs



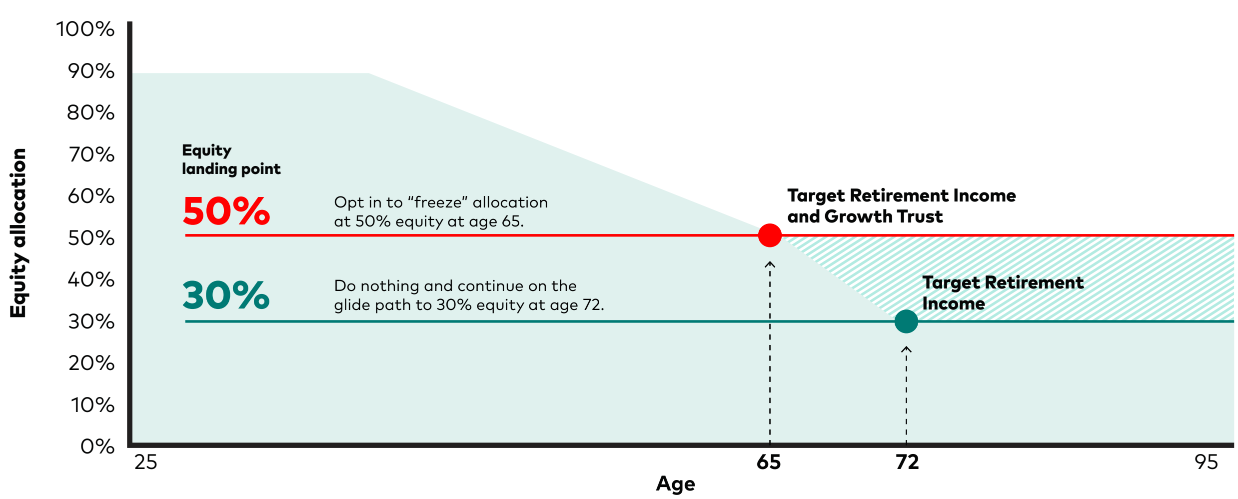
Source: Vanguard.

Notes: Analysis results are based on the Vanguard Life-Cycle Investing Model (VLCM) using 10,000 steady-state simulations from the Vanguard Capital Markets Model® (VCMM) based on market data and other information available as of December 31, 2023. 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 the 50th percentile of distribution of cumulative inflation-adjusted portfolio wealth across 10,000 simulations that accounts for portfolio returns, pre-retirement contributions, and post-retirement spending. Probability of retirement spending sufficiency is the total percentage of scenarios across 10,000 simulations where the retirement spending goal, based on the 79% replacement ratio, is met by inflation-adjusted income from the portfolio and all other sources.

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. Distributions of return outcomes from VCMM are derived from 10,000 simulations for each modeled asset class. Simulations as of December 31, 2023. Results from the model may vary with each use and over time. For more information, please see Appendix II.

FIGURE 2

Equity allocation of participants who self-select into a higher-equity landing option



Source: Vanguard.

Notes: TRIGT is available only as a collective investment trust. Target Retirement Income is available as both a trust and a 1940 Act mutual fund.

TRIGT decision framework helps evaluate trade-offs

Vanguard's decision framework can help plan sponsors evaluate trade-offs and determine the suitability of the two different equity landing points for their participant population. As illustrated in Figure 3, the higher-equity option may be appropriate for:

- 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.
- Participants with sufficient retirement savings to allow for higher spending levels than can be currently supported by the Target Retirement Income strategy.
- Participants who are comfortable with the higher risk that creates the opportunity for higher levels of spending or continued asset growth.

For most plans, especially those with participant populations that have diverse characteristics such as a defined benefit (DB) plan in addition to a defined contribution plan and/or a wide range of incomes, there is a high likelihood that both equity landing points would be appropriate for different subsets of participants. As fiduciaries, plan sponsors can add value by offering an additional ending equity option that's higher than the Target Retirement landing point.[4] Some plans may even consider offering TRIGT as the plan's qualified default investment alternative (QDIA) landing point if a majority of participants share factors suggesting that the higher-equity option may be more appropriate.

FIGURE 3

Factors to consider for participant population

Source: Vanguard.

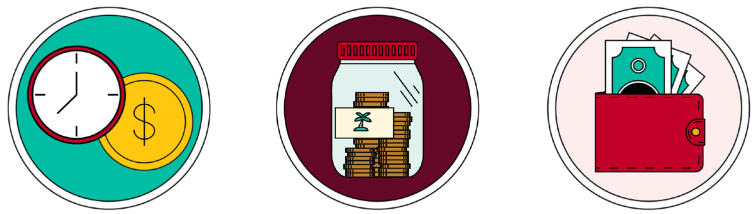
4 For participants willing or able to engage in an advised relationship, an advice program is more comprehensive and provides greater levels of flexibility and customization. This includes tailoring personalized glide paths, financial planning, and behavioral coaching to individual participant characteristics, circumstances, and needs.

Income boosters, exceptional savers, and aspirational spenders: TRIGT participant personas

We created three personas for whom TRIGT's higher ending equity allocation may provide additional benefit. These participants have higher income, wealth, or spending needs[5] and the willingness to tolerate the higher risk that comes with this higher-equity option. We use the VLCM to illustrate the benefit of the TRIGT glide path relative to the Target Retirement glide path for the three personas. We quantify the additional utility, or value, that the TRIGT option brings to each persona over the more conservative default path through a certainty fee equivalent (CFE).

FIGURE 4

Key assumptions for TRIGT personas



	Baseline participant	Persona 1: Income booster	Persona 2: Exceptional saver	Persona 3: Aspirational spender
Defined benefit replacement ratio	0%	**15%**	0%	0%
Savings rate	8.8%–12.0%	8.8%–12.0%	**12.5%–15.7%**	8.8%–12.0%
Total replacement ratio	79%	79%	79%	**90%**
Risk tolerance	Moderately conservative	**Higher**	**Higher**	**Higher**

Source: Vanguard.

Notes: Other than the different assumptions listed above, all other assumptions for Personas 1, 2, and 3 are the same as the baseline Vanguard Target Retirement participant profile. Please see Appendix I for additional details about the Vanguard Target Retirement participant profile.

What is a certainty fee equivalent?

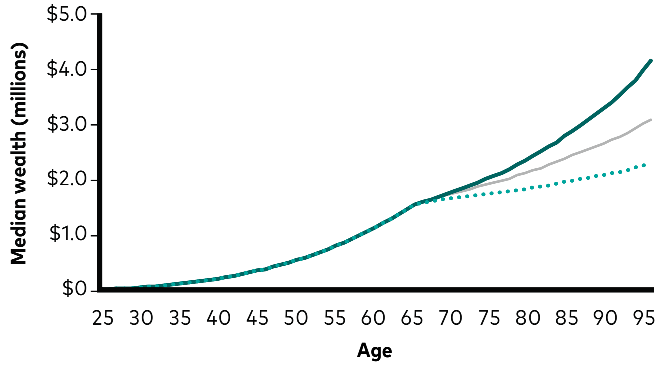
A certainty fee equivalent, or CFE, is a metric quantifying the improvements in a participant's consumption, wealth, and portfolio stability as units of return. It can also be thought of as the additional annual fee a participant is willing to pay to be on any given glide path over a reference glide path, such as the Vanguard Target Retirement glide path. The higher the CFE, the greater the potential excess value or benefit of being on that given glide path.

5 We considered these individually to simplify the analysis but would expect that some participants may align to more than one TRIGT persona.

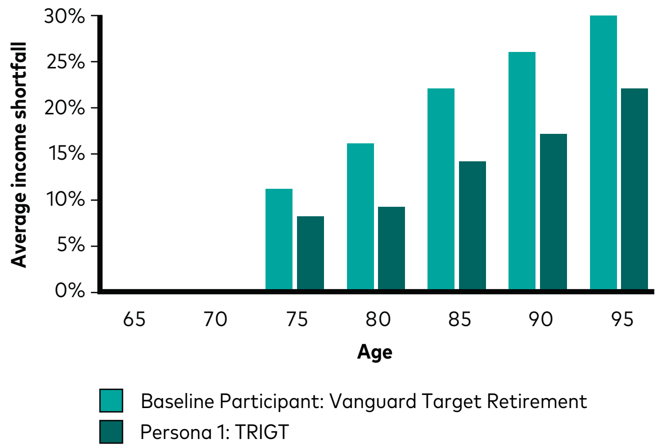
FIGURE 5A–5B

Retirement outcomes for Persona 1: Income booster

5A. Growth of median real wealth



5B. Average real income shortfall in retirement



Source: Vanguard.

Notes: Analysis results are based on the VLCM using 10,000 steady-state VCMM simulations based on market data and other information available as of December 31, 2023. Persona 1 assumes a nominal defined benefit of 15% of pre-retirement ending salary. 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 the 50th percentile of distribution of cumulative inflation-adjusted portfolio wealth across 10,000 simulations that accounts for portfolio returns, pre-retirement contributions, and post-retirement spending. Expected income shortfall is the average percentage of the retirement spending goal, based on the 79% replacement ratio, that is not met by inflation-adjusted income from the portfolio and all other sources across 10,000 simulations.

Persona 1: The income booster has additional source(s) of income in retirement

Additional sources of guaranteed income[6] provide a floor to income shortfall, which can support a higher equity allocation into retirement. Persona 1 has additional income from a DB plan that provides a nominal guaranteed benefit of 15% of ending salary throughout retirement. Social Security and the additional DB income[7] reduce the portion of retirement spending funded from their portfolio, slowing wealth depletion in retirement (Figure 5A). The slower depletion increases the chances of this participant meeting their spending goal through retirement. For Persona 1, we find a near 100% probability of meeting their 79% pre-retirement income spending goal, even as late as age 95.

If this participant does fall short of their 79% spending goal, the extra DB income effectively raises the spending floor and reduces the expected income shortfall, or the portion of their spending goal they cannot meet. Compared with that of the baseline participant, Persona 1's average income shortfall is more than 30% lower in retirement (Figure 5B). This lower portfolio dependency limits the impact of market volatility and downturns on Persona 1's ability to meet spending needs and mitigates some of the greater risks of a higher equity allocation. With a downside safety net of additional income, Persona 1 could derive significant added value by choosing the more aggressive TRIGT option to generate greater post-retirement wealth (Figure 5A), which is embodied in a CFE of 19 basis points relative to the default Target Retirement glide path.

6 Additional income sources are anything in addition to Social Security benefits.

7 For additional income in the form of an annuity, we found that results were overall similar to those of a DB plan.

Persona 2: The exceptional saver accumulates more wealth before retirement

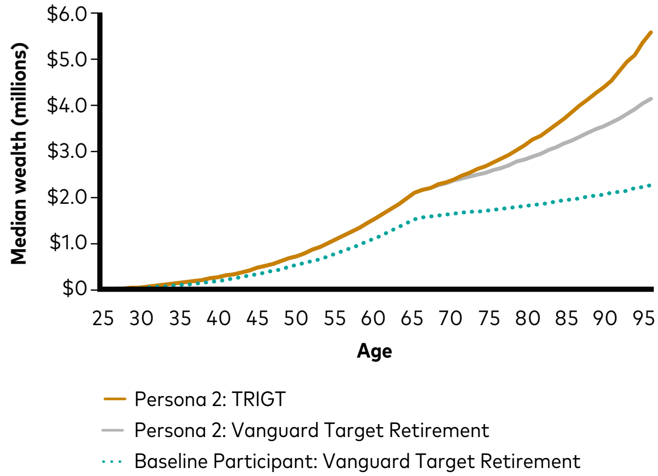
Entering retirement with more wealth than the baseline participant provides a funding reservoir that can be used to cover a potential income shortfall and support a higher post-retirement equity allocation. Persona 2 saved more[8] than the baseline rate and accumulated an additional $570,000 of median expected wealth by the start of retirement (Figure 6A). With a higher-wealth starting point, the participant is less likely to deplete their wealth and fall short of their spending goal, maintaining an almost 100% probability of meeting their 79% pre-retirement income spending goal during retirement through age 95.

The extra wealth can be drawn down to fully fund their 79% spending goal for a longer time, delaying and decreasing a potential expected income shortfall. Compared with that of the baseline participant, Persona 2's average income shortfall remains at 0% at age 75 and is more than 10% lower later in retirement (Figure 6B). The wealth cushion absorbs the initial impact of market volatility and downturns on spending, mitigating some of the higher risk of additional equity in retirement. With a downside buffer from additional wealth, TRIGT's higher-equity option has the potential to generate higher returns and more wealth through retirement (Figure 6A), a significant additional value for Persona 2 that is reflected in the 19 basis points of CFE relative to the default Target Retirement glide path.

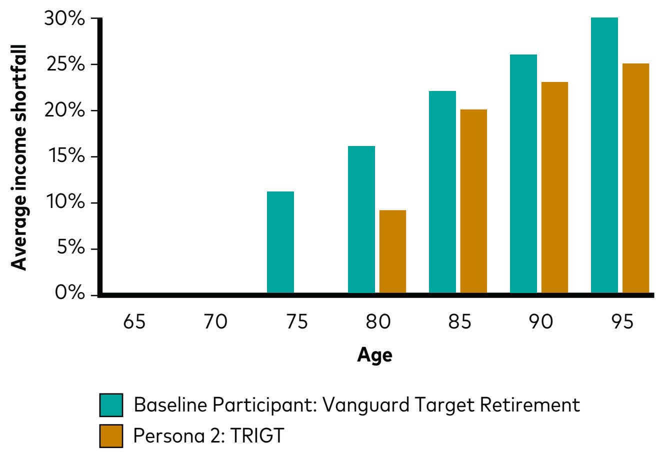
FIGURE 6A–6B

Retirement outcomes for Persona 2: Exceptional saver

6A. Growth of median real wealth



6B. Average real income shortfall in retirement



Source: Vanguard.

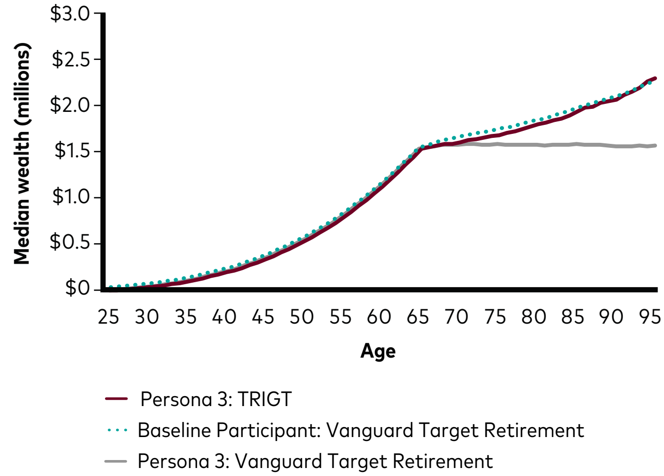
Notes: Analysis results are based on the VLCM using 10,000 steady-state VCMM simulations based on market data and other information available as of December 31, 2023. The baseline participant's beginning and ending saving contribution is assumed to be 8.8% and 12.0%, respectively. Persona 2's beginning and ending saving contribution is assumed to be 12.5% and 15.7%, respectively. 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 the 50th percentile of distribution of cumulative inflation-adjusted portfolio wealth across 10,000 simulations that accounts for portfolio returns, pre-retirement contributions, and post-retirement spending. Expected income shortfall is the average percentage of the retirement spending goal, based on the 79% replacement ratio, that is not met by inflation-adjusted income from the portfolio and all other sources across 10,000 simulations.

8 Persona 2 is assumed to have saved 12.5% to 15.7% of their salary while working from ages 25 to 65, higher than the baseline participant's 8.8% to 12.0% saving rate.

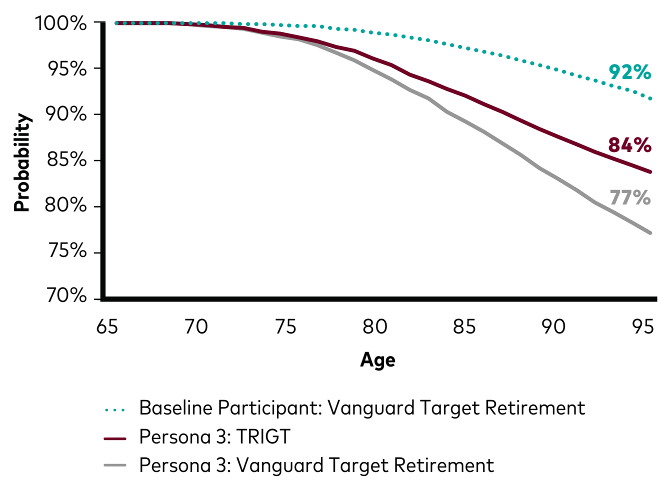
FIGURE 7A–7B

Retirement outcomes for Persona 3: Aspirational spender

7A. Growth of median real wealth



7B. Probability of meeting retirement spending



Source: Vanguard.

Notes: Analysis results are based on the VLCM using 10,000 steady-state VCMM simulations based on market data and other information available as of December 31, 2023. Retirement spending sufficiency for the baseline participant and Persona 3 is based on a 79% and 90% replacement ratio of pre-retirement ending salary, respectively. Ending salary is assumed to be $75,000. Real wealth is the 50th percentile of distribution of cumulative inflation-adjusted portfolio wealth across 10,000 simulations that accounts for portfolio returns, pre-retirement contributions, and post-retirement spending. Probability of retirement spending sufficiency is the total percentage of scenarios across 10,000 simulations where the retirement spending goal, based on the respective replacement ratios, is met by inflation-adjusted income from the portfolio and all other sources.

Persona 3: The aspirational spender desires or needs to spend more during retirement

If a participant plans to spend beyond the baseline goal of maintaining their pre-retirement lifestyle, taking on more equity risk in retirement may help them reach this goal. Persona 3 has a goal of spending 90% of their ending salary in retirement, a higher level than the baseline 79% they may have spent during their working years. Without additional wealth or income sources, this participant would need to fund their higher spending goals with larger portfolio withdrawals, which in turn would deplete wealth faster (Figure 7A) and lower their probability of meeting the 90% spending goal at age 95 to 77% (Figure 7B).

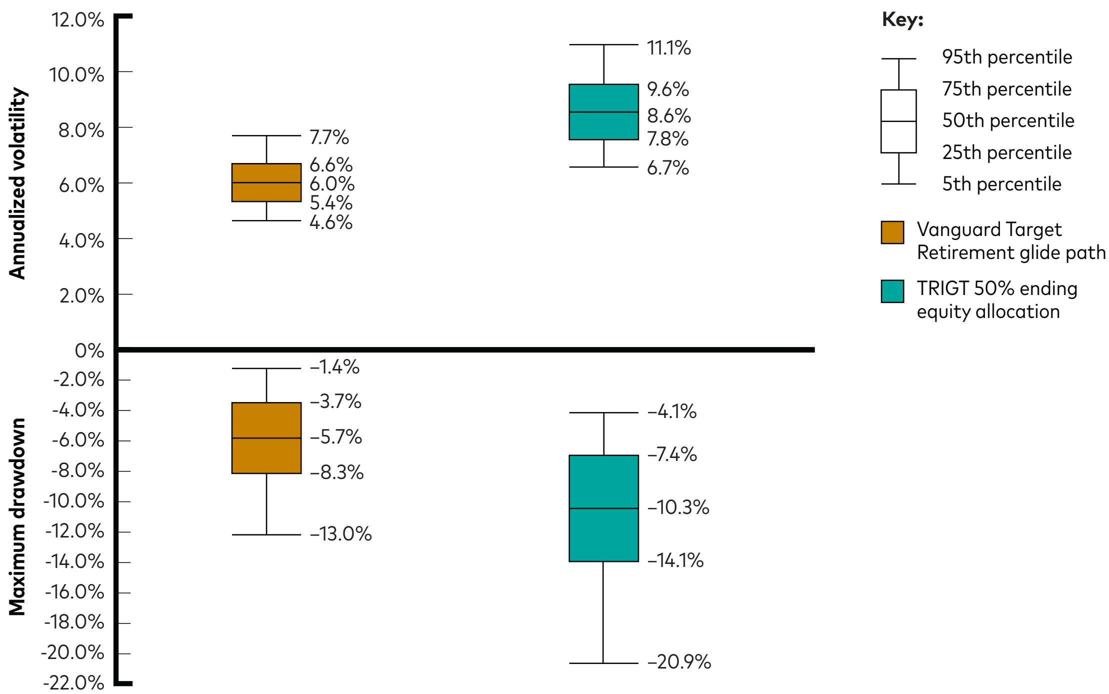
However, if Persona 3 opted in to TRIGT's 50% equity allocation, the potential for greater portfolio returns could generate extra wealth during retirement, thus funding the larger withdrawals and slowing wealth depletion. They could potentially accumulate a level of post-retirement median wealth comparable to that of a baseline participant's (Figure 7A) and raise their probability of meeting the higher spending goal at age 95 from 77% to 84% (Figure 7B). For Persona 3, the improvement in expected wealth and likelihood of meeting their higher spending goal is worth the higher portfolio volatility and greater potential drawdown associated with a higher equity allocation, resulting in 16 basis points of CFE relative to the default glide path.

As always, it's a trade-off

TRIGT's higher-equity exposure has the potential to generate more portfolio returns and wealth in retirement. However, as with all investments, that potential upside has a trade-off in the form of greater risk, including higher portfolio volatility and potential drawdowns (market or portfolio declines) of 21% or more[9] in retirement (Figure 8). This can cause fluctuations in consumption or even premature portfolio depletion, so only participants willing to bear these risks should consider TRIGT instead of the more conservative default allocation.

FIGURE 8

Expected portfolio volatility and maximum drawdown from retirement to age 95



Source: Vanguard.

Notes: Analysis results are based on the VLCM using 10,000 steady-state VCMM simulations based on market data and other information available as of December 31, 2023. Portfolio volatility is distribution of standard deviation of portfolio returns in the stated period across 10,000 simulations. Maximum drawdown is distribution of largest peak-to-trough cumulative portfolio return decline in the stated period across 10,000 simulations.

Conclusion

Vanguard recommends that plan sponsors and consultants take a holistic approach to retirement income that offers flexibility and customization to support the range of participants' investment and guidance needs. Many self-directed participants may find Target Retirement Income to be a suitable default solution, with its high probability of maintaining pre-retirement lifestyle. However, participants with the ability and willingness to assume more risk may find their needs better met with Target Retirement Income and Growth Trust's higher-equity allocation. Our analysis shows that TRIGT may be more appropriate and may add significant value over the more conservative default allocation for participants who are comfortable with additional downside risks and have higher income, wealth, or desired spending. The number of participants retiring each year is expected to continue to grow as more people reach retirement age, and with that comes the need for investment strategies that meet retirement-income spending goals and help give participants the best chance for retirement success.

9 Represented by 5th percentile outcomes, or the worst 5% of potential outcomes and not the worst possible outcome.

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Appendix I

Life-cycle assumptions for Vanguard Target Retirement glide path

Input	Assumption	Notes
Starting age	25	
Horizon age	111	
Retirement age	65	
Social Security withdrawal age	65	
Risk aversion	Moderately conservative	
Savings 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 the 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 (RR)	79%	For ending salary of $75,000 and savings rate of 15%. Single earner – RR = 79%*
Social Security replacement ratio	37%	Based on real monthly Social Security benefit estimates for ending salary of about $75,000 and savings rate of 15%. Single earner – SS RR = 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: Hank Lobel, Colleen Jaconetti, and Rebecca Cuff. *The Replacement Ratio: Making It Personal*. Vanguard, 2019.

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 importantly, 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, U.S. municipal bonds, 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 time. Forecasts represent the distribution of geometric returns over different time horizons. 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 sets 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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Diversification does not ensure a profit or protect against a loss.

Investments in Target Retirement Funds and Trusts are subject to the risks of their underlying funds. The year in the fund or trust name refers to the approximate year (the target date) when an investor in the fund or trust would retire and leave the workforce. The fund/trust will gradually shift its emphasis from more aggressive investments to more conservative ones based on its target date. The Income Trust/Fund and Income and Growth Trust have fixed investment allocations and are designed for investors who are already retired. An investment in a Target Retirement Fund or Trust is not guaranteed at any time, including on or after the target date.

Vanguard Target Retirement Trusts are not mutual funds. They are collective trusts available only to tax-qualified plans and their eligible participants. Investment objectives, risks, charges, expenses, and other important information should be considered carefully before investing. The collective trust mandates are managed by Vanguard Fiduciary Trust Company, a wholly owned subsidiary of The Vanguard Group, Inc.

All investing is subject to risk, including the possible loss of the money you invest. 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.

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