

Vanguard Target Retirement Funds and Trusts

Quarterly Review | March 31, 2025



Contents



Quarterly spotlight

Quarterly perspective	3
The case for international equities in target-date funds	4
About the SAAC	8



TDF industry and market overview

Industry growth and market share	10
Market environment	11



Vanguard fund construction and performance

Purposeful design and evolution	13
Vanguard fund performance and attribution	14



Competitor fund construction and performance

Beyond the glide path	20
12-month return attribution	22



Appendix

Absolute performance results	26
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Quarterly perspective

Navigating market waves: Revisiting the case for global diversification

Brian M. Miller, CFA
Senior Investment Specialist



Investors encountered significant market volatility in the first quarter of 2025, particularly within U.S. equity markets. This was in stark contrast to the upward trajectory of U.S. stocks over the past two years. Specifically, the CRSP U.S. Total Market Index declined by 4.85%, marking its first negative quarterly return since 2023. This shift has raised concerns among investors about the future performance of equity markets.

The CRSP U.S. Total Market Index, which serves as the benchmark for the Vanguard Total Stock Market Index in the Target Retirement Funds and represents 60% of the fund's equity exposure, was notably impacted. However, the remaining 40% of the fund's equity exposure was invested in the Vanguard Total International Stock Market Index, a global ex-U.S. equity index encompassing both developed and emerging markets securities, and performed well, returning 5.46% in the first quarter. This positive performance helped balance out the overall results across Target Retirement Fund vintages.

The divergence between U.S. and international equity markets is noteworthy, as U.S. equities have enjoyed a mostly uninterrupted bull run for much of the past decade. While many providers in the target-date fund (TDF) space have made significant strategic or tactical shifts toward U.S. equities in recent years, Vanguard remains committed to global diversification across both equity and fixed income allocations as a key best practice in our TDF design.

In this quarter's Spotlight article, we reinforce our conviction and delve into the importance of avoiding FOMO (fear of missing out) during market cycles. Partnering with Vanguard's Investment Strategy Group, we emphasize the fallacy of chasing top-performing asset classes and remind investors that maintaining a goal-oriented allocation is the most prudent path forward.

We understand that navigating the market has its fair share of challenges. We thank you for your partnership as we strive to provide the best retirement products and solutions to our investors.

Brian M. Miller

Performance of key Vanguard index funds

Fund name (inception date)	2Q 2024	3Q 2024	4Q 2024	1Q 2025	1-year
Vanguard Total Stock Market Index Fund (07/07/1997)	3.25%	6.17%	2.63%	-4.83%	7.07%
Vanguard Total International Stock Index Fund (11/29/2010)	0.80%	8.03%	-7.40%	5.51%	6.38%
Vanguard Total Bond Market Index Fund (09/18/1995)	0.18%	5.07%	-3.04%	2.77%	4.88%
Vanguard Total International Bond Index Fund (05/31/2013)	-0.58%	4.12%	0.09%	-0.16%	3.44%
Vanguard Short-Term Inflation-Protected Securities Index Fund (10/17/2012)	1.43%	2.50%	-0.10%	3.04%	7.02%

Source of performance figures: Vanguard, Institutional share class, as of March 31, 2025.

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. For performance data current to the most recent month-end, visit our website at institutional.vanguard.com. Standard performance of the funds can be located on page 30 of the Quarterly Review.



The case for international equities in target-date funds

Most investors would jump at the chance to add more money to their portfolio, but they often fail to consider the hidden costs associated with it. These costs may not be explicit, as in the form of fees or expenses, but they can implicitly manifest as an increased level of risk.

This misunderstanding has sparked extensive discussion over the past few years as more investors focus on the surging U.S. equity market, particularly U.S. growth equities, and wonder if they have somehow “missed out” by sticking with a globally diversified portfolio.



A more concentrated portfolio of U.S. equities may make sense for some direct contribution (DC) plan participants, but for the vast majority, staying the course with a diversified approach is the right decision. While this may seem like common sense, a recent Columbia University study examined 3 million investors enrolled in 296 401(k) plans and found that most individuals are underexposed to international securities. These U.S.-concentrated portfolios have performed well of late, but they subject investors to portfolio characteristics that may not align with their objectives.

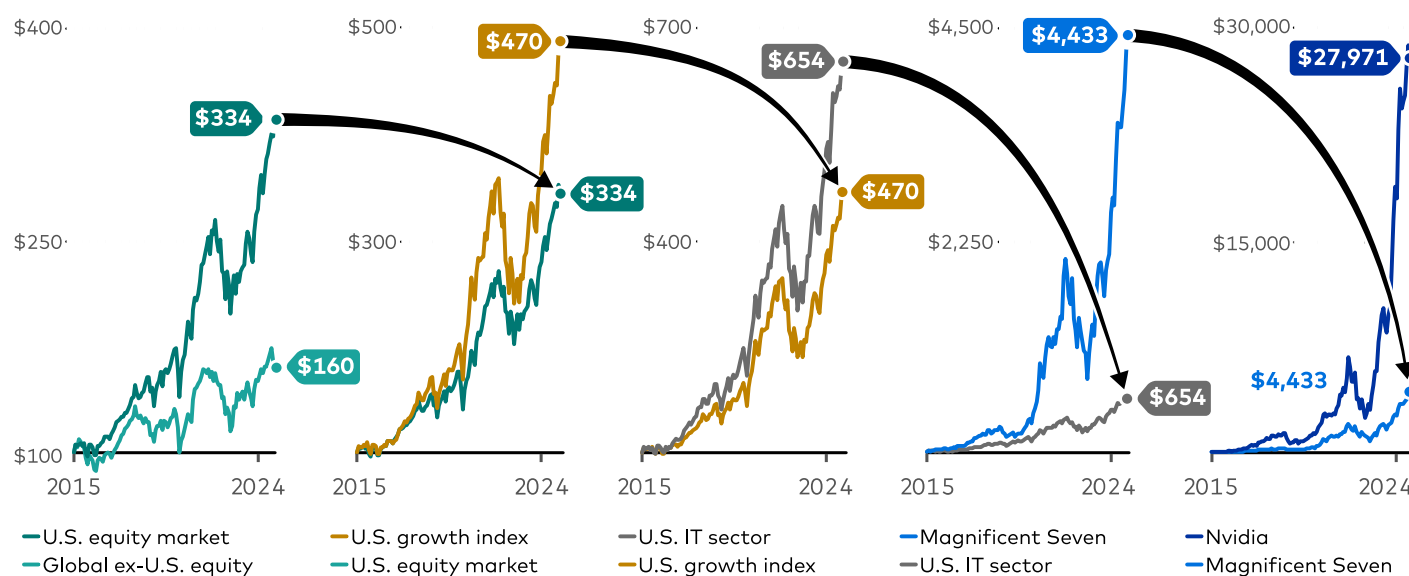
Still, it is worth noting that the past 10 years have not been as favorable to globally diversified portfolios compared with previous decades. In a recent article, Roger Aliaga-Díaz, Vanguard's global head of portfolio construction and portfolio manager of the Target Retirement Fund series, discusses the disadvantage of chasing outperformance at the expense of portfolio diversification. As illustrated in Figure 1, Aliaga-Díaz explains how "a \$100 investment in U.S. stocks 10 years ago would have grown to \$334 by the end of 2024 (an annualized 13% return)—more than twice

the final balance of \$160 (an annualized 5% return) for a similar investment in non-U.S. stocks."¹ It is understandable that some equity investors are feeling like they are missing out.

But based on this logic, asks Aliaga-Díaz, why stop with global diversification? "The same argument could apply to all levels of portfolio diversification," he says. "Looking at market results over the 10 years ended December 31, 2024, why bother with broadly diversified U.S. equity exposure when U.S. growth stocks outperformed the broad U.S. market by 1.4 times (\$470 versus \$334)? Why invest in value stocks at all?"

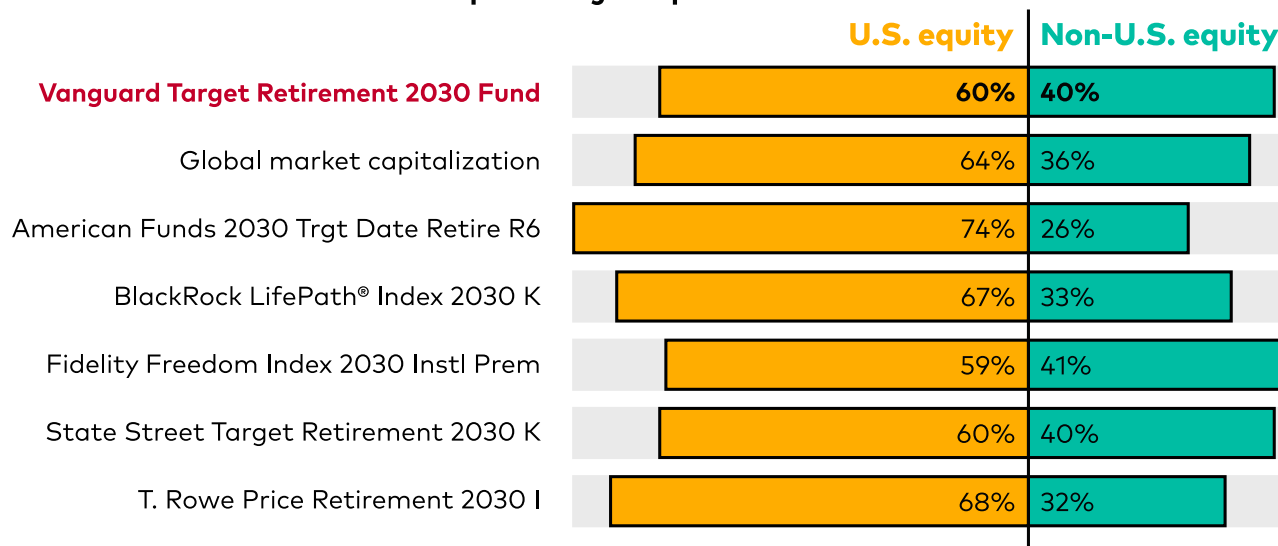
Finally, Aliaga-Díaz applies the fallacy of this argument to the information technology (IT) sector, which outperformed growth stocks by 1.4 times: "Why not just concentrate the entire equity portfolio in that sector? And why not further weed out the underperforming parts of the sector? The Magnificent Seven outperformed the IT sector by 6.8 times.² One stock, Nvidia, outperformed the collective return of the Magnificent Seven by 6.3 times" (as shown in Figure 1).

FIGURE 1. Asset performance for the past 10 years



The charts above show the final balance of a hypothetical \$100 investment in the relevant MSCI indexes and in individual stocks for the 10 years ended December 31, 2024. **Past performance is no guarantee of future results. Index performance is not representative of any particular investment, as you cannot invest directly in an index.**

Source: Vanguard calculations, based on MSCI indexes and historical stock Sources: Bloomberg.

**FIGURE 2. U.S. and non-U.S. allocation split among TDF providers**

Source: Data based on individual company website's most recent holdings disclosure for each fund included in the calculation. Global market capitalization calculated using FTSE Global All Cap Index. Data as of March 31, 2025.

While we are fairly certain that no plan sponsor has chosen a qualified default investment alternative entirely invested in Nvidia, many participants are now debating whether a portfolio with a heavier allocation to U.S. stocks or U.S. growth equity would improve investor outcomes. Although simulations might suggest that this approach could lead to a higher overall portfolio value, they overlook the crucial aspects of utility, which is the level of satisfaction associated with all possible outcomes that can take place when investing, and risk management. It is essential to recognize that an additional dollar means different things to different investors; what benefits one participant may not benefit another.

Global diversification in target-date funds

We design our target-date funds (TDFs) with the long-term retirement goals of participants in mind. This approach has remained consistent for more than 20 years since the inception of Vanguard Target Retirement Funds. To ensure that these funds meet their objectives, we annually revalidate our assumptions, inclusive of asset class projections and investor characteristics, to ensure that the allocation remains suitable to meet investor needs.

While the performance of the allocation to international equities has trailed that of the allocation to U.S. equities as of late, investors have still seen returns that allow them to maintain a high probability of achieving their retirement goals. Additionally, as Figure 2 shows, the international equity exposure within our Target Retirement Funds, while material, remains relatively in line with both the global equity market capitalization, which is a general guide for this series, and other competitors' allocations to these securities.

Given the potential for a multidecade investment timeline and that the primary purpose of a TDF is to help investors prepare for retirement, we prioritize a strategic asset allocation that can deliver consistent and reliable results. This approach has been beneficial across multiple market cycles and remains a key investment principle behind the Vanguard Target Retirement Funds.



The case for international equities still holds

This is not to say that there is no merit in choosing a TDF with less global diversification. Certain plan demographics, such as salary or retirement age, can make a case for different approaches. With that said, Vanguard looks to make changes that positively impact the needs of all investors. As the world's largest provider of TDFs, we believe in making decisions that can serve the broadest swath of participants, generally leading us away from shifts in the allocation that result in a less diversified portfolio.

Long-term investors, like those invested in TDFs, need products built for multiple market cycles. For Vanguard, this means ensuring we provide a well-diversified portfolio with an asset allocation that is rigorously reviewed on a continuous basis. This approach has served investors well for more than 20 years, and we maintain our conviction in its ability to do so in the future.

¹Returns in all the scenarios are based on our calculations using the relevant MSCI indexes through the 10 years ended December 31, 2024.

²The Magnificent Seven are the seven stocks that have driven much of the market's returns over the past few years: Alphabet, Amazon, Apple, Meta Platforms, Microsoft, Nvidia, and Tesla.



About the SAAC

The Vanguard Strategic Asset Allocation Committee (SAAC) is a multiasset oversight committee composed of global investment leaders from across the firm.

The members of the SAAC are responsible for the investment methodology behind our single-fund solutions, including Vanguard LifeStrategy® Funds, Target Retirement Funds, 529 plans, and model portfolios.

The SAAC meets regularly to review its investment methodology, debate investment strategies, and coordinate any changes with the Vanguard Advice Policy Committee, thereby ensuring a consistent approach in our single-fund solutions and advice offers.

Additional perspectives from the SAAC

A primary responsibility of the SAAC is to oversee the policy allocation of Vanguard's suite of multiasset portfolios, including a formal annual review. The SAAC has also been tasked with establishing the investment methodology and portfolio construction approaches that are most appropriate for various objectives. Since its founding in 2013, the SAAC has held research meetings to discuss investment topics, seeking the best outcomes for our clients through constant debate. These meetings, often showcasing the latest research by Vanguard Investment Strategy Group, have centered on a wide range of subjects. A summary of past topics is provided below.

2013

- Hedging currency exposure in a multiasset portfolio.
- Role of commodity futures.
- Minimum-volatility equity strategies.

2014

- Equity home bias by country.
- Glide-path construction methodology.
- Inflation protection.

2015

- Approaches to retirement income.
- Factors and strategic asset allocation.
- Fixed income glide-path allocations.

2016

- Time-varying risk premia and asset allocation.
- Expansion of the Vanguard Capital Markets Model.®
- Inflation-hedging strategies over multiyear horizons.

2017

- Long-run equilibrium risk-free rates and the equity risk premia.
- Diversified versus concentrated active equity portfolios.
- Global methodology for non-market-cap-weighted ETF model portfolios.

2018

- Role of private real estate in portfolios.
- Vanguard Life-Cycle Model (VLCM) and glide-path outcomes.
- Inflation protection in a 529 college savings plan.



Top row, left to right

Joseph Davis, Ph.D., (Committee Chair)
Global Chief Economist and Global Head of Investment Strategy Group
Roger Aliaga-Díaz, Ph.D., (Committee Vice-Chair)
Chief Economist, Americas, Global Head of Portfolio Construction
Greg Davis, CFA, (Ex-Officio) Global Chief Investment Officer
Sujatha Srinivasan, Global Head of IMG Risk Management
Geoff Parrish, CFA, Principal, Global Head of Fixed Income Indexing
(New Member)

Middle row

Duncan Burns, CFA, Head of Investments, Asia-Pacific, and of Investment Strategy Group, Asia-Pacific
Matthew Brancato, CFA, CPA, Chief Client Officer, Workplace Solutions
Dan Reyes, CFA, Head of Portfolio Review Department
Brian Wimmer, CFA, Head of Multi-Asset Solutions
(Nonvoting Member)

Bottom row

Joel Dickson, Ph.D., Head of Enterprise Advice Methodology
Michael Roach, CFA, Senior Manager, Head of Multi-Asset Portfolio Management
Brent Beardsley, Head of Strategy and Development
Yan Pu, CFA, Principal, Head of Advice Methodology
(Nonvoting Member)
Ian Kresnak, CFA, Chief of Staff, Investment Strategy Group
(Nonvoting Member)

2019

- Vanguard Asset Allocation Model (VAAM) and optimal allocations to active and passive strategies.
- VAAM-based investment methodology for ETF-model portfolios.
- Return-targeting and time-varying asset allocation.

2020

- VLCM-derived glide paths for 529 college savings plans.
- Role of private equity in multiasset portfolios.

2021

- A systematic framework for validating TDF glide paths.

2022

- *Vanguard's Approach to Target-Date Funds.*
- *Revalidating the Case for International Bonds.*

2024

- *Hybrid Annuity Target-Date Funds: A New Class of Target-Date Funds Incorporating Annuities.*
- Multiasset rebalancing strategies.

Source: Vanguard.



TDF industry and market overview

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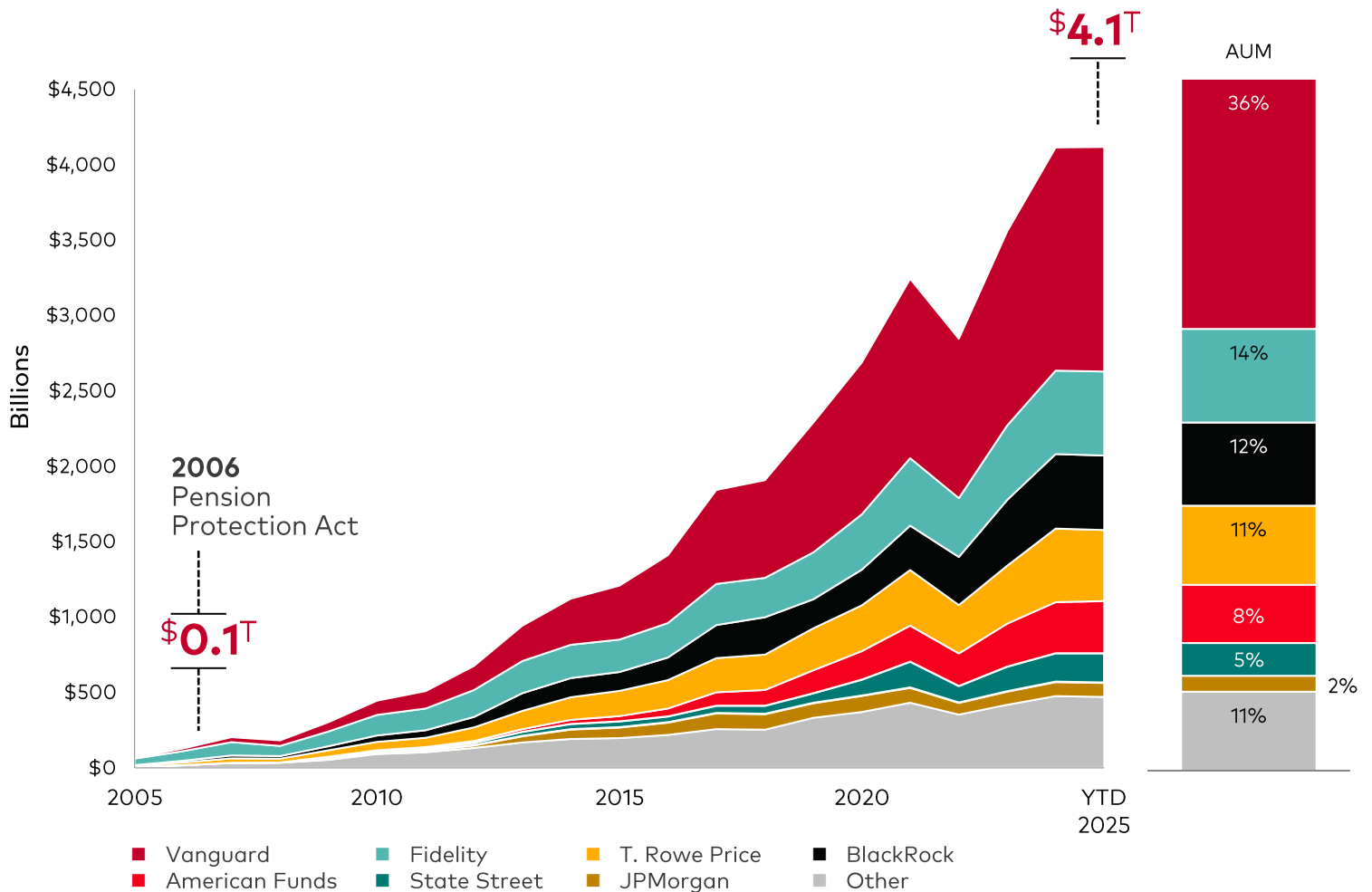
Industry growth and market share

Market environment



Industry growth and market share

Figure 10.1 Growth of target-date fund industry assets and market share



According to Sources: Morningstar combined with Vanguard's funds and trusts data, TDF industry assets exceeded \$4.11 trillion as of the end of Q1 2025. Vanguard continued to lead the industry in cash flow and assets under management, receiving more than one-third of every dollar invested in a TDF.

The industry's top providers, Vanguard, Fidelity, BlackRock, T. Rowe Price, JPMorgan, American Funds and State Street, hold a cumulative 89% share of all industry assets, or more than \$3.65 trillion, as of March 31, 2025.

Sources: Vanguard, Morningstar, as of March 31, 2025. Industry estimates are based on mutual fund and CIT data reported in Morningstar. CIT data is self-reported and is updated in Morningstar as it is received. Public company data also used prior to 2020.

* Organic growth measured as current period's net new flows divided by prior period's ending assets.



Market environment

Figure 11.1 Index returns ranked by performance

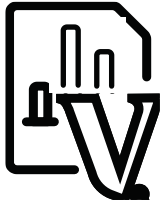
2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2Q 2024	3Q 2024	4Q 2024	1Q 2025
REIT 2.5	HYB 17.1	FTSE 27.4	IAGG 3.2	CRSP 30.8	CRSP 21.0	REIT 43.1	COM 16.1	CRSP 26.0	CRSP 23.8	CRSP 3.3	REIT 16.1	CRSP 2.6	COM 8.9
IAGG 1.3	CRSP 12.7	CRSP 21.2	CASH 1.9	REIT 25.8	FTSE 11.2	COM 27.1	CASH 1.5	FTSE 15.8	REIT 8.8	COM 2.9	FTSE 8.4	CASH 1.2	FTSE 4.6
EMB 1.3	COM 11.4	EMB 9.2	STPS 0.6	FTSE 21.8	AGG 7.5	CRSP 25.7	STPS -2.7	REIT 13.7	HYB 8.2	STPS 1.4	EMB 6.5	IAGG 0.2	STPS 3.0
AGG 0.5	EMB 9.2	HYB 7.5	AGG 0.0	HYB 14.3	HYB 7.1	FTSE 8.8	HYB -11.2	HYB 13.4	EMB 5.9	CASH 1.4	CRSP 6.2	HYB 0.2	AGG 2.8
CRSP 0.4	REIT 8.6	REIT 5.1	HYB -2.1	EMB 14.1	EMB 5.6	STPS 5.3	IAGG -12.7	EMB 10.5	FTSE 5.5	HYB 1.1	HYB 5.3	STPS -0.1	EMB 2.2
CASH 0.0	IAGG 4.9	AGG 3.5	EMB -3.9	AGG 8.7	STPS 5.1	HYB 5.3	AGG -13.0	IAGG 8.8	CASH 5.5	FTSE 0.9	AGG 5.2	COM -0.5	CASH 1.1
STPS 0.0	FTSE 4.7	IAGG 2.6	REIT -4.6	IAGG 8.1	IAGG 4.7	CASH 0.1	FTSE -16.1	AGG 5.5	COM 5.4	EMB 0.3	IAGG 3.9	EMB -2.1	REIT 1.1
FTSE -4.3	STPS 2.8	STPS 0.9	CRSP -5.2	COM 5.4	CASH 0.6	AGG -1.5	EMB -17.1	CASH 5.3	STPS 5.0	REIT 0.1	STPS 2.5	AGG -3.1	HYB 1.0
HYB -4.5	AGG 2.6	CASH 0.8	COM -13.0	STPS 4.9	COM -3.5	EMB -1.8	CRSP -19.5	STPS 4.5	IAGG 3.8	AGG 0.1	CASH 1.4	REIT -6.1	IAGG -0.1
COM -24.7	CASH 0.3	COM 0.7	FTSE -14.6	CASH 2.3	REIT -7.6	IAGG -2.1	REIT -24.5	COM -7.9	AGG 1.3	IAGG -0.4	COM 0.7	FTSE -7.5	CRSP -4.8

Index returns		Average annualized returns				
		3 months	1 year	3 years	5 years	10 years
Target Retirement Fund building blocks	CRSP	CRSP U.S. Total Market Index				
	FTSE	FTSE Global All Cap ex U.S. Index				
	AGG	Bloomberg U.S. Aggregate Bond Index				
	IAGG	Bloomberg Global Agg ex U.S. Float Adj RIC Cap Index (Hedged)				
	STPS	Bloomberg U.S. 0-5 Year TIPS Index				
Other indexes	CASH	3-Month T-Bill				
	HYB	Bloomberg U.S. Corporate High Yield Index				
	EMB	Bloomberg USD Emerging Market Gov RIC Cap Index				
	REIT	MSCI U.S. REIT Index				
	COM	Bloomberg Commodity 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.

Sources: Vanguard, Bloomberg Live, and Morningstar, as of March 31, 2025.

Note: Beginning 3Q 2021, the benchmark shown for the EMB category changed from Bloomberg Emerging Markets Sovereign Index USD to Bloomberg USD Emerging Market Gov RIC Cap Index.



Vanguard fund construction and performance

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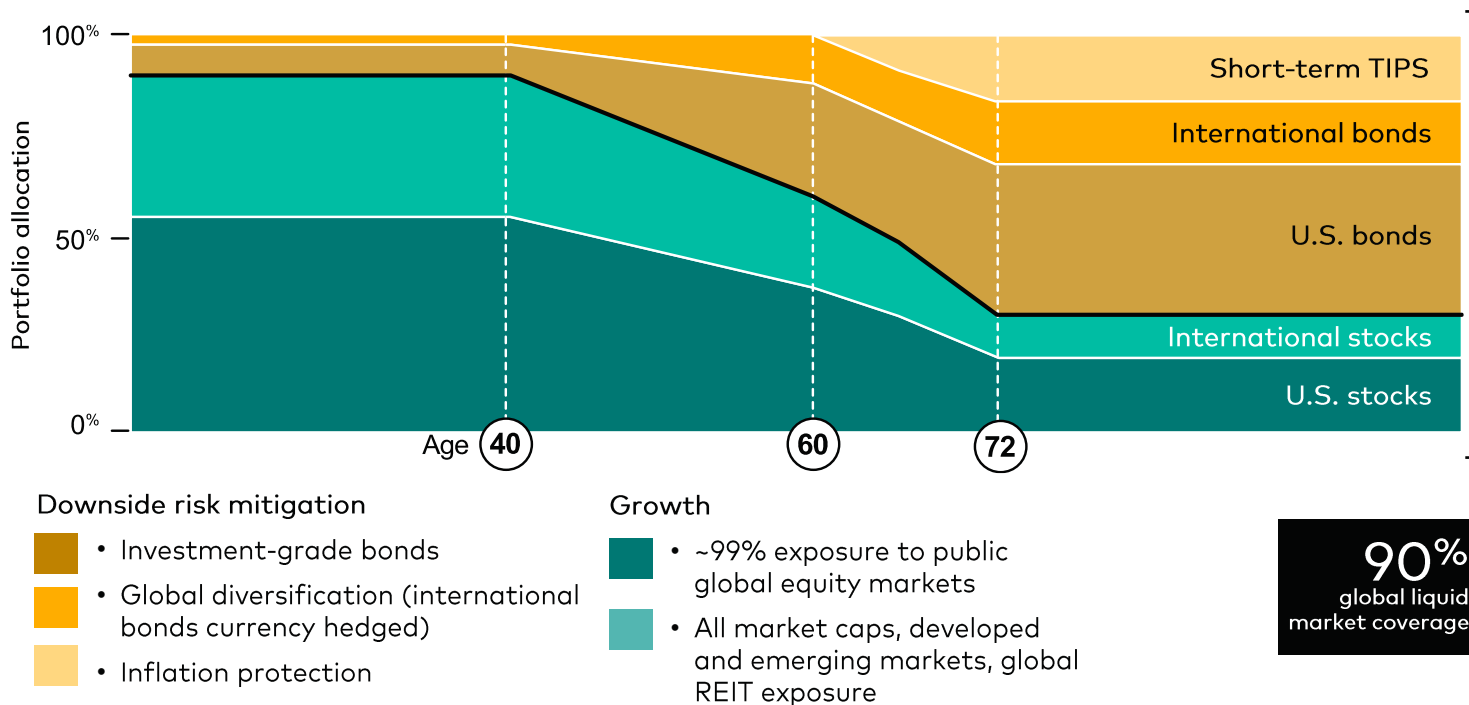
Evolution of Vanguard's glide-path design

Vanguard fund performance and attribution

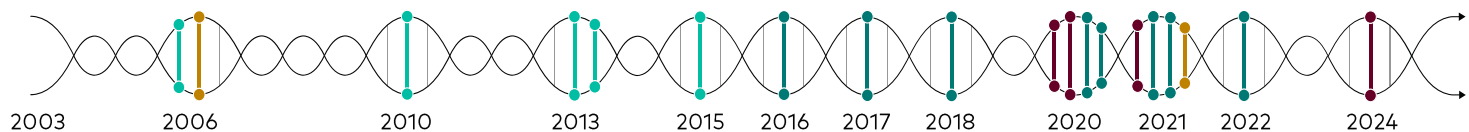


Purposeful design and evolution

Strategic asset allocation using high-quality building blocks



Meaningfully improving investor outcomes since inception



Enhanced asset allocation

- Increased equity weight in Income fund (2006).
- Added emerging markets stocks (2006).
- Added Canada and more international equity exposure (including small-caps) through Total International Stock Index replacing three regional funds (2010).
- Added international bonds (2013).
- Replaced broad TIPS fund with short-term TIPS for better responsiveness to inflation and removed money market fund (2013).
- Increased international allocations for both stocks and bonds (2015).

Lowered fees, increased access

- Lowered expense ratios (2016, 2017, 2018, 2020, and 2021).
- Reduced minimum for Institutional Target Retirement Funds (2020).
- Reduced minimum for Target Retirement Trusts (2021).
- Merging Institutional Target Retirement Funds into Target Retirement Funds (2022).

Improved fund/trust lineup

- Launched five-year vintage increments (2006).
- Added optional trust with a 50/50 allocation landing point and added enhanced retirement income services (2021).

Reduced implementation costs and tax drag

- Moved from quarterly to monthly glide path roll down (2020).
- Across trust vintages, replaced underlying international fund with an international trust, minimizing foreign tax withholdings (2021).
- Enhanced rebalancing policies to reduce transaction costs and improve performance measurement (2024).

Sources: FactSet, Fidelity, BlackRock. Stock market measured by FactSet data derived from MSCI US Broad Market Free Float and MSCI ACWI ex USA IMI Indexes. Bond market measured by FactSet data derived from Bloomberg Global Aggregate ex-USD, U.S. Aggregate Float Adjusted, Global High Yield, and EM Hard Currency Aggregate indexes. Commodities market measured by FactSet data. Data as of December 31, 2024.



Fund performance through March 31, 2025

Vanguard Target Retirement Fund and Trust performance

Portfolio/Benchmark	Expense ratio	3 months	Average annualized return as of March 31, 2025					Inception date
			1 year	3 years	5 years	10 years	Since inception	
Vanguard Target Retirement Income Vintage								
Fund	0.08	1.37	5.82	3.11	5.14	4.15	4.96	10/27/2003
Trust II	0.075	1.33	5.80	3.10	5.15	4.18	4.70	2/29/2008
Target Retirement Income Composite Index		1.21	5.73	3.18	5.31	4.36	—	—
Vanguard Target Retirement 2020 Vintage								
Fund	0.08	1.13	5.97	3.50	7.40	5.47	5.99	6/7/2006
Trust II	0.075	1.13	5.99	3.52	7.43	5.52	5.88	2/29/2008
Target Retirement 2020 Composite Index		0.96	5.89	3.61	7.61	5.73	—	—
Vanguard Target Retirement 2025 Vintage								
Fund	0.08	0.64	6.10	4.08	8.77	6.16	6.62	10/27/2003
Trust II	0.075	0.67	6.12	4.13	8.84	6.23	6.34	2/29/2008
Target Retirement 2025 Composite Index		0.44	6.00	4.24	9.04	6.45	—	—
Vanguard Target Retirement 2030 Vintage								
Fund	0.08	0.21	6.03	4.51	9.94	6.70	6.70	6/7/2006
Trust II	0.075	0.25	6.09	4.57	9.99	6.77	6.68	2/29/2008
Target Retirement 2030 Composite Index		−0.01	5.97	4.67	10.20	7.00	—	—
Vanguard Target Retirement 2035 Vintage								
Fund	0.08	0.04	6.26	5.01	11.15	7.26	7.44	10/27/2003
Trust II	0.075	0.04	6.26	5.03	11.21	7.34	7.11	2/29/2008
Target Retirement 2035 Composite Index		−0.23	6.14	5.11	11.40	7.55	—	—
Vanguard Target Retirement 2040 Vintage								
Fund	0.08	−0.21	6.42	5.47	12.36	7.80	7.41	10/27/2003
Trust II	0.075	−0.16	6.43	5.48	12.41	7.87	7.52	2/29/2008
Target Retirement 2040 Composite Index		−0.46	6.29	5.54	12.59	8.09	—	—

The performance data shown represent past performance. Past performance is no 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. For performance data current to the most recent month-end, visit our website at [vanguard.com/performance](https://www.vanguard.com/performance). Some funds assess purchase, redemption, and/or account maintenance fees. The performance data shown do not reflect deduction of these fees. If they did, performance would be lower. Details on these fees and adjusted performance figures can be found in the fund detail section.

Sources: Vanguard and Morningstar, as of March 31, 2025.



Fund performance through March 31, 2025

Vanguard Target Retirement Fund and Trust performance (continued)

Portfolio/Benchmark	Expense ratio	3 months	1 year	Average annualized return as of March 31, 2025					Inception date
				3 years	5 years	10 years	Since inception		
Vanguard Target Retirement 2045 Vintage									
Fund	0.08	−0.40	6.57	5.90	13.56	8.27	8.13	10/27/2003	
Trust II	0.075	−0.36	6.59	5.91	13.59	8.32	7.76	2/29/2008	
Target Retirement 2045 Composite Index		−0.69	6.44	5.97	13.79	8.56	—	—	
Vanguard Target Retirement 2050 Vintage									
Fund	0.08	−0.56	6.65	6.22	13.84	8.40	7.75	6/7/2006	
Trust II	0.075	−0.55	6.70	6.26	13.89	8.46	7.86	2/29/2008	
Target Retirement 2050 Composite Index		−0.88	6.55	6.30	14.09	8.70	—	—	
Vanguard Target Retirement 2055 Vintage									
Fund	0.08	−0.56	6.67	6.23	13.84	8.38	9.88	8/18/2010	
Trust II	0.075	−0.55	6.68	6.25	13.89	8.45	10.22	8/31/2010	
Target Retirement 2055 Composite Index		−0.88	6.55	6.30	14.09	8.70	—	—	
Vanguard Target Retirement 2060 Vintage									
Fund	0.08	−0.57	6.65	6.23	13.83	8.38	9.66	1/19/2012	
Trust II	0.075	−0.51	6.72	6.27	13.91	8.47	9.40	3/1/2012	
Target Retirement 2060 Composite Index		−0.88	6.55	6.30	14.09	8.70	—	—	
Vanguard Target Retirement 2065 Vintage									
Fund	0.08	−0.54	6.67	6.24	13.84	—	8.86	7/12/2017	
Trust II	0.075	−0.52	6.69	6.27	13.90	—	9.38	7/17/2017	
Target Retirement 2065 Composite Index		−0.88	6.55	6.30	14.09	8.71	—	—	
Vanguard Target Retirement 2070 Vintage									
Fund	0.08	−0.56	6.61	—	—	—	12.52	6/8/2022	
Trust II	0.075	−0.49	6.71	—	—	—	6.81	4/7/2022	
Target Retirement 2070 Composite Index		−0.88	6.55	6.30	14.09	8.71	—	—	

The performance data shown represent past performance. Past performance is no 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. For performance data current to the most recent month-end, visit our website at [vanguard.com/performance](https://www.vanguard.com/performance). Some funds assess purchase, redemption, and/or account maintenance fees. The performance data shown do not reflect deduction of these fees. If they did, performance would be lower. Details on these fees and adjusted performance figures can be found in the fund detail section.

Sources: Vanguard and Morningstar, as of March 31, 2025.



Underlying fund performance contribution

Figure 16.1 3-month return contribution by underlying funds

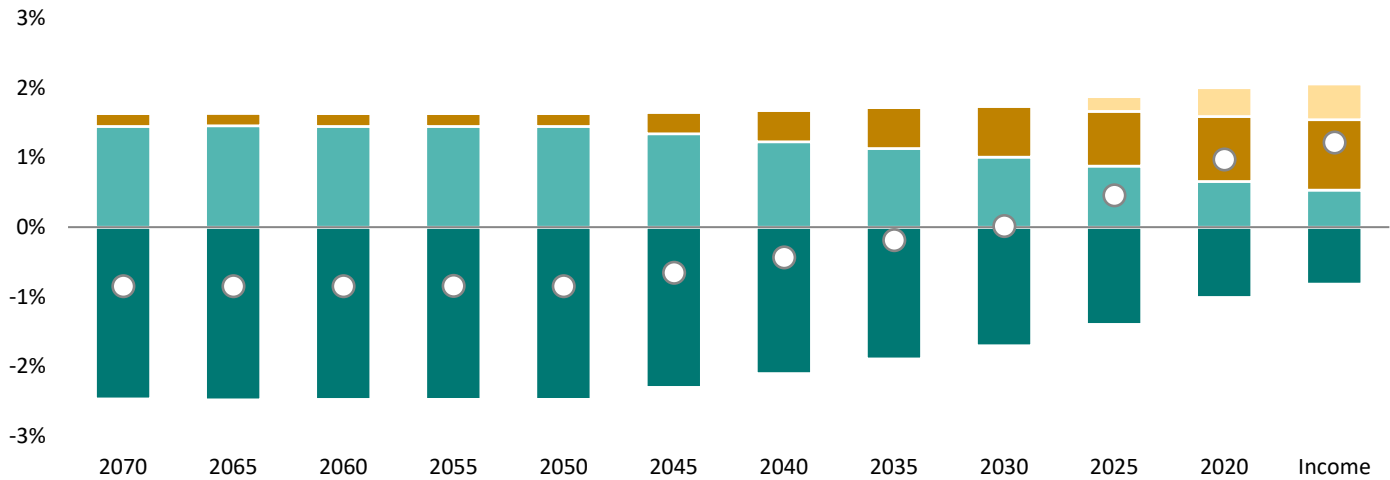
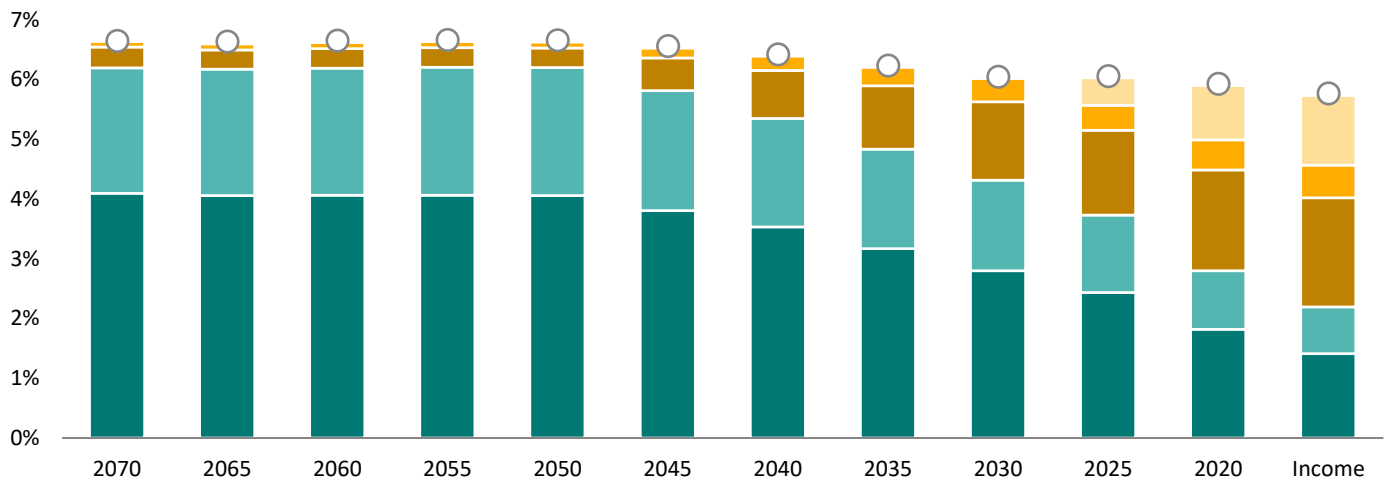


Figure 16.2 1-year return contribution by underlying funds



Past performance is not a guarantee of future results.

Sources: Vanguard and Morningstar, as of March 31, 2025.

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Excess return attribution

Figure 17.1 3-month return attribution

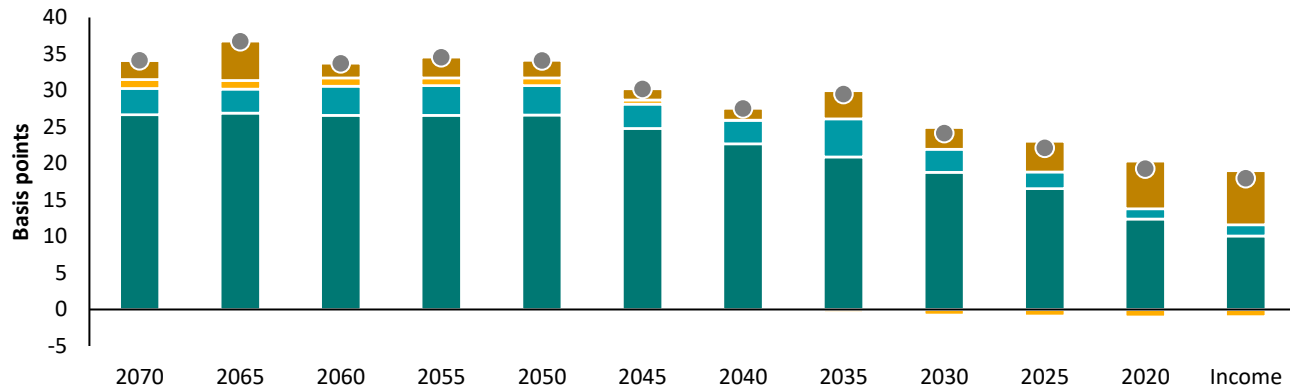
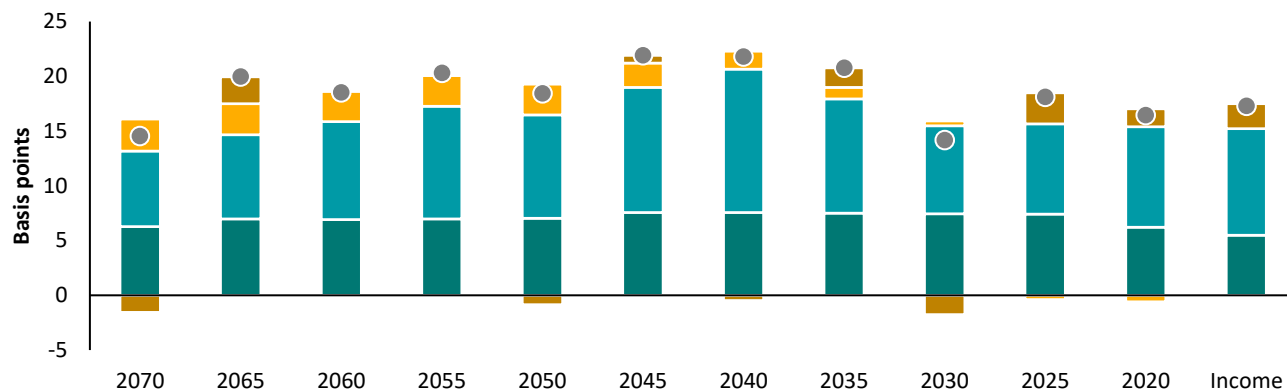


Figure 17.2 1-year return attribution



Allocation impact	Out/Underperformance due to differences in the strategic asset allocation of the funds versus their benchmarks. These differences can be particularly notable at times of significant market volatility as portfolio managers work to balance transaction costs against a daily rebalanced benchmark.
Fair-value pricing	Out/Underperformance due to the adjustment of the prices of non-U.S. equities for changes in their fair value that occur after the close of their local market but before the net asset value is calculated for each U.S. mutual fund as of 4 p.m., Eastern time. This impact is attributed to accounting and pricing policies that are outside of portfolio management control and is generally artificial and temporary.
Underlying fund tracking differences ex-FV	Out/Underperformance of the underlying portfolios versus their relative benchmarks. Figure is shown after controlling for fair-value pricing but is inclusive of the securities-lending impact, transaction costs associated with rebalancing the fund-of-funds portfolio, and pricing difference driven by Bloomberg (BB) indexes pricing at 4 p.m., Eastern time.*
Residual	Out/Underperformance due to factors outside of those captured above.
Total excess return	Indicates the total amount of fund returns that were higher or lower than benchmark returns. Calculated as the sum of the individual impacts of each of the five above drivers of benchmark-related excess return. Effect of expense ratios not included.

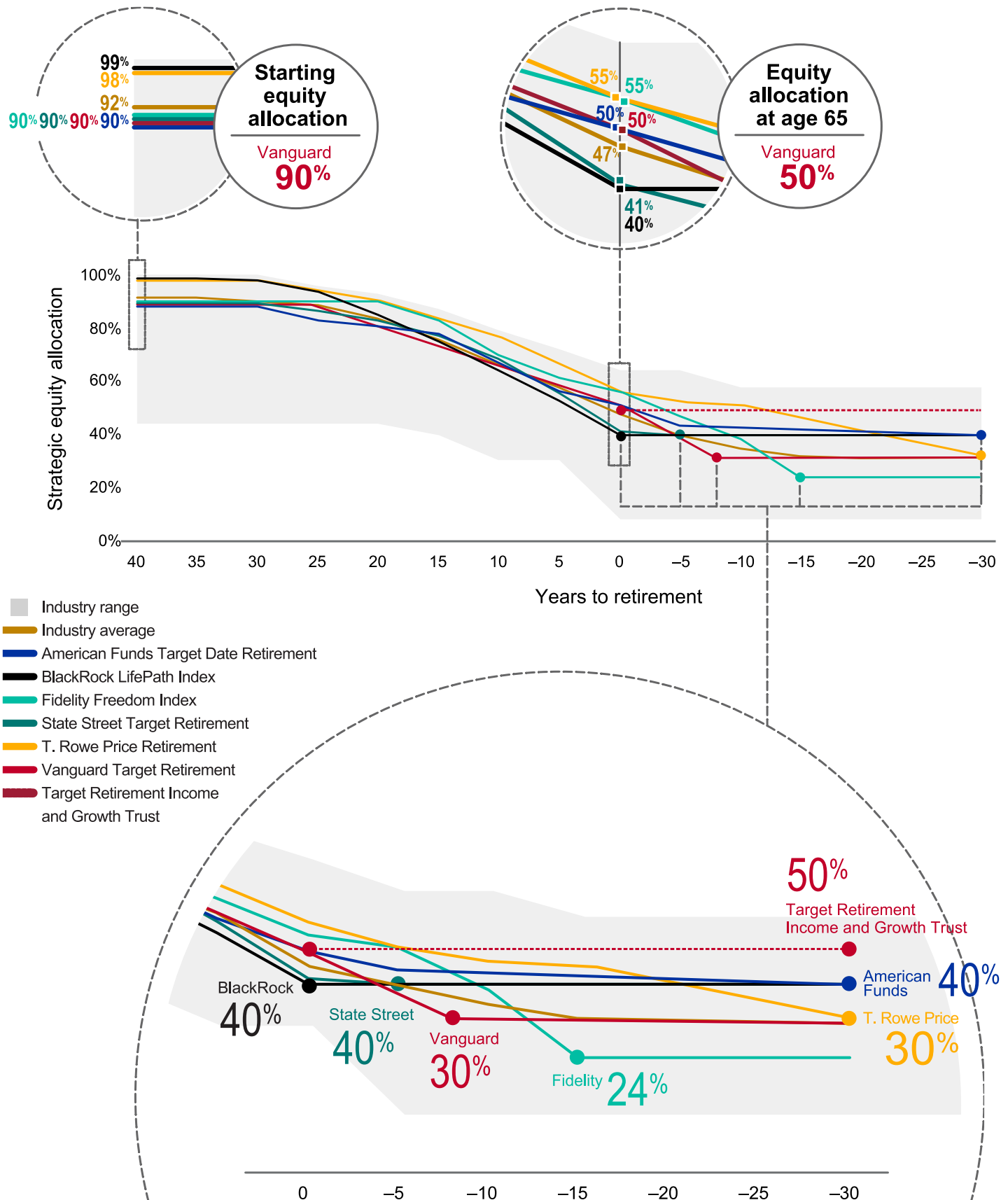
Past performance is not a guarantee of future results.

Sources: Vanguard and Morningstar, as of March 31, 2025.

* On January 14, 2021, Bloomberg changed its index pricing time from 3 p.m., Eastern time, to 4 p.m., Eastern time. The time change affects the 1- and 3-year figures.



Glide path comparison



Sources: Morningstar; data as of March 31, 2025; Vanguard calculation for industry average.

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Competitor fund construction and performance

IN THIS SECTION:

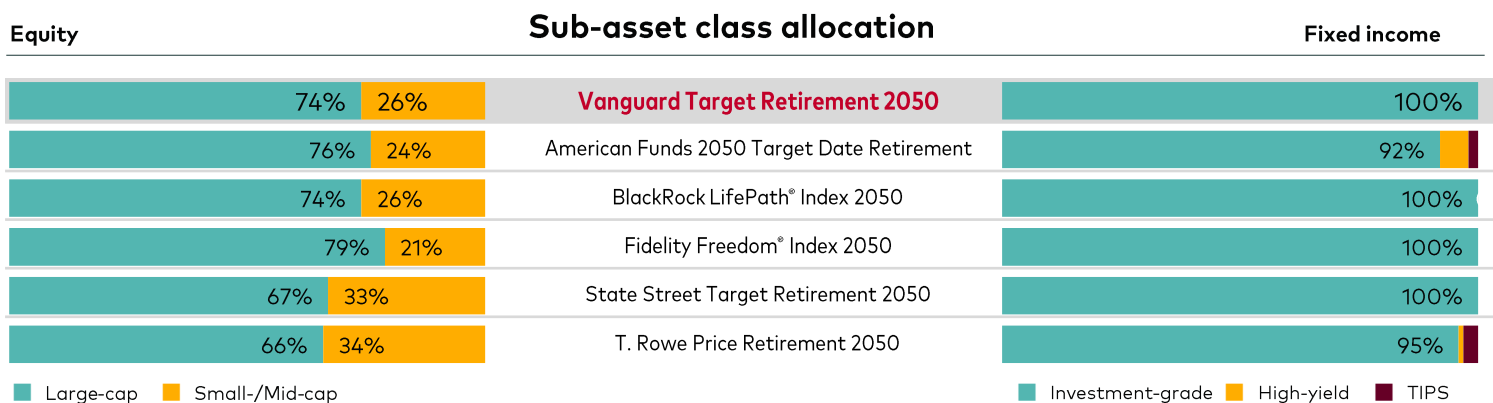
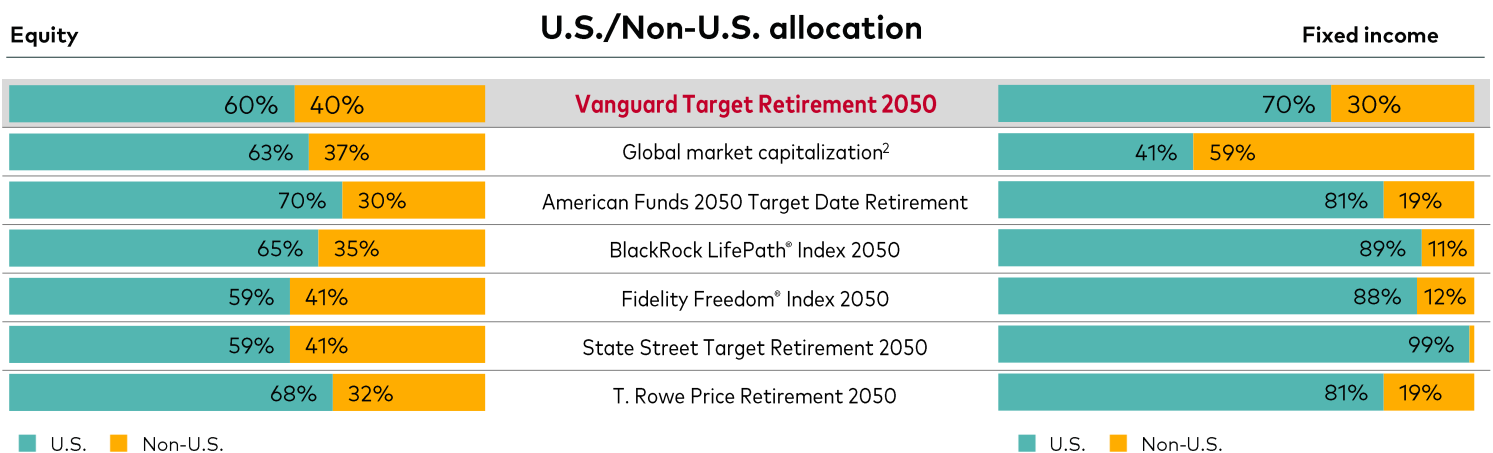
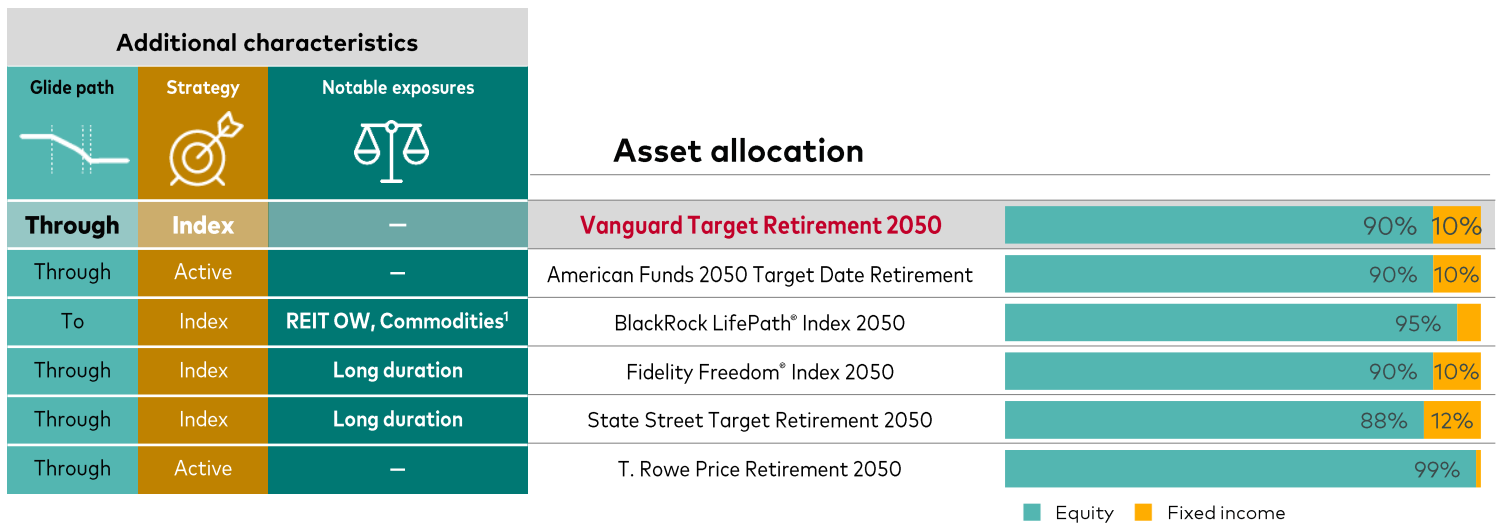
Beyond the glide path

12-month return attribution



2050 vintage: Beyond the glide path

Figure 20.1 Industry peer group asset allocation comparison



Sources: Morningstar data, based on most recent holdings disclosure for each fund included in the calculation. As-of dates may vary depending on the timing and frequency of data made available to Morningstar. Data as of March 31, 2025.

¹Commodity exposure is present in CIT product only. Mutual fund product does not include commodity exposure.

²Global market capitalization calculated using FTSE All Country Equity Index and Bloomberg Barclays Global Aggregate Bond Index.

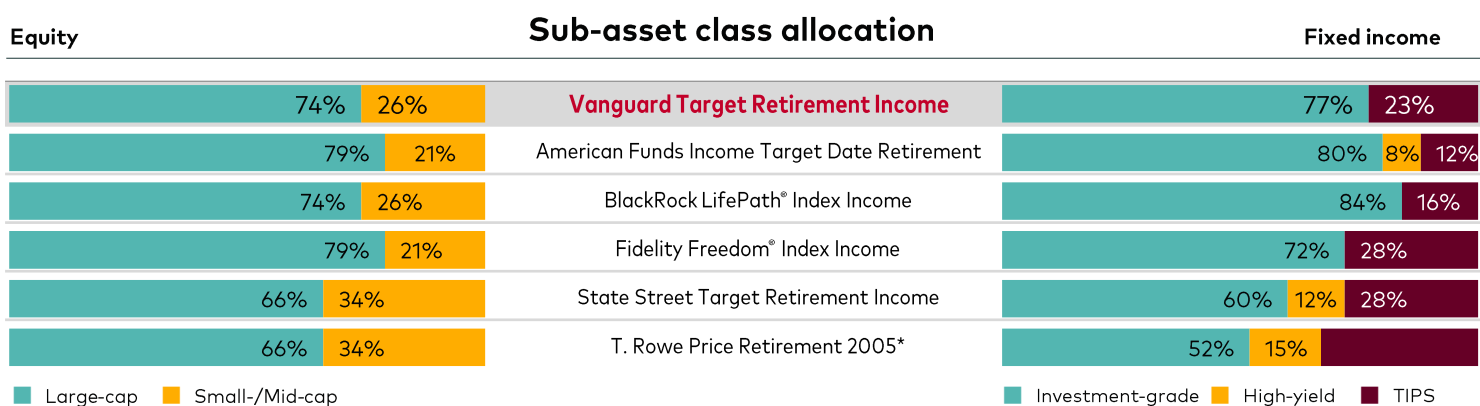
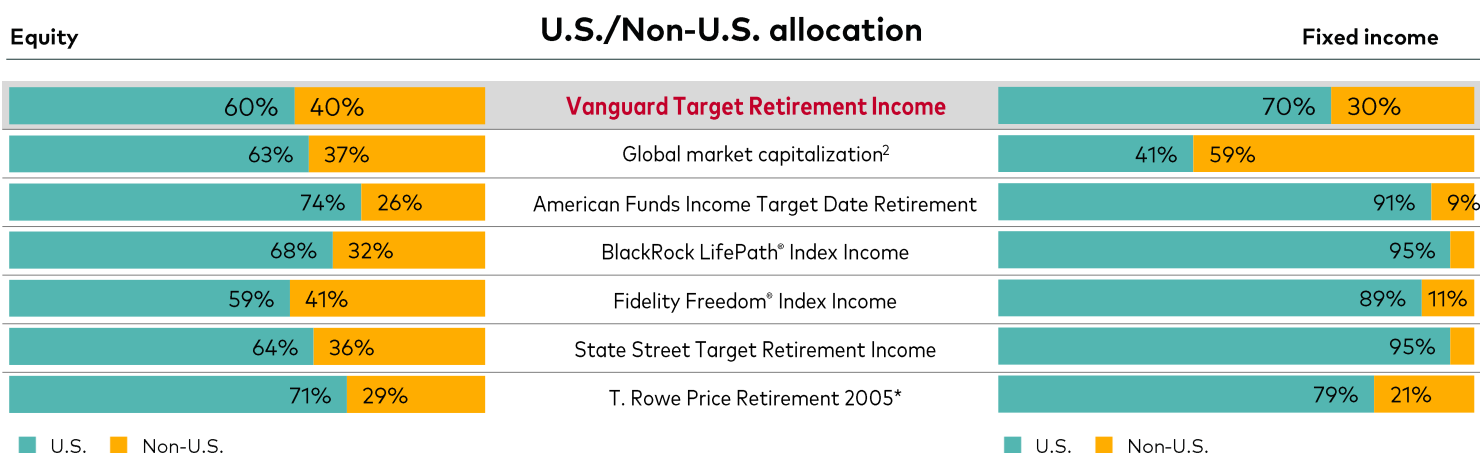
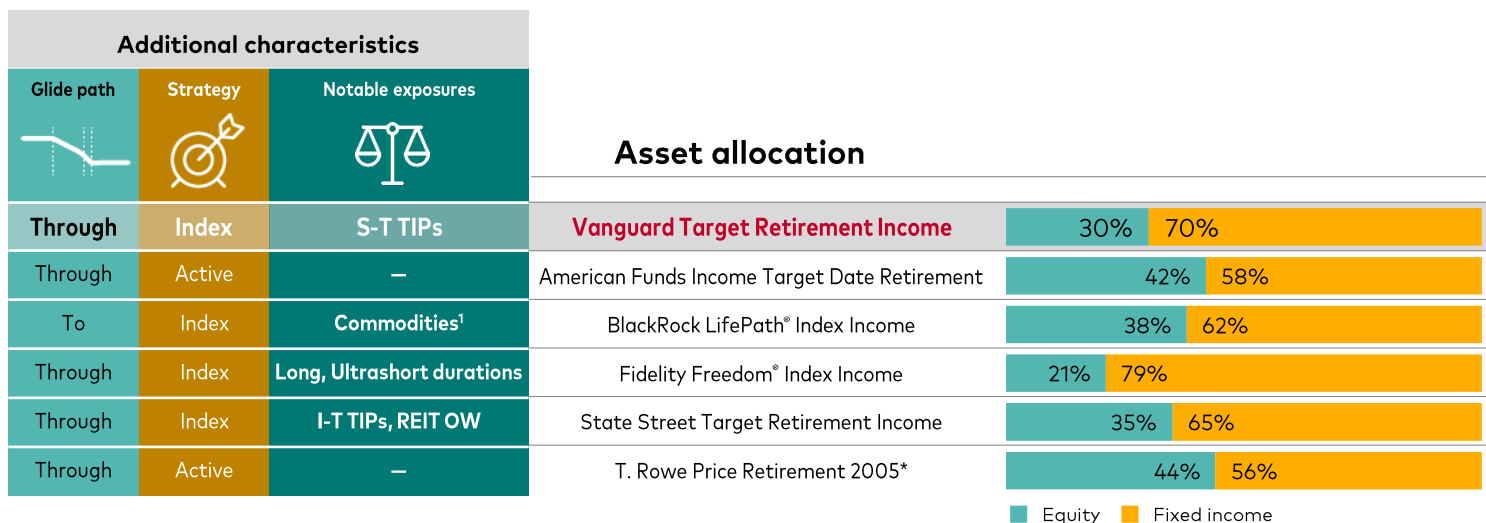
Note: Due to spacing issues, data labels below 7% are not displayed. Due to rounding, values may not total to 100%.

There may be other material differences between products that must be considered prior to investing.



Income vintage: Beyond the glide path

Figure 21.1 Industry peer group asset allocation comparison



Sources: Morningstar data, based on most recent holdings disclosure for each fund included in the calculation. As-of dates may vary depending on the timing and frequency of data made available to Morningstar. Data as of March 31, 2025.

¹Commodity exposure is present in CIT product only. Mutual fund product does not include commodity exposure.

²Global market capitalization calculated using FTSE All Country Equity Index and Bloomberg Barclays Global Aggregate Bond Index.

* No explicit income vintage in lineup. 2005 represents the most conservative asset allocation, as a proxy.

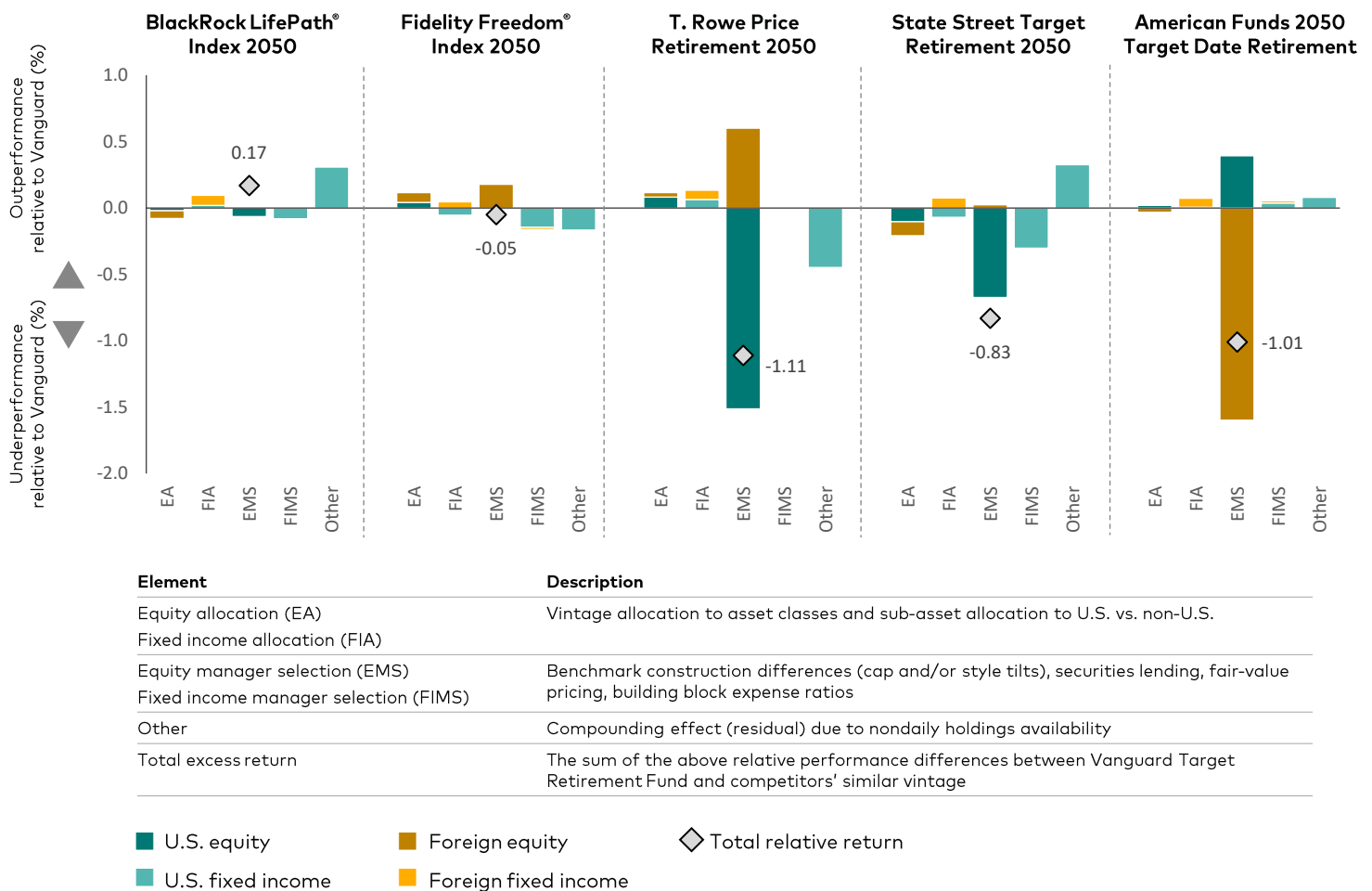
Note: Due to spacing issues, data labels below 7% are not displayed. Due to rounding, values may not total to 100%.

There may be other material differences between products that must be considered prior to investing.



12-month return attribution

Figure 22.1 Relative to top five industry 2050 funds



- **BlackRock's** outperformance relative to Vanguard was primarily driven by a higher allocation to U.S. fixed income and the exclusion of international fixed income, partially offset by the higher allocation to U.S. equity.
- **Fidelity's** underperformance relative to Vanguard was primarily driven by an allocation to long-term Treasury bonds.
- **T. Rowe Price's** underperformance relative to Vanguard was driven by poor security selection within the U.S. equity allocation.
- **State Street's** underperformance relative to Vanguard was driven by poor security selection within the U.S. equity allocation, specifically a higher allocation to small- and mid-cap securities.
- **American Funds'** underperformance relative to Vanguard was driven by poor selection within the international equity allocation.

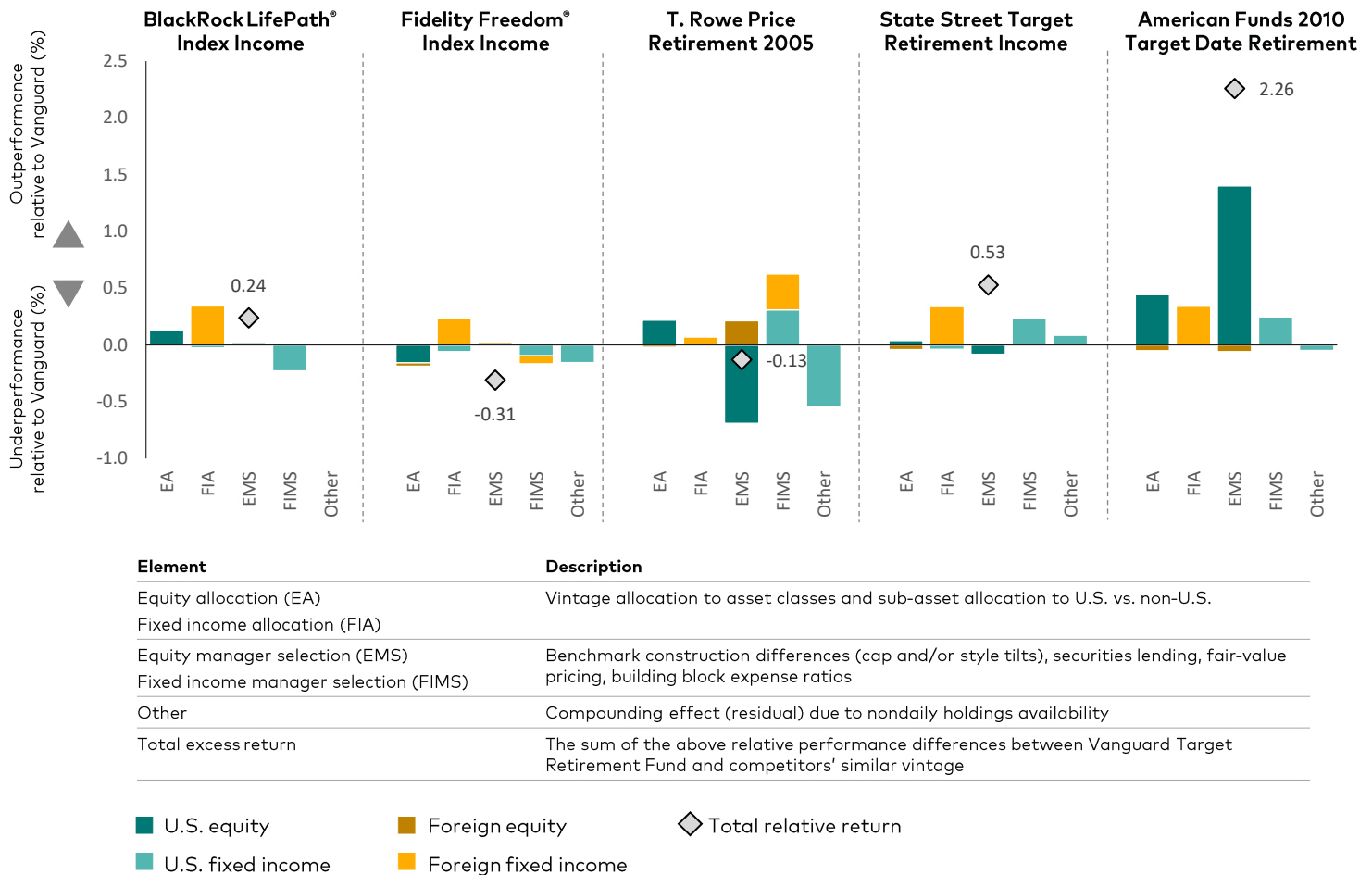
Past performance is not a guarantee of future results.

Sources: Vanguard and Morningstar, as of March 31, 2025.



12-month return attribution (continued)

Figure 23.1 Relative to top five industry income (or equivalent) funds*



- **BlackRock's** outperformance was driven by a higher allocation to U.S. fixed income coupled with an exclusion of international fixed income.
- **Fidelity's** underperformance was driven by poor security selection within both U.S. and international fixed income.
- **T. Rowe Price's** underperformance was driven by poor security selection within U.S. equity.
- **State Street's** outperformance was driven by a higher allocation to U.S. fixed income, coupled with longer duration TIPS exposure.
- **American Funds'** outperformance relative to Vanguard was driven by strong security selection in the U.S. equity sleeve of the portfolio, despite that asset classes' relative underperformance.

Past performance is not a guarantee of future results.

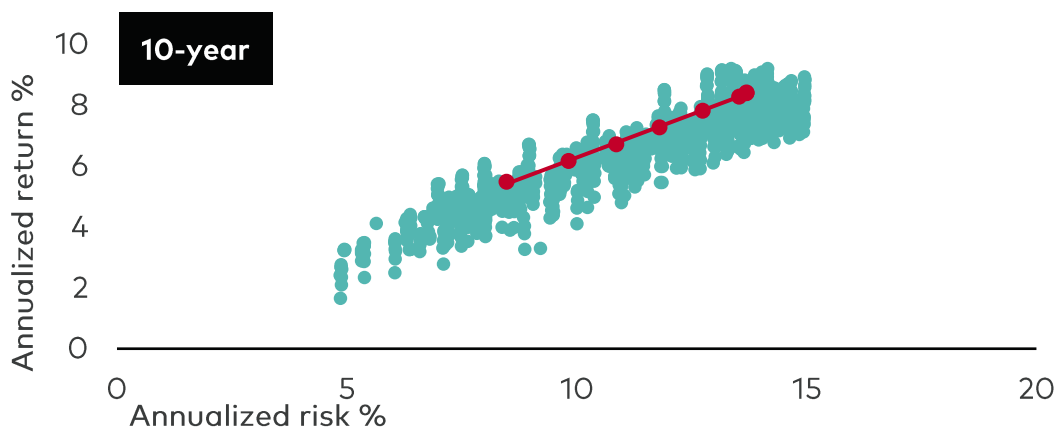
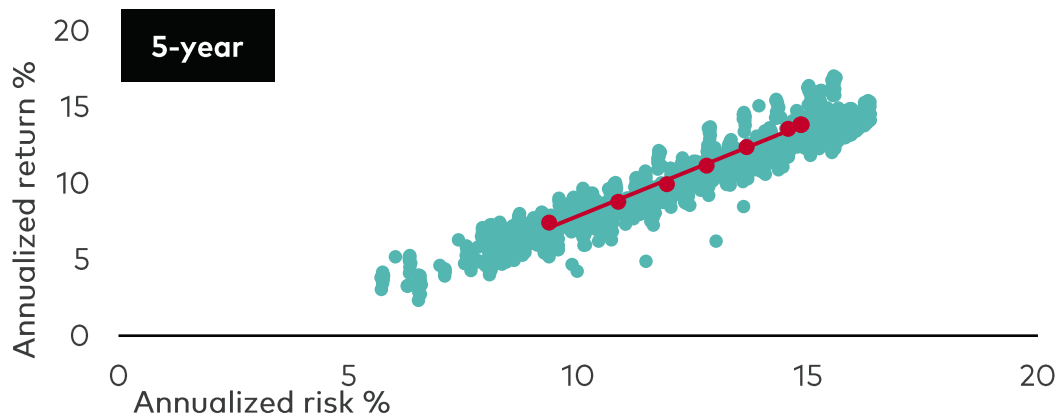
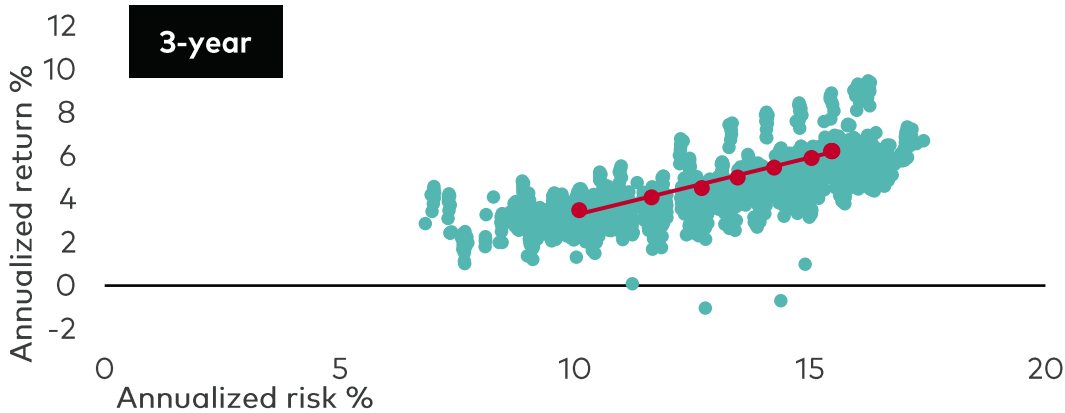
Sources: Morningstar and Vanguard calculations; data as of March 31, 2025.

* The 2005 fund is used as a proxy for T. Rowe Price and the 2010 fund is used as a proxy for American Funds, as there is no terminal income fund currently.



A history of consistently strong risk-adjusted performance

● TDF peers in Morningstar universe ● Vanguard Target Retirement Funds



Investors may be in TDFs for decades.

Consistent performance across all market environments is critical.

Standard deviation was used for annualized risk. Results will vary for other time periods. All funds in the Morningstar peer group with a minimum 3-, 5-, or 10-year history, respectively, were included in the comparison. There may be other material differences between products that must be considered before investing.

Note that the competitive performance data shown represent past performance, which is not a guarantee of future results, and that all investments are subject to risks. 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. For the most recent performance, visit our website at vanguard.com/performance.

Sources: Vanguard and Morningstar, Inc., as of March 31, 2025. Vanguard Target Retirement Funds highlighted.



Appendix

IN THIS SECTION:

Absolute performance results



Appendix: Absolute performance results

Average annualized return
as of March 31, 2025

Fund	Expense ratio	3 months	Year- to-date	1 year	3 years	5 years	10 years	Since inception	Inception date
Vanguard Target Retirement Income Fund	0.08	1.37	1.37	5.82	3.11	5.14	4.15	4.96	10/27/2003
Target Retirement Income Composite Index	—	1.21	1.21	5.73	3.18	5.31	4.36	—	—
Lipper Target Target Consrv Funds Average	—	1.35	1.35	5.23	2.82	5.32	3.77	—	—
Fidelity Freedom Income	0.47	2.24	2.24	5.21	2.19	3.82	3.37	4.44	10/17/1996
Fidelity Freedom Index Income Investor	0.12	1.91	1.91	5.51	2.42	3.24	3.22	3.60	10/2/2009
T. Rowe Price Retirement 2005	0.49	1.42	1.42	5.70	3.54	7.26	5.04	5.57	2/27/2004
American Funds 2010 Trgt Date Retire R5	0.34	2.65	2.65	8.08	4.24	7.21	5.35	5.14	2/1/2007
BlackRock LifePath Index Retire K	0.13	1.53	1.53	6.06	2.85	5.95	4.68	5.11	5/31/2011
State Street Target Retirement K	0.26	1.49	1.49	6.35	3.43	6.47	4.62	4.64	9/30/2014
JPMorgan SmartRetirement® Income R5	0.48	1.11	1.11	5.62	3.70	6.26	4.25	4.92	5/15/2006
JPMorgan SmartRetirement® Blend IncomeR5	0.50	1.27	1.27	6.29	3.71	6.27	4.39	4.85	7/2/2012
Nuveen Lifecycle Retire Income R6	0.56	0.86	0.86	5.05	3.47	6.75	4.91	4.98	11/30/2007
Vanguard Target Retirement 2020 Fund	0.08	1.13	1.13	5.97	3.50	7.40	5.47	5.99	6/7/2006
Target Retirement 2020 Composite Index	—	0.96	0.96	5.89	3.61	7.61	5.73	—	—
Lipper Target 2020 Funds Average	—	1.37	1.37	5.60	3.26	6.88	4.68	—	—
Fidelity Freedom 2020	0.56	1.67	1.67	5.22	3.07	7.88	5.62	6.48	10/17/1996
Fidelity Freedom Index 2020 Investor	0.12	1.33	1.33	5.78	3.02	7.03	5.45	6.56	10/2/2009
T. Rowe Price Retirement 2020	0.52	1.18	1.18	5.73	4.04	9.28	6.25	7.90	9/30/2002
State Street Target Retirement 2020 K	0.35	2.29	2.29	7.72	4.42	8.04	6.02	5.71	2/1/2007
JPMorgan SmartRetirement 2020 R5	0.47	1.15	1.15	5.63	3.67	6.47	4.63	5.51	5/15/2006
JPMorgan SmartRetirement® Blend 2020 R5	0.49	1.24	1.24	6.30	3.77	6.55	4.81	5.90	7/2/2012
Nuveen Lifecycle 2020 R6	0.53	0.64	0.64	4.88	3.73	7.91	5.63	5.49	1/17/2007
Vanguard Target Retirement 2025 Fund	0.08	0.64	0.64	6.10	4.08	8.77	6.16	6.62	10/27/2003
Target Retirement 2025 Composite Index	—	0.44	0.44	6.00	4.24	9.04	6.45	—	—
Lipper Target 2025 Funds Average	—	1.05	1.05	5.34	3.31	7.52	5.16	—	—
Fidelity Freedom 2025	0.61	1.46	1.46	5.13	3.49	8.86	6.09	6.34	11/6/2003
Fidelity Freedom Index 2025 Investor	0.12	1.18	1.18	5.84	3.39	7.97	5.93	7.22	10/2/2009
T. Rowe Price Retirement 2025	0.54	1.03	1.03	5.64	4.24	10.30	6.78	7.08	2/27/2004
American Funds 2025 Trgt Date Retire R5	0.36	1.97	1.97	7.38	4.53	8.93	6.66	6.32	2/1/2007
JPMorgan SmartRetirement 2025 R5	0.47	0.96	0.96	5.58	3.84	7.95	5.31	5.65	7/31/2007
JPMorgan SmartRetirement® Blend 2025 R5	0.48	1.04	1.04	6.32	3.92	8.03	5.51	6.72	7/2/2012
Nuveen Lifecycle 2025 R6	0.55	0.30	0.30	4.77	3.97	8.93	6.13	5.76	1/17/2007
State Street Target Retirement 2025 K	0.23	1.17	1.17	6.47	3.76	9.05	6.40	6.53	9/30/2014

The performance data shown represent past performance. Past performance is no 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. For performance data current to the most recent month-end, visit our website at [vanguard.com/performance](https://www.vanguard.com/performance). Some funds assess purchase, redemption, and/or account maintenance fees. The performance data shown do not reflect deduction of these fees. If they did, performance would be lower. Details on these fees and adjusted performance figures can be found in the fund detail section.

Sources: Vanguard and Morningstar.



Appendix: Absolute performance results *(continued)*

Average annualized return as of March 31, 2025									
Fund	Expense ratio	3 months	Year- to-date	1 year	3 years	5 years	10 years	Since inception	Inception date
Vanguard Target Retirement 2030 Fund	0.08	0.21	0.21	6.03	4.51	9.94	6.70	6.70	6/7/2006
Target Retirement 2030 Composite Index	—	−0.01	−0.01	5.97	4.67	10.20	7.00	—	—
Lipper Target 2030 Funds Average	—	0.71	0.71	5.32	3.81	9.04	5.89	—	—
Fidelity Freedom 2030	0.65	1.19	1.19	5.14	4.06	10.18	6.85	6.91	10/17/1996
Fidelity Freedom Index 2030 Investor	0.12	0.89	0.89	5.95	3.90	9.24	6.70	7.89	10/2/2009
T. Rowe Price Retirement 2030	0.56	0.82	0.82	5.53	4.65	11.40	7.34	8.79	9/30/2002
American Funds 2030 Trgt Date Retire R5	0.38	0.98	0.98	6.72	5.00	10.26	7.45	6.95	2/1/2007
JPMorgan SmartRetirement 2030 R5	0.47	0.49	0.49	5.49	4.45	9.49	6.02	6.47	5/15/2006
JPMorgan SmartRetirement® Blend 2030 R5	0.45	0.69	0.69	6.38	4.52	9.61	6.28	7.56	7/2/2012
Nuveen Lifecycle 2030 R6	0.57	−0.10	−0.10	4.58	4.36	10.07	6.68	6.02	1/17/2007
BlackRock Lifepath Index 2030 K	0.13	1.00	1.00	6.31	3.76	9.20	6.31	6.75	5/31/2011
State Street Target Retirement 2030 K	0.19	0.85	0.85	6.32	4.18	9.99	6.98	7.10	9/30/2014
Vanguard Target Retirement 2035 Fund	0.08	0.04	0.04	6.26	5.01	11.15	7.26	7.44	10/27/2003
Target Retirement 2035 Composite Index	—	−0.23	−0.23	6.14	5.11	11.40	7.55	—	—
Lipper Target 2035 Funds Average	—	0.16	0.16	5.33	4.54	10.84	6.79	—	—
Fidelity Freedom 2035	0.69	0.76	0.76	5.30	4.95	12.41	7.82	7.24	11/6/2003
Fidelity Freedom Index 2035 Investor	0.12	0.47	0.47	6.18	4.68	11.42	7.67	8.74	10/2/2009
T. Rowe Price Retirement 2035	0.59	0.57	0.57	5.43	5.20	12.50	7.86	7.77	2/27/2004
American Funds 2035 Trgt Date Retire R5	0.39	0.26	0.26	6.59	5.65	12.19	8.45	7.50	2/1/2007
JPMorgan SmartRetirement 2035 R5	0.51	0.25	0.25	5.69	5.17	11.68	6.88	6.67	7/31/2007
JPMorgan SmartRetirement® Blend 2035 R5	0.47	0.21	0.21	6.42	5.14	11.31	7.00	8.32	7/2/2012
Nuveen Lifecycle 2035 R6	0.60	−0.47	−0.47	4.48	4.92	11.31	7.27	6.40	1/17/2007
BlackRock Lifepath Index 2035 K	0.14	0.48	0.48	6.38	4.47	10.96	7.10	7.42	5/31/2011
State Street Target Retirement 2035 K	0.18	0.51	0.51	5.96	4.34	10.74	7.32	7.44	9/30/2014
Vanguard Target Retirement 2040 Fund	0.08	−0.21	−0.21	6.42	5.47	12.36	7.80	7.41	6/7/2006
Target Retirement 2040 Composite Index	—	−0.46	−0.46	6.29	5.54	12.59	8.09	—	—
Lipper Target 2040 Funds Average	—	−0.47	−0.47	5.19	5.18	12.08	7.25	—	—
Fidelity Freedom 2040	0.73	0.26	0.26	5.37	5.93	14.08	8.44	5.38	9/6/2000
Fidelity Freedom Index 2040 Investor	0.12	0.04	0.04	6.53	5.55	13.07	8.30	9.18	10/2/2009
T. Rowe Price Retirement 2040	0.60	0.39	0.39	5.48	5.69	13.46	8.32	9.34	9/30/2002
American Funds 2040 Trgt Date Retire R5	0.41	−0.77	−0.77	6.16	6.29	13.33	8.96	7.81	2/1/2007
JPMorgan SmartRetirement 2040 R5	0.51	−0.09	−0.09	5.64	5.67	12.97	7.45	7.38	5/15/2006
JPMorgan SmartRetirement® Blend 2040 R5	0.48	−0.13	−0.13	6.46	5.62	12.56	7.57	8.86	7/2/2012
Nuveen Lifecycle 2040 R6	0.63	−1.09	−1.09	4.16	5.54	12.61	7.85	6.84	1/17/2007
BlackRock Lifepath Index 2040 K	0.14	—	—	6.59	5.18	12.61	7.82	8.04	5/31/2011
State Street Target Retirement 2040 K	0.17	0.21	0.21	5.90	4.57	11.54	7.62	7.74	9/30/2014

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Sources: Vanguard and Morningstar.



Appendix: Absolute performance results *(continued)*

Average annualized return
as of March 31, 2025

Fund	Expense ratio	3 months	Year-to-date	1 year	3 years	5 years	10 years	Since inception	Inception date
Vanguard Target Retirement 2045 Fund	0.08	-0.40	-0.40	6.57	5.90	13.56	8.27	8.13	10/27/2003
Target Retirement 2045 Composite Index	—	-0.69	-0.69	6.44	5.97	13.79	8.56	—	—
Lipper Target 2045 Funds Average	—	-0.72	-0.72	5.22	5.51	13.01	7.70	—	—
Fidelity Freedom 2045	0.75	0.07	0.07	5.33	6.25	14.31	8.54	7.05	6/1/2006
Fidelity Freedom Index 2045 Investor	0.12	-0.19	-0.19	6.58	5.87	13.28	8.40	9.29	10/2/2009
T. Rowe Price Retirement 2045	0.61	0.22	0.22	5.55	6.07	14.19	8.63	8.28	5/31/2005
American Funds 2045 Trgt Date Retire R5	0.42	-1.13	-1.13	5.90	6.39	13.55	9.10	7.89	2/1/2007
JPMorgan SmartRetirement 2045 R5	0.52	-0.37	-0.37	5.58	5.97	14.00	7.81	7.31	7/31/2007
JPMorgan SmartRetirement® Blend 2045 R5	0.46	-0.40	-0.40	6.43	5.95	13.56	7.89	9.11	7/2/2012
Nuveen Lifecycle 2045 R6	0.65	-1.49	-1.49	3.93	5.80	13.68	8.27	6.77	11/30/2007
BlackRock Lifepath Index 2045 K	0.14	-0.54	-0.54	6.70	5.84	13.98	8.40	8.54	5/31/2011
State Street Target Retirement 2045 K	0.16	—	—	5.84	4.75	12.28	7.91	7.99	9/30/2014
Vanguard Target Retirement 2050 Fund	0.08	-0.56	-0.56	6.65	6.22	13.84	8.40	7.75	6/7/2006
Target Retirement 2050 Composite Index	—	-0.88	-0.88	6.55	6.30	14.09	8.70	—	—
Lipper Target 2050 Funds Average	—	-0.92	-0.92	5.08	5.65	13.28	7.76	—	—
Fidelity Freedom 2050	0.75	—	—	5.33	6.25	14.30	8.54	6.95	6/1/2006
Fidelity Freedom Index 2050 Investor	0.12	-0.19	-0.19	6.60	5.86	13.28	8.40	9.32	10/2/2009
T. Rowe Price Retirement 2050	0.63	0.16	0.16	5.54	6.21	14.29	8.68	7.62	12/29/2006
American Funds 2050 Trgt Date Retire R5	0.42	-1.38	-1.38	5.64	6.38	13.58	9.14	7.91	2/1/2007
JPMorgan SmartRetirement 2050 R5	0.53	-0.53	-0.53	5.55	6.14	14.09	7.85	7.35	7/31/2007
JPMorgan SmartRetirement® Blend 2050 R5	0.45	-0.51	-0.51	6.47	6.11	13.68	7.98	9.17	7/2/2012
Nuveen Lifecycle 2050 R6	0.66	-1.72	-1.72	3.82	5.93	13.94	8.41	6.83	11/30/2007
BlackRock Lifepath Index 2050 K	0.14	-0.95	-0.95	6.82	6.29	14.74	8.70	8.84	5/31/2011
State Street Target Retirement 2050 K	0.18	-0.20	-0.20	5.82	4.99	12.76	8.05	8.11	9/30/2014
Vanguard Target Retirement 2055 Fund	0.08	-0.56	-0.56	6.67	6.23	13.84	8.38	9.88	8/18/2010
Target Retirement 2055 Composite Index	—	-0.88	-0.88	6.55	6.30	14.09	8.70	—	—
Lipper Target 2055+ Funds Average	—	-0.95	-0.95	5.18	5.77	13.52	7.95	—	—
Fidelity Freedom 2055	0.75	—	—	5.33	6.23	14.30	8.53	8.64	6/1/2011
Fidelity Freedom Index 2055 Investor	0.12	-0.19	-0.19	6.63	5.88	13.28	8.40	8.48	6/1/2011
T. Rowe Price Retirement 2055	0.64	0.15	0.15	5.52	6.20	14.28	8.66	7.60	12/29/2006
American Funds 2055 Trgt Date Retire R5	0.44	-1.78	-1.78	5.21	6.33	13.46	9.07	10.20	2/1/2010
JPMorgan SmartRetirement 2055 R5	0.53	-0.51	-0.51	5.57	6.16	14.09	7.87	9.39	1/31/2012
JPMorgan SmartRetirement® Blend 2055 R5	0.47	-0.55	-0.55	6.45	6.14	13.69	7.97	9.14	7/2/2012
Nuveen Lifecycle 2055 R6	0.67	-1.79	-1.79	3.79	5.98	14.09	8.49	8.75	4/29/2011
BlackRock Lifepath Index 2055 K	0.14	-1.16	-1.16	6.87	6.50	14.90	8.80	8.98	5/31/2011
State Street Target Retirement 2055 K	0.19	-0.26	-0.26	5.79	5.01	12.75	8.07	8.12	9/30/2014

The performance data shown represent past performance. Past performance is no 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. For performance data current to the most recent month-end, visit our website at vanguard.com/performance. Some funds assess purchase, redemption, and/or account maintenance fees. The performance data shown do not reflect deduction of these fees. If they did, performance would be lower. Details on these fees and adjusted performance figures can be found in the fund detail section.

Sources: Vanguard and Morningstar.



Appendix: Absolute performance results *(continued)*

				Average annualized return as of March 31, 2025					
Fund	Expense ratio	3 months	Year- to-date	1 year	3 years	5 years	10 years	Since inception	Inception date
Vanguard Target Retirement 2060 Fund	0.08	−0.57	−0.57	6.65	6.23	13.83	8.38	9.66	1/19/2012
Target Retirement 2060 Composite Index	—	−0.88	−0.88	6.55	6.30	14.09	8.70	—	—
Lipper Target 2060+ Funds Average	—	−0.96	−0.96	5.22	5.81	13.83	—	—	—
Fidelity Freedom 2060	0.75	—	—	5.36	6.23	14.29	8.52	8.59	8/5/2014
Fidelity Freedom Index 2060 Investor	0.12	−0.22	−0.22	6.60	5.87	13.28	8.39	8.34	8/5/2014
T. Rowe Price Retirement 2060	0.64	0.12	0.12	5.48	6.17	14.27	8.65	8.38	6/23/2014
American Funds 2060 Trgt Date Retire R5	0.44	−1.95	−1.95	5.10	6.29	13.41	9.04	9.04	3/27/2015
JPMorgan SmartRetirement 2060 R5	0.56	−0.48	−0.48	5.57	6.17	14.09	—	9.22	8/31/2016
JPMorgan SmartRetirement® Blend 2060 R5	0.51	−0.55	−0.55	6.46	6.18	13.68	—	8.98	8/31/2016
Nuveen Lifecycle 2060 R6	0.69	−1.80	−1.80	3.85	6.04	14.26	8.58	8.65	9/26/2014
BlackRock Lifepath Index 2060 K	0.14	−1.21	−1.21	6.87	6.50	14.90	—	10.91	2/29/2016
State Street Target Retirement 2060 K	0.23	−0.25	−0.25	5.81	5.04	12.74	8.05	8.11	9/30/2014
Vanguard Target Retirement 2065 Fund	0.08	−0.54	−0.54	6.67	6.24	13.84	—	8.86	7/12/2017
Target Retirement 2065 Composite Index	—	−0.88	−0.88	6.55	6.30	14.09	8.71	—	—
Lipper Target 2060+ Funds Average	—	−0.96	−0.96	5.22	5.81	13.83	—	—	—
Fidelity Freedom 2065	0.75	—	—	5.34	6.23	14.28	—	9.48	6/28/2019
Fidelity Freedom Index 2065 Investor	0.13	−0.20	−0.20	6.54	5.86	13.27	—	8.93	6/28/2019
T. Rowe Price Retirement 2065	0.64	0.16	0.16	5.48	6.15	—	—	8.92	10/13/2020
American Funds 2065 Trgt Date Retire R5	0.44	−1.95	−1.95	5.10	6.30	13.46	—	13.75	3/27/2020
JPMorgan SmartRetirement® Blend 2065 R5	2.79	−0.49	−0.49	6.19	—	—	—	14.89	11/1/2022
Nuveen Lifecycle 2065 R6	0.96	−1.84	−1.84	3.74	6.08	—	—	9.46	9/30/2020
BlackRock Lifepath Index 2065 K	0.15	−1.19	−1.19	6.92	6.50	14.72	—	9.77	10/30/2019
State Street Target Retirement 2065 K	0.33	−0.39	−0.39	5.72	4.98	12.48	—	12.25	3/30/2020
Vanguard Target Retirement 2070 Fund	0.08	−0.56	−0.56	6.61	—	—	—	12.52	6/28/2022
Target Retirement 2070 Composite Index	—	−0.88	−0.88	6.55	6.30	14.09	8.71	—	—
Lipper Target 2060+ Funds Average	—	−0.96	−0.96	5.22	5.81	13.83	—	—	—
Fidelity Freedom 2070	0.75	−0.10	−0.10	—	—	—	—	3.35	6/28/2024
Fidelity Freedom Index 2070 Investor	0.12	−0.10	−0.10	—	—	—	—	4.61	6/28/2024
American Funds 2070 Trgt Date Retire R5	0.44	−1.93	−1.93	—	—	—	—	7.56	5/3/2024
BlackRock Lifepath® Index 2070 K	0.33	−0.51	−0.51	—	—	—	—	−1.26	9/24/2024
State Street Target Retirement 2070 K	0.33	1.80	1.80	—	—	—	—	1.80	12/31/2024

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Sources: Vanguard and Morningstar.





Appendix: Standardized returns

	Average annualized return as of March 31, 2025								
	Expense ratio	3 months	Year- to-date	1 year	3 years	5 years	10 years	Since inception	Inception date
Vanguard Total Stock Market Index Fund Institutional Shares	0.03	-4.83	-4.83	7.07	8.11	18.09	11.75	8.84	7/7/1997
Vanguard Total International Stock Index Fund Institutional Shares	0.06	5.51	5.51	6.38	4.67	11.47	5.24	5.22	11/29/2010
Vanguard Total Bond Market Index Fund Institutional Shares	0.025	2.77	2.77	4.88	0.54	-0.40	1.45	4.23	9/18/1995
Vanguard Total International Bond Index Fund Institutional Shares	0.06	-0.16	-0.16	3.44	1.10	0.06	1.71	2.36	5/31/2013
Vanguard Short-Term Inflation-Protected Securities Index Fund Institutional Shares	0.03	3.04	3.04	7.02	3.25	4.09	2.81	2.10	10/17/2012

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Sources: Vanguard and Morningstar.

Notes

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Target 2015 Composite Index: An index derived by applying the fund's target asset allocation to the results of the following benchmarks: for international stocks of developed markets, the MSCI EAFE Index through December 15, 2010, the MSCI ACWI ex USA IMI Index through June 2, 2013, and the FTSE Global All Cap ex U.S. Index thereafter; for emerging-market stocks, the Select Emerging Markets Index through August 23, 2006, the MSCI Emerging Markets Index through December 15, 2010, the MSCI ACWI ex USA IMI Index through June 2, 2013, and the FTSE Global All Cap ex U.S. Index thereafter; for U.S. bonds, the Bloomberg U.S. Aggregate Bond Index through December 31, 2009, and the Bloomberg U.S. Aggregate Float Adjusted Index thereafter, as well as the Bloomberg U.S. Treasury Inflation-Protected Securities Index through June 2, 2013, and the Bloomberg U.S. Treasury Inflation-Protected Securities (TIPS) 0-5 Year Index thereafter; for international bonds, the Bloomberg Global Aggregate ex-USD Float Adjusted RIC Capped Index; and for U.S. stocks, the Dow Jones U.S. Total Stock Market Index (formerly known as the Dow Jones Wilshire 5000 Index) through April 22, 2005, the MSCI U.S. Broad Market Index through June 2, 2013, and the CRSP U.S. Total Market Index thereafter.

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Target 2025, 2035, and 2045 Composite Indexes: Indexes derived by applying the fund's target asset allocation to the results of the following benchmarks: for international stocks of developed markets, the MSCI EAFE Index through December 15, 2010, the MSCI ACWI ex USA IMI Index through June 2, 2013, and the FTSE Global All Cap ex U.S. Index thereafter; for emerging-market stocks, the Select Emerging Markets Index through August 23, 2006, the MSCI Emerging Markets Index through December 15, 2010, the MSCI ACWI ex USA IMI Index through June 2, 2013, and the FTSE Global All Cap ex U.S. Index thereafter; for U.S. bonds, the Bloomberg U.S. Aggregate Bond Index through December 31, 2009, and the Bloomberg U.S. Aggregate Float Adjusted Index thereafter; for international bonds, the Bloomberg Global Aggregate ex-USD Float Adjusted RIC Capped Index; and for U.S. stocks, the Dow Jones U.S. Total Stock Market Index (formerly known as the Dow Jones Wilshire 5000 Index) through April 22, 2005, the MSCI U.S. Broad Market Index through June 2, 2013, and the CRSP U.S. Total Market Index thereafter. International stock benchmark returns are adjusted for withholding taxes.

Important information

Target 2055 Composite Index: An index derived by applying the fund's target asset allocation to the results of the following benchmarks: for international stocks of developed markets, the MSCI EAFE Index through December 15, 2010, the MSCI ACWI ex USA IMI Index through June 2, 2013, and the FTSE Global All Cap ex U.S. Index thereafter; for emerging-market stocks, the MSCI Emerging Markets Index through December 15, 2010, the MSCI ACWI ex USA IMI Index through June 2, 2013, and the FTSE Global All Cap ex U.S. Index thereafter; for U.S. bonds, the Bloomberg U.S. Aggregate Float Adjusted Index; for international bonds, the Bloomberg Global Aggregate ex-USD Float Adjusted RIC Capped Index beginning June 3, 2013; and for U.S. stocks, the MSCI U.S. Broad Market Index through June 2, 2013, and the CRSP U.S. Total Market Index thereafter. International stock benchmark returns are adjusted for withholding taxes.

Target 2060 Composite Index: An index derived by applying the fund's target asset allocation to the results of the following benchmarks: for international stocks of developed markets, the MSCI ACWI ex USA IMI Index through June 2, 2013, and the FTSE Global All Cap ex U.S. Index thereafter; for emerging market stocks, the MSCI ACWI ex USA IMI Index through June 2, 2013, and the FTSE Global All Cap ex U.S. Index thereafter; for U.S. bonds, the Bloomberg U.S. Aggregate Float Adjusted Index; for international bonds, the Bloomberg Global Aggregate ex-USD Float Adjusted RIC Capped Index beginning June 3, 2013; and for U.S. stocks, the MSCI U.S. Broad Market Index through June 2, 2013, and the CRSP U.S. Total Market Index thereafter. International stock benchmark returns are adjusted for withholding taxes.

Target 2065 Composite Index: An index derived by applying the fund's target asset allocation to the results of the following benchmarks: the FTSE Global All Cap ex U.S. Index for international stocks, the Bloomberg U.S. Aggregate Float Adjusted Index for U.S. bonds, the Bloomberg Global Aggregate ex-USD Float Adjusted RIC Capped Index for international bonds, and the CRSP U.S. Total Market Index for U.S. stocks. International stock benchmark returns are adjusted for withholding taxes.

Target 2070 Composite Index: An index derived by applying the fund's target asset allocation to the results of the following benchmarks: the FTSE Global All Cap ex US Index for international stocks, the Bloomberg U.S. Aggregate Float Adjusted Index for U.S. bonds, the Bloomberg Global Aggregate ex-USD Float Adjusted RIC Capped Index Hedged for international bonds, and the CRSP US Total Market Index for U.S. stocks. International stock benchmark returns are adjusted for withholding taxes.

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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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