

Vanguard Target Retirement Funds and Trusts

Quarterly Review | December 31, 2024



Contents



Quarterly spotlight

Quarterly perspective	3
TDF glide-path essentials: Setting the right starting point	5
About the SAAC	9



TDF industry and market overview

Industry growth and market share	11
Market environment	12



Vanguard fund construction and performance

Purposeful design and evolution	14
Vanguard fund performance and attribution	15



Competitor fund construction and performance

Beyond the glide path	21
12-month return attribution	23



Appendix

Absolute performance results	27
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Quarterly perspective

2024 year in review

Brian M. Miller, CFA
Senior Investment Specialist



Market and Target Retirement Fund series performance

2024 was a strong year for markets globally, with most major markets and sectors posting positive returns for investors. Broad market growth was led by an appreciation in U.S. equities, which was magnified by large gains in mega-cap stocks in the technology sector, specifically the "Magnificent Seven." Additionally, the Federal Reserve enacted three rate cuts that served as an additional tailwind for strong market performance. Outside the U.S., international equities continued to materially lag U.S. equities. However, international bonds continued to outpace U.S. bonds, demonstrating their benefits as a portfolio diversifier.

The market environment resulted in strong performance for Vanguard Target Retirement Funds, with absolute returns ranging from 6.6% (Income vintage) to 14.6% (2070 vintage) in 2024. Peer-relative results were mixed in 2024, as the risk-on environment benefited active providers that took concentrated bets and/or were materially overweight U.S. equities. While these tactics were fruitful for some in 2024, our focus continues to be on providing a thoughtful and client-centric strategic asset allocation that produces consistent results year over year and can lead to long-term retirement success.

Performance of key Vanguard index funds

Fund name (inception date)	1Q 2024	2Q 2024	3Q 2024	4Q 2024	1-year
Vanguard Total Stock Market Index Fund (07/07/1997)	10.00%	3.25%	6.17%	2.63%	23.75%
Vanguard Total International Stock Index Fund (11/29/2010)	4.32%	0.80%	8.03%	-7.40%	5.18%
Vanguard Total Bond Market Index Fund (09/18/1995)	-0.79%	0.18%	5.07%	-3.04%	1.25%
Vanguard Total International Bond Index Fund (05/31/2013)	0.10%	-0.58%	4.12%	0.09%	3.71%
Vanguard Short-Term Inflation-Protected Securities Index Fund (10/17/2012)	0.85%	1.43%	2.50%	-0.10%	4.75%

Source of performance figures: Vanguard, Institutional share class, as of December 31, 2024.

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 31 of the Quarterly Review.

Research focused on long-term outcomes

Select TDF-related thought leadership and research pieces that we released in 2024 are listed on page 4. One notable research topic that was enacted this year involved reevaluating [our approach to TDF rebalancing](#).

We first announced [changes to our rebalancing methodology](#) during the first quarter of 2024 and, over the past nine months, have worked diligently to ensure a smooth and effective implementation. These enhancements not only allow us to provide better outcomes through lower transaction costs but also aim to provide tighter tracking to the benchmark, facilitating a clearer analysis of benchmark-relative performance for our client and consultant partners.

In the year ahead, be on the lookout for new research from Vanguard on a host of TDF-related topics, including retirement income, participant behavioral studies, and sub-asset allocation analysis on fixed income, inflation hedging, and the focus of this edition's Quarterly Spotlight piece: our reevaluation of the equity allocation for our glide-path starting point.

As always, we thank you for your trust and partnership, and we look forward to serving you in 2025.

Brian M. Miller



Quarterly perspective

Research and thought leadership

Quarterly spotlight articles

[Adding value through a strategic approach](#)

Strategic asset allocation is a core part of the portfolio construction framework that underpins our investment philosophy and our approach to target-date fund (TDF) design.

[Vanguard's approach to target-date fund rebalancing](#)

We are committed to seeking ways to improve outcomes for our clients, which includes developing innovative approaches to rebalancing TDFs. Our rebalancing policy seeks to strike the right balance between minimizing transaction costs and maintaining close alignment to the target asset allocation.

[Hybrid annuity target-date funds: Assessing investment value and suitability for participants](#)

Guaranteed income is one of the hottest topics in retirement income right now, particularly as part of an offer that blends TDFs with an annuity product. The value offered to a participant, however, depends on the design of the hybrid annuity TDF and is influenced by several factors.

[How America is saving with Vanguard Target Retirement Funds](#)

We highlight some key trends from [How America Saves 2024](#), specifically those that relate to participants who are invested in TDFs. We also look at how changes in regulation, such as the passing of the SECURE 2.0 Act, may impact TDF investing and spending patterns.

Vanguard viewpoints

[From theory to practice: Guaranteed income and hybrid annuity target-date funds](#)

We evaluate investment merits for hybrid annuity TDFs using our life-cycle model and a voice-of-client study and specifically address some of the potential challenges around suitability, complexity, and costs associated with this investment vehicle.

[How America Saves 2024](#)

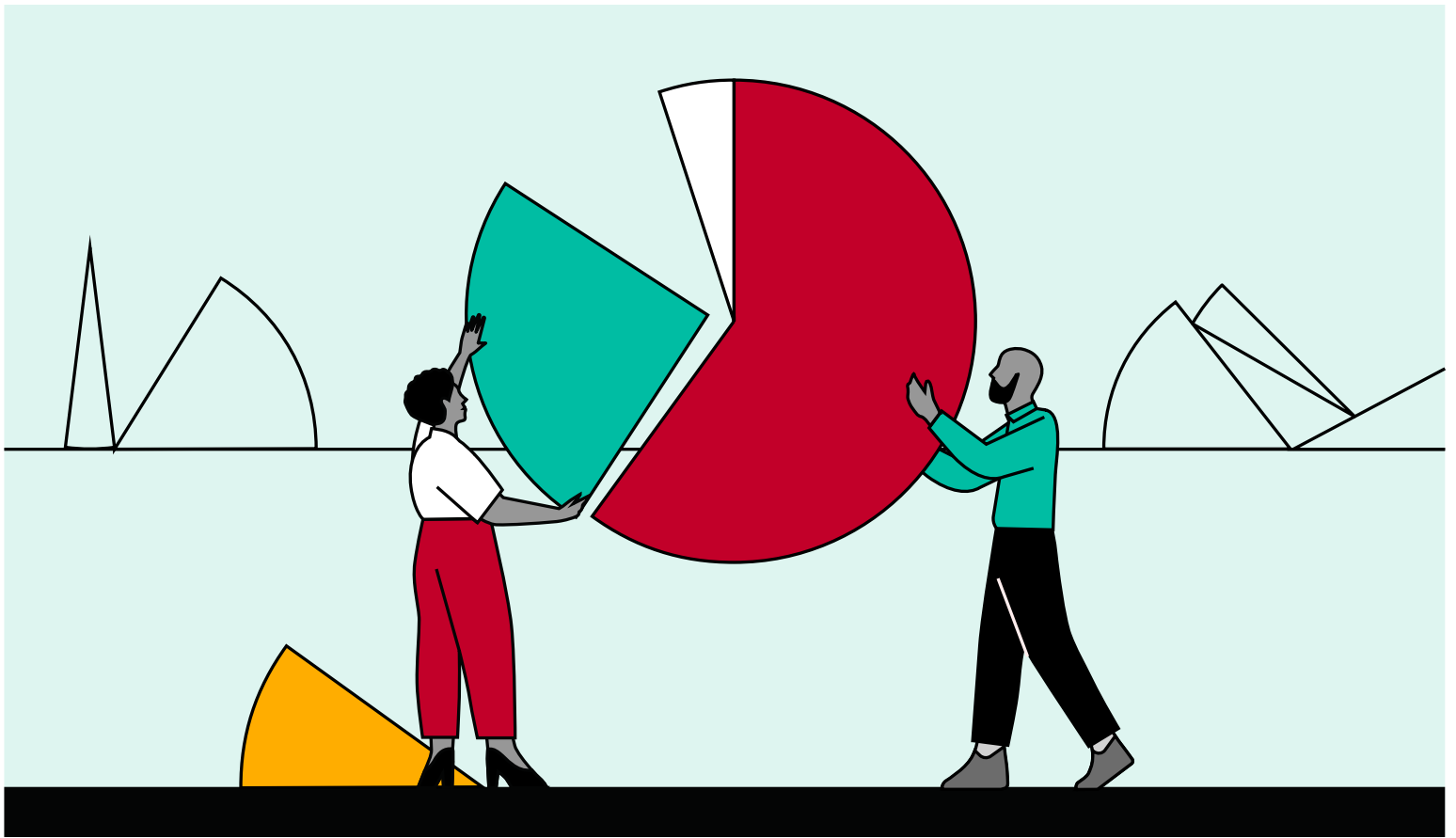
Vanguard believes in dedicating ample time, effort, and resources toward studying the trends that may lead to better investment outcomes. One example of this is *How America Saves*, our annual analysis of nearly 5 million Vanguard DC plan participants.

[The rebalancing edge: Optimizing target-date fund rebalancing through threshold-based strategies](#)

We focus on rebalancing approaches—monthly, quarterly, and threshold-based—commonly used by TDF providers. We propose an optimal rebalancing policy that focuses on helping improve long-term investor outcomes by balancing the trade-off between transaction costs and deviation from the target asset allocation over time.

[Target-date strategies and advice: The impact of saving and spending differences](#)

Continuing our exploration of the advice and self-directed decision framework, we examine how participants, whether they find themselves on or off track in their retirement saving journey, may benefit from guidance on portfolio construction, goal setting, and financial planning.



TDF glide-path essentials: Setting the right starting point

When constructing a target-date fund (TDF) glide path, providers have many decisions to make, such as what asset classes to include, when to include them, and how much to allocate to each. These decisions support participants in building enough wealth during their working years to generate the income needed to maintain their lifestyle in retirement.

At Vanguard, investor outcomes drive our approach to evaluating and making glide-path changes. Any change that we make represents our belief in that change having an enduring, positive impact on investor outcomes. After rigorous analysis, we have decided to maintain a 90% equity weighting for our glide-path starting point. This article outlines the considerations behind the decision to continue with our current allocation.



The role of equities

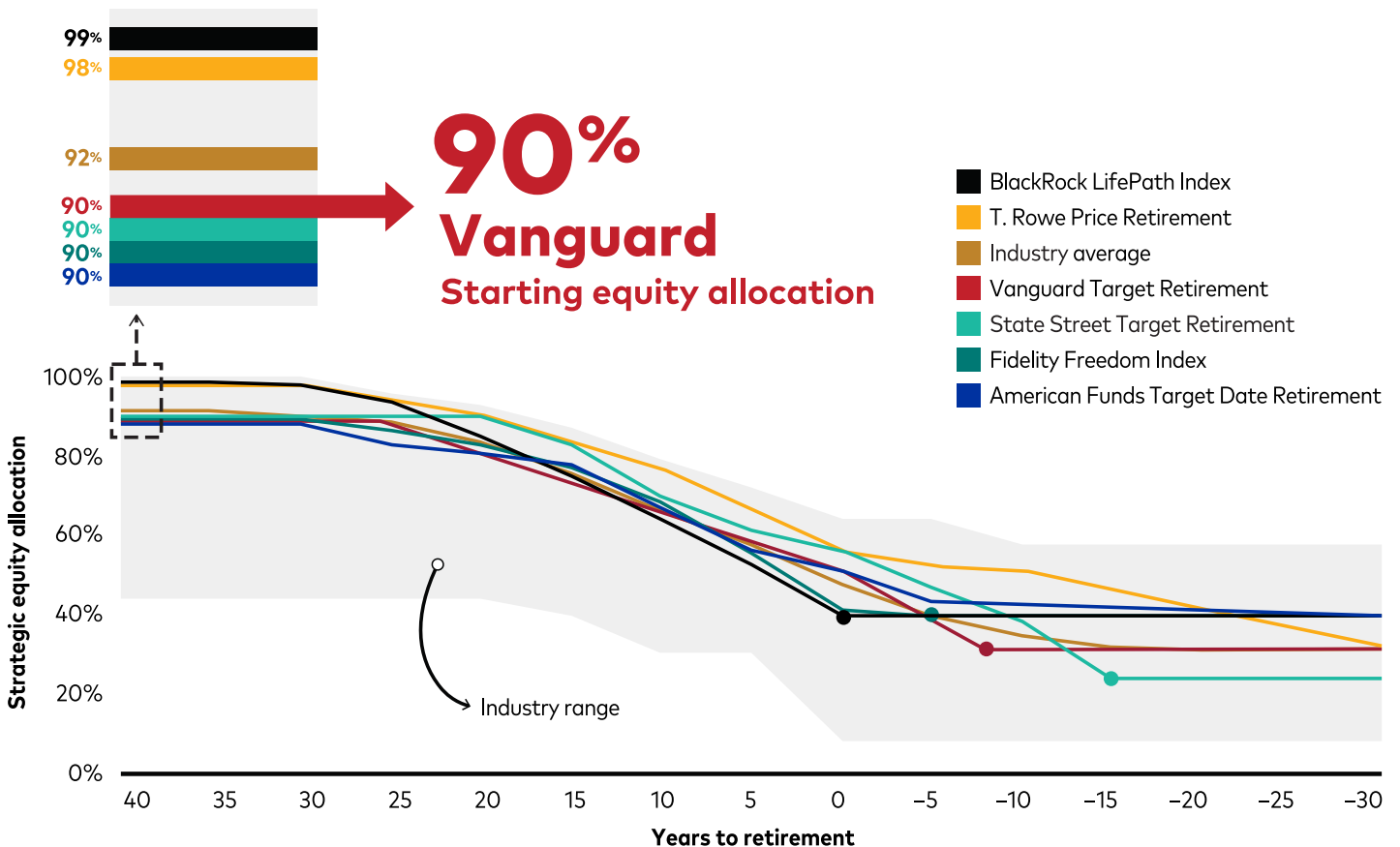
The equity weighting across the glide path is one of the most important determinants of TDF outcomes, as it characterizes the trade-off between growth and safety throughout the portfolio's life cycle. While we continuously evaluate the equity weighting as part of our annual glide-path revalidations, we placed additional emphasis on this topic given the strong equity performance in 2023 and 2024.

Much of the industry tends to allocate more heavily toward risky assets, such as equity securities, in the early years of the glide path. **Figure 1** illustrates how some of our competitors maintain, or shift to, equity starting points of 95% or higher (relative to our 90% equity starting point). Although it may enhance a TDF's ability to grow wealth over time, a higher

equity weighting can also lead to greater-than-necessary risk exposure due to the higher volatility profile that equities have relative to fixed income securities.

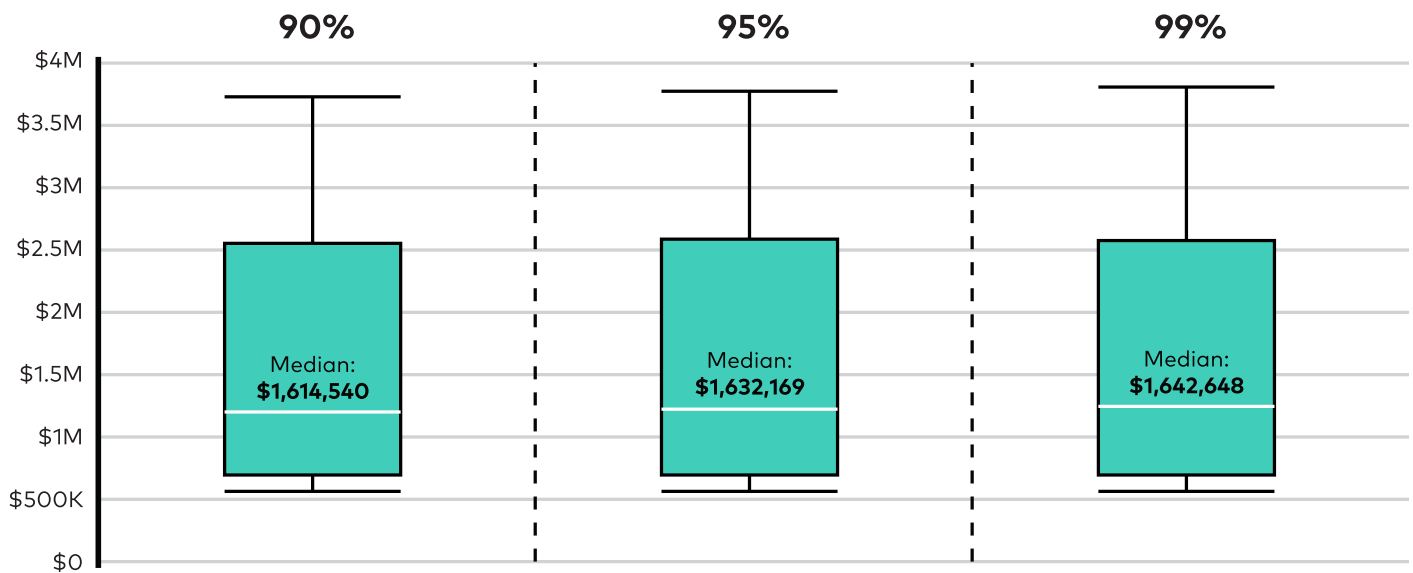
While younger investors can potentially better withstand greater market volatility than their older cohorts (and should expect to do so), it doesn't have a meaningful impact on securing their financial saving goals. Most TDF investors—especially those who are defaulted into an investment plan—skew more conservative given their lack of familiarity with markets and investing. A higher allocation to riskier asset classes and, in turn, more volatility, can be a reasonable decision based on one's risk tolerance. Providers that take this aggressive stance, we believe, can miss the goal of meeting the expected lifetime spending that a glide path will fund. To enable the investor to maintain their lifestyle, we look to replace 79% of an investor's income at age 65, to and through age 95.

FIGURE 1. Glide-path comparison among TDF providers



Note: Vanguard Target Retirement Funds and Trusts reach a 30% equity allocation via a Target Retirement Income Fund or Trust. Alternatively, participants can maintain a 50% equity allocation by switching to Vanguard Target Retirement Income and Growth Trust.

Sources: Vanguard and competitor websites; data as of December 31, 2024; Vanguard calculation for industry average.


FIGURE 2. Wealth distribution at age 65


Source: Vanguard, 2024.

For more information on the key assumptions and VLCM inputs used here, see Appendix 4 and 5 in [Vanguard's Approach to Target-Date Funds](#).

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, 2024. Results from the model may vary with each use and over time. For more information, please see the important information section.

Revalidation by the numbers

The VLCM generates two goals-based metrics—certainty fee equivalent (CFE) and probability of success—which together provide relative and client-centric benchmarks. The CFE is the variable that determines the amount an investor is willing to pay to invest in an improved glide path (for example, the optimized one) relative to a reference glide path (for example, the current one). Probability of success refers to the likelihood that a particular glide path will meet an investor's spending goals through retirement across the full range of economic scenarios.

The [Vanguard Life-Cycle Investing Model \(VLCM\)](#) provides a robust framework for assessing any potential changes or additions to the glide path. Using the VLCM, our assessment shows that increasing the equity weighting does not provide a meaningful increase in the probability of success,

a key metric that estimates the probability of maintaining a positive balance throughout a participant's life.

As previously noted, an increased equity weighting does *slightly* increase a portfolio's projected median wealth. But while projected increased wealth is a positive, TDFs are not designed as vehicles to maximize wealth. Their purpose is to help participants accumulate sufficient savings by providing a balanced, risk-adjusted path toward retirement. That is why evaluating investor outcomes, through the lens of the VLCM, remains at the center of our approach. Again, we look for changes that exhibit a high CFE benefit (which we define as >10 bps) and a meaningful improvement to the probability of success. As **Figure 2** shows, median wealth increases only by about 1% in portfolios with a 95% and 99% starting point, respectively, when compared with portfolios with a 90% equity starting point.



Despite a slight projected increase in total wealth, there is no impact on the probability of success for participants who are invested in portfolios with either a 95% or 99% equity starting point relative to a 90% equity starting point. However, this estimation assumes that participants remain fully invested throughout the course of the TDF and that their contributions remain consistent. It does not account for every investor's risk preference. When you take these factors into consideration, we find it reasonable to maintain the 90% equity starting point.

Behavioral considerations for younger investors

We appreciate the trust our clients place in us when it comes to allocating their participants' savings. In addition to a rigorous quantitative process, we prioritize participants' sentiments and behaviors to ensure that we meet the needs of a range of investors. Although younger investors can typically endure more risk and be comfortable with portfolio volatility, there is no meaningful increase in the probability of meeting their goal. Let's consider the nuanced cases of younger investors, both those who are unengaged and those who are engaged:

Unengaged investors are those who rarely, if ever, transact in their accounts, a common archetype for Defined Contribution participants. This, however, should not result in a full risk-on approach unless there is a stated objective driving that decision. It is worth noting that younger investors often face income volatility early in their investment journey as they navigate the job market, variable earnings, and other spending needs, such as student loan repayments. A portfolio with a 90% equity starting point can balance the dual realities of long-term growth needs and short-term income uncertainty.

On the other hand, engaged investors are those who are at risk of making poor decisions if they experience equity corrections early on. For these younger investors, the stability sought by fixed income assets can act as a ballast within the portfolio. This ballast will not offset poor equity performance entirely, but it can lessen the blow.

Lastly, there are additional non-participant-based, qualitative aspects to consider, such as plan sponsor and consultant sentiment. Strong absolute returns are always a plus, but we actively balance that objective with the desire to provide a qualified default investment alternative (QDIA) that is well diversified and calibrated to meet participants' financial goals.

Our commitment to improving outcomes

We are committed to continually evaluating our glide-path assumptions and measuring the impacts of changing dynamics on a regular basis. This commitment gives us the conviction that our current equity weighting is best suited to meet our clients' needs and is in line with our investment philosophy of creating clear, appropriate investment goals; keeping a balanced and diversified mix of investments; minimizing costs; and maintaining perspective and long-term discipline.

Given their typical use as a QDIA, TDFs require a high bar for change, which is why we prioritize providing actual long-term value for our investors. While increasing the equity weighting would likely boost absolute returns in isolation, it would lead to only a slight improvement in peer-relative results during good years and underperformance during bad ones.

We will continue to monitor and evaluate this assumption and will shift our approach if necessary. However, we believe that a focus on reducing portfolio volatility combined with accessible education, guidance, and advice solutions within a plan will give participants the best chance of staying the course and meeting their retirement saving goals.



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.

Source: Vanguard.



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, Institutional Investor Group
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.



TDF industry and market overview

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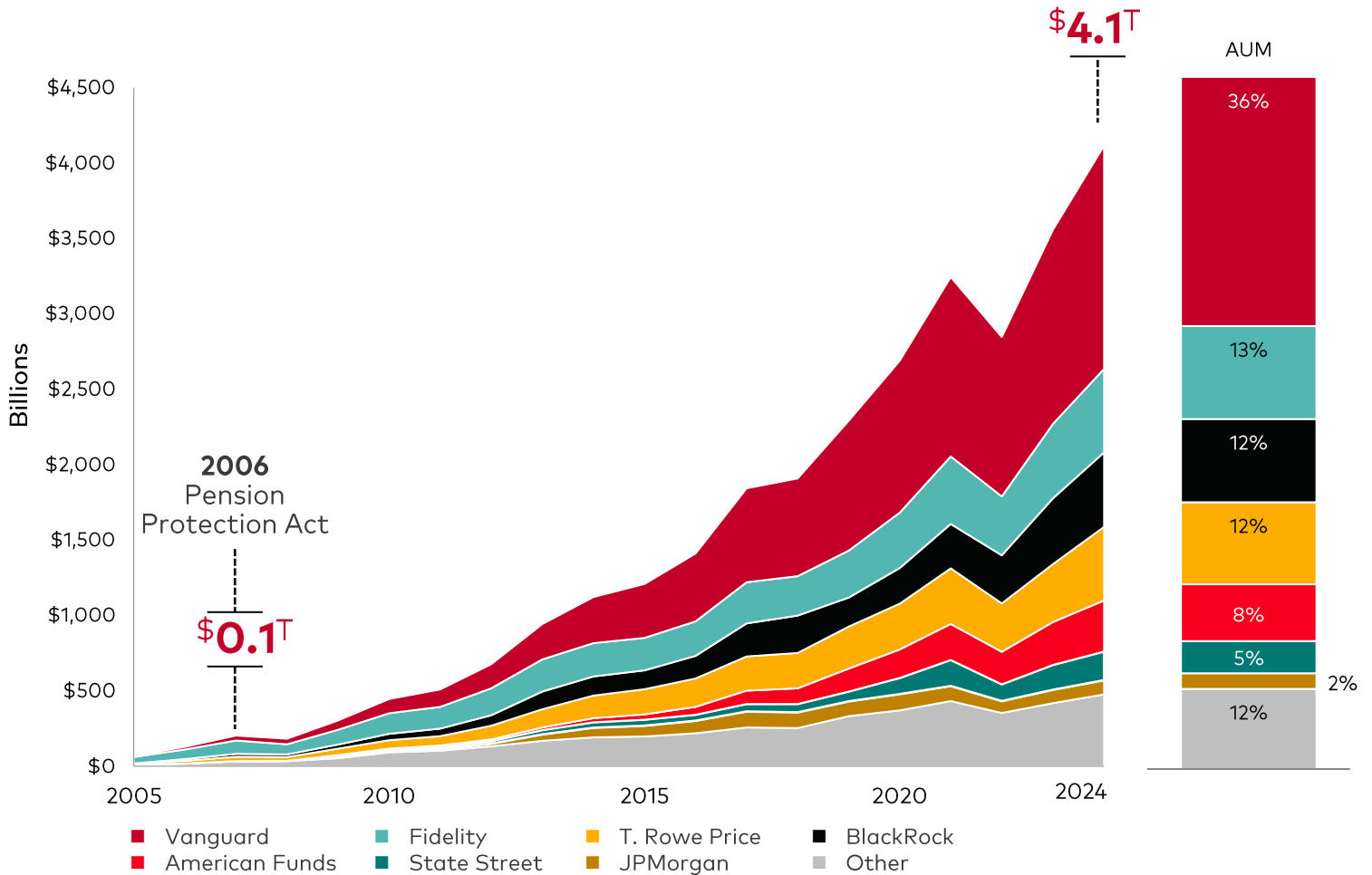
Industry growth and market share

Market environment



Industry growth and market share

Figure 11.1 Growth of target-date fund industry assets and market share



According to data from Morningstar combined with Vanguard’s funds and trusts data, TDF industry assets exceeded \$4.12 trillion as of the end of Q4 2024. 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 88% share of all industry assets, or more than \$3.63 trillion, as of December 31, 2024.

Sources: Vanguard, Morningstar, as of December 31, 2024. 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 12.1 Index returns ranked by performance

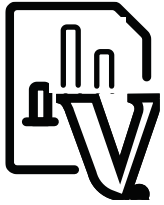
2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	1Q 2024	2Q 2024	3Q 2024	4Q 2024
REIT 2.5	HYB 17.1	FTSE 27.4	IAGG 3.2	CRSP 30.8	CRSP 21.0	REIT 43.1	COM 16.1	CRSP 26.0	CRSP 23.8	CRSP 10.0	CRSP 3.3	REIT 16.1	CRSP 2.6
IAGG 1.3	CRSP 12.7	CRSP 21.2	CASH 1.9	REIT 25.8	FTSE 11.2	COM 27.1	CASH 1.5	FTSE 15.8	REIT 8.8	FTSE 4.3	COM 2.9	FTSE 8.4	CASH 1.2
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	COM 2.2	STPS 1.4	EMB 6.5	IAGG 0.2
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	HYB 1.5	CASH 1.4	CRSP 6.2	HYB 0.2
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	CASH 1.4	HYB 1.1	HYB 5.3	STPS -0.1
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	EMB 1.2	FTSE 0.9	AGG 5.2	COM -0.5
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	STPS 0.9	EMB 0.3	IAGG 3.9	EMB -2.1
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	IAGG 0.1	REIT 0.1	STPS 2.5	AGG -3.1
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	REIT -0.3	AGG 0.1	CASH 1.4	REIT -6.1
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	AGG -0.8	IAGG -0.4	COM 0.7	FTSE -7.5

		Average annualized returns					
Index returns		3 months	1 year	3 years	5 years	10 years	
Target Retirement Fund building blocks	CRSP	CRSP U.S. Total Market Index	2.63	23.77	7.87	13.81	12.50
	FTSE	FTSE Global All Cap ex U.S. Index	-7.49	5.52	0.83	4.42	5.13
	AGG	Bloomberg U.S. Aggregate Bond Index	-3.06	1.25	-2.41	-0.33	1.35
	IAGG	Bloomberg Global Agg ex U.S. Float Adj RIC Cap Index (Hedged)	0.20	3.79	-0.50	0.21	2.08
	STPS	Bloomberg U.S. 0-5 Year TIPS Index	-0.11	4.69	2.11	3.34	2.57
Other indexes	CASH	3-Month T-Bill	1.23	5.45	4.05	2.54	1.79
	HYB	Bloomberg U.S. Corporate High Yield Index	0.17	8.19	2.92	4.21	5.17
	EMB	Bloomberg USD Emerging Market Gov RIC Cap Index	-2.11	5.91	-1.01	0.16	3.11
	REIT	MSCI U.S. REIT Index	-6.12	8.75	-2.26	4.31	5.66
	COM	Bloomberg Commodity Index	-0.45	5.38	4.05	6.77	1.28

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 December 31, 2024.

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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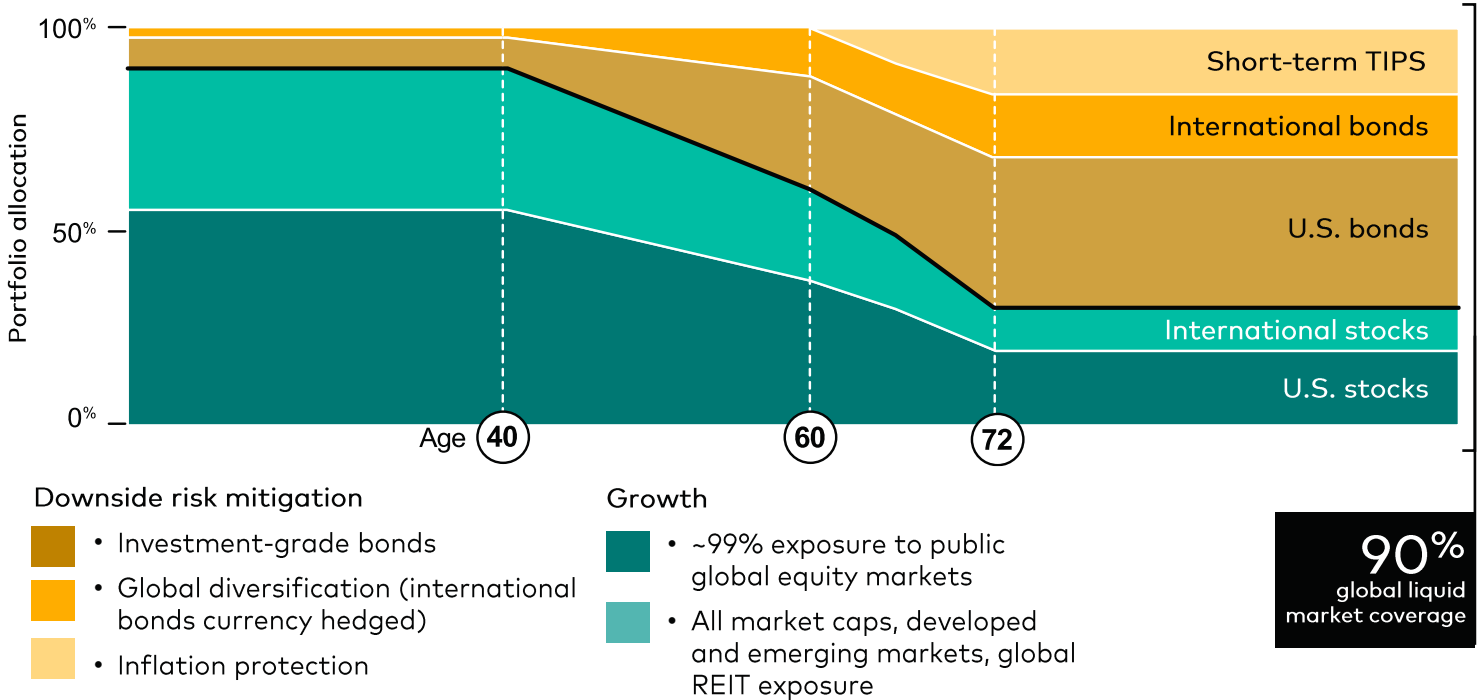
Evolution of Vanguard's glide-path design

Vanguard fund performance and attribution

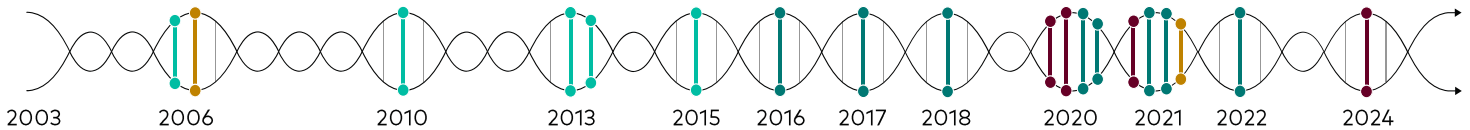


Purposeful design and evolution

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 December 31, 2024

Vanguard Target Retirement Fund and Trust performance

Portfolio/Benchmark	Expense ratio	Average annualized return as of December 31, 2024						Inception date
		3 months	1 year	3 years	5 years	10 years	Since inception	
Vanguard Target Retirement Income Vintage								
Fund	0.08	-1.57	6.58	0.98	3.58	4.19	4.95	10/27/2003
Trust II	0.075	-1.55	6.63	1.00	3.60	4.22	4.69	2/29/2008
Target Retirement Income Composite Index		-1.53	6.74	1.17	3.86	4.42	—	—
Vanguard Target Retirement 2020 Vintage								
Fund	0.08	-1.59	7.75	1.34	4.75	5.58	6.01	6/7/2006
Trust II	0.075	-1.57	7.79	1.36	4.79	5.64	5.90	2/29/2008
Target Retirement 2020 Composite Index		-1.55	7.91	1.58	5.10	5.86	—	—
Vanguard Target Retirement 2025 Vintage								
Fund	0.08	-1.64	9.44	1.92	5.66	6.32	6.66	10/27/2003
Trust II	0.075	-1.63	9.46	1.97	5.73	6.40	6.39	2/29/2008
Target Retirement 2025 Composite Index		-1.59	9.63	2.25	6.09	6.64	—	—
Vanguard Target Retirement 2030 Vintage								
Fund	0.08	-1.69	10.64	2.44	6.44	6.92	6.78	6/7/2006
Trust II	0.075	-1.69	10.63	2.48	6.50	6.99	6.77	2/29/2008
Target Retirement 2030 Composite Index		-1.66	10.82	2.79	6.87	7.24	—	—
Vanguard Target Retirement 2035 Vintage								
Fund	0.08	-1.61	11.78	2.97	7.20	7.51	7.53	10/27/2003
Trust II	0.075	-1.62	11.73	3.01	7.27	7.59	7.21	2/29/2008
Target Retirement 2035 Composite Index		-1.62	11.90	3.31	7.63	7.82	—	—
Vanguard Target Retirement 2040 Vintage								
Fund	0.08	-1.50	12.88	3.51	7.97	8.08	7.52	10/27/2003
Trust II	0.075	-1.57	12.81	3.51	8.01	8.14	7.64	2/29/2008
Target Retirement 2040 Composite Index		-1.58	12.99	3.81	8.37	8.40	—	—

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, as of December 31, 2024.



Fund performance through December 31, 2024

Vanguard Target Retirement Fund and Trust performance (continued)

Portfolio/Benchmark	Expense ratio	Average annualized return as of December 31, 2024					Since inception	Inception date
		3 months	1 year	3 years	5 years	10 years		
Vanguard Target Retirement 2045 Vintage								
Fund	0.08	-1.46	13.91	4.00	8.73	8.57	8.25	10/27/2003
Trust II	0.075	-1.52	13.83	4.00	8.75	8.62	7.91	2/29/2008
Target Retirement 2045 Composite Index		-1.54	14.08	4.31	9.12	8.89	—	—
Vanguard Target Retirement 2050 Vintage								
Fund	0.08	-1.48	14.64	4.37	9.03	8.72	7.89	6/7/2006
Trust II	0.075	-1.47	14.66	4.40	9.09	8.78	8.01	2/29/2008
Target Retirement 2050 Composite Index		-1.50	14.92	4.72	9.45	9.05	—	—
Vanguard Target Retirement 2055 Vintage								
Fund	0.08	-1.49	14.64	4.37	9.02	8.70	10.10	8/18/2010
Trust II	0.075	-1.50	14.64	4.40	9.08	8.77	10.45	8/31/2010
Target Retirement 2055 Composite Index		-1.50	14.92	4.72	9.45	9.05	—	—
Vanguard Target Retirement 2060 Vintage								
Fund	0.08	-1.50	14.63	4.38	9.02	8.70	9.90	1/19/2012
Trust II	0.075	-1.51	14.63	4.41	9.10	8.78	9.64	3/1/2012
Target Retirement 2060 Composite Index		-1.50	14.92	4.72	9.45	9.05	—	—
Vanguard Target Retirement 2065 Vintage								
Fund	0.08	-1.53	14.62	4.39	9.01	—	9.24	7/12/2017
Trust II	0.075	-1.52	14.60	4.41	9.09	—	9.78	7/17/2017
Target Retirement 2065 Composite Index		-1.50	14.92	4.72	9.45	9.08	—	—
Vanguard Target Retirement 2070 Vintage								
Fund	0.08	-1.53	14.59	—	—	—	14.08	6/8/2022
Trust II	0.075	-1.57	14.62	—	—	—	7.64	4/7/2022
Target Retirement 2065 Composite Index		-1.50	14.92	4.72	9.45	9.08	—	—

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, as of December 31, 2024.





Underlying fund performance contribution

Figure 17.1 3-month return contribution by underlying funds

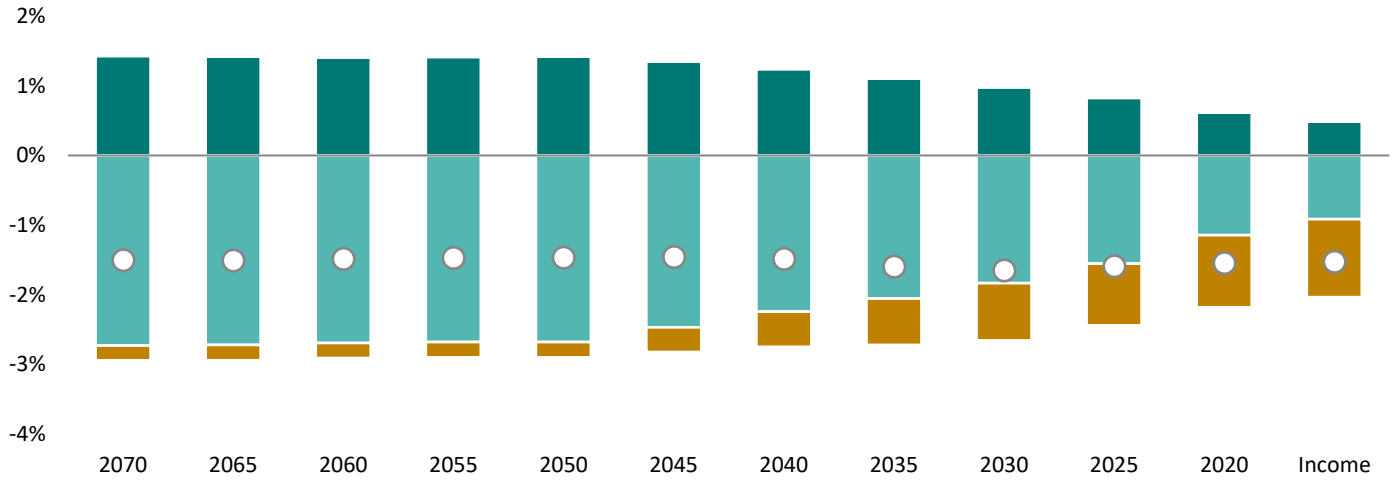
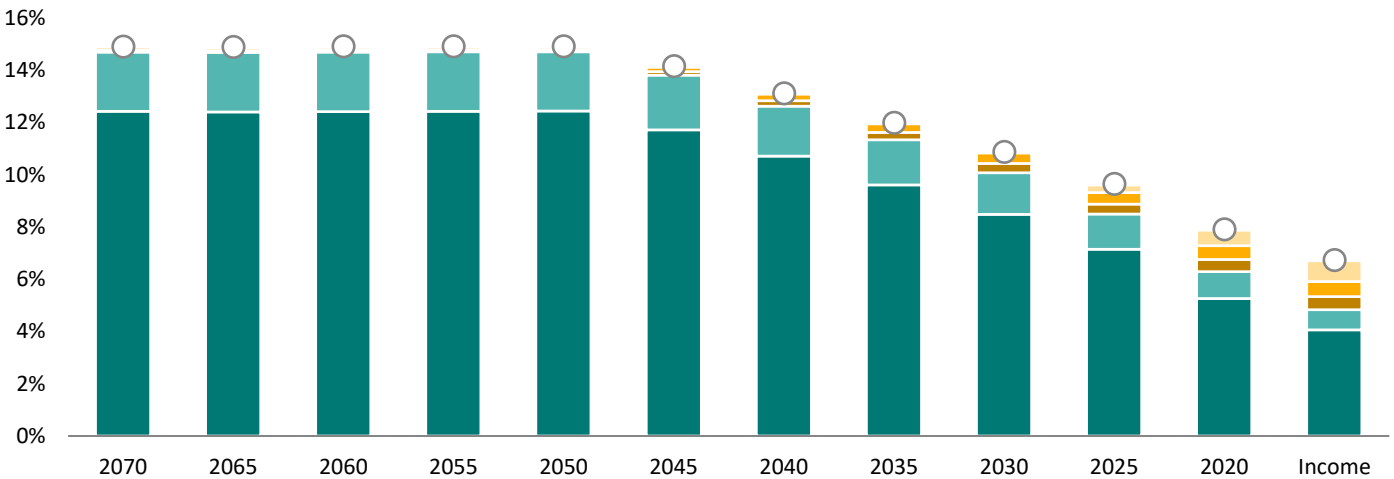


Figure 17.2 1-year return contribution by underlying funds



- Total Stock Market Index
- Total International Stock Index
- Total return
- Total Bond Market II Index
- Total International Bond Index
- Short-Term Inflation-Protected Securities Index
- Cash

Past performance is not a guarantee of future results.

Sources: Vanguard and Morningstar, as of December 31, 2024.

For institutional investor use only. Not for distribution to retail investors.



Excess return attribution

Figure 18.1 3-month return attribution

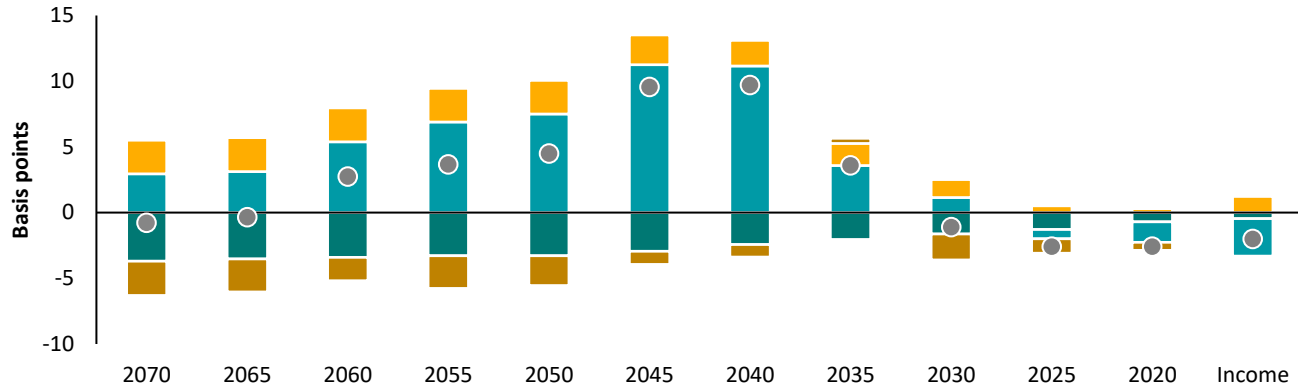
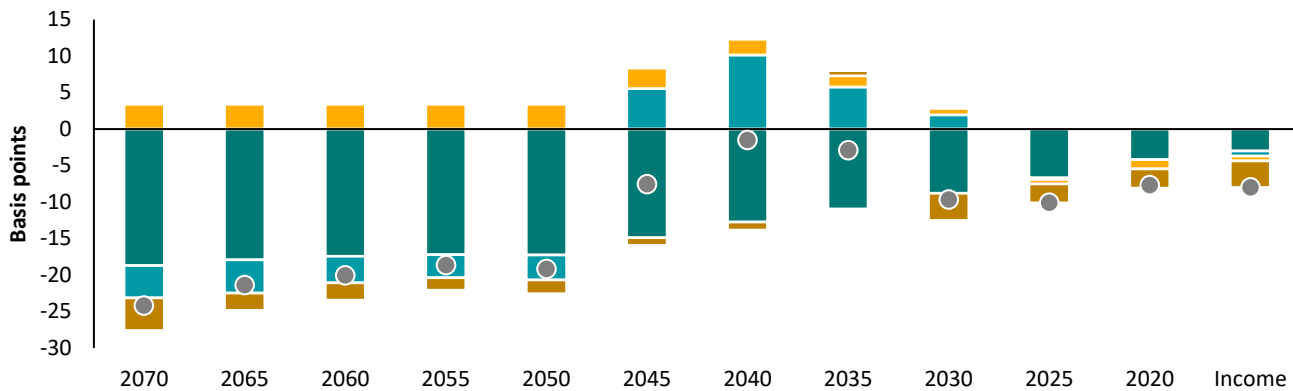


Figure 18.2 1-year return attribution



■ 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.

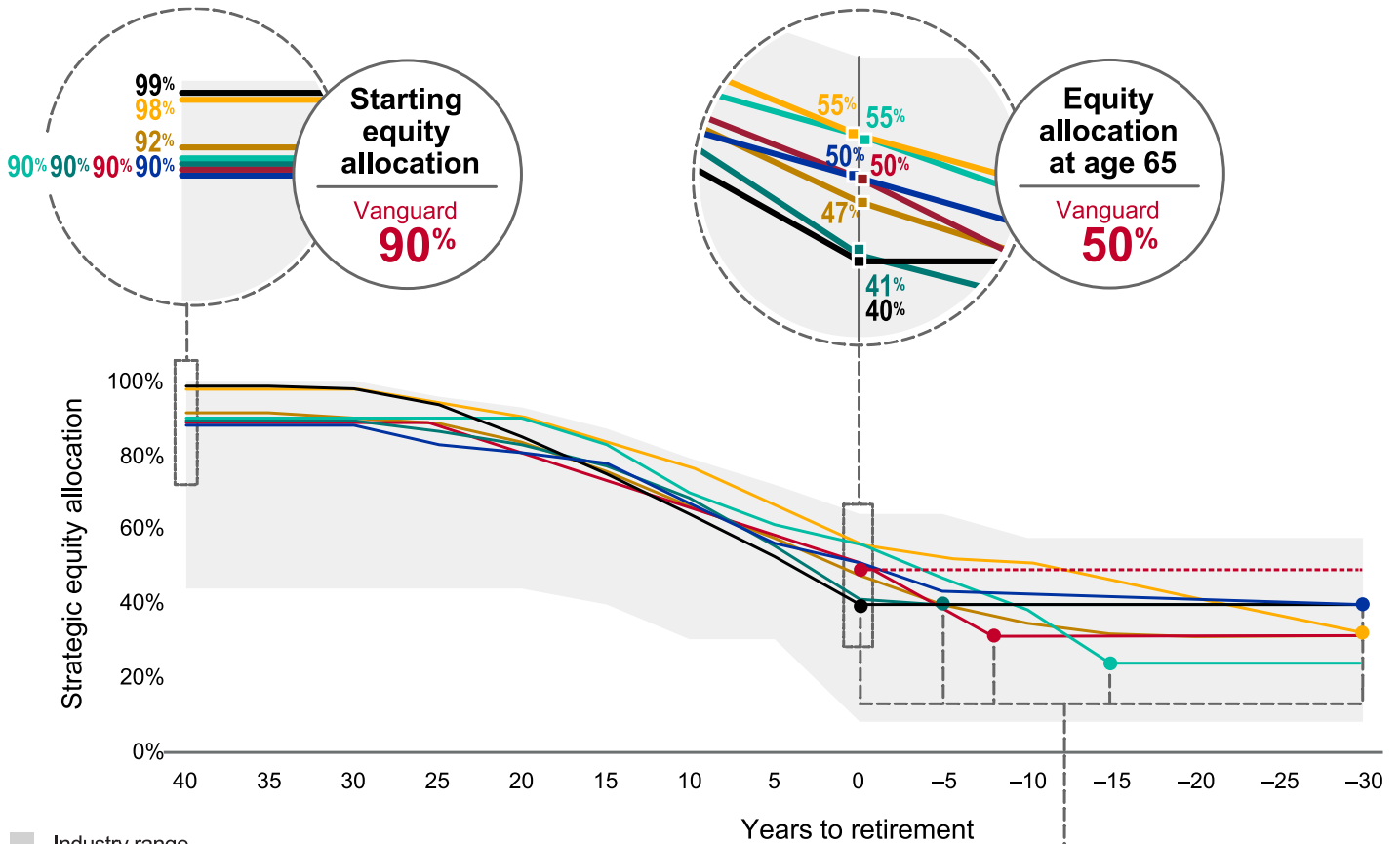
Past performance is not a guarantee of future results.

Sources: Vanguard and Morningstar, as of December 31, 2024.

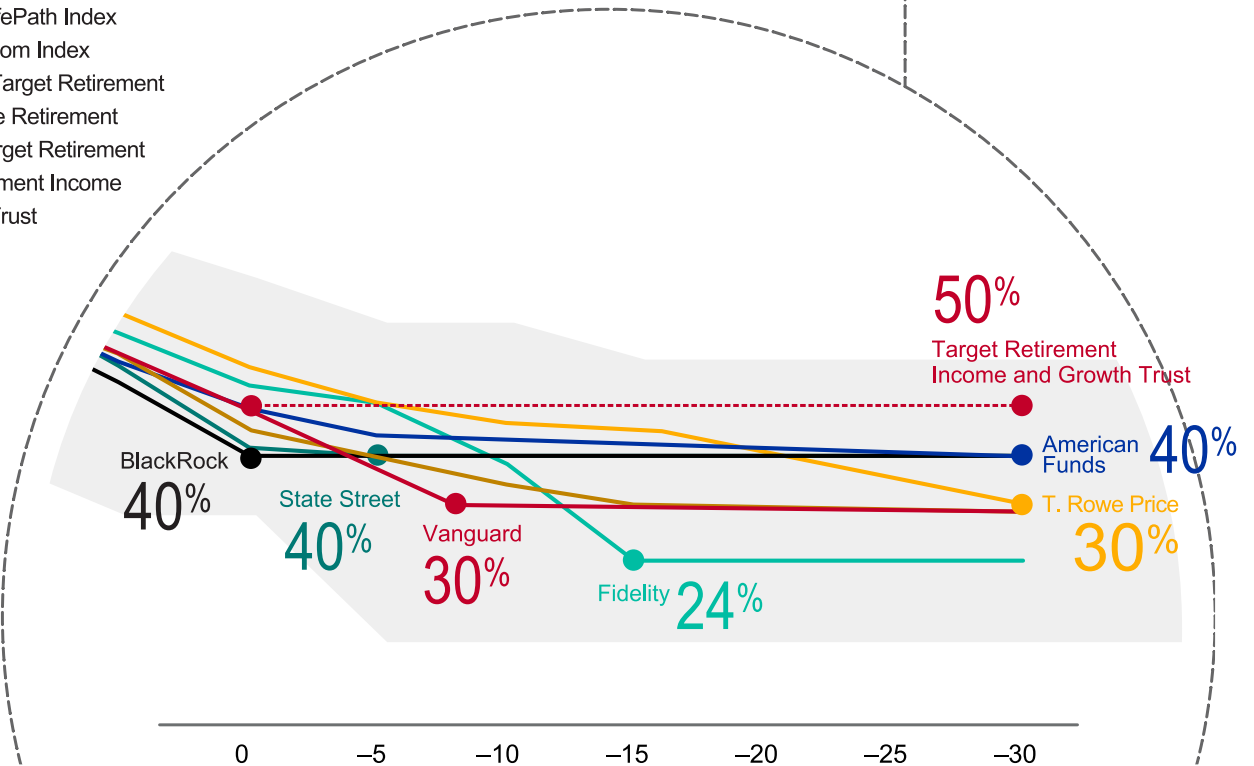
* On January 14, 2021, Bloomberg changed its index pricing time from 3 p.m., Eastern time, to 4 p.m., Eastern time. The time change affects the 1- and 3-year figures.



Glide path comparison



- Industry range
- Industry average
- American Funds Target Date Retirement
- BlackRock LifePath Index
- Fidelity Freedom Index
- State Street Target Retirement
- T. Rowe Price Retirement
- Vanguard Target Retirement
- Target Retirement Income and Growth Trust



Sources: Morningstar; data as of December 31, 2024; Vanguard calculation for industry average.



Competitor fund construction and performance

IN THIS SECTION:

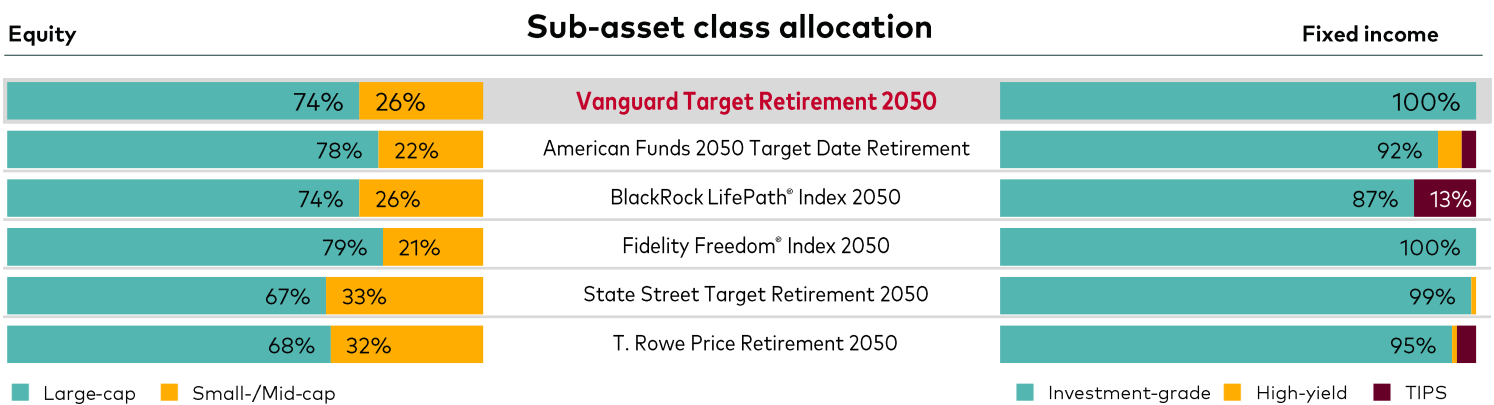
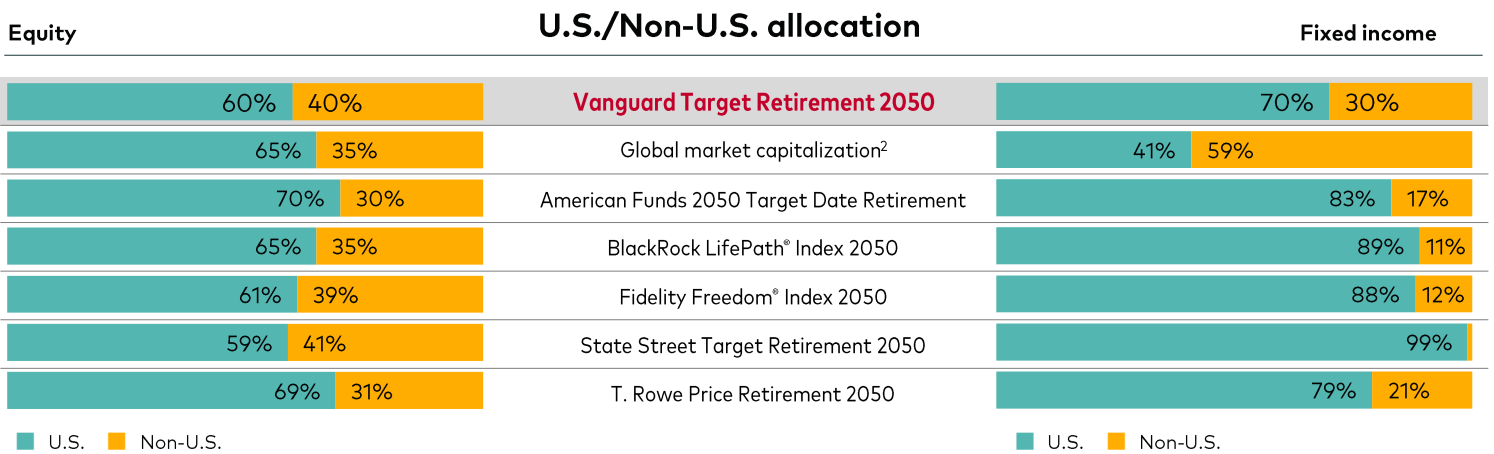
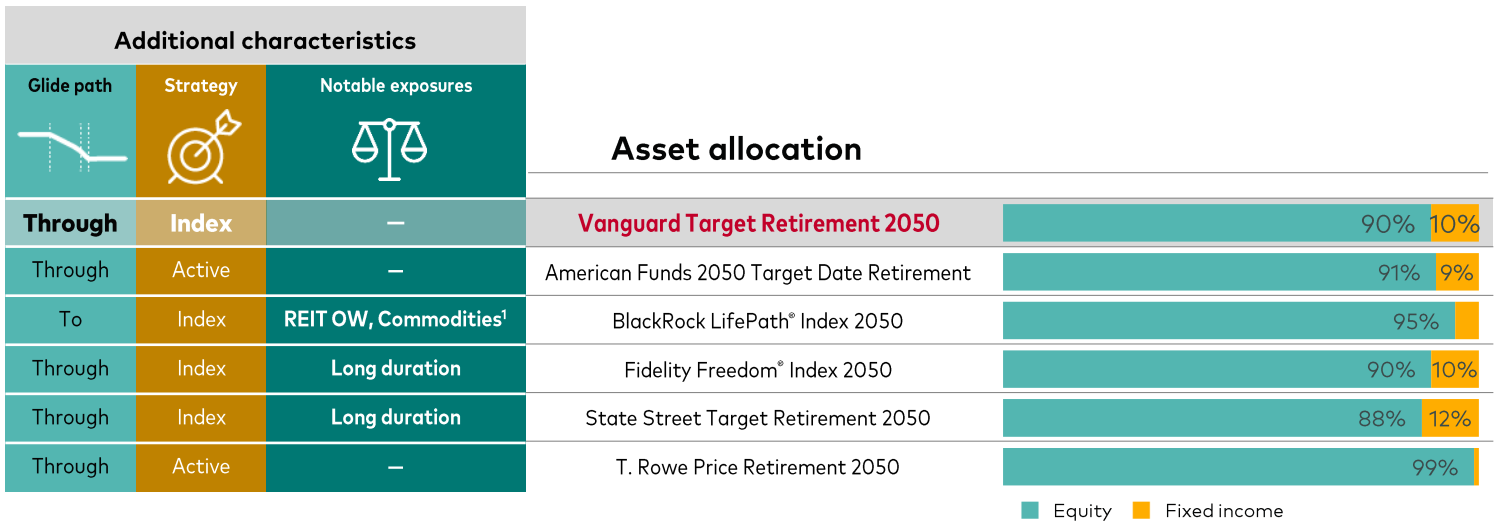
Beyond the glide path

12-month return attribution



2050 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 December 31, 2024.

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.

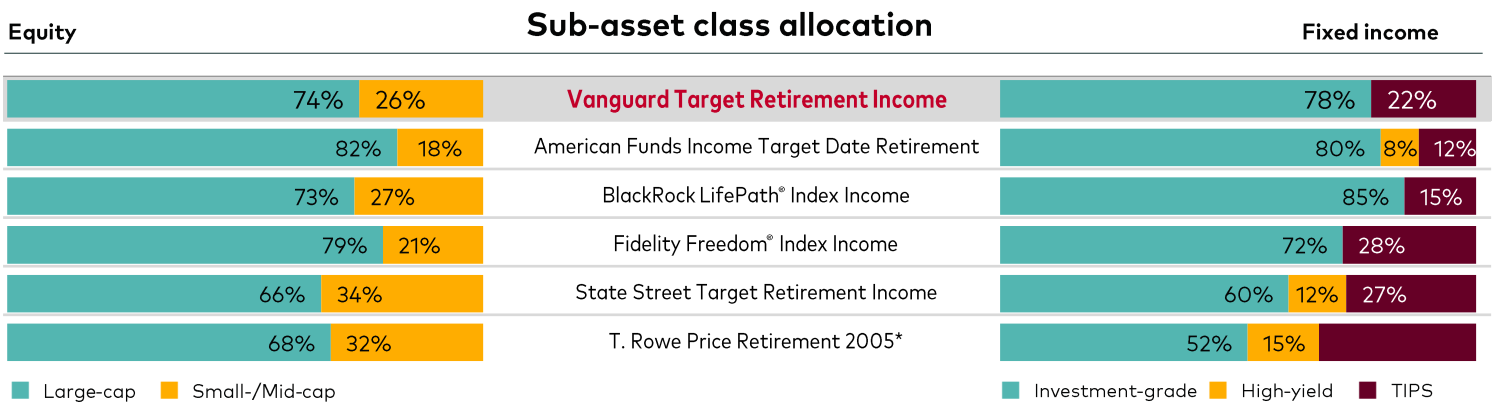
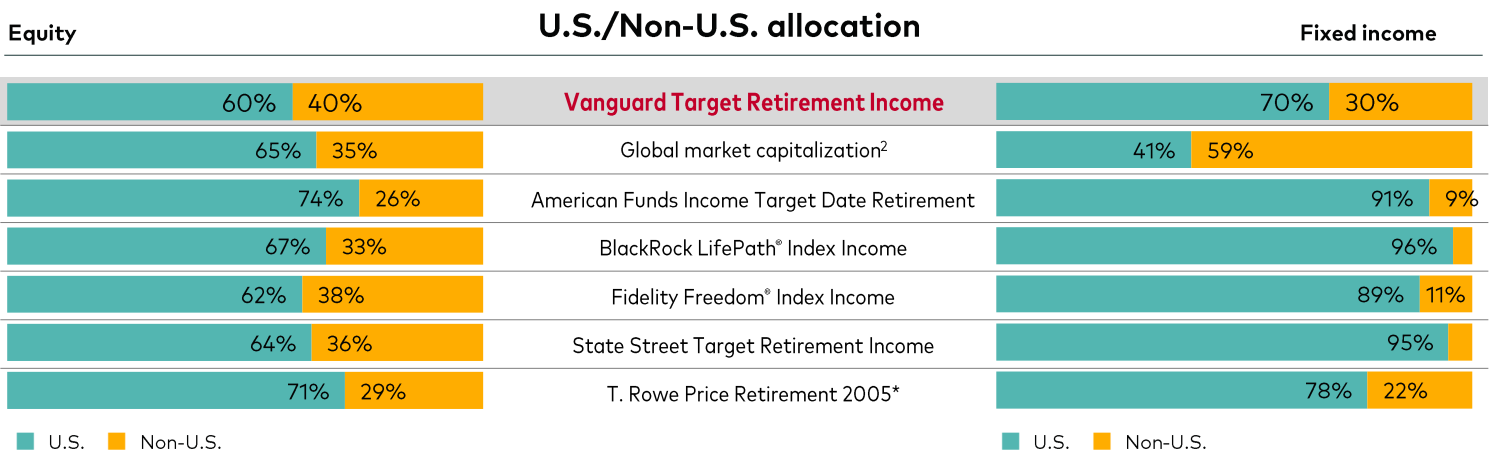
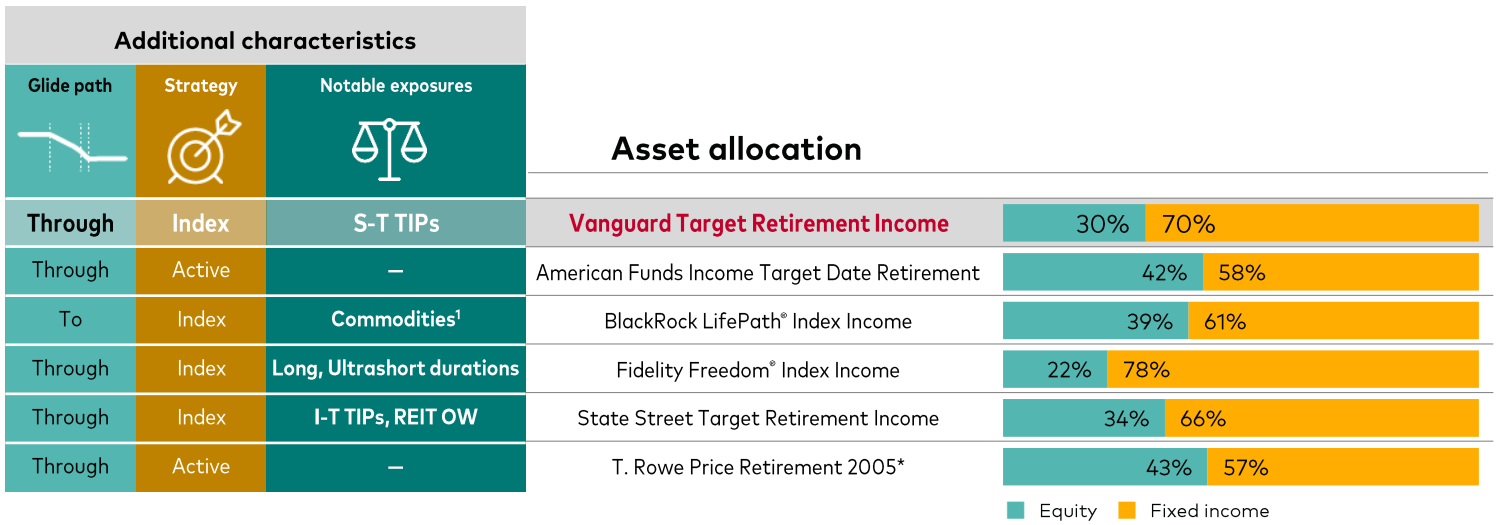
Note: Due to spacing issues, data labels below 7% are not displayed. Due to rounding, may not total to 100%.

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



Income vintage: Beyond the glide path

Figure 22.1 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 December 31, 2024.

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.

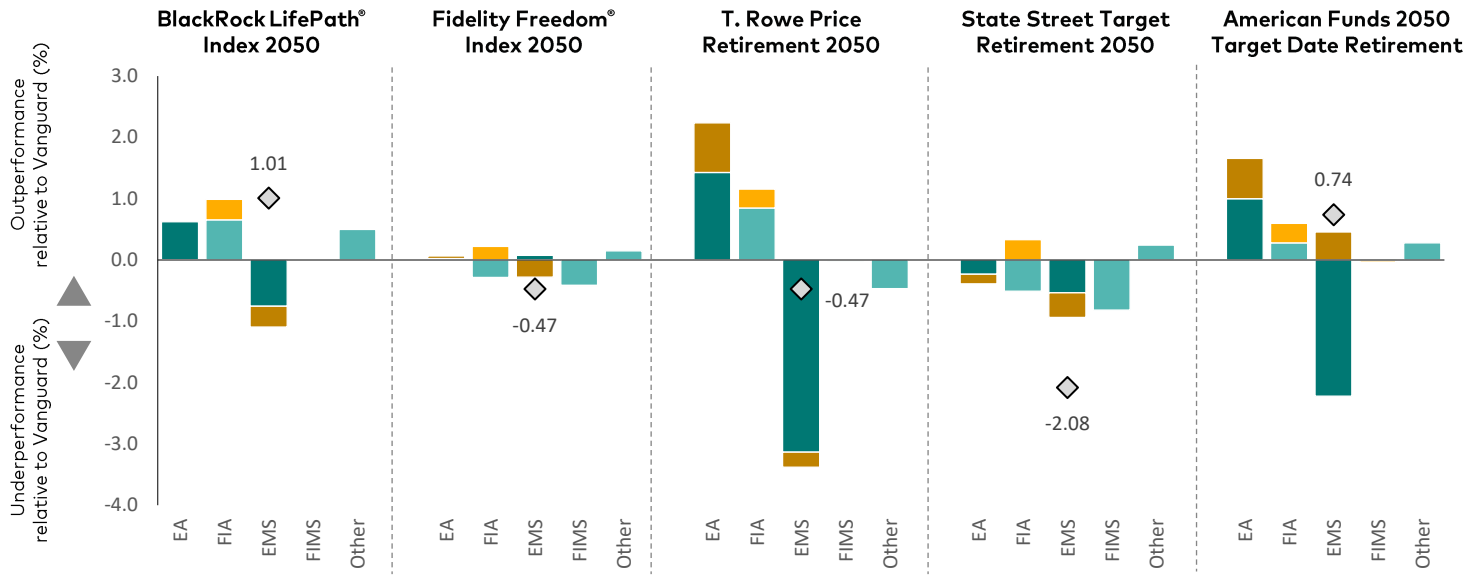
Note: Due to spacing issues, data labels below 7% are not displayed. Due to rounding, may not total to 100%.

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



12-month return attribution

Figure 23.1 Relative to top five industry 2050 funds



Element	Description
Equity allocation (EA)	Vintage allocation to asset classes and sub-asset allocation to U.S. vs. non-U.S.
Fixed income allocation (FIA)	
Equity manager selection (EMS)	Benchmark construction differences (cap and/or style tilts), securities lending, fair-value pricing, building block expense ratios
Fixed income manager selection (FIMS)	
Other	Compounding effect (residual) due to nondaily holdings availability
Total excess return	The sum of the above relative performance differences between Vanguard Target Retirement Fund and competitors' similar vintage

■ U.S. equity
 ■ Foreign equity
 ◇ Total relative return
■ U.S. fixed income
 ■ Foreign fixed income

- **BlackRock's** outperformance relative to Vanguard was driven by a higher allocation to U.S. equities, partially offset by poor security selection within both the international and U.S. equity allocations.
- **Fidelity's** underperformance relative to Vanguard was primarily driven by an overweight to U.S. fixed income relative to international fixed income, as well as poor security selection within fixed income.
- **T. Rowe Price's** underperformance relative to Vanguard was driven by poor security selection across U.S. and international equities.
- **State Street's** underperformance relative to Vanguard was driven by an overweight to U.S. fixed income relative to international fixed income and poor security selection within U.S. fixed income.
- **American Funds'** outperformance relative to Vanguard was driven by a higher overall allocation to equity securities, particularly in the U.S., which offset poor security selection within this segment of the portfolio.

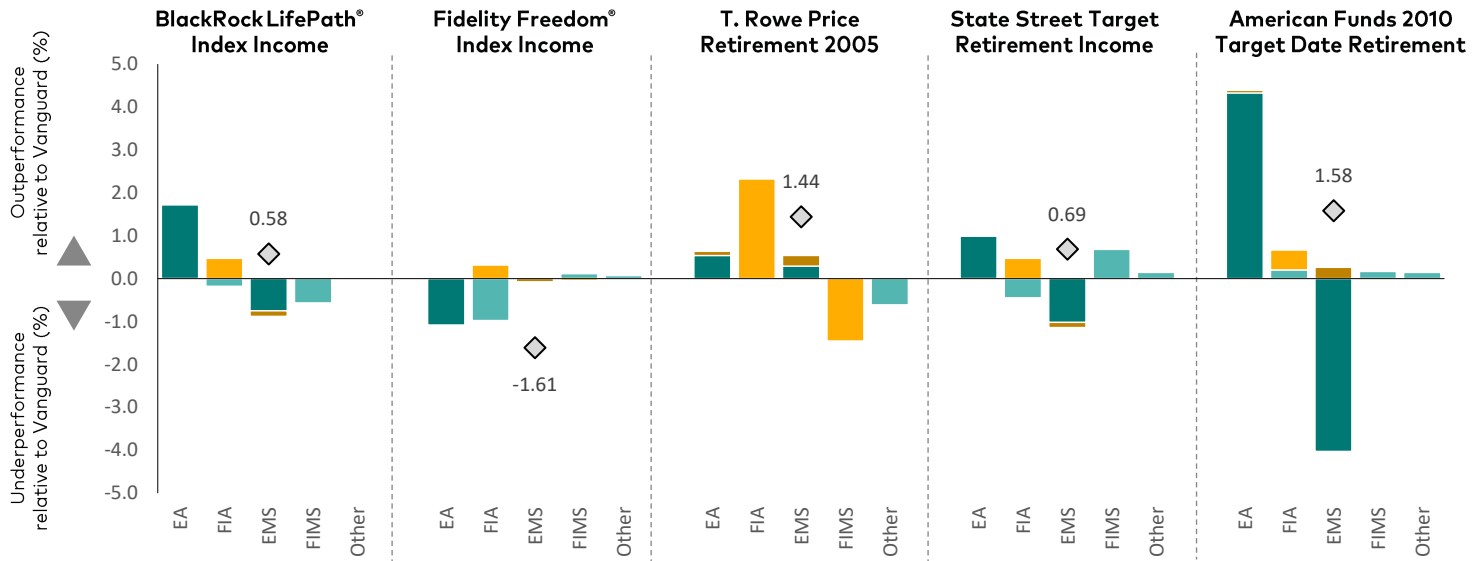
Past performance is not a guarantee of future results.

Sources: Vanguard and Morningstar, as of December 31, 2024.



12-month return attribution (continued)

Figure 24.1 Relative to top five industry income (or equivalent) funds*



Element	Description
Equity allocation (EA)	Vintage allocation to asset classes and sub-asset allocation to U.S. vs. non-U.S.
Fixed income allocation (FIA)	
Equity manager selection (EMS)	Benchmark construction differences (cap and/or style tilts), securities lending, fair-value pricing, building block expense ratios
Fixed income manager selection (FIMS)	
Other	Compounding effect (residual) due to nondaily holdings availability
Total excess return	The sum of the above relative performance differences between Vanguard Target Retirement Fund and competitors' similar vintage

■ U.S. equity
 ■ Foreign equity
 ◆ Total relative return
■ U.S. fixed income
 ■ Foreign fixed income

- **BlackRock's** outperformance relative to Vanguard was driven by a higher allocation to U.S. equities, partially offset by an overweight to mega cap equities.
- **Fidelity's** underperformance was driven by a significant underweight to equity securities relative to Vanguard and a large exposure to cash equivalents.
- **T. Rowe Price's** outperformance was driven by a higher allocation to U.S. equities, partially offset by poor security selection within that same portion of the fund.
- **State Street's** outperformance was driven by an overweight to U.S. equities and short duration within the U.S. fixed income portion of the portfolio.
- **American Funds'** outperformance relative to Vanguard was driven by a higher allocation to U.S. equities, narrowly overcoming poor security selection in this same segment of the portfolio.

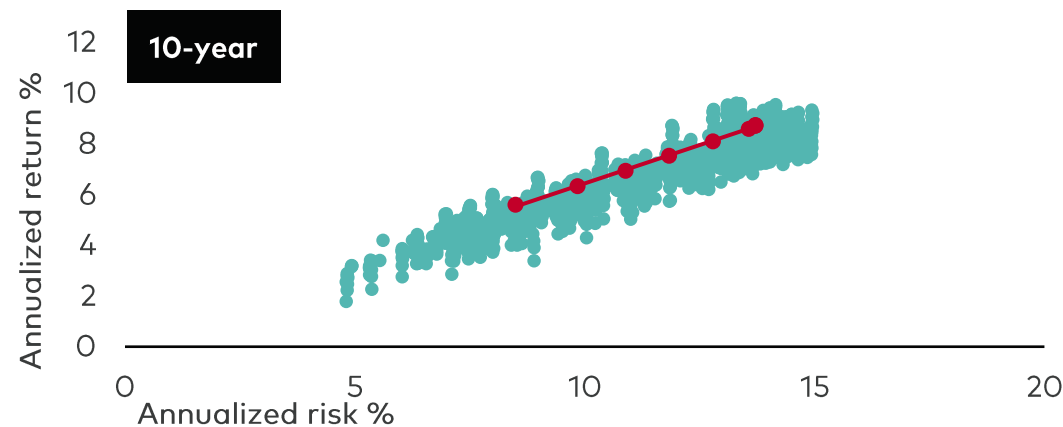
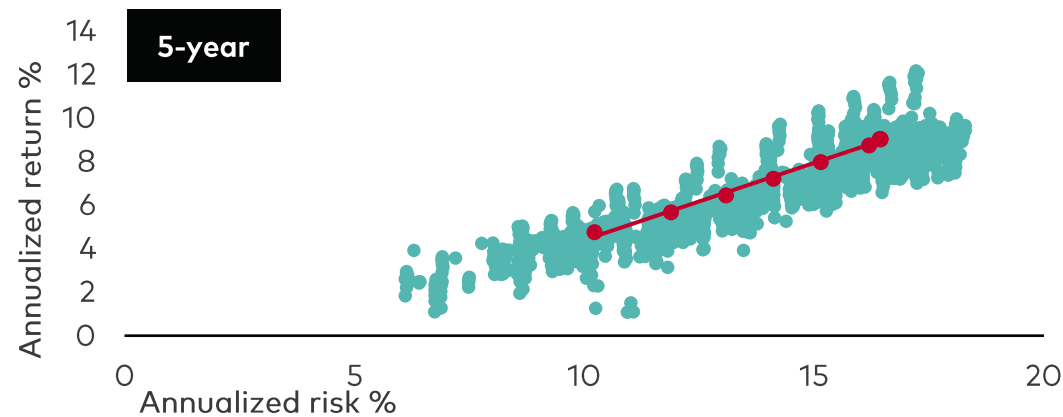
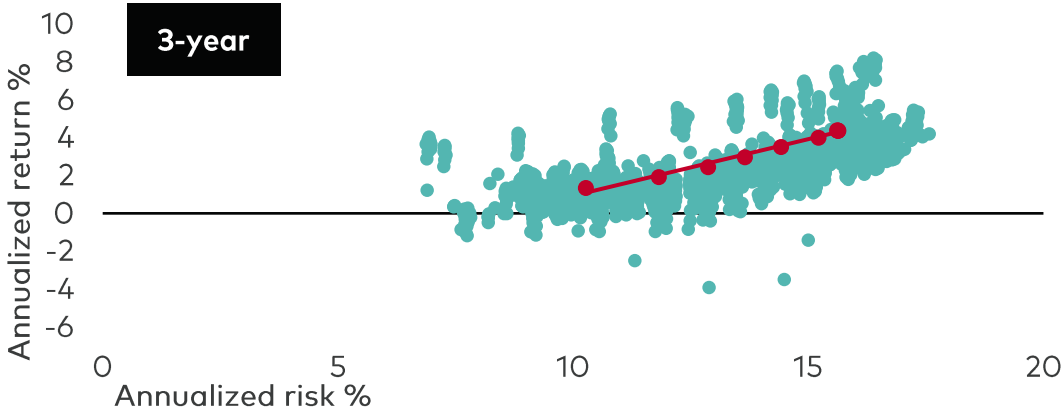
Past performance is not a guarantee of future results.

Sources: Morningstar and Vanguard calculations; data as of December 31, 2024.
 * 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 December 31, 2024. Vanguard Target Retirement Funds highlighted.



Appendix

IN THIS SECTION:

Absolute performance results

Appendix: Absolute performance results

Average annualized return
as of December 31, 2024

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	-1.57	6.58	6.58	0.98	3.58	4.19	4.95	10/27/2003
Target Retirement Income Composite Index	—	-1.53	6.74	6.74	1.17	3.86	4.42	—	—
Lipper Target Target Consvr Funds Average	—	-2.03	6.48	6.48	0.75	3.26	3.80	—	—
Fidelity Freedom Income	0.47	-2.40	4.34	4.34	0.03	2.37	3.31	4.40	10/17/1996
Fidelity Freedom Index Income Investor	0.12	-1.80	4.96	4.96	0.34	2.42	3.15	3.53	10/2/2009
T. Rowe Price Retirement 2005	0.49	-1.48	8.02	8.02	1.45	4.65	5.06	5.56	2/27/2004
American Funds 2010 Trgt Date Retire R5	0.34	-1.77	8.16	8.16	2.18	4.95	5.19	5.06	2/1/2007
BlackRock LifePath Index Retire K	0.13	-2.25	7.15	7.15	0.43	3.98	4.73	5.09	5/31/2011
State Street Target Retirement K	0.26	-1.72	7.26	7.26	1.45	4.44	4.65	4.61	9/30/2014
JPMorgan SmartRetirement® Income R5	0.48	-2.13	8.06	8.06	1.35	3.95	4.36	4.93	5/15/2006
JPMorgan SmartRetirement® Blend IncomeR5	0.50	-1.85	8.30	8.30	1.40	3.94	4.42	4.84	7/2/2012
Nuveen Lifecycle Retire Income R6	0.56	-1.47	7.66	7.66	1.44	4.43	5.08	5.00	11/30/2007
Vanguard Target Retirement 2020 Fund	0.08	-1.59	7.75	7.75	1.34	4.75	5.58	6.01	6/7/2006
Target Retirement 2020 Composite Index	—	-1.55	7.91	7.91	1.58	5.10	5.86	—	—
Lipper Target 2020 Funds Average	—	-2.11	7.71	7.71	1.01	4.32	4.74	—	—
Fidelity Freedom 2020	0.56	-2.88	7.33	7.33	0.56	4.73	5.72	6.48	10/17/1996
Fidelity Freedom Index 2020 Investor	0.12	-2.34	7.68	7.68	0.67	4.51	5.51	6.57	10/2/2009
T. Rowe Price Retirement 2020	0.52	-1.59	9.14	9.14	1.86	5.73	6.39	7.93	9/30/2002
American Funds 2020 Trgt Date Retire R5	0.35	-1.88	8.93	8.93	2.24	5.57	5.95	5.66	2/1/2007
State Street Target Retirement 2020 K	0.24	-1.72	7.51	7.51	1.31	4.93	5.56	5.59	9/30/2014
JPMorgan SmartRetirement 2020 R5	0.47	-2.15	7.99	7.99	1.30	3.99	4.79	5.52	5/15/2006
JPMorgan SmartRetirement® Blend 2020 R5	0.49	-1.84	8.32	8.32	1.47	4.08	4.90	5.91	7/2/2012
Nuveen Lifecycle 2020 R6	0.53	-1.50	8.33	8.33	1.63	5.05	5.87	5.53	1/17/2007
Vanguard Target Retirement 2025 Fund	0.08	-1.64	9.44	9.44	1.92	5.66	6.32	6.66	10/27/2003
Target Retirement 2025 Composite Index	—	-1.59	9.63	9.63	2.25	6.09	6.64	—	—
Lipper Target 2025 Funds Average	—	-2.15	8.08	8.08	1.10	4.61	5.28	—	—
Fidelity Freedom 2025	0.61	-3.02	8.21	8.21	0.96	5.36	6.23	6.34	11/6/2003
Fidelity Freedom Index 2025 Investor	0.12	-2.57	8.50	8.50	1.02	5.10	6.03	7.26	10/2/2009
T. Rowe Price Retirement 2025	0.54	-1.64	9.69	9.69	1.96	6.34	6.97	7.11	2/27/2004
American Funds 2025 Trgt Date Retire R5	0.36	-1.83	9.25	9.25	2.18	6.19	6.62	6.29	2/1/2007
JPMorgan SmartRetirement 2025 R5	0.47	-2.16	8.61	8.61	1.33	4.79	5.51	5.68	7/31/2007
JPMorgan SmartRetirement® Blend 2025 R5	0.48	-1.90	8.93	8.93	1.47	4.83	5.63	6.77	7/2/2012
Nuveen Lifecycle 2025 R6	0.55	-1.49	9.06	9.06	1.88	5.67	6.43	5.82	1/17/2007
BlackRock Lifepath Index 2025 K	0.23	-1.88	8.92	8.92	1.58	5.93	6.53	6.57	5/31/2011
State Street Target Retirement 2025 K									9/30/2014

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Data from Vanguard and Morningstar.



Appendix: Absolute performance results *(continued)*

Average annualized return
as of December 31, 2024

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	-1.69	10.64	10.64	2.44	6.44	6.92	6.78	6/7/2006
Target Retirement 2030 Composite Index	—	-1.66	10.82	10.82	2.79	6.87	7.24	—	—
Lipper Target 2030 Funds Average	—	-2.11	9.27	9.27	1.60	5.60	6.06	—	—
Fidelity Freedom 2030	0.65	-2.93	9.23	9.23	1.53	6.16	7.04	6.93	10/17/1996
Fidelity Freedom Index 2030 Investor	0.12	-2.39	9.51	9.51	1.59	5.84	6.85	7.96	10/2/2009
T. Rowe Price Retirement 2030	0.56	-1.84	10.71	10.71	2.25	7.06	7.58	8.85	9/30/2002
American Funds 2030 Trgt Date Retire R5	0.38	-1.57	10.81	10.81	2.72	7.12	7.57	6.99	2/1/2007
JPMorgan SmartRetirement 2030 R5	0.47	-2.30	10.02	10.02	1.98	5.76	6.28	6.53	5/15/2006
JPMorgan SmartRetirement® Blend 2030 R5	0.45	-1.95	10.36	10.36	2.12	5.84	6.44	7.65	7/2/2012
Nuveen Lifecycle 2030 R6	0.57	-1.46	10.16	10.16	2.31	6.41	7.04	6.11	1/17/2007
BlackRock Lifepath Index 2030 K	0.13	-2.21	9.26	9.26	1.52	5.68	6.47	6.80	5/31/2011
State Street Target Retirement 2030 K	0.19	-2.29	9.97	9.97	1.87	6.66	7.14	7.19	9/30/2014
Vanguard Target Retirement 2035 Fund	0.08	-1.61	11.78	11.78	2.97	7.20	7.51	7.53	10/27/2003
Target Retirement 2035 Composite Index	—	-1.62	11.90	11.90	3.31	7.63	7.82	—	—
Lipper Target 2035 Funds Average	—	-1.99	11.15	11.15	2.38	6.82	7.04	—	—
Fidelity Freedom 2035	0.69	-2.64	11.04	11.04	2.47	7.57	8.07	7.29	11/6/2003
Fidelity Freedom Index 2035 Investor	0.12	-2.14	11.23	11.23	2.43	7.14	7.87	8.85	10/2/2009
T. Rowe Price Retirement 2035	0.59	-2.02	11.97	11.97	2.71	7.86	8.16	7.84	2/27/2004
American Funds 2035 Trgt Date Retire R5	0.39	-1.25	12.73	12.73	3.31	8.39	8.65	7.59	2/1/2007
JPMorgan SmartRetirement 2035 R5	0.51	-2.10	11.97	11.97	2.86	7.23	7.18	6.75	7/31/2007
JPMorgan SmartRetirement® Blend 2035 R5	0.47	-1.83	11.94	11.94	2.90	6.92	7.23	8.47	7/2/2012
Nuveen Lifecycle 2035 R6	0.60	-1.51	11.36	11.36	2.88	7.22	7.67	6.52	1/17/2007
BlackRock Lifepath Index 2035 K	0.14	-2.06	10.98	10.98	2.37	6.79	7.33	7.53	5/31/2011
State Street Target Retirement 2035 K	0.18	-2.53	10.62	10.62	2.03	7.08	7.54	7.58	9/30/2014
Vanguard Target Retirement 2040 Fund	0.08	-1.50	12.88	12.88	3.51	7.97	8.08	7.52	6/7/2006
Target Retirement 2040 Composite Index	—	-1.58	12.99	12.99	3.81	8.37	8.40	—	—
Lipper Target 2040 Funds Average	—	-1.77	12.82	12.82	3.12	7.73	7.58	—	—
Fidelity Freedom 2040	0.73	-2.41	13.21	13.21	3.56	8.86	8.74	5.42	9/6/2000
Fidelity Freedom Index 2040 Investor	0.12	-1.96	13.33	13.33	3.44	8.35	8.54	9.34	10/2/2009
T. Rowe Price Retirement 2040	0.60	-2.04	13.13	13.13	3.14	8.56	8.65	9.43	9/30/2002
American Funds 2040 Trgt Date Retire R5	0.41	-0.93	14.67	14.67	4.09	9.34	9.29	7.97	2/1/2007
JPMorgan SmartRetirement 2040 R5	0.51	-2.03	13.12	13.12	3.44	8.07	7.80	7.49	5/15/2006
JPMorgan SmartRetirement® Blend 2040 R5	0.48	-1.74	13.18	13.18	3.47	7.69	7.83	9.05	7/2/2012
Nuveen Lifecycle 2040 R6	0.63	-1.40	12.76	12.76	3.61	8.17	8.34	7.00	1/17/2007
BlackRock Lifepath Index 2040 K	0.14	-1.85	12.66	12.66	3.23	7.81	8.11	8.19	5/31/2011
State Street Target Retirement 2040 K	0.17	-2.48	11.40	11.40	2.32	7.56	7.88	7.91	9/30/2014

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Data from Vanguard and Morningstar.



Appendix: Absolute performance results (continued)

Fund	Expense ratio	Average annualized return as of December 31, 2024							
		3 months	Year-to-date	1 year	3 years	5 years	10 years	Since inception	Inception date
Vanguard Target Retirement 2045 Fund	0.08	-1.46	13.91	13.91	4.00	8.73	8.57	8.25	10/27/2003
Target Retirement 2045 Composite Index	—	-1.54	14.08	14.08	4.31	9.12	8.89	—	—
Lipper Target 2045 Funds Average	—	-1.75	13.76	13.76	3.53	8.30	8.07	—	—
Fidelity Freedom 2045	0.75	-2.43	13.96	13.96	3.94	9.09	8.86	7.15	6/1/2006
Fidelity Freedom Index 2045 Investor	0.12	-1.86	14.16	14.16	3.82	8.60	8.66	9.46	10/2/2009
T. Rowe Price Retirement 2045	0.61	-2.01	13.93	13.93	3.54	9.07	8.98	8.37	5/31/2005
American Funds 2045 Trgt Date Retire R5	0.42	-0.93	15.16	15.16	4.19	9.55	9.47	8.07	2/1/2007
JPMorgan SmartRetirement 2045 R5	0.52	-1.96	14.07	14.07	3.83	8.73	8.19	7.44	7/31/2007
JPMorgan SmartRetirement® Blend 2045 R5	0.46	-1.69	14.05	14.05	3.88	8.31	8.20	9.33	7/2/2012
Nuveen Lifecycle 2045 R6	0.65	-1.34	13.80	13.80	3.98	8.86	8.81	6.96	11/30/2007
BlackRock Lifepath Index 2045 K	0.14	-1.65	14.36	14.36	4.08	8.77	8.76	8.74	5/31/2011
State Street Target Retirement 2045 K	0.16	-2.39	12.00	12.00	2.56	7.94	8.17	8.19	9/30/2014
Vanguard Target Retirement 2050 Fund	0.08	-1.48	14.64	14.64	4.37	9.03	8.72	7.89	6/7/2006
Target Retirement 2050 Composite Index	—	-1.50	14.92	14.92	4.72	9.45	9.05	—	—
Lipper Target 2050 Funds Average	—	-1.74	14.19	14.19	3.71	8.52	8.16	—	—
Fidelity Freedom 2050	0.75	-2.35	14.12	14.12	3.96	9.12	8.87	7.05	6/1/2006
Fidelity Freedom Index 2050 Investor	0.12	-1.86	14.17	14.17	3.82	8.60	8.67	9.49	10/2/2009
T. Rowe Price Retirement 2050	0.63	-1.96	14.17	14.17	3.68	9.19	9.03	7.72	12/29/2006
American Funds 2050 Trgt Date Retire R5	0.42	-0.90	15.37	15.37	4.13	9.58	9.53	8.10	2/1/2007
JPMorgan SmartRetirement 2050 R5	0.53	-1.90	14.58	14.58	4.04	8.85	8.25	7.49	7/31/2007
JPMorgan SmartRetirement® Blend 2050 R5	0.45	-1.63	14.55	14.55	4.09	8.49	8.29	9.41	7/2/2012
Nuveen Lifecycle 2050 R6	0.66	-1.34	14.27	14.27	4.14	9.09	8.97	7.04	11/30/2007
BlackRock Lifepath Index 2050 K	0.14	-1.37	15.65	15.65	4.66	9.38	9.12	9.08	5/31/2011
State Street Target Retirement 2050 K	0.18	-2.33	12.56	12.56	2.82	8.28	8.32	8.34	9/30/2014
Vanguard Target Retirement 2055 Fund	0.08	-1.49	14.64	14.64	4.37	9.02	8.70	10.10	8/18/2010
Target Retirement 2055 Composite Index	—	-1.50	14.92	14.92	4.72	9.45	9.05	—	—
Lipper Target 2055+ Funds Average	—	-1.73	14.47	14.47	3.83	8.67	8.35	—	—
Fidelity Freedom 2055	0.75	-2.37	14.03	14.03	3.94	9.10	8.87	8.80	6/1/2011
Fidelity Freedom Index 2055 Investor	0.12	-1.83	14.16	14.16	3.84	8.61	8.66	8.66	6/1/2011
T. Rowe Price Retirement 2055	0.64	-2.03	14.22	14.22	3.68	9.16	9.01	7.70	12/29/2006
American Funds 2055 Trgt Date Retire R5	0.44	-0.90	15.51	15.51	4.09	9.56	9.52	10.51	2/1/2010
JPMorgan SmartRetirement 2055 R5	0.53	-1.89	14.59	14.59	4.05	8.86	8.26	9.62	1/31/2012
JPMorgan SmartRetirement® Blend 2055 R5	0.47	-1.63	14.61	14.61	4.14	8.49	8.29	9.37	7/2/2012
Nuveen Lifecycle 2055 R6	0.67	-1.29	14.46	14.46	4.23	9.19	9.06	9.06	4/29/2011
BlackRock Lifepath Index 2055 K	0.14	-1.20	16.29	16.29	4.92	9.57	9.23	9.24	5/31/2011
State Street Target Retirement 2055 K	0.19	-2.35	12.66	12.66	2.87	8.29	8.33	8.35	9/30/2014

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Data from Vanguard and Morningstar.



Appendix: Absolute performance results *(continued)*

Fund	Expense ratio	3 months	Year-to-date	Average annualized return as of December 31, 2024					
				1 year	3 years	5 years	10 years	Since inception	Inception date
Vanguard Target Retirement 2060 Fund	0.08	-1.50	14.63	14.63	4.38	9.02	8.70	9.90	1/19/2012
Target Retirement 2060 Composite Index	—	-1.50	14.92	14.92	4.72	9.45	9.05	—	—
Lipper Target 2060+ Funds Average	—	-1.74	14.60	14.60	3.87	8.61	—	—	—
Fidelity Freedom 2060	0.75	-2.37	14.03	14.03	3.94	9.10	8.86	8.80	8/5/2014
Fidelity Freedom Index 2060 Investor	0.12	-1.83	14.17	14.17	3.84	8.60	8.66	8.57	8/5/2014
T. Rowe Price Retirement 2060	0.64	-2.05	14.20	14.20	3.66	9.15	9.00	8.57	6/23/2014
American Funds 2060 Trgt Date Retire R5	0.44	-0.79	15.64	15.64	4.10	9.54	—	9.50	3/27/2015
JPMorgan SmartRetirement 2060 R5	0.56	-1.90	14.64	14.64	4.06	8.85	—	9.57	8/31/2016
JPMorgan SmartRetirement® Blend 2060 R5	0.51	-1.61	14.58	14.58	4.18	8.48	—	9.33	8/31/2016
Nuveen Lifecycle 2060 R6	0.69	-1.31	14.56	14.56	4.29	9.31	9.16	9.06	9/26/2014
BlackRock Lifepath Index 2060 K	0.14	-1.20	16.29	16.29	4.94	9.57	—	11.39	2/29/2016
State Street Target Retirement 2060 K	0.23	-2.28	12.67	12.67	2.88	8.30	8.32	8.34	9/30/2014
Vanguard Target Retirement 2065 Fund	0.08	-1.53	14.62	14.62	4.39	9.01	—	9.24	7/12/2017
Target Retirement 2065 Composite Index	—	-1.50	14.92	14.92	4.72	9.45	9.08	—	—
Lipper Target 2060+ Funds Average	—	-1.74	14.60	14.60	3.87	8.61	—	—	—
Fidelity Freedom 2065	0.75	-2.38	14.02	14.02	3.95	9.09	—	9.92	6/28/2019
Fidelity Freedom Index 2065 Investor	0.13	-1.89	14.11	14.11	3.82	8.59	—	9.39	6/28/2019
T. Rowe Price Retirement 2065	0.64	-2.01	14.22	14.22	3.67	—	—	9.42	10/13/2020
American Funds 2065 Trgt Date Retire R5	0.44	-0.81	15.60	15.60	4.11	—	—	14.98	3/27/2020
JPMorgan SmartRetirement® Blend 2065 R5	2.79	-1.81	14.46	14.46	—	—	—	16.98	11/1/2022
Nuveen Lifecycle 2065 R6	0.96	-1.30	14.71	14.71	4.42	—	—	10.52	9/30/2020
BlackRock Lifepath Index 2065 K	0.15	-1.14	16.34	16.34	4.94	9.67	—	10.51	10/30/2019
State Street Target Retirement 2065 K	0.33	-2.24	12.75	12.75	2.89	—	—	13.02	3/30/2020
Vanguard Target Retirement 2070 Fund	0.08	-1.53	14.59	14.59	—	—	—	14.08	6/28/2022
Target Retirement 2070 Composite Index	—	-1.50	14.92	14.92	4.72	9.45	9.08	—	—
Lipper Target 2060+ Funds Average	—	-1.74	14.60	14.60	3.87	8.61	—	—	—
Fidelity Freedom 2070	0.75	-2.22	—	—	—	—	—	3.45	6/28/2024
Fidelity Freedom Index 2070 Investor	0.12	-1.95	—	—	—	—	—	4.72	6/28/2024
American Funds 2070 Trgt Date Retire R5	0.44	-0.83	—	—	—	—	—	9.68	5/3/2024
BlackRock Lifepath® Index 2070 K	0.33	-1.25	—	—	—	—	—	-0.76	9/24/2024
State Street Target Retirement 2070 K	0.33	—	—	—	—	—	—	—	12/31/2024

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Data from Vanguard and Morningstar.



Appendix: Standardized returns

	Average annualized return as of December 31, 2024								
	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	2.63	23.75	23.75	7.87	13.81	12.50	9.12	7/7/1997
Vanguard Total International Stock Index Fund Institutional Shares	0.09	-7.40	5.18	5.18	0.69	4.31	5.09	4.91	11/29/2010
Vanguard Total Bond Market Index Fund Institutional Shares	0.035	-3.04	1.25	1.25	-2.40	-0.30	1.34	4.17	9/18/1995
Vanguard Total International Bond Index Fund Institutional Shares	0.07	0.09	3.71	3.71	-0.55	0.12	1.94	2.42	5/31/2013
Vanguard Short-Term Inflation-Protected Securities Index Fund Institutional Shares	0.04	-0.10	4.75	4.75	2.13	3.33	2.54	1.90	10/17/2012

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Data from Vanguard and Morningstar.

Notes

Important information

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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.

Target 2020, 2030, 2040, and 2050 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 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 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.

Product guarantees are subject to the claims-paying ability of the issuing insurance company.

Deferred variable annuities are long-term vehicles designed for retirement purposes and contain underlying investment portfolios that are subject to investment risk, including possible loss of principal.

Immediate variable annuities contain underlying investment portfolios that are subject to investment risk, including possible loss of principal.

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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