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2017 Target-Date Fund Landscape

Answers to Frequently Asked Questions

Morningstar Manager Research
20 April 2017

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Executive Summary

Target-date funds added to their multiyear trend of strong growth in 2016, due in large part to their role as the default investment option in many defined-contribution plans. The funds' unobstructed path for growth has attracted the attention of many asset-management firms eager to participate in the growth. As a result, the competitive landscape for target-date funds continues to evolve as each target-date manager attempts to be distinctive or establish an advantage over peers. The competition spans all facets of target-date funds, including investment philosophy, underlying exposures, and even fees. The changing landscape undoubtedly spurs questions in the minds of investors, and this year's report aims to deliver insight into the trends in the target-date fund space and provide added perspective by answering questions that frequently arise.

Key Takeaways

Asset, Flows, and the Competitive Landscape

- Target-date funds continued to see strong asset growth, particularly those that focus on investing in index funds. Assets in target-date mutual funds reached an all-time high of $880 billion by the end of 2016, and roughly two of every three dollars directed to them in 2016 went to a passive series.
- Competition remained stiff among target-date managers. Three firms collectively hold more than 70% of the market share, and three of the 10 largest managers saw net outflows in 2016. Series from Vanguard, which holds the top spot in terms of assets, and American Funds experienced exceptional growth for the year.
- Despite difficulties in gaining traction, asset managers continued to explore ways to participate in the target-date fund growth. At the end of 2016, 12 firms offered more than one target-date series in an attempt to cater to different investor preferences, whereas no firm offered more than one 10 years ago.

The Target-Date Investor Experience

- It is too soon to determine if target-date funds prove effective over the long haul, but investors have already begun to reap benefits from the buy-and-hold mentality behind the funds. The funds boast of a positive 1.4-percentage-point investor return gap over the 10 years through 2016.
- The amount of equity exposure determines a target-date fund's relative performance rank more than prevailing groupings, such as active versus passive, to versus through, and open versus closed.

- When evaluating target-date fund performance, investors should place added emphasis on funds that are closer to the target date because the results of those funds have a much bigger effect on wealth. Plus, the dispersion of returns is still significant among those funds.

The Fee Spotlight

- Fees for target-date funds continue to decline as managers continue to find ways to bring down expenses. The average asset-weighted expense ratio fell to 0.71% by the end of 2016, a notable decrease from 0.99% just five years earlier.
- Fees may not be a strong predictor of future performance for target-date funds, but they are a strong predictor of survivorship.
- Differences in asset allocation can offset a fee advantage. Over the past seven years, a 1-percentage-point increase in equity exposure resulted in a 6-basis-point annualized improvement in performance.

The Evolution of Target-Date Funds

- The average equity glide path hasn't changed dramatically in recent years, particularly for the youngest and oldest investors. However, midcareer investors have seen a modest increase in equity exposure.
- The average sub-asset-class glide path for active target-date series and passive ones do not differ significantly, but the average passive series tends to hold less in high-yield bonds and Treasury Inflation-Protected Securities than its active counterpart.
- Many target-date series still stand out far from the consensus, and the dispersion is greatest for target-date funds nearing their target date.
- Alternatives have not gained much traction within target-date funds, likely because of the high costs associated with them.

The Next Frontier

- Many of the same firms that run target-date funds have also been exploring strategies that help investors with retirement income. However, none of the prominent players have inserted those retirement-income strategies into their flagship target-date fund offerings.

List of Questions and Short Answers

(Click on question to go to the full response in the report.)

Asset, Flows, and the Competitive Landscape

Q: How much assets are in target-date funds? And how have flows been?

A: Target-date mutual funds saw another year of strong flows in 2016, though not quite as strong as seen in 2015. The inflows, coupled with the funds' generally positive returns, lifted assets to over $880 billion by the end of 2016.

Q: Are active or passive series of target-date funds attracting more assets?

A: Over the past couple of years, target-date series that invest exclusively in index funds have seen more flows than those that use actively managed underlying funds. As a result, the market share of active and passive series has converged.

Q: Which firms are the biggest winners/losers in terms of flows?

A: Vanguard and American Funds both saw exceptionally strong flows in 2016, but not all firms were thriving. Three of the 10 largest target-date managers experienced outflows for the year.

Q: Who are the major players in the target-date fund space?

A: The "big three"—Vanguard, Fidelity, and T. Rowe Price—continued to hold the lion's share of target-date mutual fund assets, but Vanguard lengthened its lead over the other two.

Q: Do new entrants have a chance to compete in the space?

A: Many firms have flocked to the scene, but it has been very difficult for new entrants to gain even modest traction in the target-date space.

Q: What are firms doing to compete?

A: Firms are more commonly offering multiple approaches to fit a variety of investor preferences, and then naming them to reflect the approach.

The Target-Date Investor Experience

Q: Have target-date funds worked for investors?

A: Target-date funds haven't been around long enough to be able to say whether they will successfully take investors through a full 40-plus-year investment time horizon. However, a positive 10-year investor return gap—to the tune of 1.4 percentage points through the end of 2016—suggests that investors have benefited from the buy-and-hold mentality they engender.

Q: How have "to" versus "through" target-date funds compared with one another? How about active versus passive or open versus closed target-date funds?

A: Some of the broad distinctions that investors use to bifurcate target-date series—namely, whether they are active/passive or open/closed—often have little bearing on performance. Instead, equity

allocation generally determines how well a series' results will compare with those of its peers. As a consequence, "through" series, which tend to hold more in equities, on average have better returns than "to" series.

Q: How have target-date funds stacked up against other Qualified Default Investment Alternatives?

A: In addition to target-date funds, the 2006 Pension Protection Act included managed accounts and balanced funds as QDIAs. While managed accounts' customized approach prevents a clear performance comparison with target-date funds, the typical balanced fund has produced better annualized total and risk-adjusted returns than the average target-date fund. Contrary to intuition, though, that has not necessarily resulted in better ending balances for investors.

Q: Should investors emphasize any specific part of the glide path?

A: Investors have good reason to place greater emphasis on target-date funds approaching or past the target date when evaluating performance, as the results of those funds have an outsized effect on an investor's outcome.

The Fee Spotlight

Q: What has happened to the cost of target-date funds?

A: Fees for target-date funds continued to decline in 2016, building on a multiyear trend.

Q: Should investors focus on fees when selecting a target-date series?

A: Fees have proved to be a solid predictor of whether a target-date fund will survive, but they have not been as clear a predictor for outperformance due to differences in asset allocation.

Q: How much do asset-allocation differences offset fee differences?

A: It depends on the market environment, but over the past seven years through 2016, a 1-percentage-point additional exposure to equities resulted in 6 basis points of higher return, on average.

The Evolution of Target-Date Funds

Q: How have equity glide paths changed over time?

A: The average strategic equity glide path has not changed much over the past five years, but it held slightly more in stocks for midcareer investors at the end of 2016.

Q: How has the industry average sub-asset-class glide path changed in recent years?

A: Similar to the strategic equity glide path, there haven't been sizable changes in exposures in recent years. However, funds' exposure to equities has generally increased, particularly in the funds designed for investors approaching their target date.

Q: Do active and passive series have similar exposure to subasset classes?

A: While not drastically different from one another, passive target-date series generally have notably lighter stakes in high-yield bonds and Treasury Inflation-Protected Securities than their active peers, particularly near the target date.

Q: Have target-date series converged to consensus exposure to subasset classes?

A: Target-date funds designed for investors of the same age can still look very different from one another, even when both are "passive" series. 2015 funds showed the greatest dispersion from the industry average.

Q: Are alternatives gaining traction within target-date funds?

A: Alternative funds have made only minimal headway into target-date funds. Their generally high fees make them a hard sell for the fee-sensitive target-date fund space.

Q: How are target-date managers using other niche asset classes?

A: Amid a long stretch of negative returns, some target-date managers have backed away from commodities, whereas others have stayed the course. Meanwhile, emerging-markets debt remains on the fringe, with some managers wading into local-currency options.

Q: Are any new asset classes cropping up in target-date funds?

A: While REITs have long played a role in many target-date series, TIAA-CREF became the first to introduce private real estate into a mutual fund series of target-date funds.

The Next Frontier

Q: Where is the next frontier for target-date managers to explore?

A: Many prominent managers of target-date funds are also behind a variety of retirement-income strategies. These strategies have not made their way into flagship target-date series.

Assets, Flows, and the Competitive Landscape

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Target-date funds continue to play an outsized role in the investment space. For investors, they are pervasive and widely used in workplace retirement accounts, and for managers, they often represent the main source of their firms' new assets. As the funds have grown more than four-fold in the past decade, offerings continue to change as the major players jostle for market share. This section addresses how assets and flows have changed in size and composition over time, as well as how target-date firms have adapted their businesses and investments in an attempt to take advantage of changing growth trends.

Assets and Flows

- How much assets are in target-date funds? And how have flows been?
- Are active or passive series of target-date funds attracting more assets?

Competitive Landscape

- Which firms are the biggest winners/losers in terms of flows?
- Who are the major players in the target-date fund space?
- Do new entrants have a chance to compete in the space?
- What are firms doing to compete?

Q: How much assets are in target-date funds? And how have flows been?

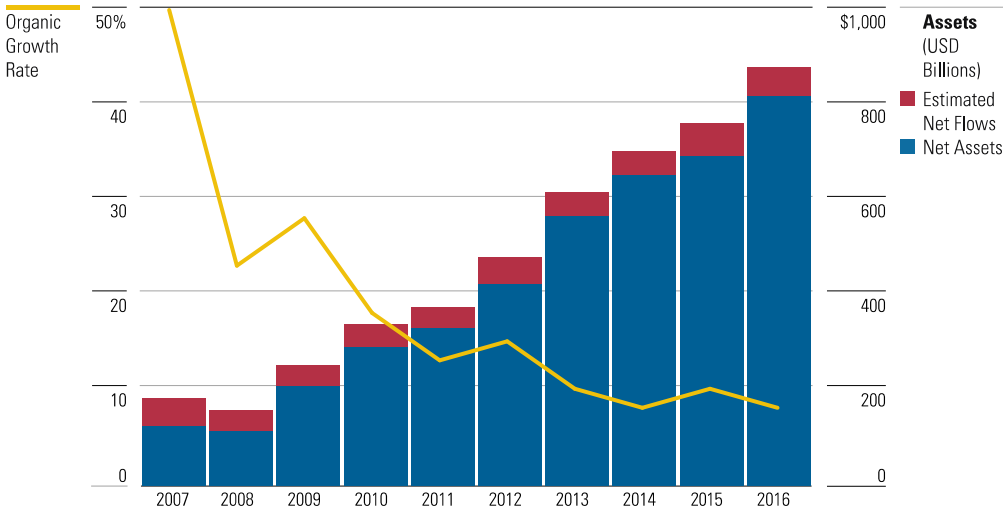
A: Target-date mutual funds saw another year of strong flows in 2016, though not quite as strong as seen in 2015. The inflows, coupled with the funds' generally positive returns, lifted assets to over $880 billion by the end of 2016.

Target-date funds' prominence continued to grow in 2016. As displayed in Exhibit 1, assets in target-date mutual funds reached an all-time high of $880 billion by the end of 2016, up from $763 billion the previous year. Assets in the funds have increased each year since 2008, when the financial crisis wreaked havoc across the board. The asset growth in 2016 came from the combination of positive returns—the average return for Morningstar's target-date fund categories ranged from 5.1% to 8.2%—and positive flows from investors.

Flows to target-date mutual funds in 2016 didn't match 2015's banner year, but they weren't far off. The funds saw an estimated $59 billion in net inflows in 2016, compared with 2015's $69 billion. The funds' common role as the default investment option in most defined-contribution plans led to the steady flows, as investors contribute to funds with each paycheck. The move to collective investment trusts from mutual funds explains, at least in part, why 2016's flows failed to keep pace with 2015's. For instance, Vantagepoint converted its Milestone mutual fund series to CITs in September 2016, and that series had more than $4 billion in assets at conversion. Also, Wells Fargo reported that a large portion of

its $6 billion in outflows in 2016 were attributable to a large transfer from its mutual fund series to its CIT version.

Exhibit 1 Net Assets, Estimated Net Flow, and Organic Growth Rates of U.S. Target-Date Mutual Funds, 2007-16



Source: Morningstar, Inc. Data as of 12/31/2016.

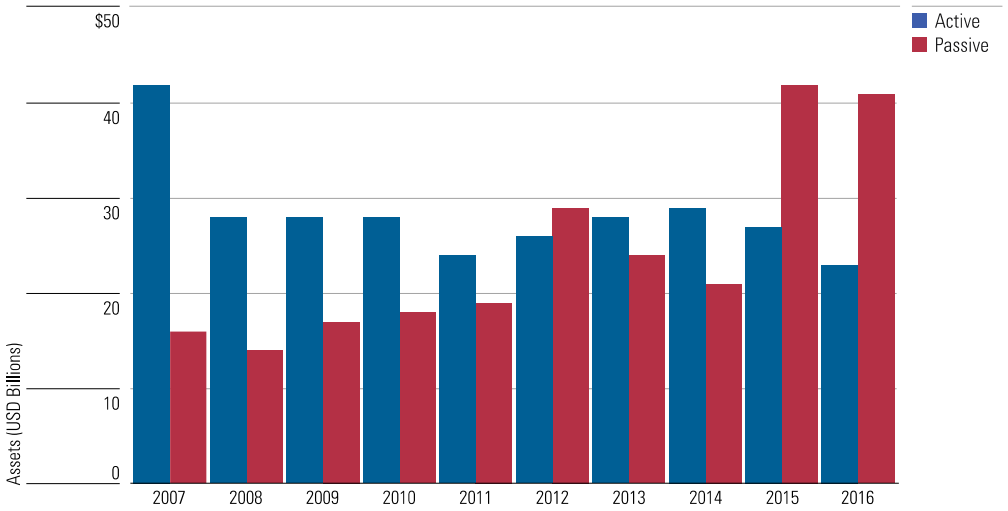
Q: Are active or passive series of target-date funds attracting more assets?

A: Over the past couple of years, target-date series that invest exclusively in index funds have seen more flows than those that use actively managed underlying funds. As a result, the market share of active and passive series has converged.

Target-date series that hold only index funds—commonly called **passive series**—have attracted significantly more flows than ones that invest primarily in actively managed funds in each of the past two calendar years. (As emphasized in last year's report, no target-date series is truly passively managed, as every target-date manager makes active decisions in building a glide path and selecting asset classes.) In 2016, passive series saw more than $40 billion in estimated inflows compared with $23 billion for active ones. This suggests that roughly two of every three dollars directed to target-date mutual funds that year went to a passive series. This built on the trend that emerged in 2015.

Passive target-date series haven't always had the edge on flows. As displayed in Exhibit 2, the positions were flipped in 2007 when active series reaped more than $40 billion in estimated inflows, whereas passive series only saw $16 billion in estimated inflows. Active series generally attracted more flows until 2012 when passive series saw slightly higher inflows. Only in the past couple of years have passive series had a sizable advantage.

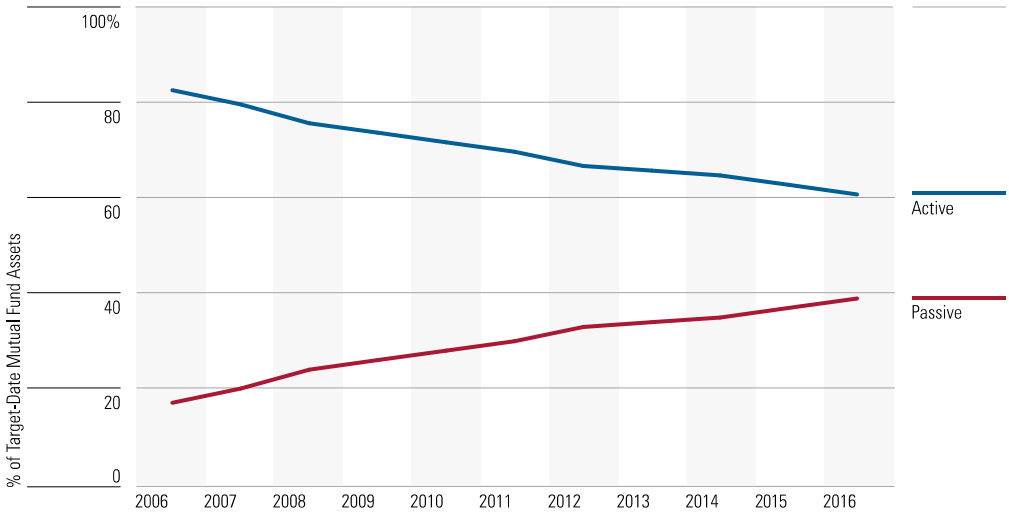
Exhibit 2 Estimated Net Yearly Flows by Active vs. Passive Target-Date Series, 2007-16



Source: Morningstar, Inc. Data as of 12/31/2016.

As a result of investors' increased interest in passive series, the asset split between active and passive series has converged. As shown in Exhibit 3, active series' lead in terms of assets has dwindled over the past 10 years. At the end of 2006, active series held 83% of target-date mutual fund assets, but by the end of 2016 they only accounted for 61% of assets. While active series still hold the lead, passive series are poised to keep closing the gap unless the prevailing trend with flows reverses.

Exhibit 3 Percentage of Target-Date Mutual Funds Assets by Active vs. Passive, 2006-16



Source: Morningstar, Inc. Data as of 12/31/2016.

Q: Which firms are the biggest winners/losers in terms of flows?

A: Vanguard and American Funds both saw exceptionally strong flows in 2016, but not all firms were thriving. Three of the 10 largest target-date managers experienced outflows for the year.

Target-date funds continue to see positive flows year after year, but the growth hasn't been shared equally by firms. As displayed in Exhibit 4, Vanguard's $37 billion in estimated inflows in 2016 represented more than half of flows to target-date mutual funds in general. This contributed significantly to the aforementioned trend of passive series seeing more flows than active ones as Vanguard sits in the passive camp. American Funds came in a distant second with nearly $16 billion in flows. Aside from these two firms, T. Rowe Price was the only other one that saw at least $5 billion in estimated inflows.

Despite target-date funds' broad growth, multiple firms struggled with outflows from their target-date funds. Wells Fargo's nearly $7 billion in estimated outflows was the largest in 2016, but Wells Fargo attributed much of it to moving a large client to a collective investment trust version of the strategy. While Fidelity remained the second largest target-date manager, it saw nearly $3 billion in estimated outflows in 2016, marking the third consecutive year of outflows for the firm. Within the 10 largest target-date managers, Principal and John Hancock also experienced estimated outflows from their target-date mutual funds in 2016.

Target-date funds are often crucial to asset-management firms, as they may represent a significant portion of assets and are often one of the only sources for growth. For example, target-date funds represent roughly 30% of T. Rowe Price's and TIAA-CREF's mutual fund assets. Even smaller asset-management firms, such as State Farm, Great-West, and Guidestone, have a significant amount of their assets under management in target-date funds. On average, the 10 largest target-date managers have 16% of their assets under management in target-date funds. Possibly even more important, target-date funds help to buoy firms' overall flows. As shown in Exhibit 4, T. Rowe Rice, American Funds, JPMorgan, and American Century each saw estimated outflows from mutual funds at the firm level, and the positive flows to their target-date funds helped soften the blow. (These firms have a "G" in the last column of Exhibit 4.)

Exhibit 4 2016 Target-Date and Firm Assets and Net Flows

	2016 Total Assets			2016 Net Flows		
Fund Company	Target-Date US$ Million	Firm US$ Million	Firm Assets From TD Assets %	Target-Date US$ Million	Firm US$ Million	Firm Flows From TD Flows %
Vanguard	280,332.4	3,404,657.0	8.2	37,037.2	277,304.1	13.4
Fidelity Investments	192,912.9	1,228,897.4	15.7	-2,797.4	-23,452.5	11.9
T. Rowe Price	148,007.7	501,133.1	29.5	5,456.0	-4,520.2	(G)
American Funds	53,637.4	1,255,327.2	4.3	15,820.4	-4,927.3	(G)
JPMorgan	44,770.7	274,386.5	16.3	4,663.5	-10,297.2	(G)
TIAA-CREF Asset Management	31,339.4	103,861.6	30.2	4,103.6	8,161.9	50.3
Principal Funds	26,114.2	119,993.1	21.8	-496.8	355.4	(L)
American Century Investments	17,025.2	105,705.6	16.1	1,389.1	-335.8	(G)
John Hancock	16,331.1	131,290.0	12.4	-238.9	-3,633.8	6.6
BlackRock	11,679.3	230,136.1	5.1	3,154.0	-8,411.5	(G)
Wells Fargo Funds	9,451.4	92,065.5	10.3	-6,603.5	-15,444.6	42.8
State Farm	7,410.9	19,201.7	38.6	-110.7	-122.5	90.3
Great-West Funds	6,642.3	16,282.7	40.8	-223.9	-32.3	692.5
Voya	5,317.6	81,608.8	6.5	41.3	-7,259.2	(G)
KP Funds	5,310.3	5,664.8	93.7	521.5	496.2	105.1
USAA	3,895.0	59,293.0	6.6	-156.1	-1,641.3	9.5
Schwab Funds	3,452.6	61,648.5	5.6	62.2	-1,044.0	(G)
MFS	2,567.1	188,027.0	1.4	353.0	2,086.8	16.9
GuideStone Funds	2,394.8	9,893.3	24.2	235.3	-137.0	(G)
MassMutual	2,343.4	22,707.1	10.3	-38.1	-965.9	3.9
Nationwide	1,767.0	16,056.1	11.0	10.3	-687.9	(G)
State Street Global Advisors	1,259.0	7,853.9	16.0	996.4	2,592.8	38.4
Putnam	828.0	63,444.7	1.3	216.3	-7,799.2	(G)
MainStay	713.4	53,807.0	1.3	-37.4	-7,932.8	0.5
AllianceBernstein	564.2	65,440.5	0.9	34.1	2,321.2	1.5
Manning & Napier	543.0	8,848.3	6.1	-91.6	-3,126.2	2.9
Franklin Templeton Investments	503.9	379,273.1	0.1	6.9	-42,891.9	(G)
Transamerica	488.5	32,782.9	1.5	300.2	-980.0	(G)
BMO Funds	406.0	6,712.5	6.0	-15.2	-1,099.7	1.4
PIMCO	393.6	299,164.9	0.1	-166.9	-15,345.7	1.1
AXA Equitable	382.1	100,277.6	0.4	-19.1	-5,255.7	0.4
Allianz Funds	378.8	21,132.4	1.8	-17.4	-5,378.1	0.3
Dimensional Fund Advisors	323.5	316,561.4	0.1	286.4	21,417.0	1.3
Russell	267.1	33,613.6	0.8	-67.0	-4,264.4	1.6
Invesco	261.6	152,844.1	0.2	-107.7	1,230.7	(L)
Goldman Sachs	243.8	80,767.7	0.3	35.9	-11,261.3	(G)
Harbor	146.4	67,018.1	0.2	0.6	-10,304.2	(G)
PNC Funds	27.4	4,471.4	0.6	9.8	344.2	2.8
Virtus	12.4	22,396.5	0.1	11.2	-6,076.8	(G)
Prudential Investments	0.7	83,545.9	0.0	0.7	4,444.6	0.0
	880,445.9	**9,727,792.4**	**9.1%**	**63,558.4**	**116,125.5**	**54.7%**

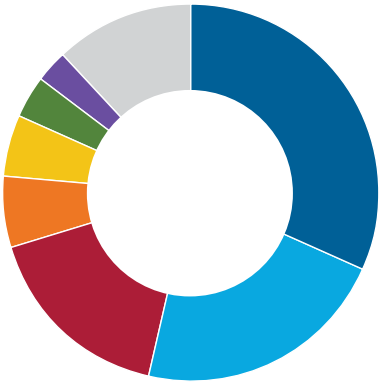
Source: Morningstar, Inc. Data as of 12/31/2016. Morningstar flows data strips out firms' funds-of-funds assets in order to avoid double counting. This also results in firm total asset levels and net flow figures that omit assets invested in nonproprietary funds. Exhibit 4 adds back the estimated effect from those nonproprietary funds to firms' total assets and total new flows in order to show a more complete and intuitive picture. Otherwise, KP Funds, for example, which only offers target-date mutual funds and also has significant investments in nonproprietary funds, would show that its target-date assets make up more than 100% of the firm's total assets under management. Assets include mutual fund and exchange-traded fund assets, where applicable. Series marked (G) under "Firm Flows From TD Flows %" saw positive growth in flows on top of negative overall firm-level flows—the sign change makes percentage representations less meaningful. Series marked (L) had target-date outflows on top of inflows for the overall firm.

Q: Who are the major players in the target-date fund space?

A: The "big three"—Vanguard, Fidelity, and T. Rowe Price—continued to hold the lion's share of target-date mutual fund assets, but Vanguard lengthened its lead over the other two.

Vanguard, Fidelity, and T. Rowe Price have long been the three largest managers of target-date mutual funds. Each of those firms arrived to the target-date scene early—Vanguard's appearance in 2003 was the most recent of the three—and benefited from a strong presence in recordkeeping defined-contribution plans. As target-date funds have become a common offering in those plans, these firms grabbed market share early on. While increased competition and the push for open architecture in defined-contribution plans have put pressure on these firms, they still collectively represented 71% of target-date mutual fund assets at the end of 2016. (Exhibit 5 shows the market share split.)

Exhibit 5 2016 Firm Market Share of Target-Date Mutual Funds

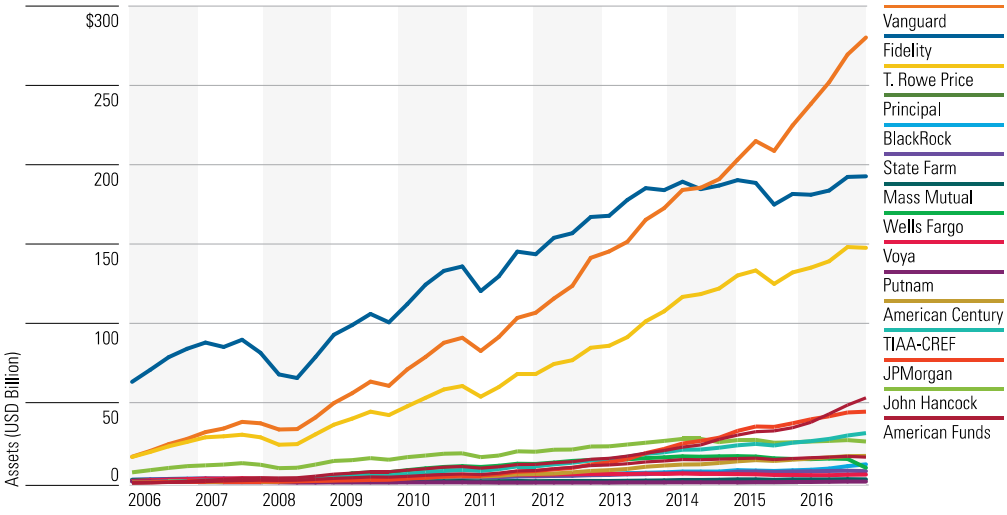


Fund Family	% of Market
Vanguard	31.8
Fidelity Investments	21.9
T. Rowe Price	16.8
American Funds	6.1
JPMorgan	5.1
TIAA-CREF Asset Management	3.6
Principal Funds	3.0
Other	11.7

Source: Morningstar, Inc. Data as of 12/31/2016.

The market-share split between the "big three" and other notable players has changed significantly over time. Exhibit 6 shows the change in assets from the end of 2006 through 2016 of the 10 largest target-date managers at the beginning and the end of that period. Fidelity had a sizable lead going into that period; the firm's approximately $64 billion in target-date mutual fund assets roughly doubled the assets of Vanguard and T. Rowe Price combined. Fidelity maintained the top spot until Vanguard took the lead in the second half of 2014. Vanguard has since widened the gap over the other two. Also, five of the 10 largest target-date managers—State Farm, MassMutual, Wells Fargo, Voya, and Putnam—as of the end of 2006 failed to stay in the top 10 by end of 2016, and none of them had grown to $10 billion in assets as of 2016. American Century, TIAA-CREF, JPMorgan, John Hancock, and American Funds entered the top 10 over that span.

Exhibit 6 10-Year Asset Growth of 10 Largest Target-Date Fund Families, 2006-16



Source: Morningstar, Inc. Data as of 12/31/2016.

"The big three" have substantially more target-date mutual fund assets than all other peers, but some firms are creeping up. Exhibit 7 shows the year over year change in target-date assets, market share, and organic growth for each target-date manager. Vanguard was the only one of "the big three" to increase market share in 2016, as the other two lagged the approximate 8% average organic growth rate in 2016. In addition to Vanguard, five other of the 10 largest target-date managers—American Funds, JPMorgan, TIAA-CREF, American Century, and BlackRock—grew faster than the norm in 2016, resulting in increased market share. Notably, American Funds and JPMorgan joined the fray a little late—2007 and 2006, respectively—but both reached 5% of market share in 2016.

Exhibit 7 2016 Target-Date Net Assets, Market Share, and Organic Growth, by Firm

	Total Net Assets US$ Million		**Market Share %**		**Organic Growth Rate %**	
Fund Company	2016	2015	2016	2015	2016	2015
Vanguard	280,332.4	224,916.1	31.8	29.5	16.5	19.2
Fidelity Investments	192,912.9	181,778.5	21.9	23.8	–1.5	–2.5
T. Rowe Price	148,007.7	132,429.1	16.8	17.3	4.1	8.8
American Funds	53,637.4	34,793.8	6.1	4.6	45.5	27.2
JPMorgan	44,770.7	37,574.3	5.1	4.9	12.4	34.2
TIAA-CREF Asset Management	31,339.4	25,306.2	3.6	3.3	16.2	14.7
Principal Funds	26,114.2	25,613.8	3.0	3.4	–1.9	3.8
American Century Investments	17,025.2	14,637.7	1.9	1.9	9.5	18.5
John Hancock	16,331.1	15,406.7	1.9	2.0	–1.6	4.7
BlackRock	11,679.3	7,930.0	1.3	1.0	39.8	12.8
Wells Fargo Funds	9,451.4	15,133.8	1.1	2.0	–43.6	–8.0
State Farm	7,410.9	7,055.7	0.8	0.9	–1.6	15.6
Great-West Funds	6,642.3	6,337.9	0.8	0.8	–3.5	5.4
Voya	5,317.6	4,997.9	0.6	0.7	0.8	–8.3
KP Funds	5,310.3	4,470.4	0.6	0.6	11.7	10.4
USAA	3,895.0	3,745.0	0.4	0.5	–4.2	–2.8
Schwab Funds	3,452.6	3,209.4	0.4	0.4	1.9	9.3
MFS	2,567.1	2,074.3	0.3	0.3	17.0	11.4
GuideStone Funds	2,394.8	1,994.5	0.3	0.3	11.8	10.4
MassMutual	2,343.4	2,229.7	0.3	0.3	–1.7	16.0
Nationwide	1,767.0	1,622.2	0.2	0.2	0.6	4.2
State Street Global Advisors	1,259.0	234.2	0.1	0.0	425.4	613.3
Putnam	828.0	575.2	0.1	0.1	37.6	64.5
MainStay	713.4	705.0	0.1	0.1	–5.3	–1.7
AllianceBernstein	564.2	491.1	0.1	0.1	6.9	–53.8
Manning & Napier	543.0	610.0	0.1	0.1	–15.0	–20.5
Franklin Templeton Investments	503.9	481.7	0.1	0.1	1.4	20.4
Transamerica	488.5	170.8	0.1	0.0	175.8	—
BMO Funds	406.0	397.9	0.0	0.1	–3.8	–7.0
PIMCO	393.6	537.8	0.0	0.1	–31.0	–32.7
AXA Equitable	382.1	375.4	0.0	0.0	–5.1	9.1
Allianz Funds	378.8	368.0	0.0	0.0	–4.7	–7.8
Dimensional Fund Advisors	323.5	18.8	0.0	0.0	1,523.5	—
Russell	267.1	312.1	0.0	0.0	–21.5	–28.4
Invesco	261.6	342.5	0.0	0.0	–31.4	–18.3
Goldman Sachs	243.8	195.4	0.0	0.0	18.4	–11.8
Harbor	146.4	138.2	0.0	0.0	0.5	–3.5
PNC Funds	27.4	16.0	0.0	0.0	61.0	44.3
Virtus	12.4	—	0.0	—	—	—
Prudential Investments	0.7	—	0.0	—	—	—
Vantagepoint Funds	—	4,165.6	—	0.5	–105.5	5.3
Total	**880,445.9**	**763,392.6**	**100.0**	**100.0**	**7.8**	**9.8**

Source: Morningstar, Inc. Data as of 12/31/2016.

Q: Do new entrants have a chance to compete in the space?

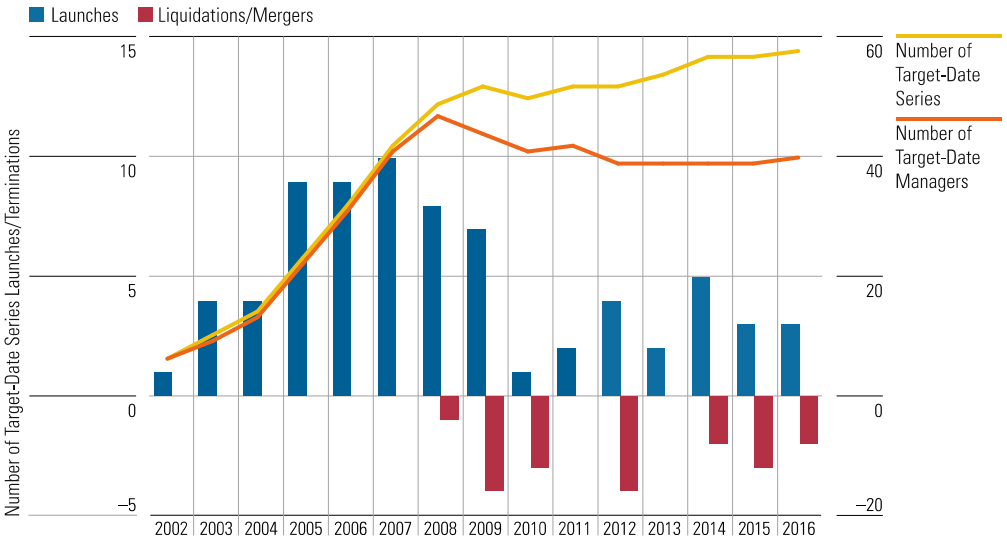
A: Many firms have flocked to the scene, but it has been very difficult for new entrants to gain even modest traction in the target-date space.

Despite many attempts, few asset-management firms have been able to participate meaningfully in the growing popularity of target-date funds. Exhibit 8 shows the dramatic growth in the number of target-date series available over the past 15 years. Only six target-date series existed at the end of 2002, but the universe ballooned in the following five years, reaching 42 series by the end of 2007. The Pension Protection Act of 2006 provided a strong tailwind for the funds, as it listed target-date funds as one of the three Qualified Default Investment Alternatives for defined-contribution plans. Over the past eight years, the number of target-date series has stayed between 50 and 60, as new series come to market and others fall by the wayside. Notably, the number of firms running target-date funds has hovered around 40 since 2010.

Target-date series started to disappear in 2008 amid the financial crisis. The first casualty —XTF ETF Target Date—came in 2008, and then four more series vanished in 2009, as they were likely unable to recover from the previous year's woes. This has continued in recent years—two to three series have dropped off the landscape each of the past three calendar years. In 2016, Vantagepoint converted its Milestone series to a CIT version and the Great-West Lifetime II series merged into one of Great-West's other series.

The difficulty in gaining traction in the target-date space hasn't stopped asset managers from trying, and some have tried even multiple times. While the space hasn't seen the same dramatic influx of new series that was experienced from 2005 to 2009, there has been a fairly steady stream of series launches each calendar year since then. (Exhibit 9 shows the inception dates and terminations dates, if applicable, for all target-date mutual fund series as of Dec. 31, 2016.) The Prudential Day One series was the most recent entrant in December 2016, but Prudential was not a stranger to target-date strategies, as it has run a CIT version since 2014. Earlier in the year, Schwab launched its second series—Schwab Target Index—to serve as an index-based alternative to its legacy strategy. (The Natixis Sustainable Future series, which has an environmental, social, and governance focus, had its inception in February 2017, and thus is not included in Exhibit 9.)

Exhibit 8 Number of Target-Date Series, Launches and Terminations 2002-16



Source: Morningstar, Inc. Data as of 12/31/2016.

Exhibit 9 Target-Date Series Inception Dates and Termination Dates

Target-Date Series Name	Inception Date	Termination Date (if applicable)
Prudential Day One	12/13/16	—
Schwab Target Index	8/25/16	—
Virtus DFA Trgt Date Retire Inc	1/11/16	—
Wells Fargo Dynamic Target	11/30/15	—
Dimensional Target Date Retirement Income	11/2/15	—
ClearTrack	3/2/15	—
PIMCO RealPath Blend	12/31/14	—
AllianceBernstein Multi-Manager Select	12/15/14	—
Principal Lifetime Hybrid	9/30/14	—
State Street Target Retirement	9/30/14	—
KP RETIREMENT PATH	1/10/14	—
John Hancock Multi-Index Lifetime	11/7/13	—
T. Rowe Price Target Retire	8/20/13	—
Fidelity Multi-Manager	12/20/12	—
Voya Target Retirement	12/20/12	—
PNC Target	9/28/12	—
JPMorgan SmartRetirement Blend	7/2/12	—

Source: Morningstar, Inc. Data as of 12/31/2016.

Exhibit 9 Target-Date Series Inception Dates and Termination Dates (Continued)

Target-Date Series Name	Inception Date	Termination Date (if applicable)
Presidential Managed Risk	11/2/11	12/18/15
BlackRock LifePath Index	5/31/11	—
John Hancock Multi-Index Preservation	4/29/10	—
Great-West SecureFoundation Lifetime	11/13/09	—
Fidelity Freedom Index	10/2/09	—
TIAA-CREF Lifecycle Index	9/30/09	—
Great-West Lifetime Conservative	5/1/09	—
Great-West Lifetime II	5/1/09	4/22/16
Great-West Lifetime	5/1/09	—
Harbor Target Retirement	1/2/09	—
AllianzGI Retirement	12/29/08	—
Van Kampen Retirement	10/23/08	6/1/10
Legg Mason Target Retirement	8/29/08	11/14/14
USAA TARGET RETIREMENT FUNDS	7/31/08	—
Allstate ClearTarget	4/14/08	6/30/09
PIMCO RealPathTM	3/31/08	—
Manning & Napier Target	3/28/08	—
Voya Index Solution	3/10/08	—
DWS LifeCompass	11/14/07	10/16/15
Goldman Sachs Target Date Portfolio (Madison)	10/1/07	—
Goldman Sachs Retirement Strategy	9/5/07	12/7/12
Nationwide Target Destination	8/29/07	—
MainStay Retirement	6/29/07	—
Payden/Wilshire Target Date	6/29/07	10/16/09
XTF ETF Target Date	5/1/07	6/20/08
BlackRock LifePath Smart Beta	4/20/07	—
American Funds Trgt Date Rtrmt	2/1/07	—
Invesco Balanced-Risk Retirement	1/31/07	—
Guidestone Funds MyDestination	12/29/06	—
Oppenheimer LifeCycle	12/15/06	11/1/12
John Hancock Multimanager Lifetime	10/30/06	—
AXA Target Allocation	8/31/06	—
Franklin LifeSmart	8/1/06	—
Columbia Retirement Portfolios	5/31/06	10/29/10
Columbia Retirement Plus	5/18/06	8/27/12
JPMorgan SmartRetirement	5/15/06	—
Federated Target ETF	4/6/06	6/15/09
BMO Target Date Retirement Funds	10/25/05	—
RidgeWorth Life Vision	10/12/05	2/27/09
Seligman TargetHorizon ETF	10/3/05	11/30/10
Hartford Target Retirement	9/30/05	6/26/14
MFS Lifetime	9/29/05	—
AllianceBernstein Retirement Strategies	9/1/05	11/20/15
Schwab Target	7/1/05	—
Voya Solution	4/29/05	—
Vantagepoint Milestone	1/3/05	9/16/16
Russell LifePoints Target Date	12/31/04	—
Putnam RetirementReady	11/1/04	—

Source: Morningstar, Inc. Data as of 12/31/2016.

Exhibit 9 Target-Date Series Inception Dates and Termination Dates (Continued)

Target-Date Series Name	Inception Date	Termination Date (if applicable)
TIAA-CREF Lifecycle	10/15/04	—
American Century One Choice	8/31/04	—
MassMutual RetireSMART	12/31/03	—
Vanguard Target Retirement	10/27/03	—
Fidelity Advisor Freedom	7/24/03	—
State Farm Lifepath	5/9/03	—
T. Rowe Price Retirement	9/30/02	—
Principal LifeTime	3/1/01	—
American Independence NestEgg	1/4/99	9/28/12
Fidelity Freedom	10/17/96	—
BlackRock LifePath Dynamic	3/1/94	—
Wells Fargo DJ Target	3/1/94	—

Source: Morningstar, Inc. Data as of 12/31/2016.

Q: What are firms doing to compete?

A: Firms are more commonly offering multiple approaches to fit a variety of investor preferences, and then naming them to reflect the approach.

Instead of relying on a single approach, target-date managers have become more inclined to offer variations of their legacy offering, or even completely different approaches. Initially, firms came to market with a single approach and sought to convince investors of its superiority. That changed in 2008 when Voya—then under the ING name—launched a version of its strategy that invested only in index funds. By the end of 2016, 12 firms offered more than one target-date series.

In most cases, one series still represents the lion's share of a firm's target-date assets. As displayed in Exhibit 10, 10 of the 12 firms that offer more than one series have at least 75% of their target-date fund assets in a single series. John Hancock serves as an exception, as its Multimanager Lifetime and Multi-Index Preservation series hold nearly the same amount of assets. The latter launched nearly four years after the former, but it held more assets than the legacy series at the end of 2016. Voya is the only other firm that splits at least 40% of assets between two series.

New series often fail to garner interest. Five of the firms—JPMorgan, Principal, Schwab, T. Rowe Price, and Wells Fargo—have at least 97% of their target-date fund assets in a single series. In most of these instances, the new series haven't been around long. The BlackRock LifePath Index, which launched in 2011, stands out as a series that came long after the initial offering yet now represents the majority of its firm's target-date assets. That series represented nearly 85% of BlackRock's target-date assets at the end of 2016 despite just reaching its five-year mark that year. Meanwhile, BlackRock had launched its legacy offering in 1994.

Investors appear to be gravitating toward a firm's index-based offering over the actively managed one. BlackRock offers three target-date series, but BlackRock LifePath Index was the only one that saw positive estimated flows in 2016. Fidelity Freedom, which invests predominantly in actively managed

underlying funds, remained the second-largest target-date series at year-end. However, that series saw outflows in 2016, whereas Fidelity's much smaller Freedom Index series experienced positive flows. Similarly, the two John Hancock series that focus on index funds saw positive flows in 2016, whereas the legacy offering saw outflows. Voya and Schwab also saw more interest in their index-based offering than their active one, with TIAA-CREF serving as an exception.

Exhibit 10 Fund Firms With Multiple Target-Date Fund Series

Firm and Target-Date Series Name	Inception Date	Assets US$ Million	% of Firm's TDF Assets	2016 Estimated Flows US$ Million
BlackRock		**11,679.3**		
BlackRock LifePath Dynamic	3/1/94	1,694.1	14.5	–535.6
BlackRock LifePath Smart Beta	4/20/07	149.6	1.3	–35.3
BlackRock LifePath Index	5/31/11	9,835.6	84.2	3,724.9
Fidelity		**192,912.9**		
Fidelity Freedom	10/17/96	158,736.4	82.3	–3,450.2
Fidelity Advisor Freedom	7/24/03	17,035.7	8.8	–1,828.6
Fidelity Freedom Index	10/2/09	17,119.1	8.9	2,493.7
Fidelity Multi-Manager	12/20/12	21.7	0.0	2.0
Great-West		**6,642.3**		
Great-West Lifetime Conservative	5/1/09	673.9	10.1	–156.3
Great-West Lifetime	5/1/09	5,418.8	81.6	–39.0
Great-West SecureFoundation Lifetime	11/13/09	549.6	8.3	35.2
John Hancock		**16,331.1**		
John Hancock Multimanager Lifetime	10/30/06	7,344.4	45.0	–768.9
John Hancock Multi-Index Preservation	4/29/10	8,006.0	49.0	207.0
John Hancock Multi-Index Lifetime	11/7/13	980.7	6.0	328.0
JPMorgan		**44,770.7**		
JPMorgan SmartRetirement	5/15/06	43,658.2	97.5	4,493.9
JPMorgan SmartRetirement Blend	7/2/12	1,112.5	2.5	169.5
PIMCO		**393.6**		
PIMCO RealPath	3/31/08	350.3	89.0	–173.2
PIMCO RealPath Blend	12/31/14	43.2	11.0	11.6
Principal		**26,114.2**		
Principal LifeTime	3/1/01	25,868.3	99.1	–645.6
Principal Lifetime Hybrid	9/30/14	245.9	0.9	148.8
Schwab		**3,452.6**		
Schwab Target	7/1/05	3,403.2	98.6	13.3
Schwab Target Index	8/25/16	49.4	1.4	49.0
T. Rowe Price		**148,007.7**		
T. Rowe Price Retirement	9/30/02	146,862.4	99.2	5,210.9
T. Rowe Price Target Retire	8/20/13	1,145.3	0.8	245.1
TIAA-CREF		**31,339.4**		
TIAA-CREF Lifecycle	10/15/04	24,348.7	77.7	2,151.8
TIAA-CREF Lifecycle Index	9/30/09	6,990.7	22.3	1,951.8
Voya		**5,317.6**		
Voya Solution	4/29/05	3,080.5	57.9	–417.2
Voya Index Solution	3/10/08	2,214.5	41.6	446.9
Voya Target Retirement	12/20/12	22.6	0.4	11.6
Wells Fargo		**9,451.4**		
Wells Fargo DJ Target	3/1/94	9,392.4	99.4	–6,605.2
Wells Fargo Dynamic Target	11/30/15	59.0	0.6	1.8

Source: Morningstar, Inc. Data as of 12/31/2016.

The initial and most prevalent approach to adding another series has been to launch one that invests only in index funds. As previously mentioned, Voya started this trend in 2008 and several other firms have since followed suit. (Wells Fargo is unique in launching an active series after already having an index-based version.) Exhibit 11 uses Fidelity as an example to show how underlying holdings may differ from an active series to a passive one. Often, as in the case of Fidelity, the index-based series sacrifice dedicated exposure to niche asset classes, such as high-yield bonds and emerging-markets debt.

Exhibit 11 Fidelity Freedom vs. Fidelity Freedom Index Underlying Holdings

Fidelity Freedom	% of Assets	**Fidelity Freedom Index**	% of Assets
Fidelity Series Investment Grade Bond	20.4	Fidelity Total Market Index F	52.0
Fidelity Series Emerging Markets	7.7	Fidelity Series Global ex US Index	21.4
Fidelity Series Equity-Income	7.1	Fidelity US Bond Index F	20.0
Fidelity Series International Value	6.2	Fidelity Series Government Money Mkt F	4.1
Fidelity Series International Growth	6.0	Fidelity Series Commodity Strategy F	1.3
Fidelity Series Growth Company	5.9	Fidelity Series Infl-Prtct Bd Idx F	1.2
Fidelity Series Growth & Income	5.3		
Fidelity Series Government Money Mkt	5.0		
Fidelity Series Stk Selec Lg Cp Val	4.8		
Fidelity Series Intrinsic Opps	4.2		
Fidelity Series Blue Chip Growth	3.4		
Fidelity Series Opportunistic Insights	3.2		
Fidelity Series All-Sector Equity	2.9		
Fidelity Series Small Cap Opps	2.8		
Fidelity Series High Income	2.4		
Fidelity Series Short-Term Credit	2.3		
Fidelity Series Commodity Strategy	1.7		
Fidelity Series 100 Index	1.5		
Fidelity Series Infl-Prtct Bd Idx	1.5		
Fidelity Series 1000 Value Index	1.5		
Fidelity Series International Sm Cap	1.4		
Fidelity Series Small Cap Discovery	0.9		
Fidelity Series Emerging Markets Debt	0.6		
Fidelity Series Real Estate Equity	0.5		
Fidelity Series Real Estate Income	0.5		
Fidelity Series Floating Rate Hi Inc	0.3		
Fidelity Series Long-Term Trs Bd Idx	0.0		

Source: Morningstar, Inc. Data as of 12/31/2016.

More recently, some firms with target-date series invested predominantly in actively managed funds have launched a version that blends active funds and index funds. These are commonly referred to as **blend** or **hybrid** series. JPMorgan, Principal, and PIMCO have each gone this route. One of the primary objectives of these series is to lower costs by going passive in major asset classes. Exhibit 12 provides an example by showing how the JPMorgan SmartRetirement series' underlying holdings compare with those of the JPMorgan SmartRetirement Blend series. The blend series uses index funds and exchange-traded funds to gain broad exposure to markets, but it retains active exposure to niche asset classes like high-yield bonds and emerging-markets debt.

Exhibit 12 JPMorgan SmartRetirement vs. JPMorgan SmartRetirement Blend Underlying Holdings

JPMorgan SmartRetirement	% of Assets
JPMorgan Core Bond R6	13.8
JPMorgan Disciplined Equity R6	11.2
JPMorgan High Yield R6	7.4
JPMorgan Value Advantage R6	5.4
JPMorgan Growth Advantage R6	5.3
JPMorgan Intrepid America R6	5.2
JPMorgan International Opps R6	5.2
JPMorgan International Equity R6	5.2
JPMorgan Intrepid International R6	5.0
JPMorgan US Equity R6	4.7
JPMorgan Corporate Bond R6	4.6
JPMorgan Realty Income R6	3.8
JPMorgan Core Plus Bond R6	3.4
JPMorgan Emerging Markets Equity R6	3.2
JPMorgan Emerging Markets Debt R6	3.2
JPMorgan Mid Cap Equity R6	2.9
JPMorgan Emerging Economies R6	2.6
JPMorgan US Government MMkt Instl	2.3
JPMorgan Inflation Managed Bond R6	1.6
JPMorgan Small Cap Value R6	0.8
JPMorgan Floating Rate Income R6	0.8
JPMorgan Small Cap Growth R6	0.8
iShares TIPS Bond	0.8
JPMorgan Small Cap Equity R6	0.7
JPMorgan Commodities Strategy R6	0.2
JPMorgan Emerging Markets Strat Dbt R6	0.1

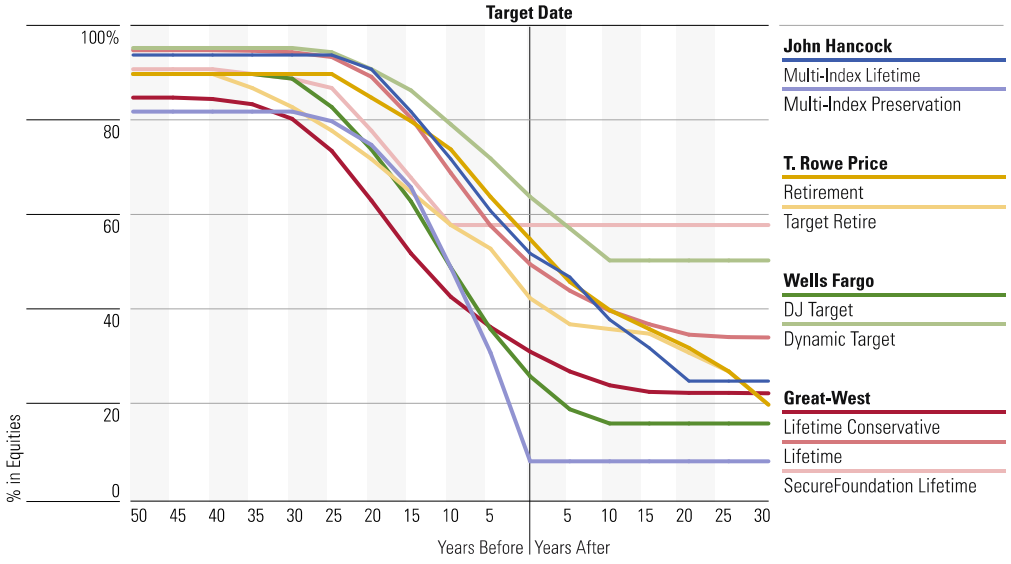
JPMorgan SmartRetirement Blend	% of Assets
Vanguard 500 ETF	32.9
iShares Core MSCI EAFE	16.0
iShares Core US Aggregate Bond	10.7
JPMorgan High Yield R6	5.8
JPMorgan Core Bond R6	5.3
iShares Russell Mid-Cap	4.9
iShares Russell 2000	4.4
iShares Core MSCI Emerging Markets	4.1
JPMorgan Realty Income R6	4.0
JPMorgan Corporate Bond R6	2.4
JPMorgan Emerging Markets Debt R6	2.4
JPMorgan US Government MMkt Instl	2.2
JPMorgan Emerging Markets Equity R6	1.6
JPMorgan Emerging Economies R6	1.3
iShares TIPS Bond	1.3
JPMorgan Floating Rate Income R6	0.5
JPMorgan Emerging Markets Strat Dbt R6	0.2
JPMorgan Commodities Strategy R6	0.1
JPMorgan Inflation Managed Bond R6	0.0

Source: Morningstar, Inc. Data as of 12/31/2016.

In most instances, firms have stuck with the same general glide path when launching a new series, but some firms have designed a completely different glide path. Great-West and John Hancock were the first to offer a different glide path, in 2009 and 2010, respectively. Notably, T. Rowe Price launched its Target Retirement series in 2013 as an alternative with less equity than its legacy Retirement series, which has long held more in stocks than the typical peer across most of the glide path. Wells Fargo did the opposite in 2015 when it launched an equity-heavy target-date series as an alternative to the light equity stakes seen in the Wells Fargo Dow Jones Target series.

As seen in Exhibit 13, the differences between glide paths from a single firm can be significant. The difference in strategic equity exposure for two series from John Hancock range between 12 and 44 percentage points, with the biggest difference being at the target date when Multi-Index Lifetime series allocates 52% to equities and the Multi-Index Preservation series targets a mere 8%. Similarly, the Wells Fargo series have sizable differences in equity glide path (a 38-percentage-point difference at the target date). In the case of T. Rowe Price's two series, both start and end at the same place but take different paths to get there. The newer Target Retirement begins shifting exposure toward bonds 15 years earlier than the legacy version, and the biggest difference in equity exposure between the two is 16 percentage points 10 years before the target date.

Exhibit 13 Firms With Multiple Strategic Equity Glide Paths



Source: Morningstar, Inc. Data as of 12/31/2016.

As firms have launched multiple offerings, they often try to convey the differences in the funds' names. Series that invest only in index funds often, but not always, have "index" in their name to denote that approach. Series that consciously attempt to strike a mix between active underlying investments and passive ones commonly include "blend" or "hybrid" in their name. Within the past year, both BlackRock and John Hancock changed the name of target-date fund series to reflect the approach. Exhibit 14 shows the name changes that occurred or were announced in 2016.

Exhibit 14 Target-Date Series Name Changes in 2016

Current Name	Previous Name	Change Date
John Hancock Multi-Index Lifetime	John Hancock Retirement Living II	2/1/17
John Hancock Multi-Index Preservation	John Hancock Retirement Choices	2/1/17
John Hancock Multimanager Lifetime	John Hancock Retirement Living Through	2/1/17
BlackRock LifePath Dynamic	BlackRock LifePath	11/18/16
BlackRock LifePath Smart Beta	BlackRock LifePath Active	11/18/16
Goldman Sachs Target Date Portfolio	Madison Target Retirement	8/22/16
Great-West Lifetime Conservative	Great-West Lifetime I	4/29/16
Great-West Lifetime	Great-West Lifetime III	4/29/16

Source: Morningstar, Inc. Data as of 12/31/2016.

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The various components that make up a target-date fund—including asset allocation and underlying investments—can sometimes make performance and the investor experience difficult to judge. This section looks at a few of the main performance drivers for target-date funds, as well as their investor returns and how investors have fared versus other investment options.

- Have target-date funds worked for investors?
- How have "to" versus "through" target-date funds compared with one another? How about active versus passive or open versus closed target-date funds?
- How have target-date funds stacked up against other Qualified Default Investment Alternatives?
- Should investors emphasize any specific part of the glide path?

Q: Have target-date funds worked for investors?

A: Target-date funds haven't been around long enough to be able to say whether they will successfully take investors through a full 40-plus-year investment horizon. However, a positive 10-year investor return gap—to the tune of 1.4 percentage points at the end of 2016—suggests that investors have benefited from the buy-and-hold mentality they engender.

Target-date funds are in some ways the almost $900 billion (and counting) experiment in retirement investing. Barclays Global Investors (now part of BlackRock) launched the first target-date funds less than 25 years ago, so it is a bit more than halfway through the 40-year timeline that many asset managers use to model and determine the asset-allocation glide path that drives their target-date funds. Even then, target-date funds only took off beginning in about 2006, with their inclusion in the Pension Protection Act's list of acceptable default investment options. Given that relatively short track record, it is still anyone's guess as to whether they will turn out to be the right investments to get investors to a successful retirement.

Investor returns for the 18 target-date series that have been around for at least the past decade through the end of 2016 provide encouraging signs, though. As shown by Exhibit 15, at the end of 2016, target-date funds had a positive 10-year annualized return gap of 1.4 percentage points off of an asset-weighted average 10-year investor return of 5.4% and average target-date return of 4.0%. In contrast, most broad fund groups had negative return gaps. Overall, U.S. mutual funds during that period had a negative return gap of 0.4 percentage points.

Exhibit 15 Total Return and Investor Return by Broad Categories

Broad Category	Average 10-Year Total Return (%)	Asset-Weighted Average 10-Year Investor Return (%)	Return Gap (%)	Number of Funds
Allocation–Target	3.99	5.38	1.39	303
Allocation–Non-Target	4.35	3.99	–0.36	934
Alternative	–2.17	–0.67	1.50	161
US Sector Funds	4.29	4.40	0.11	582
Intl Equity Funds	1.77	1.23	–0.54	1,050
US Diversified Funds	6.47	5.73	–0.74	2,537
Taxable Bond	4.04	3.27	–0.77	1,504
Municipal	3.14	1.80	–1.34	871
All Funds	**4.33**	**3.96**	**–0.37**	**7,942**

Source: Morningstar, Inc. Data as of 12/31/2016.

Investor returns use asset inflows and outflows to measure the returns that investors have actually experienced with a fund; this number typically differs from a fund's official performance track record, usually to the detriment of investors. Morningstar's annual Mind the Gap study, for instance, has consistently found that investors tend to chase returns, buying funds after they've done well and selling them when they hit rough spots. This pattern results in negative investor return gaps, as investors end up not benefitting from performance turnarounds.

That self-defeating behavior generally hasn't been seen within target-date funds, which have consistently shown positive return gaps. While the long-term nature of target-date funds may help encourage that behavior, the funds' widespread use as default investment options gives them a natural advantage over competitors when it comes to investor return gaps: Whether using target-date funds by default or by choice, these investors tend to be more hands-off, which has worked to their advantage.

Investors in or near retirement have generally been taking money out of their target-date funds in the past decade, which has led to negative return gaps for some target-date fund categories. As shown in Exhibit 16, investors in the Retirement Income and Target-Date 2000-2010 groups have seen negative return gaps of roughly 0.1 percentage points each in the past decade through the end of 2016. Many of those investors have started retiring and pulling their savings out of target-date funds. Indeed, within the 12 target-date fund categories, only the Retirement Income, Target-Date 2000-2010, and Target-Date 2015 categories have seen outflows over the past 10 years.

Exhibit 16 Total Return and Investor Return by Target-Date Category

Category	Average 10-Year Total Return (%)	Asset-Weighted Average 10-Year Investor Return (%)	Return Gap (%)	Number of Funds
Retirement Income	3.02	2.93	-0.10	16
Target-Date 2000-2010	3.66	3.52	-0.14	32
Target-Date 2015	4.21	4.81	0.60	19
Target-Date 2020	3.87	4.74	0.88	52
Target-Date 2025	4.25	5.57	1.31	23
Target-Date 2030	3.97	5.48	1.51	52
Target-Date 2035	4.36	6.22	1.86	23
Target-Date 2040	4.09	6.22	2.14	52
Target-Date 2045	4.42	6.99	2.57	22
Target-Date 2050	3.91	6.95	3.04	12
All Target-Date Funds	**3.99**	**5.38**	**1.39**	**303**

Source: Morningstar, Inc. Data as of 12/31/2016.

Similarly, a steady pattern of outflows at MassMutual RetireSMART series in the first half of the past decade and at Fidelity Freedom series in the second half of the decade have produced negative return gaps for those investors, as shown in Exhibit 17. While other series have also seen steady outflows during this period, the outflows worked to investors' advantage as far as investor return gaps are concerned. The Russell LifePoints series, for instance, has shrunk considerably over the past six years and has the second-best 10-year investor return gap, at 2.4 percentage points. This coincided with a period when its target-date funds struggled against peers, largely due to the series' outsized positions in commodities and international equities, some of the poorer-performing parts of the market.

Exhibit 17 Total Return and Investor Return by Target-Date Series

Target-Date Series	Average 10-Year Total Return (%)	Asset-Weighted Average 10-Year Investor Return (%)	Return Gap (%)	Number of Funds
John Hancock Multimanager Lifetime	4.39	6.85	2.45	32
Russell LifePoints Strategy	3.47	5.81	2.35	12
TIAA-CREF Lifecycle	4.62	6.31	1.69	7
Wells Fargo DJ Target	3.55	5.02	1.47	15
Vanguard Target Retirement	5.04	6.35	1.31	9
Fidelity Advisor Freedom	3.57	4.84	1.27	33
MFS Lifetime	4.46	5.56	1.10	21
American Century One Choice	5.05	6.13	1.08	12
T. Rowe Price Retirement	5.07	6.10	1.03	17
Schwab Target	4.59	5.59	1.00	4
Principal LifeTime	3.43	4.32	0.89	42
JPMorgan SmartRetirement	4.72	5.33	0.61	16
Franklin LifeSmart	4.19	4.71	0.52	16
BlackRock LifePath Dynamic	3.33	3.81	0.48	6
State Farm Lifepath	2.96	3.43	0.47	24
Voya Solution	3.53	3.98	0.45	12
MassMutual RetireSMART	3.74	3.19	-0.55	15
Fidelity Freedom	4.26	3.63	-0.63	10
All Target-Date Funds	**3.99**	**5.38**	**1.39**	**303**

Quintile: Top Second Middle Third Bottom

Source: Morningstar, Inc. Data as of 12/31/2016.

Q: How have "to" versus "through" target-date funds compared with one another? How about active versus passive or open versus closed target-date funds?

A: Some of the broad distinctions that investors use to bifurcate target-date series—namely, whether they are active/passive or open/closed—often have little bearing on performance. Instead, equity allocation generally determines how well a series' results will compare with those of its peers. As a consequence, "through" series, which tend to hold more in equities, on average have better returns than "to" series.

Target-date fund series are most commonly classified by whether they are:

- Managed with a "to" glide path that ceases to change allocation at the retirement date or a "through" glide path that continues to change;
- Implemented using active or passive underlying investments; or
- Invested using a "closed" architecture platform of in-house strategies or through an "open" architecture format with nonaffiliated strategies.

For the most part, these classifications have little bearing on funds' relative performance results. Instead, funds' equity allocations tend to determine how well they fare against one another. That makes sense looking at historical returns, as the S&P 500 has annually gained 7.0% over the past 10 years through the end of 2016 compared with the Bloomberg Barclays Aggregate Bond Index's 4.3% gain during that time. It is also reasonable to expect this pattern to continue given that the commonly accepted view of market returns has stocks outperforming bonds over long-enough time horizons.

To that end, because "through" series tend to have higher equity allocations than "to" series, they generally have better return rankings. Exhibit 18 gives a sampling of these results using the lowest-priced share class of target-date funds for vintage years 2020 and 2040.[1]

Exhibit 18 "To" and "Through" Target-Date Total and Morningstar Risk-Adjusted Return Ranks for 2020 and 2040 Funds

	Total Return % Rank			Morningstar Risk-Adjusted Return % Rank			
Category	3 Years	5 Years	10 Years	3 Years	5 Years	10 Years	Average Equity Allocation %
2020 Funds							
Through Retirement	32.4	34.3	20.6	39.4	35.0	27.1	47.4
To Retirement	35.3	50.4	40.8	48.5	53.4	52.0	41.9
2020 Funds—All	33.7	41.6	28.2	43.2	42.2	31.6	45.3
2040 Funds							
Through Retirement	36.4	36.7	22.6	43.0	36.2	33.1	78.5
To Retirement	37.0	46.1	44.2	45.2	57.5	82.3	75.2
2040 Funds—All	36.7	41.0	30.7	43.9	44.6	42.1	77.3

Source: Morningstar, Inc. Data as of 12/31/2016.

Across the board through the last three-, five-, and 10-year periods through the end of 2016, the "through" funds for both 2020 and 2040 vintage years have better average ranks (as delineated by their lower numbers) than their "to" counterparts. Over the past five years, for example, 2020 funds from "through" series have an average percent rank of 34 while 2020 funds from "to" series have an average of 50.

"Through" series' greater overall allocations to equities have been tailwinds to results. For instance, at the end of 2016, the 2040 "through" funds have an average equity allocation of about 79% compared with 2040 "to" funds' average of 75%. That greater average allocation to equities for "through" series holds true across all vintage years, resulting in generally better rankings for "through" series for almost all vintage years across those time periods.

A regression analysis can help determine if a series' use of active/passive or open/closed strategies could help predict success. The results generally suggest that those delineations have little predictive

1 Using the lowest-priced share class helps to put results for various series on more equal footing with one another and eliminates the various revenue sharing arrangements that often come to bear when plan sponsors choose target-date funds for their participants. It does, however, result in positively skewed performance ranks, so the ranks presented in Exhibit 18 are for the most part all better than average.

power. Instead, the regressions also show that a fund's equity allocation is the most meaningful data point to forecast relative returns.

The regressions for this analysis used the return ranks of series' lowest-cost 2020 and 2040 funds over the last three-, five-, and 10-year periods through the end of 2016 and fitted them on the following variables:

- the fund's allocation to equities,
- the fund's expense ratio,
- the series' allocation to actively managed underlying strategies, and
- the series' allocation to underlying strategies that are open architecture.

As shown in Exhibit 19, only equity percentage consistently shows a statistically meaningful effect, which is indicated by the asterisks next to the table's numbers. For example, a simple interpretation of Exhibit 19 would say that for 2020 funds over the past three years, each additional percentage point invested in equities would lead to a lower (which is also better) performance rank of 0.988. Over five- and 10-year periods, rankings would improve by 1.442 and 1.015, respectively.

Exhibit 19 Regression Results for Target-Date 2020 and 2040 Fund Rankings

	2020 Funds			**2040 Funds**		
Variable	3 Years	5 Years	10 Years	3 Years	5 Years	10 Years
Constant	0.521***	1.009***	0.385	0.237	0.866***	0.459
	0.160	*0.182*	*0.242*	*0.274*	*0.285*	*0.310*
Equity %	–0.988***	–1.442***	–1.015**	–0.168	–0.721**	–0.477**
	0.269	*0.294*	*0.393*	*0.289*	*0.289*	*0.321*
Expense %	0.253	0.162	0.988**	0.112	0.142	0.709**
	0.196	*0.217*	*0.333*	*0.228*	*0.240*	*0.310*
Active %	0.160	–0.069	–0.237	0.227	–0.050	–0.361
	0.099	*0.105*	*0.133*	*0.133*	*0.131*	*0.144*
Open %	0.091	0.052	0.058	0.132	0.152	0.250
	0.093	*0.103*	*0.134*	*0.119*	*0.122*	*0.135*
R-Squared	0.418	0.478	0.599	0.185	0.244	0.585
Adjusted R-Squared	0.356	0.409	0.453	0.100	0.143	0.435
No. Observations	43	35	16	43	35	16

Source: Morningstar, Inc. Data as of 12/31/2016. Standard errors are reported in italics.
*, **, *** indicates significance at the 90%, 95%, and 99% level, respectively.

The relatively low R-squared and adjusted R-squared figures—which here measure how well the model predicts return ranks—suggest that the figures in Exhibit 19 should not be interpreted so precisely. Instead, the main takeaways should be more general: Higher equity allocations have resulted in better performance ranks. Meanwhile, over the longer 10-year period, higher expense ratios have generally produced worse performance ranks.

In contrast, a target-date fund's allocation to active/passive or open/closed strategies appears to have little bearing on results—none of the numbers in rows for those variables contain an asterisk and thus don't register as having statistically significant results. For instance, Exhibit 19 basically shows that a 1-percentage-point increase to a series' allocation to open architecture would result in a ranking that gets worse by 0.091. However, the results are noisy, and, at least within this batch of 43 funds tested, there's a good chance that the figure was just a result of chance.

Target-date series' allocations to actively managed or open-architecture underlying strategies correlate strongly with higher expenses, and research from Morningstar and others has long showed that expenses are among the best predictors of a fund's success. So, it might be surprising that those variables generally show limited predictive power when it comes to target-date return performance ranks. The trade-off between expenses and equity allocations is addressed in more detail on Page 39.

Q: How have target-date funds stacked up against other Qualified Default Investment Alternatives?
A: In addition to target-date funds, the 2006 Pension Protection Act included managed accounts and balanced funds as QDIAs. While managed accounts' customized approach prevents a clear performance comparison with target-date funds, the typical balanced fund has produced better annualized total and risk-adjusted returns than the average target-date fund. Contrary to intuition, though, that hasn't necessarily resulted in better ending balances for investors.

The Pension Protection Act of 2006 named target-date funds, managed accounts, and balanced funds as long-term Qualified Default Investment Alternatives (capital preservation products—such as stable value funds—were named QDIAs for a participant's first 120 days in a plan). The customized nature of managed accounts complicates assessing how they have done as a group.

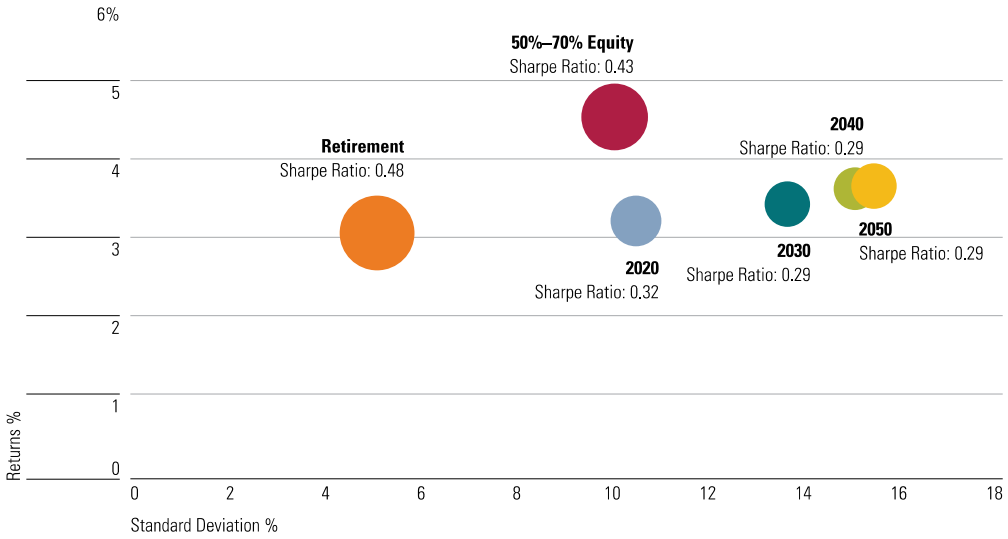
Instead, we compared how typical target-date funds investors might have fared versus a representative balanced fund with allocations of 60% equities and 40% fixed income. The results were sometimes surprising. Balanced funds have easily won the day from a total return and risk-adjusted return perspective, as they have generally delivered better annualized returns with lower volatility to boot compared with most target-date category averages. However, the typically steady flow of savings that comes from investors saving through workplace retirement plans would have resulted in higher ending balances for many investors using target-date funds compared with balanced funds.

Exhibit 20 plots the return, standard deviation, and Sharpe ratios for selected target-date fund category averages as well as the typical Allocation—50% to 70% Equity fund, which serves as a balanced fund proxy here. Over the past decade through the end of 2016, the Allocation—50% to 70% Equity Morningstar Category has delivered annualized returns of 4.8% with a standard deviation of 10.9%, resulting in a Sharpe ratio of 0.43.

Most target-date fund category averages fall behind this representative balanced fund from a total return perspective, clocking in with higher volatilities that ultimately result in lower Sharpe ratios. Only

the Target-Date Retirement category's 0.48 Sharpe ratio compares with that of the average balanced fund, though it also comes with a lower annualized return of 3.6%.

Exhibit 20 10-Year Risk/Return Target-Date Funds vs. Balanced Funds



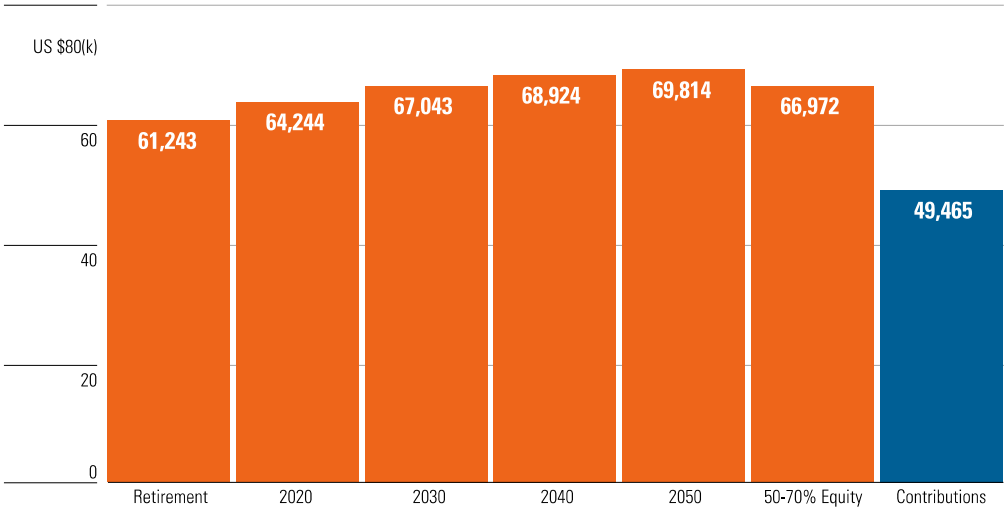
Source: Morningstar, Inc. Data as of 12/31/2016.

Target-date funds tend to be more diversified than static allocation funds, which has been a disadvantage in recent markets. Over the past 10 years, for instance, both the typical balanced and 2020 target-date fund have equity allocations that averaged roughly 60%. However, the 2020 category average for international equities stands at a 16% allocation, while the 50% to 70% category average in that asset class is 12%. That's made a difference in a period when the S&P 500 has annually gained 7% while the MSCI EAFE has risen just 0.8%.

Perhaps surprisingly, the Allocation—50% to 70% Equity category's higher annualized total return doesn't necessarily result in higher ending balances. That's because investors don't usually just buy and hold target-date funds like they may do with other investments. Instead, target-date funds are typically used within workplace retirement plans, where investors supply a steady and predictable flow of savings. It turns out that these cash flows can have a material effect on participant's ending balances, and it has so far mostly worked to target-date fund investors' favor.

To measure this, we looked at the ending balance that would result from a worker initially earning $45,000 per year with annual salary growth of 2% saving 10% of earnings (representing a 7% election and 3% employer match) and contributing every two weeks. We looked at how that pattern of contributions would have fared using the returns streams of the various target-date and allocation categories, and Exhibit 21 presents the ending balances for those scenarios.

Exhibit 21 Simulated Ending Balance From 10 Years of Savings and Contributions in Selected Target-Date and Allocation Categories



Source: Morningstar, Inc. Data as of 12/31/2016.

As expected, given the overall upward-trending markets we've seen in the past 10 years, investments in any of the given category average returns produced endings balances in excess of the roughly $49,000 in contributions. But whereas Exhibit 20 would have suggested that the 50% to 70% category's greater annualized 10-year return would have produced the greatest ending balance, that wasn't the case. Instead, the 2030, 2040, and 2050 funds would have produced higher ending balances. That's largely because returns for those categories have been relatively better in more recent years, when balances would have been higher and investors would have enjoyed a more pronounced compounding effect.

Granted, those higher balances come at the expense of greater volatility compared with the average balanced fund. Whether that higher volatility affects investor behavior in the same way as investments in other categories is an open question, though. Our research into investor returns (on Page 22 of this report and in our annual Mind the Gap studies) suggests that target-date fund investors are a notable exception to the buy high, sell low behavior that often undermines results.

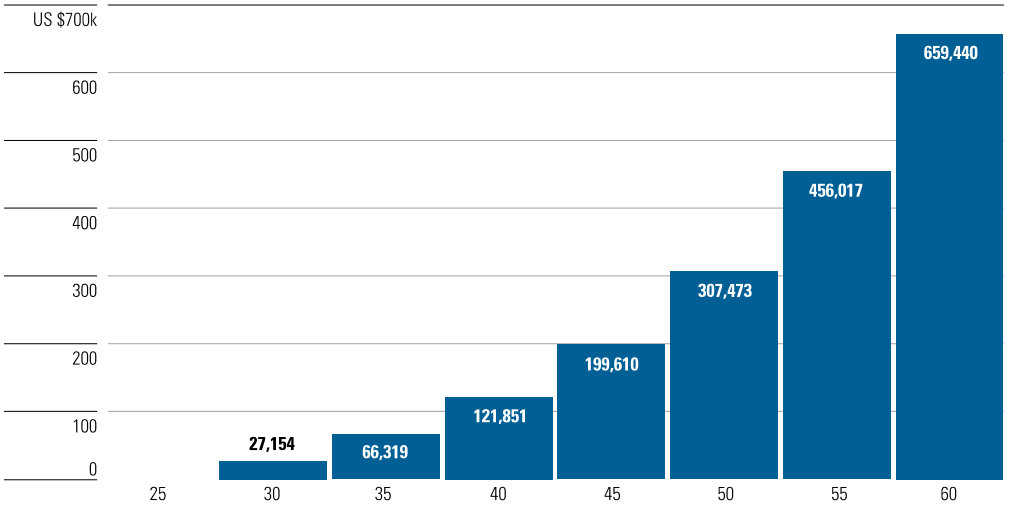
Q: Should investors emphasize any specific part of the glide path?

A: Investors have good reason to place greater emphasis on target-date funds approaching or past the target date when evaluating performance, as the results of those funds have an outsized effect on an investor's outcome.

It is sensible for an investor to place more emphasis on performance of their portfolios near retirement, when their investment balance is at or near its peak. At that time, small differences in returns can have a significant impact on total portfolio value. An example helps illustrate this point. Suppose a 25-year-old worker earns $45,000 per year initially and begins saving for retirement by contributing 10% (representing a 7% election and 3% employer match) of salary annually split into bi-weekly

contributions. Assuming that worker also experiences 2% salary growth annually and achieves a 6% steady annual return, Exhibit 22 shows how the worker's account balance would grow with age.

Exhibit 22 Simulated Account Balances by Age

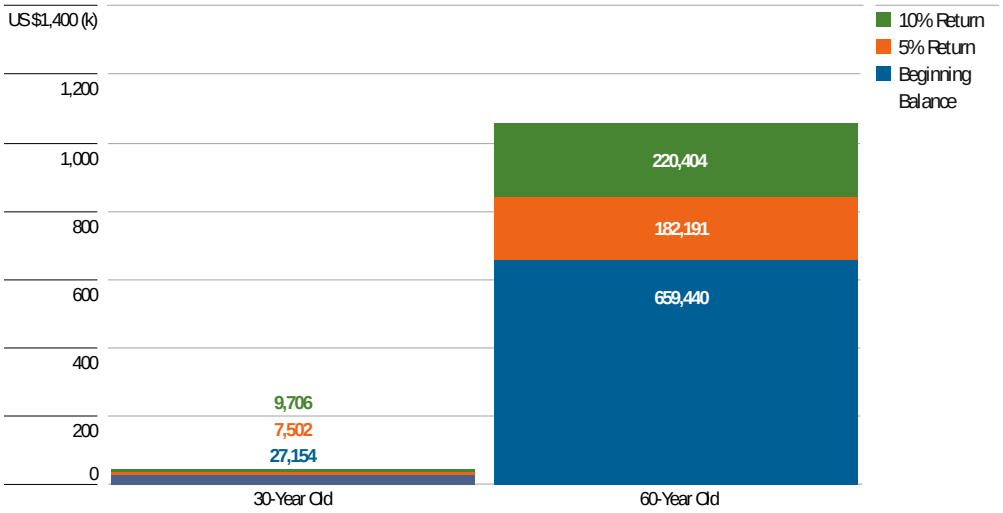


Source: Morningstar, Inc. Data as of 12/31/2016.

To illustrate why an investor might emphasize performance at or near retirement, consider the following example. According to the simulation in Exhibit 22, the worker would have an account balance of $27,154 at age 30 and that would grow to $659,440 by the time the worker reached age 60. To isolate the impact that investment returns have on account balances thereafter, suppose scenarios where the worker earned either a 5% annualized return or a 10% annualized return over the next five years—assuming no additional contributions.

Earning a 5% annualized return for five years would increase the 30-year-old's account by only $7,502, though it would increase the 60-year-old's account by $182,191. If the investor earned a 10% annual return for those five years, the 60-year-old's balance would grow by $402,595, as compared with $16,578 for the 30-year old. Because the investor has a much larger balance at age 60, the account value fluctuates more than at age 30, even given the same annualized return. Exhibit 23 illustrates this point.

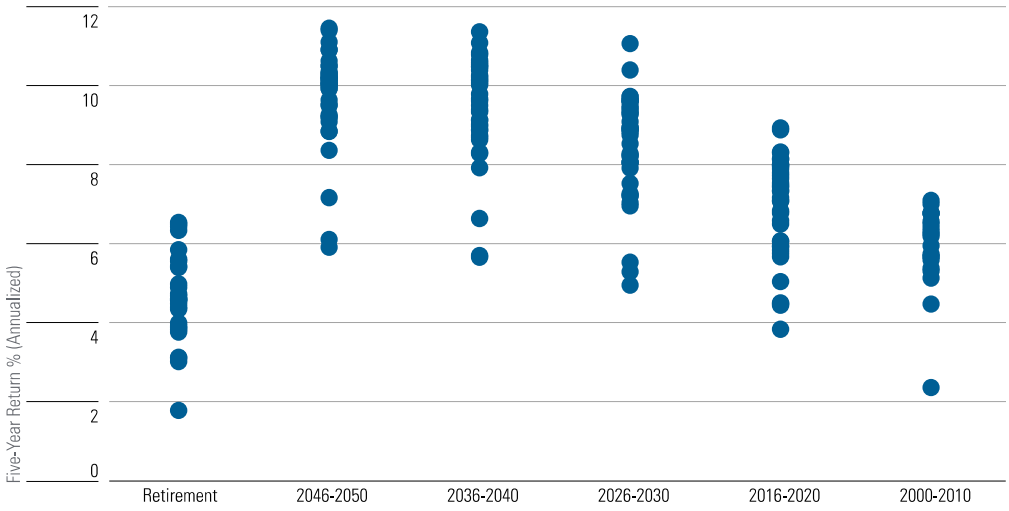
Exhibit 23 Comparison of 5% and 10% Annualized Five-Year Returns for 30- and 60-Year Olds



Source: Morningstar, Inc. Data as of 12/31/2016.

Target-date funds can have meaningful dispersions in returns, even those designed for investors near or in the retirement phase. The dispersion stems from the significant differences in exposures from series to series. As shown in Exhibit 24, in any given target-date Morningstar Category, the best-performing fund outperformed the worst by about 5 to 6 percentage points annualized over the past five years.

Exhibit 24 Dispersion of Returns Within Target-Date Categories (Oldest Share Class)



Source: Morningstar, Inc. Data as of 12/31/2016.

A comparison of the growth of a hypothetical account in all 2020 funds across the target-date landscape provides a real-world example of how savers approaching retirement would have fared during the past five years. Assuming investors in 2020 funds will retire at the target date, this analysis measures the investor experience from ages 57 to 62. Under the same scenario set forth in Exhibit 22, a worker would have an account balance of $529,859 at age 57. Assuming a monthly contribution of $700 (roughly a 10% contribution rate on an $81,511 salary), Exhibit 25 shows how different 2020 funds fared.

Depending on the target-date series selected, investors have had meaningfully different outcomes, highlighting the importance of carefully selecting a target-date fund. Those in T. Rowe Price Retirement 2020 and American Funds 2020 Target Date Retirement saw their balances grow to more than $860,000. Both series have benefited from strong underlying managers, and T. Rowe Price has also reaped the rewards of an aggressive glide path. Meanwhile, investors in PIMCO RealPath 2020 and Wells Fargo Dow Jones Target 2020 ended the period with less than $705,000. Both those series struggled to keep pace because they hold less in stocks than most across the glide path. Significant international exposure also weighed on results for the Wells Fargo series.

Exhibit 25 Five-Year Results of 2020 Funds (Oldest Share Class)

Fund Name	Ending Account Balance USD
T. Rowe Price Retirement 2020	861,747
American Funds 2020 Trgt Date Retire R5	860,198
JHancock Multimanager 2020 Lifetime 1	839,058
BMO Target Retirement 2020 R6	838,089
Vanguard Target Retirement 2020 Inv	832,378
TIAA-CREF Lifecycle 2020 Retirement	832,237
TIAA-CREF Lifecycle Index 2020 Instl	827,399
MainStay Retirement 2020 I	826,573
Principal LifeTime 2020 Institutional	824,972
JPMorgan SmartRetirement 2020 Instl	822,826
Voya Solution 2020 Port I	819,641
Schwab Target 2020	816,458
MassMutual RetireSMART 2020 Service	813,009
Great-West SecureFoundation LT 2020 G	810,097
Voya Index Solution 2020 Port I	807,807
Fidelity Freedom K 2020	806,801
Fidelity Freedom 2020	802,942
Nationwide Destination 2020 R6	802,867
BlackRock LifePath Smart Beta 2020 K	796,490
Fidelity Advisor Freedom 2020 I	793,824
American Century One Choice 2020 Instl	793,370
BlackRock LifePath Index 2020 K	785,118
MFS Lifetime 2020 I	782,539
Goldman Sachs Target Date 2020 R6	776,172
Fidelity Freedom Index 2020 Investor	773,385

Source: Morningstar, Inc. Data as of 12/31/2016.

Exhibit 25 Five-Year Results of 2020 Funds (Oldest Share Class) (Continued)

Fund Name	Ending Account Balance USD
Russell LifePoints 2020 Strategy S	758,108
Putnam RetirementReady 2020 Y	757,232
BlackRock LifePath Dyn 2020 Instl	753,116
Manning & Napier Target 2020 I	751,871
State Farm LifePath 2020 Inst	749,860
Harbor Target Retirement 2020 Instl	746,853
USAA Target Retirement 2020	744,520
JHancock Multi-Index 2020 Presv 1	723,272
AllianzGI Retirement 2020 R6	705,722
Wells Fargo Dow Jones Target 2020 A	704,382
Invesco Balanced-Risk Retire 2020 R5	704,059
PIMCO RealPath 2020 Institutional	684,225

Source: Morningstar, Inc. Data as of 12/31/2016.

The Fee Spotlight

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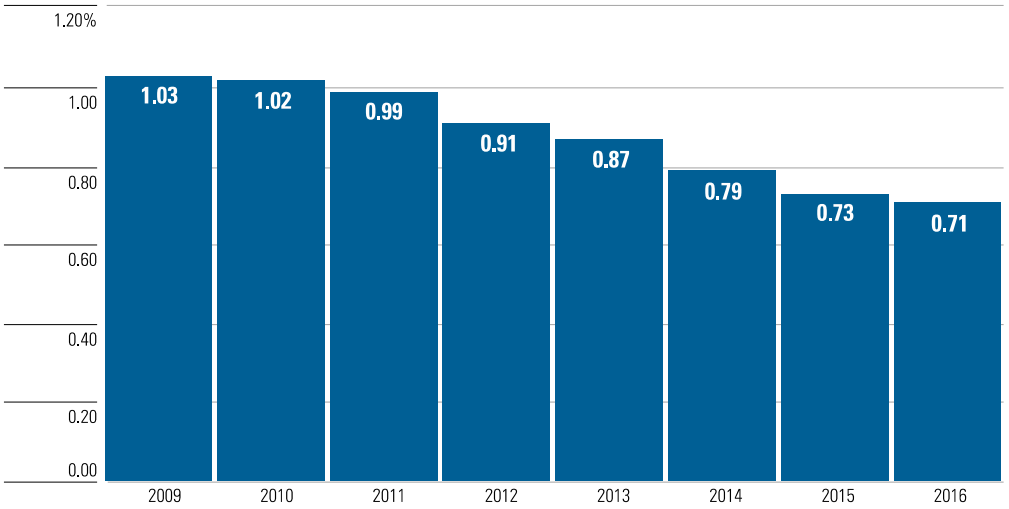
As a result of litigation concerns for charging excessive fees, the cost of target-date funds has taken a front-and-center role for many investors when selecting a series of funds, particularly given their prominent role as the default investment in many retirement plans. This section covers the latest trends with target-date fund fees and explores the strength of a low-cost advantage in the target-date fund space.

Q: What has happened to the cost of target-date funds?

A: Fees for target-date funds continued to decline in 2016, building on a multiyear trend.

Unsurprisingly, target-date fund fees continued to tick down. Even though the U.S. Department of Labor's Fiduciary Rule remains in limbo, a flurry of lawsuits brought against plan sponsors alleging excess fees in defined-contribution retirement plans have elevated attention to fees. Concurrently, the general preference for passive investing continues to grow, thereby spurring active managers to bring down costs to stay competitive. Target date-funds—the commonly used default option in defined-contribution plans—have reaped the rewards of the downward pressure on fees. The average asset-weighted expense ratio for a target-date series was 0.71% at the end of 2016. That's only down slightly from 0.73% in 2015, but it represents a considerable decline from five years ago when the asset-weighted average expense ratio was nearly 1.00%. Exhibit 26 illustrates the steady decline in fees over the past eight years.

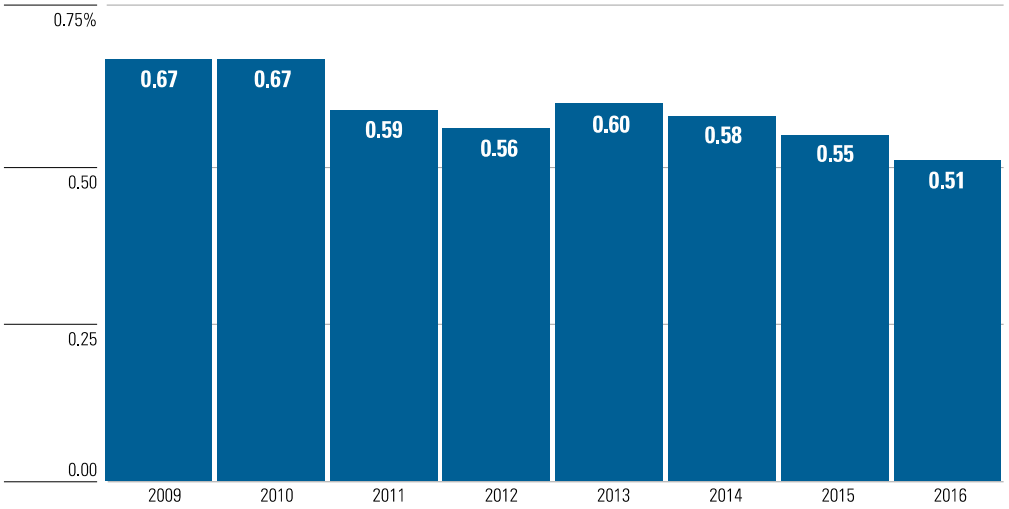
Exhibit 26 Industry's Average Asset-Weighted Expense Ratio, 2009-16



Source: Morningstar, Inc. Data as of 12/31/2016.

Most investors actually pay less than the average asset-weighted expense ratio since investors, or their plan sponsors, have gravitated toward lower-cost target-date series. For instance, industry behemoth Vanguard, which has a series with one of the lowest expense ratios, has over 30% of the market share for target-date mutual funds, whereas many firms have less than 1% market share. The good news for investors is that low-cost target-date series' success in attracting assets has caused peers to lower fees to stay competitive. Exhibit 27 shows the market-share-weighted expense ratio, weighing each series' asset-weighted expense ratio according to its market share.

Exhibit 27 Industry's Market-Share-Weighted Expense Ratio, 2009-16



Source: Morningstar, Inc. Data as of 12/31/2016.

Target-date managers continued to compete on cost, bringing fees lower and lower. In 2016, Schwab launched an index-only target-date fund series that has an asset-weighted average expense ratio of 0.13%, which is on par with Vanguard's asset-weighted average expense ratio. As noted in last year's report, Fidelity and T. Rowe Price—the second- and third-largest target-date managers, respectively—each launched institutional share classes in 2015 with expense ratios below the 2014 average. Fidelity launched a W share of its Freedom Index series priced at 0.10% (after waivers), making it the cheapest target-date fund option. (That series' asset-weighted expense ratio is 0.12%, 1 basis point lower than Vanguard's.) T. Rowe Price wasn't quite as bold with its price cut, but its new I shares, with expense ratios between 0.49% and 0.66%, are cheaper than most. As shown in Exhibit 28, most target-date fund series saw their asset-weighted expense ratios decline in 2016.

Exhibit 28 Target-Date Series' Expense and Market Share

	Weighted Average Expense Ratio %			Market Share %	
Target-Date Series	2016	2015	2016 to 2015 Change (bps)	2016	2015
BlackRock LifePath Smart Beta	0.68	1.01	–0.33	0.02	2.00
JPMorgan SmartRetirement Blend	0.35	0.50	–0.15	0.13	0.12
AllianzGI Retirement	0.70	0.82	–0.12	0.04	0.05
Voya Index Solution	0.73	0.86	–0.12	0.25	0.22
John Hancock Multi–Index Lifetime	0.42	0.53	–0.10	0.11	0.08
John Hancock Multi–Index Preservation	0.41	0.49	–0.08	0.91	0.95
PIMCO RealPath	0.77	0.85	–0.08	0.04	0.07
MFS Lifetime	0.87	0.94	–0.07	0.29	0.27
MassMutual RetireSMART	0.99	1.06	–0.07	0.27	0.29
American Funds Target Date Retirement Series	0.75	0.82	–0.06	6.09	4.56
Principal LifeTime	0.81	0.87	–0.06	2.94	3.34
John Hancock Multimanager Lifetime	0.67	0.72	–0.06	0.83	0.99
Voya Target Retirement	0.73	0.79	–0.06	0.00	0.00
State Street Target Retirement	0.13	0.19	–0.05	0.14	0.03
PNC Target	0.71	0.75	–0.04	0.00	0.00
Nationwide Target Destination	0.76	0.79	–0.04	0.20	0.21
MainStay Retirement	0.86	0.89	–0.03	0.08	0.09
JPMorgan SmartRetirement	0.74	0.77	–0.03	4.96	4.81
Russell LifePoints Target Date	0.80	0.82	–0.02	0.03	0.04
KP Retirement Path	0.45	0.47	–0.02	0.60	0.59
USAA Target Retirement Funds	0.82	0.84	–0.02	0.44	0.49
Vanguard Target Retirement	0.13	0.15	–0.02	31.84	29.46
Great–West SecureFoundation Lifetime	0.71	0.73	–0.02	0.06	0.06
Great–West Lifetime Conservative	0.99	1.00	–0.01	0.08	0.10
Dimensional Target Date Retirement Income	0.26	0.27	–0.01	0.04	0.00
Guidestone Funds MyDestination	1.02	1.03	–0.01	0.27	0.26
Fidelity Freedom Index	0.12	0.14	–0.01	1.94	1.76
Schwab Target	0.69	0.71	–0.01	0.39	0.42
AXA Target Allocation	1.04	1.05	–0.01	0.04	0.05
TIAA–CREF Lifecycle Index	0.18	0.19	–0.01	0.79	0.61

Source: Morningstar, Inc. Data as of 12/31/2016.

Exhibit 28 Target-Date Series' Expense and Market Share (Continued)

	Weighted Average Expense Ratio %			Market Share %	
Target-Date Series	2016	2015	2016 to 2015 Change (bps)	2016	2015
BlackRock LifePath Index	0.17	0.18	–0.01	1.12	0.74
T. Rowe Price Retirement	0.76	0.77	–0.01	16.68	17.24
PIMCO RealPath Blend	0.28	0.29	–0.01	0.00	0.00
Goldman Sachs Target Date Portfolio	0.54	0.55	–0.01	0.03	0.30
Voya Solution	1.10	1.11	–0.01	0.35	0.44
Great–West Lifetime	1.02	1.02	0.00	0.62	0.63
American Century One Choice	0.87	0.88	0.00	1.93	1.92
TIAA–CREF Lifecycle	0.52	0.52	0.00	2.77	2.71
T. Rowe Price Target Retire	0.69	0.70	0.00	0.13	0.11
BlackRock LifePath Dynamic	0.81	0.81	0.00	0.19	0.28
Prudential Day One	0.73	—	—	0.00	—
Schwab Target Index	0.13	—	—	0.01	—
Virtus DFA Trgt Date Retire Inc	0.70	—	—	0.00	—
Harbor Target Retirement	0.71	0.71	0.00	0.02	0.02
ClearTrack	1.19	1.19	0.00	0.06	0.02
Fidelity Advisor Freedom	0.95	0.95	0.00	1.93	2.31
State Farm Lifepath	0.95	0.95	0.00	0.84	0.92
AllianceBernstein Multi–Manager Select	1.08	1.07	0.01	0.06	0.06
Wells Fargo Dynamic Target	0.65	0.64	0.01	0.01	0.01
Fidelity Freedom	0.66	0.64	0.01	18.03	19.73
Manning & Napier Target	1.02	1.01	0.02	0.06	0.08
Invesco Balanced–Risk Retirement	1.16	1.14	0.02	0.03	—
Principal Lifetime Hybrid	0.50	0.47	0.03	0.03	0.01
Franklin LifeSmart	1.12	1.09	0.04	0.06	0.06
Wells Fargo DJ Target	0.54	0.50	0.05	1.07	0.01
Putnam RetirementReady	1.08	1.03	0.06	0.09	0.08
Fidelity Multi-Manager	1.04	0.94	0.10	0.00	0.00
BMO Target Date Retirement Funds	0.77	0.57	0.20	0.05	0.07

Source: Morningstar, Inc. Data as of 12/31/2016.

As many target-date series' expense ratios simply reflect the costs of the underlying components, the fee war within underlying asset classes has benefited target-date fund investors. The race to woo investors with rock-bottom fees heated up again in 2016, as Vanguard's growth allowed it to lower its index funds' prices and BlackRock's iShares unit responded by slashing the fees on its lineup of "core" exchange-traded funds. Not to be outdone, Schwab responded by slashing the expense ratios on its ETFs, so it could still claim to be the lowest-cost ETF provider. Despite these cuts, Fidelity still stakes its claim to offering the cheapest target-date fund series.

Even firms that haven't cut their own fees have benefited from the fee war. Perhaps surprisingly, JPMorgan has been one of those that have benefited the most among target-date fund managers. JPMorgan's SmartRetirement Blend target-date fund series, which uses a mix of third-party passive ETFs and in-house active mutual funds, saw its asset-weighted expense ratio drop by 15 basis points in 2016—the second-largest drop among all target-date series—thanks to the fee cuts from BlackRock's iShares. The JPMorgan SmartRetirement Blend funds invest in three of the "core" iShares ETFs that cut

fees. However, the biggest impact came from swapping out of iShares MSCI Emerging Markets EEM, which charges 0.72%, for iShares Core MSCI Emerging Markets IEMG, which charges just 0.14% while offering similar exposure to emerging markets.

Target-date managers can better serve investors by using cheap options when selecting underlying index funds. There are over 40 large-cap passive options used within target-date funds, ranging from large-value to equally weighted indexes, but most reside in the large-blend Morningstar Category and track the S&P 500. Despite near identical objectives, prices vary. Fees range from cheap—Schwab and State Street both charged 0.03% on their U.S. large-cap index offerings—to simply outrageous—MainStay offers its MainStay S&P 500 Index for 0.35% and T. Rowe Price charges 0.25% for T. Rowe Price Equity Index 500, which has $27 billion in assets. In early 2017, Fidelity slashed fees by 63% on its Fidelity Total Market Index to 0.015% from 0.04%. That fund, used in the Fidelity Freedom Index Series, offers exposure to the broad U.S. market. Fidelity's aggressive pricing move suggests U.S. large-cap index fees have even more room to come down.

Q: Should investors focus on fees when selecting a target-date series?
A: Fees have proved to be a solid predictor of whether a target-date fund will survive, but they have not been as clear a predictor for outperformance due to differences in asset allocation.

Morningstar has analyzed the predictive nature of expenses in other mutual fund categories (the most recent study covering various equity and bond categories is available here) but hadn't examined the target-date fund categories because they had limited performance records. Many target-date funds have now reached track records of at least seven years, making an evaluation on the relationship between fees and future performance reasonable at this time.

The success ratio can be used to gauge the predictive power of fees. The success ratio is Morningstar's way of eliminating survivorship bias. It includes funds that were merged away or liquidated before the end of the period, in this case Dec. 31, 2016. To be considered a success, a target-date fund must have survived through the end of the period and its absolute return must have outperformed the category median.

This study focused on the cheapest share class available from a target-date series, based on the prospectus net expense ratio, of 2020 and 2040 funds at three separate starting points: the beginning of 2007, 2010, and 2012. (The prospectus net expense ratio includes the fees of underlying funds, whereas the annual report net expense ratio doesn't.) Funds were grouped into quintiles based on their starting expense ratio; the funds with the lowest fees placed into the first quintile and the most expensive placed into the fifth quintile. Performance through 2016 was compared with the typical category peer. The average performance rank is based on funds that survived the entire period. Exhibit 29 shows the results, the fee range for each quintile, the number of funds in each quintile at the start of the period, and the number of funds that were obsolete by the end of the period.

Exhibit 29 Success Ratios by Fee Quintiles for 2020 and 2040 Target-Date Funds

2020	Fee range (bps)	Success Ratio %	Total	Obsolete	Average Rank
10-Year					
1	<70	60	5	1	40
2	70–76	40	5	2	50
3	76–85	25	4	1	69
4	85–94	50	4	1	92
5	>94	20	5	3	65
7-Year					
1	<57	57	7	0	38
2	57–71	33	9	3	58
3	71–80	29	7	1	51
4	80–85	43	7	2	51
5	>85	27	11	6	54
5-Year					
1	<52	56	9	0	41
2	52–68	29	7	0	59
3	68–74	44	9	1	51
4	74-84	33	9	3	55
5	>84	33	9	4	47

2040	Fee range (bps)	Success Ratio %	Total	Obsolete	Average Rank
10-Year					
1	<75	100	4	0	22
2	75–81	0	5	3	68
3	81–87	0	4	1	77
4	87–99	50	4	1	35
5	>99	60	5	1	56
7-Year					
1	<65	63	8	0	37
2	65–78	43	7	3	39
3	78-85	13	8	2	67
4	85-96	33	9	4	54
5	>96	33	9	3	54
5-Year					
1	<54	56	9	0	34
2	54-76	50	8	1	55
3	76-79	43	7	2	45
4	79-87	40	10	3	48
5	>87	0	9	4	80

Source: Morningstar, Inc. Data as of 12/31/2016.

Fees appear to be a strong predictor of whether a target-date fund will endure. Over each of the three time periods, the 2020 and 2040 target-date funds in the cheapest quintile had the best odds of both surviving and outperforming their typical peer. Only one target-date fund that ranked in the cheapest quintile failed to survive over the 10-year period, as American Independence NestEgg 2020 ranked as one of the cheapest 2020 target-date fund options in 2007 but was liquidated in 2012. Notably, that fund slipped out of the cheapest quintile when funds were re-ranked based on their beginning of 2010 expense ratios, as cheaper options came to market. In both the five- and seven-year periods, none of the target-date funds that ranked in the cheapest quintile were liquidated or merged away. Survivorship should be important for target-date investors, as these funds are designed to be a one-stop shop for retirement savers and have a multidecade investment horizon.

From a performance perspective, the funds in the cheapest fee quintile generally outperformed the most expensive one, but funds in the middle quintiles posted mixed results. The average rank for funds in the cheapest fee quintile topped the average rank for funds in the most expensive fee quintile for all periods shown in Exhibit 29, with the largest gap of 46 percentage points for 2040 funds over the five-year period. That period also saw the biggest gap in success ratios for 2040 funds. Five of the nine cheapest options were successes, but none of the nine most expensive options succeeded, and four of them vanished by the end of 2016. Still, high fees didn't guarantee lagging results. For instance, each of the four 2040 target-date funds that had the cheapest fees survived and outperformed the typical peer over the 10 year-period, but three of the five most expensive target-date funds did as well.

Earning a spot in the cheapest fee quintile has gotten tougher over the years. At the start of 2007, an expense ratio of less than 0.70% would have earned a 2020 fund a spot in the cheapest quintile. However, five years later, an expense ratio of 0.69% would have been considered just average compared with peers.

Equity exposure may have more predictive power for performance than fees. The John Hancock Multimanager, MFS Lifetime, and Schwab Target series were three of the most expensive 2020 target-date funds available in 2007, but they also had some of the highest equity exposures, ranging from 68% to 76%, compared with the peer group average at the time of 68%. Each of those funds landed in the top half of the peer group over the 10-year period through December 2016. On the other hand, the Wells Fargo Dow Jones Target Date series was one of the cheapest 2020 vintages in 2007, but the series' low exposure to equity—the lowest of peers at 52%—curbed results as equities trounced fixed income over the 10-year period.

The dispersion in equity exposure was tighter for 2040 funds than 2020 funds, but the results were similar. The equity range of 2040 funds available in 2007 ranged from 85% to 98% compared with 52% to 86% for 2020 funds. Still, three of the most expensive series at the time—Putnam RetirementReady, John Hancock Multimanager, and MFS Lifetime—outperformed the typical peer over the trailing 10 years.

Q: How much do asset-allocation differences offset fee differences?
A: It depends on the market environment, but over the past seven years through 2016, a 1-percentage-point additional exposure to equities resulted in 6 basis points of higher return, on average.

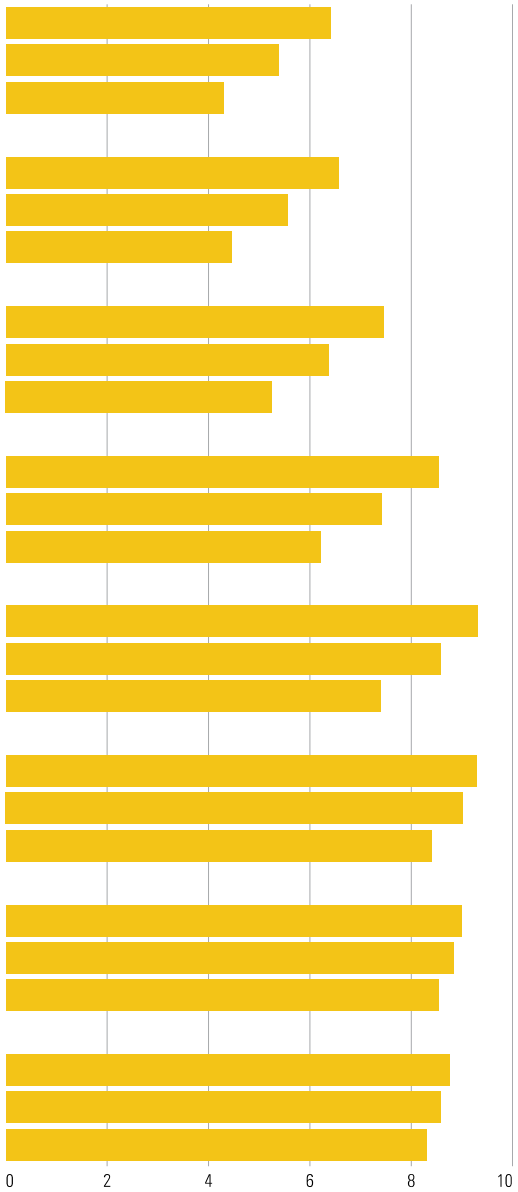
Investors have flocked to low-cost target-date offerings for good reason, as lower fees provide a meaningful head start versus higher-cost competitors. However, target-date funds' asset allocation varies significantly from one another, potentially offsetting any fee advantage. An example attempts to quantify the impact that asset allocation can have on performance.

To isolate the effect of asset allocation on returns, we used the Morningstar Lifetime target-date indexes. The indexes come in three distinct risk profiles: aggressive, moderate, and conservative. They follow the same general philosophy and use the same underlying constituents, allowing asset allocation to explain any difference in performance.

The three series of indexes have posted very different returns. The indexes' inceptions were in 2009, so we evaluated performance for the past seven years. Not surprisingly, the aggressive track has performed the best, followed by the moderate track, and then the conservative track. Exhibit 30 shows the seven-year annualized returns for the even-dated vintages across the index suite. In three out of seven instances, the aggressive version outperformed the conservative version by more than 2 percentage points annually.

Exhibit 30 Seven-Year Performance Comparison of Morningstar Lifetime Allocation Indexes

Morningstar Lifetime Allocation Indexes	Return % (Annualized)
Aggressive Income	6.40
Moderate Income	5.39
Conservative Income	4.30
Aggressive 2000	6.57
Moderate 2000	5.56
Conservative 2000	4.46
Aggressive 2010	7.45
Moderate 2010	6.36
Conservative 2010	5.25
Aggressive 2020	8.54
Moderate 2020	7.41
Conservative 2020	6.21
Aggressive 2030	9.31
Moderate 2030	8.58
Conservative 2030	7.39
Aggressive 2040	9.28
Moderate 2040	9.02
Conservative 2040	8.40
Aggressive 2050	8.99
Moderate 2050	8.84
Conservative 2050	8.53
Aggressive 2060	8.75
Moderate 2060	8.58
Conservative 2060	8.30



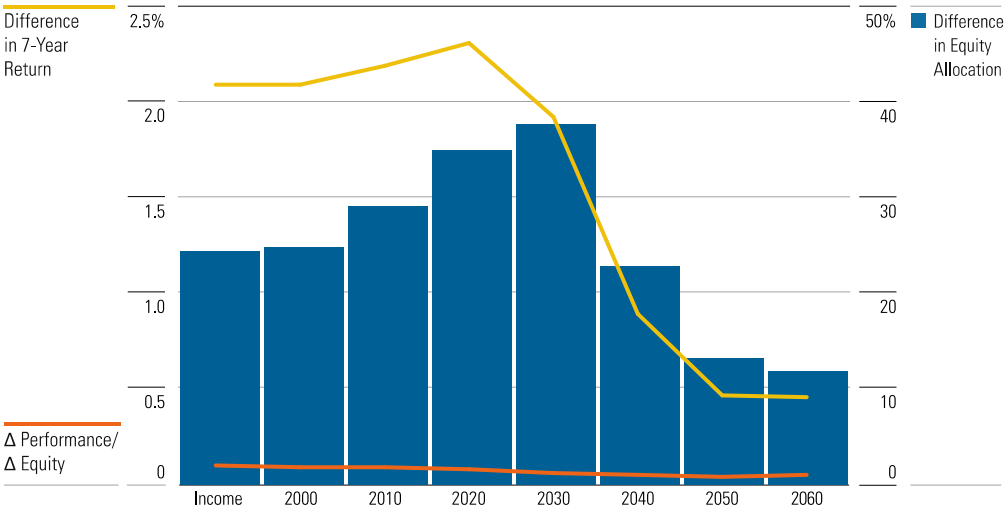
Source: Morningstar, Inc. Data as of 12/31/2016.

To quantify the impact that a greater equity allocation can have on performance, we compared the returns and stock allocations of the aggressive and conservative index series, as shown in Exhibit 31. On average, during the past seven years, a 1-percentage-point increase in equities coincided with a 0.06% annualized improvement in performance. This implies that an additional 10, 20, and 30 percentage points in equities would have, on average, increased returns by 0.60%, 1.20%, and 1.80%, respectively. This difference in performance can quickly make up for a difference in fees. To put it into context, the

cheapest target-date fund costs 0.08%, whereas the most expensive target-date fund, excluding A, B, and C shares, charges 1.66%.

The three series of indexes have similar, though not identical, sub-asset-class mixes within equities and bonds. Therefore, the overall stock/bond split does not explain all of the difference in performance, but it explains the majority of it.

Exhibit 31 Differences in Seven-Year Returns and Equity Allocations: Morningstar Lifetime Aggressive and Conservative Indexes



Source: Morningstar, Inc. Data as of 12/31/2016.

The example in Exhibit 31 is relevant, because it is common to see target-date series with 20-percentage-point differences in equity allocation at various points in the glide path. In fact, at any given age, the difference in equity allocation between the most conservative and the most aggressive target-date series is between 35 and 55 percentage points.

As evidenced by this study, asset allocation sometimes trumps expenses. It is imperative that investors keep asset mix, as well as fees, front-and-center when selecting a target-date series. Of course, the challenge is predicting what asset allocation will generate superior returns in the future. Typically, greater equity exposure will lead to stronger returns because stocks outperform bonds over long time periods. More stock exposure will also usually lead to higher volatility, though, so investors must identify an asset mix that they can tolerate.

The Evolution of Target-Date Funds

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Target-date funds may be intended as long-term investments for the set-it-and-forget-it investor, but that hardly means the investment processes behind the funds have stood still. In fact, the strategies have changed markedly over the past decade, generally becoming more equity heavy and often venturing into more esoteric and specialized asset classes. This section explores how target-date managers have altered their approaches, as well as how their various glide paths compare with one another.

Asset-Allocation Glide Paths

- How have equity glide paths changed over time?
- How has the industry average sub-asset-class glide path changed in recent years?
- Do active and passive series have similar exposure to subasset classes?
- Have target-date series converged to consensus exposure to subasset classes?

Asset Classes Used in Target-Date Funds

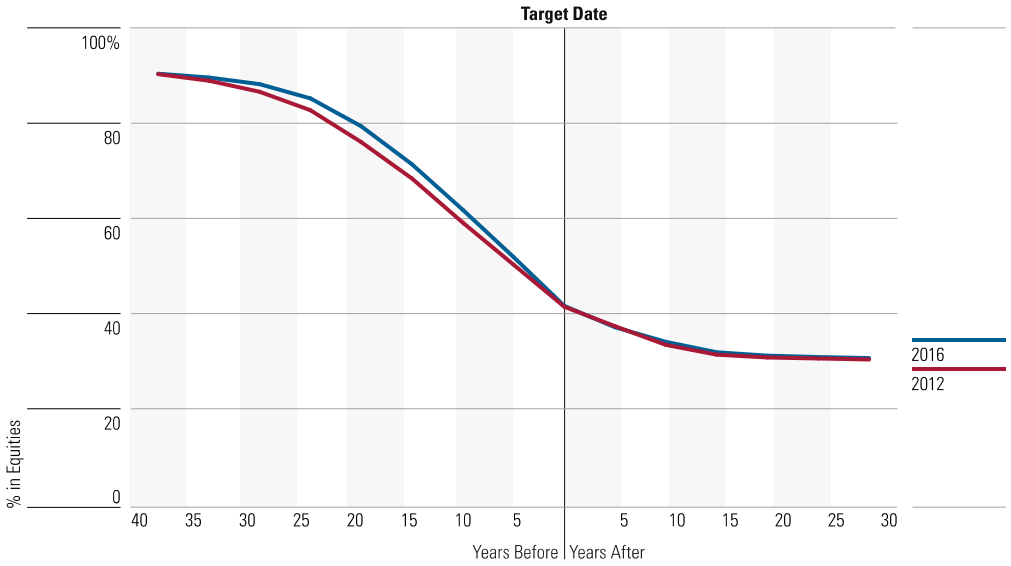
- Are alternatives gaining traction within target-date funds?
- How are target-date managers using other niche asset classes?
- Are any new asset classes cropping up in target-date funds?

Q: How have equity glide paths changed over time?

A: The average strategic equity glide path has not changed much over the past five years, but it held slightly more in stocks for midcareer investors at the end of 2016.

Generally, firms haven't drastically altered equity glide paths in recent years, but when they do, they usually increase exposure to equities. Exhibit 32 illustrates how the average equity glide path—based on strategic targets, not actual holdings—compared from 2012 to 2016. It includes new entrants to the space and excludes those that have been shuttered. The biggest change—3.3 percentage points—occurred 20 years before an investor reaches the target date. The average glide path remained relatively unchanged for the youngest investors and those in the retirement phase.

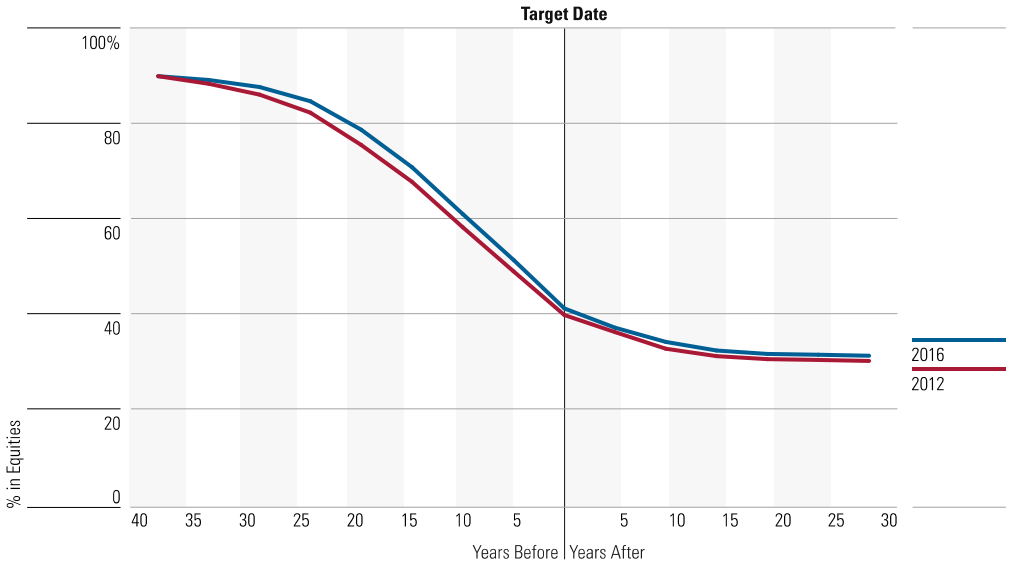
Exhibit 32 Average Strategic Equity Glide Path: 2012 vs. 2016



Source: Morningstar, Inc. Data as of 12/31/2016.

In an effort to focus on how firms are changing their glide paths, Exhibit 33 only includes series that existed from 2012 to 2016, eliminating those that joined the fray after 2012 and those that failed to survive until the end of 2016. This shows the same general trend of higher equity exposure, particularly from those 10 to 20 years before their target-retirement date.

Exhibit 33 Average Strategic Equity Glide Path of Series That Have Existed for Five Years: 2012 vs. 2016



Source: Morningstar, Inc. Data as of 12/31/2016.

The modest change in the average equity glide path from 2012 to 2016 doesn't mean that individual target-date series didn't undergo significant change over that time. Exhibit 34 shows the maximum change in strategic equity exposure for each target-date series that existed from 2012 through 2016, grouping them by the amount of change. For instance, the PIMCO RealPath series saw as much as a 21-percentage-point change in equity exposure at some point along the glide path, whereas the American Century One Choice series changed by less than 2 percentage points over that time.

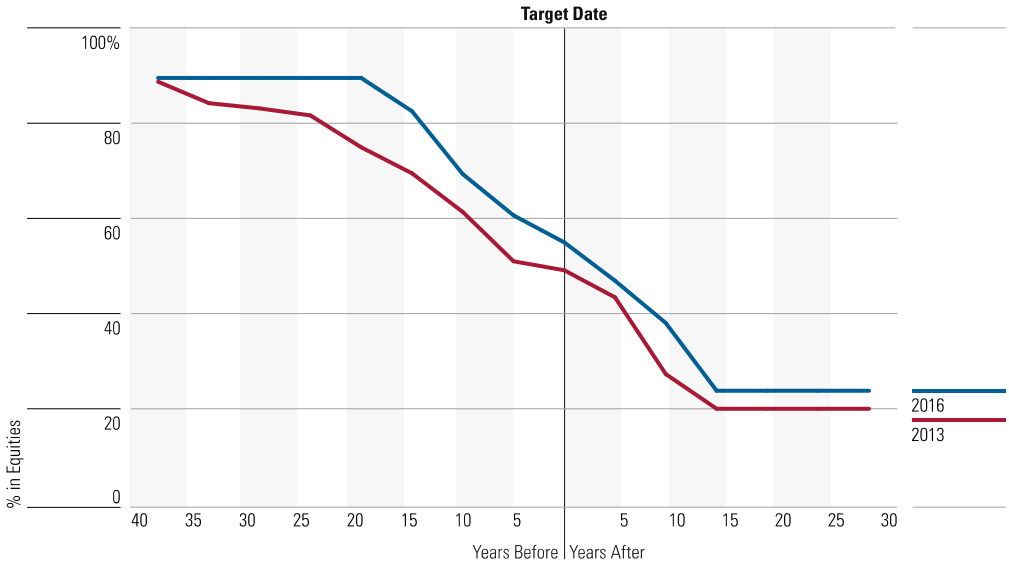
Exhibit 34 Maximum Five-Year Change in Strategic Equity Exposure by Series, 2012-16

Percentage-Point Change	Target-Date Series Name	Maximum Five-Year Change in Equity Exposure 2012-16
20 or greater	AllianzGI Retirement	35.0
	Franklin LifeSmart	22.5
	PIMCO RealPath	21.0
	State Farm Lifepath	21.0
	Russell LifePoints Target Date	20.0
15–19.99	BlackRock LifePath Dynamic	19.9
	BlackRock LifePath Smart Beta	19.9
	BlackRock LifePath Index	19.9
	Nationwide Target Destination	18.2
	Guidestone Funds MyDestination	17.0
	Fidelity Advisor Freedom	15.0
	Fidelity Freedom Index	15.0
	Fidelity Freedom	15.0
	PNC Target	15.0
10–14.99	Principal LifeTime	14.0
	USAA TARGET RETIREMENT FUNDS	13.0
	Invesco Balanced-Risk Retirement	12.4
	MainStay Retirement	10.0
5–9.99	Putnam RetirementReady	8.0
	American Funds Trgt Date Rtrmt	6.8
	AXA Target Allocation	6.0
	Wells Fargo DJ Target	6.0
	T. Rowe Price Retirement	5.5
	TIAA-CREF Lifecycle Index	5.0
	TIAA-CREF Lifecycle	5.0
Less Than 5	John Hancock Multi-Index Preservation	4.5
	Vanguard Target Retirement	4.3
	John Hancock Multimanager Lifetime	4.0
	MassMutual RetireSMART	3.3
	Great-West Lifetime Conservative	3.1
	Great-West Lifetime	3.0
	JPMorgan SmartRetirement Blend	3.0
	JPMorgan SmartRetirement	3.0
	Voya Solution	2.1
	Great-West SecureFoundation Lifetime	2.0
	Manning & Napier Target	2.0
	MFS Lifetime	2.0
	Schwab Target	2.0
	Voya Index Solution	2.0
	American Century One Choice	1.3
	Harbor Target Retirement	0.0

Source: Morningstar, Inc. Data as of 12/31/2016.

Glide-path changes may occur gradually over time, but they may also come in one fell swoop. For example, Fidelity announced in 2013 that equities would be taking a much more prominent role in its target-date series. Exhibit 35 shows how the strategic glide path for the Fidelity Freedom series changed from the end of 2013 to the end of 2016. The biggest change—roughly 15 percentage points—occurred 20 years before the target date, contributing to the rise in equity exposure in the aforementioned average glide paths at that point.

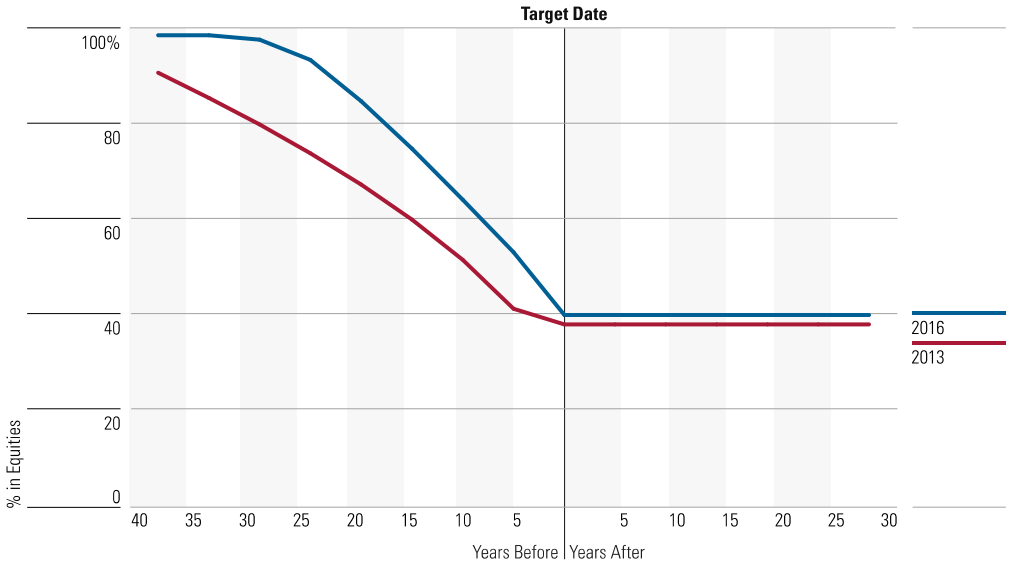
Exhibit 35 Change in the Fidelity Freedom Strategic Equity Glide Path, 2013 vs. 2016



Source: Morningstar, Inc. Data as of 12/31/2016.

Similarly, BlackRock ramped up exposure to equities in 2014. Exhibit 36 shows how the glide path for the BlackRock LifePath Index series changed from 2013 to 2016. Investors in the retirement phase didn't see dramatic change, as the equity exposure only increased 2 percentage points, to 40% from 38%. However, younger investors saw a significant increase in the equity stake, by as much as 20 percentage points for investors 25 years from their target-retirement dates.

Exhibit 36 Change in the BlackRock LifePath Index Strategic Equity Glide Path, 2013 vs. 2016



Source: Morningstar, Inc. Data as of 12/31/2016.

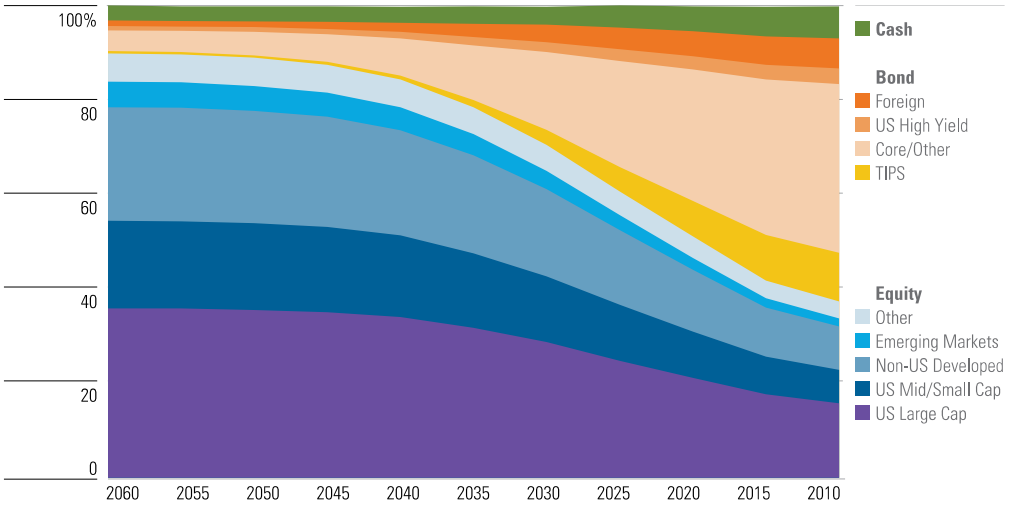
Q: How has the industry average sub-asset-class glide path changed in recent years?

A: Similar to the strategic equity glide path, there haven't been sizable changes in exposures in recent years. However, funds' exposure to equities has generally increased, particularly in the funds designed for investors approaching their target date.

A look at the target-date funds' security-level holdings data confirms that target-date funds' equity exposure has increased in recent years. Morningstar's 2015 Target-Date Fund Landscape report introduced the industry average sub-asset-class glide path. This year's glide path, shown in Exhibit 37, was constructed using the observations of 49 target-date series. Series that tend to make heavy use of derivatives were excluded, as their sub-asset-class allocations don't accurately reflect their exposures. Other series were omitted because of incomplete or inaccurate holdings. (Exhibit 38 shows the target-date series that were included and excluded from the industry average sub-asset-class glide path.)

The industry average sub-asset-class glide path incorporates 11 observations for each series, ranging from the 2060 to the 2010 vintages. If a series did not offer a 2060 vintage, the 2055 allocation extended to the 2060 vintage. If a series did not have a 2015 or 2010 fund, the series' retirement fund stretched to those vintages. For series that only offer vintages in 10-year increments, midpoints between the existing funds were used as extrapolated observations. The result is a collection of more than 5,000 data points to calculate the industry average sub-asset-class glide path.

Exhibit 37 Industry Average Sub-Asset-Class Glide Path



											Equity
35.9	35.9	35.6	35.1	34.1	31.8	28.8	24.8	21.2	17.7	15.8	US Large Cap
18.6	18.5	18.4	18.1	17.3	15.8	13.9	11.9	9.8	8.0	7.1	US Mid/Small Cap
24.1	24.1	23.8	23.4	22.3	20.8	18.5	15.8	13.1	10.4	9.2	Non-US Developed
5.4	5.4	5.3	5.1	4.9	4.5	3.9	3.2	2.5	2.0	1.7	Emerging Markets
6.0	5.9	6.0	5.9	5.9	5.7	5.5	5.0	4.6	3.7	3.6	Other
											Bond
0.5	0.5	0.5	0.6	0.8	1.5	3.2	5.2	7.5	9.7	10.3	TIPS
4.4	4.5	5.0	5.9	7.9	11.6	16.5	22.5	27.9	33.0	35.8	Core/Other Bond
0.9	0.9	1.0	1.1	1.4	1.8	2.1	2.5	2.8	3.1	3.3	US High Yield
1.2	1.2	1.2	1.5	1.9	2.8	3.7	4.6	5.3	6.0	6.4	Foreign Bond
3.2	3.1	3.2	3.3	3.4	3.7	3.8	4.7	5.3	6.3	6.8	Cash

Source: Morningstar, Inc. Data as of 12/31/2016.

Exhibit 38 Sub-Asset-Class Glide-Path Constituents and Exclusions

Constituents		Exclusions
AllianceBernstein Multi-Manager Select	MainStay Retirement	AllianzGI Retirement
American Century One Choice	Manning & Napier Target	BlackRock LifePath Dynamic
American Funds Trgt Date Rtrmt	MFS Lifetime	Franklin LifeSmart
AXA Target Allocation	Nationwide Target Destination	Invesco Balanced-Risk Retirement
BlackRock LifePath Index	PNC Target	MassMutual RetireSMART
BlackRock LifePath Smart Beta	Principal LifeTime	PIMCO RealPath Blend
BMO Target Date Retirement Funds	Principal Lifetime Hybrid	PIMCO RealPath
ClearTrack	Russell LifePoints Target Date	Prudential Day One
Dimensional Target Date Retirement Income	Schwab Target	Putnam RetirementReady
Fidelity Advisor Freedom	Schwab Target Index	
Fidelity Freedom	State Farm Lifepath	
Fidelity Freedom Index	State Street Target Retirement	
Fidelity Multi-Manager	T. Rowe Price Retirement	
Goldman Sachs Target Date Portfolio	T. Rowe Price Target Retire	
Great-West Lifetime	TIAA-CREF Lifecycle	
Great-West Lifetime Conservative	TIAA-CREF Lifecycle Index	
Great-West SecureFoundation Lifetime	USAA Target Retirement	
Guidestone Funds MyDestination	Vanguard Target Retirement	
Harbor Target Retirement	Virtus DFA Trgt Date Retire Inc	
John Hancock Multi-Index Lifetime	Voya Index Solution	
John Hancock Multi-Index Preservation	Voya Solution	
John Hancock Multimanager Lifetime	Voya Target Retirement	
JPMorgan SmartRetirement	Wells Fargo DJ Target	
JPMorgan SmartRetirement Blend	Wells Fargo Dynamic Target	
KP Retirement Path		

Source: Morningstar, Inc. Data as of 12/31/2016.

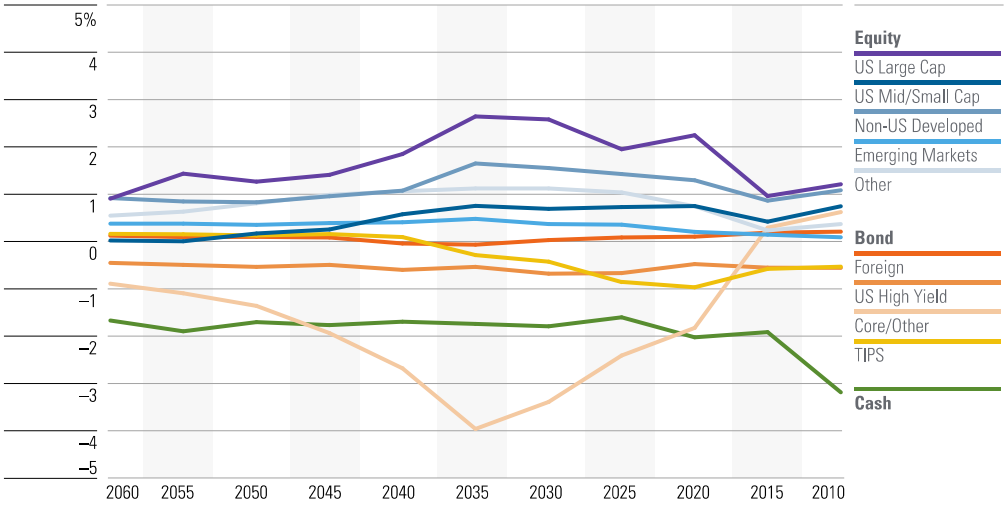
In examining the change in the industry average sub-asset-class glide path over time, it appears that target-date funds have not changed dramatically, on average, over the past five years. This provides investors some level of confidence that the strategy selected today may not change dramatically over time. However, the allocation to equity has crept higher across all points along the glide path.

To capture changes in sub-asset-class exposures, a peer group was constructed of series that existed in 2012 and were still around at the end of 2016. These series must also have had five years of uninterrupted portfolio data that accurately reflected the sub-asset-class exposures. Then, the 2012 and 2016 industry average asset allocation was compared by shifting the portfolios five years to align investment horizons. Exhibit 39 shows the 2016 average glide path compared with the same strategies in 2012. Lines above zero indicate increased exposure in 2016 from 2012, whereas lines below zero indicate a decline over that time. The 2016 equity exposures were higher across the board at the expense of bonds and cash in varying percentages. Exhibit 40 shows the aggregated increase in equity exposure.

The increase in equity exposure peaked with 2016 glide path's 2035 portfolio. Target-date managers have more flexibility allocating between stocks and bonds at this point on the glide path. 2055 funds typically start with more than 80% stocks, and many have more than 90%, so there is not much room to

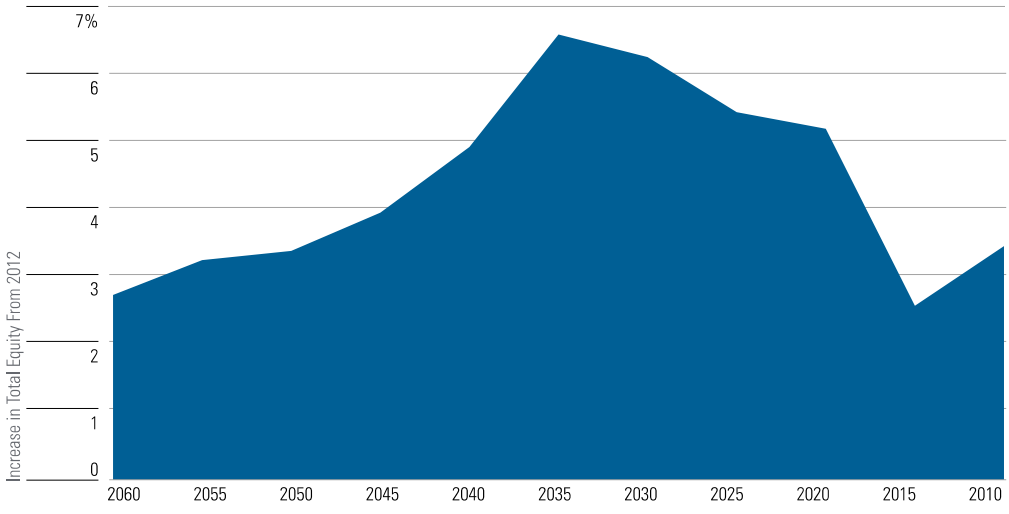
add more equity exposure. Past year 2020, capital preservation is paramount, and many managers may be reluctant to increase equity exposure. These constraints leave the middle years as the most amenable toward increased equity exposure in search of higher long-term returns, which is supported by Exhibit 40.

Exhibit 39 Changes in Industry Average Sub-Asset-Class Glide Path, 2012 vs. 2016



Source: Morningstar, Inc. Data as of 12/31/2016.

Exhibit 40 Aggregate Change in Total Equity Exposure by Vintage, 2012 vs. 2016



Source: Morningstar, Inc. Data as of 12/31/2016.

Q: Do active and passive series have similar exposure to subasset classes?

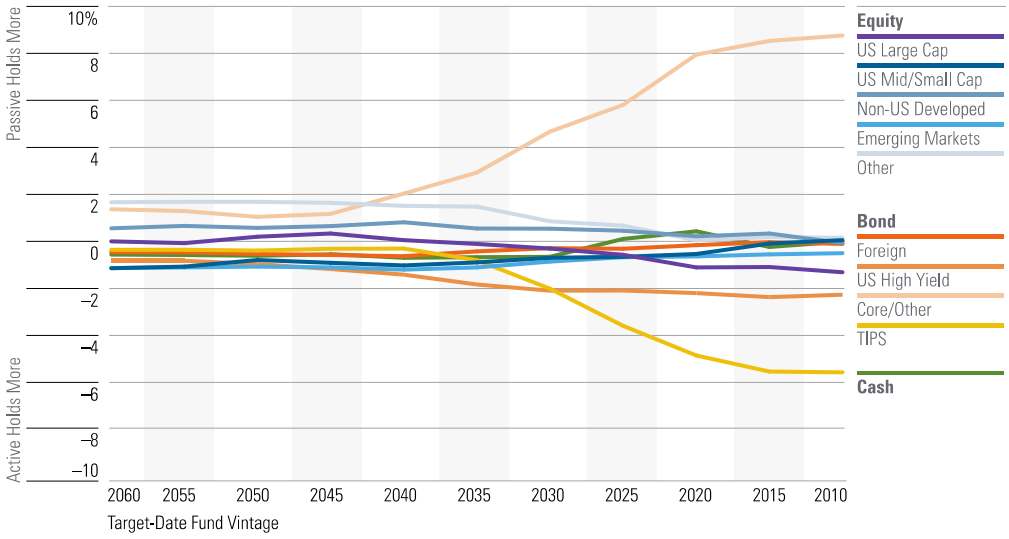
A: While not drastically different from one another, passive target-date series generally have notably lighter stakes in high-yield bonds and Treasury Inflation-Protected Securities than their active peers, particularly near the target date.

There are a couple of notable differences when comparing sub-asset-class exposures of active and passive target-date series. Exhibit 41 shows that series that invest passively, on average, tend to put more assets in core/other bond than their active peers, particularly near or into the retirement phase. This relative overweighting comes at the expense of high-yield bonds and TIPS.

The limited availability of index funds in certain asset classes may prevent target-date managers from gaining exposure. For instance, only 3.5% of funds in the high-yield bond Morningstar Category are index funds, suggesting that managers of passive target-date series may have trouble finding a viable option to gain exposure to the asset class. (All the passively managed options for high-yield bonds are ETFs.) Passively managing high-yield bonds is fraught with issues. The indexes are often market-cap-weighted and stick to the most liquid bond issues, which immediately constrains the opportunity set relative to active bond managers. As a result of the complication in gaining passive exposure to high-yield bonds, many target-date managers have opted to forgo the asset class altogether, instead allocating more to core bonds.

A similar story of limited options holds true for TIPS. Only 11.9% of funds in the inflation-protected bond Morningstar Category are labeled as index funds. Fidelity, Northern Trust, Vanguard, BlackRock, PIMCO, Schwab, and State Street offer passively managed inflation-protected bond funds that could be used as in-house target-date options.

Exhibit 41 Differences in Average Sub-Asset-Class Glide Path, Active vs. Passive



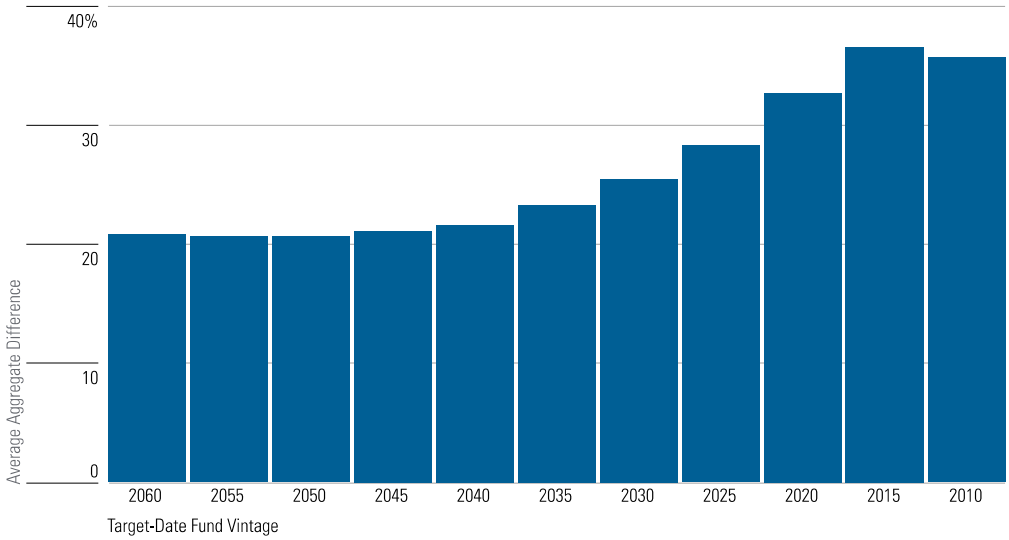
Source: Morningstar, Inc. Data as of 12/31/2016.

Q: Have target-date series converged to consensus exposure to subasset classes?

A: Target-date funds designed for investors of the same age can still look very different from one another, even when both are "passive" series. 2015 funds showed the greatest dispersion from the industry average.

The industry average sub-asset-class glide path gives investors a general sense of exposures, but target-date series deviate from that norm, often meaningfully. Target-date funds aimed at the youngest investors are the most similar with one another, but the dispersion of exposures widens as the investor approaches retirement. The sums of the absolute value of differences relative to the industry average for each vintage capture this trend. For example, if a series' 2050 fund's exposure to Foreign was 2 percentage points higher than the norm and its exposure to Emerging Markets Equity was 4 percentage points below the norm, those deviations would combine to contribute 6 points to the difference score. Exhibit 42 shows how the difference scores increase as funds near retirement and, even at their lowest, are substantial.

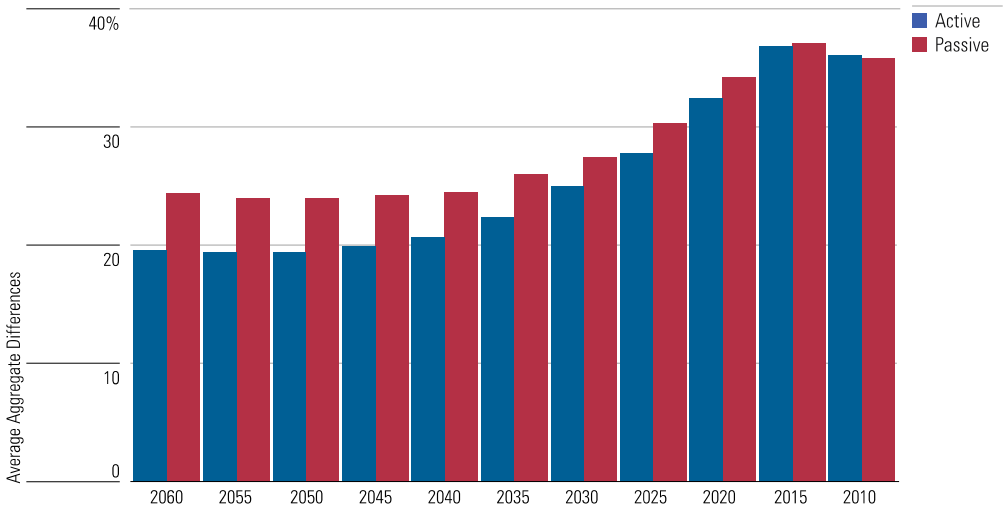
Exhibit 42 Aggregate Differences From Industry Average Sub-Asset-Class Glide Path, by Target Date



Source: Morningstar, Inc. Data as of 12/31/2016.

Interestingly, passive target-date series tend to differ more from one another than active ones. Exhibit 43 shows the average aggregate difference of active and passive target-date series compared with their respective industry averages. Consistent with the broad finding, the difference from the norm rises as funds near the retirement phase.

Exhibit 43 Aggregate Difference From Industry Average Sub-Asset-Class Glide Path for Active and Passive Target-Date Series, by Target Date

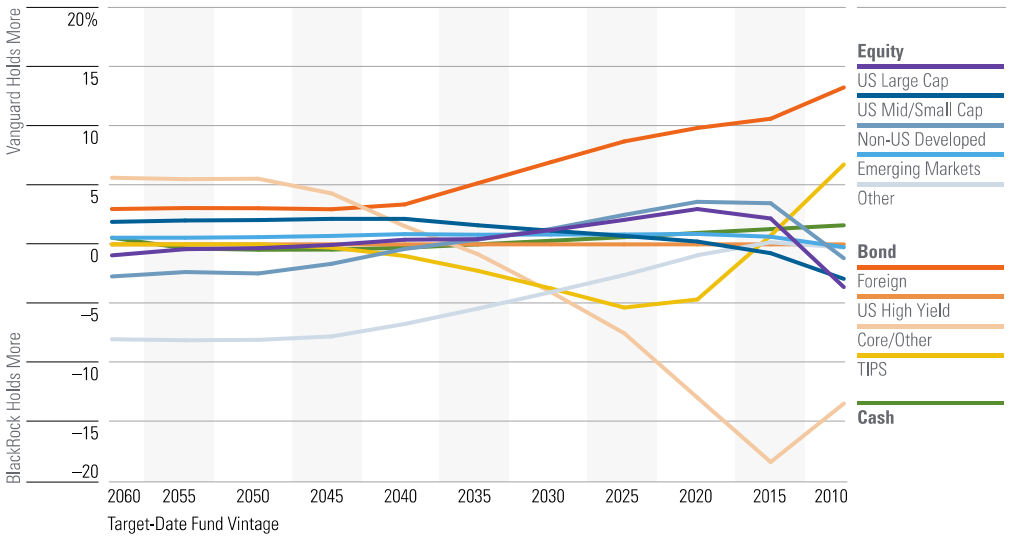


Source: Morningstar, Inc. Data as of 12/31/2016.

A comparison of two prominent passive target-date series supports the notion that even passive target-date series can be significantly different from one another. The Vanguard Target Retirement and BlackRock LifePath Index series both invest exclusively in passively managed strategies. (Both also receive Morningstar Analyst Ratings of Gold.) Despite their "passive" approach, these series look markedly different from one another.

A comparison of their sub-asset-class glide paths captures the differences. Exhibit 44 shows how the sub-asset-class exposures of the Vanguard Target Retirement series vary from the exposures of the BlackRock LifePath Index series. (Using Vanguard as the baseline portfolio would simply result in the inverse of the chart displayed.) It shows that the Vanguard series has notably less in Other Equity than the BlackRock series, particularly early on in the glide path. This is result of BlackRock's sizable, dedicated exposure to global REITs, whereas Vanguard gains its exposure to REITs via broad stock market index funds. Further down the glide path, Vanguard stands out with much more exposure—at least 5 percentage points higher—to Foreign Bonds and TIPS than BlackRock. Among all mutual fund peers, Vanguard's 17% stake in Foreign Bond in 2015 fund stands out as the highest.

Exhibit 44 Sub-Asset-Class Glide-Path Comparison: Vanguard Target Retirement vs. BlackRock LifePath Index



Source: Morningstar, Inc. Data as of 12/31/2016.

A wide look across the entire target-date fund landscape reveals that some series veer significantly from the norm and others stay close to it. An average difference score was calculated for each target-date series relative to their respective active or passive industry average sub-asset-class glide path. The score reflects the series' average absolute value of the difference to the industry average for each subasset class. While the numerical values of scores do not specify in which vintages or which asset classes the differences occur, they allow investors to get a general sense of the degree in which a target-date series stands out from the norm. Exhibit 45 and Exhibit 46 highlight the most- and least-distinctive target-date series compared with the industry average sub-asset-class glide path for active series and passive series, respectively.

Exhibit 45 The Highest and Lowest Average Sub-Asset-Class Difference Scores for Active Series

Series Name	Average Difference
Virtus DFA Trgt Date Retire Inc	6.64
Dimensional Target Date Retirement Income	6.00
Harbor Target Retirement	4.57
BlackRock LifePath Smart Beta	4.20
Manning & Napier Target	3.79
Principal LifeTime	1.79
JPMorgan SmartRetirement Blend	1.71
John Hancock Multimanager Lifetime	1.67
TIAA-CREF Lifecycle	1.63
Guidestone Funds MyDestination	1.56

Source: Morningstar, Inc. Data as of 12/31/2016.

Exhibit 46 The Highest and Lowest Average Sub-Asset-Class Difference Scores for Passive Series

Series Name	Average Difference
Nationwide Target Destination	5.02
Wells Fargo DJ Target	4.66
John Hancock Multi-Index Preservation	4.15
Great-West SecureFoundation Lifetime	3.35
ClearTrack	3.30
BlackRock LifePath Index	2.27
TIAA-CREF Lifecycle Index	2.25
John Hancock Multi-Index Lifetime	2.03
State Farm Lifepath	1.90
Schwab Target Index	1.74

Source: Morningstar, Inc. Data as of 12/31/2016.

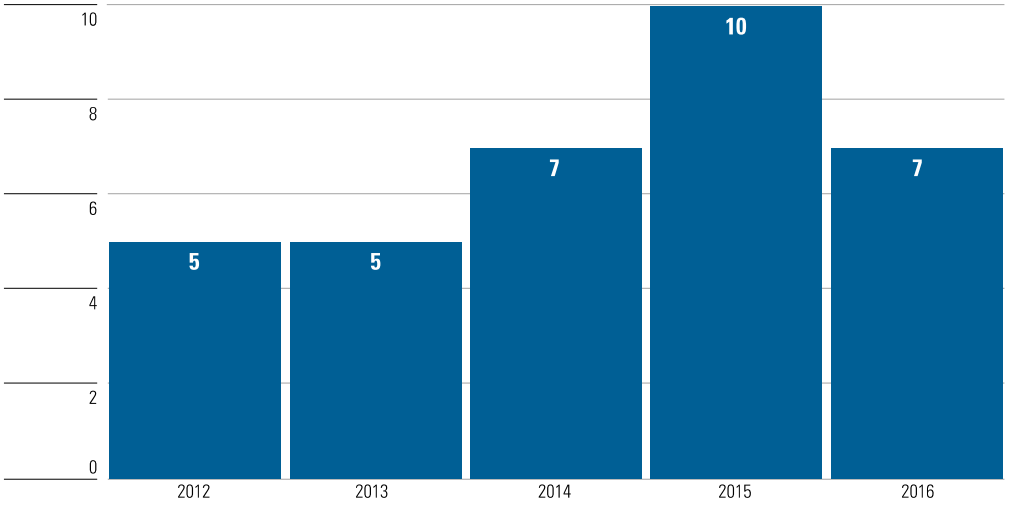
(Appendix 2 shows how the sub-asset-class exposures of series that receive a Morningstar Analyst Rating compared with the industry average as of Dec. 31, 2016. Lines above zero indicate that the series held more in that subasset class than the industry average, whereas lines below zero indicate that the series held less.)

Q: Are alternatives gaining traction within target-date funds?

A: Alternative funds have made only minimal headway into target-date funds. Their generally high fees make them a hard sell for the fee-sensitive target-date fund space.

Alternative funds have turned up in some target-date series, but not many. The main appeal of alternatives funds is often the potential of a smoother ride for investors, as alternative funds tend to have a low correlation to traditional equity and fixed-income funds. However, very few target-date fund managers have opted to invest in funds that fall into one of the seven alternative Morningstar Categories. Exhibit 47 displays the number of target-date series that held an alternative fund each of the past five years. The number fell to seven from 10 over the past year, as the Allianz Retirement, BlackRock LifePath Smart Beta, and PIMCO RealPath series each dropped their underlying alternative fund from their lineup. Furthermore, when target-date managers have used alternatives, they have generally held modest positions. Exhibit 48 shows which target-date series have held a fund in at least one of the seven Morningstar Categories for alternative funds, the market share of those series, and the position size over the past five years.

Exhibit 47 Number of Target-Date Series Holding an Alternative Fund, 2012-16



Source: Morningstar, Inc. Data as of 12/31/2016.

Exhibit 48 Target-Date Series' Alternatives Exposure by Morningstar Category, 2012-16

		Percent Market Share	2012	2013	2014	2015	2016
Long-Short Credit	BlackRock LifePath Smart Beta *BlackRock Global Long/Short Credit Instl*	0.0	0.0	4.5	3.2	3.2	0.0
	Franklin LifeSmart Series *Franklin K2 Long Short Credit R6*	0.1	0.0	0.0	0.0	0.0	2.4
Long-Short Equity	AllianceBernstein Multi-Manager Select S *AQR Long-Short Equity R6*	0.1	—	—	0.0	3.3	5.4
	AllianzGI Retirement Series *PIMCO EqS Long/Short Institutional*	0.0	0.0	0.0	0.0	1.8	0.0
Managed Futures	PIMCO RealPathTM Series *PIMCO TRENDS Managed Futures Strat Instl*	0.0	0.0	0.0	3.3	4.7	0.0
Market Neutral	BlackRock LifePath Smart Beta *BlackRock Emerging Mkt L/S Eq Instl* *BlackRock Global Long/Short Equity Instl*	0.0	0.0	0.0	6.2	8.0	0.0
	DWS LifeCompass Series *Deutsche Diversified Market Netrl Instl*	—	1.3	1.1	1.3	—	—
	Wells Fargo Dynamic Target Ser *Calamos Market Neutral Income I*	0.0	—	—	—	5.0	5.0
Multialternative	AllianceBernstein Multi-Manager Select S *AQR Style Premia Alternative R6*	0.1	—	—	0.0	1.2	1.8
	BMO Target Date Retirement Funds *BMO Alternative Strategies I*	0.0	0.0	0.0	0.0	4.0	6.9
	Franklin LifeSmart Series *Franklin K2 Alternative Strategies R6*	0.1	0.0	0.0	3.2	6.3	2.4
	John Hancock Multimanager Lifetime S *JHancock Global Absolute Ret Strats NAV*	0.8	1.1	1.1	1.0	2.1	2.1
	Principal LifeTime Series *Principal Global Multi-Strategy Instl*	2.7	1.2	2.3	2.5	2.9	2.8
	Putnam RetirementReady Series *Putnam Absolute Return 500* *Putnam Absolute Return 700*	0.1	21.1	20.8	20.8	20.5	23.3
Multicurrency	John Hancock Multimanager Lifetime S *JHancock Absolute Return Currency NAV*	0.8	2.1	2.1	2.1	1.4	1.4
Option Writing	AllianzGI Retirement Series *AllianzGI Structured Return Instl*	0.0	0.0	0.0	0.0	1.8	0.0
	John Hancock Multimanager Lifetime S *JHancock Redwood NAV*	0.8	1.0	0.9	0.9	0.9	0.8

Source: Morningstar, Inc. Data as of 12/31/2016.

Notably, most of the target-date managers that have allocated to alternative funds are relatively small players in the space. Exhibit 48 shows that Principal LifeTime is the largest series that holds an alternative fund, and that series had just 2.7% of the target-date mutual fund market share at the end of 2016. None of the other series with an alternative fund had more than 1.0% of the market share at that time. Target-date behemoths, such as Vanguard, Fidelity, and T. Rowe Price, have not ventured into alternatives within their target-date funds, suggesting that smaller players may use alternatives to differentiate their series. Also, target-date managers tend to only add positions to alternatives if they run

a strategy in-house. Of the seven series with alternatives exposure, only two use outside strategies-—AllianceBernstein Multi-Manager Select and Wells Fargo Dynamic.

The multialternative category has been the most popular alternative category for target-date managers. That category is the most diverse of the alternative categories, encompassing funds that invest in a variety of strategies such as hedge fund strategies, global macro funds, and event-driven strategies. It is also the largest of the seven categories in terms of assets, as it represented 32% of the liquid alternatives market as of December 2016. Six target-date series have held positions in the multialternative category over the past five years. The Putnam RetirementReady series has had the largest allocation to alternatives and was one of the first target-date series to allocate to multialternative strategies in 2009 when it added the firm's two Absolute Return funds to the underlying mix. The series has built up the position in those two funds over the past five years; 23.3% of series' assets were in the funds as of December 2016.

The high fees associated with alternatives have likely hindered their adoption by target-date managers. Generally, alternative funds come with a higher price tag when compared with their more traditional equity and fixed-income counterparts. Exhibit 49 shows the median expense ratio for the institutional share class of a liquid alternative investment relative to its traditional fixed-income or equity category. In some cases, the cost of an alternative investment more than doubles the traditional option. As highlighted in other sections of this report, target-date managers have become very fee conscious to compete in the space, contributing to alternatives funds' lack of popularity.

Exhibit 49 Median Expense Ratio, by Morningstar Category

Category	Median Expense Ratio (%)
Long-Short Credit	1.38
Multisector Bond	0.74
Long-Short Equity	1.75
Option-Writing	1.25
Large Blend	0.74
Multialternative	1.50
Target-Date Fund	**0.71**

Source: Morningstar, Inc. Data as of 12/31/2016.

Q: How are target-date managers using other niche asset classes?

A: Amid a long stretch of negative returns, some target-date managers have backed away from commodities, whereas others have stayed the course. Meanwhile, emerging-markets debt remains on the fringe, with some managers wading into local-currency options.

Some asset classes are widely held by target-date managers, but others remain less common. Even when target-date series don't have underlying funds dedicated to a specific asset class, they may gain exposure to that asset class via a broad fund. However, some asset classes are rarely found in broad funds, meaning target-date series likely do not have exposure unless they have included a dedicated

underlying fund. Exhibit 50 shows the percentage of target-date series that have dedicated fund exposure to three unconventional asset classes.

Exhibit 50 Percentage of Target-Date Series With Underlying Holdings, by Morningstar Category

Category	2012	2013	2014	2015	2016
Commodities	35	37	40	41	34
Emerging-Markets Debt	23	30	28	32	24
Emerging-Markets Debt–Local Currency	4	6	5	9	10

Source: Morningstar, Inc. Data as of 12/31/2016.

Commodities have played a role in target-date funds for some time. Target-date managers began allocating to them as early as 2005, often citing commodities' low correlation to stocks and bonds and inflation hedge as reasons to add them to the mix. While less than half of target-date series hold a commodities fund, the percentage of target-date series that hold a fund in the commodities broad basket Morningstar Category has held fairly steady over the past five years, ranging from 34% to 41%.

Target-date managers' use of commodities has changed over time. Exhibit 51 shows the exposure to underlying holdings in the commodities broad basket Morningstar Category throughout the past five years. In many cases, a target-date series' holding in commodities funds has decreased, despite more managers adding exposure through 2015.

Exhibit 51 Target-Date Series' Exposure to Underlying Funds in the Commodities Broad Basket Morningstar Category, 2012-16

Series Name	2012	2013	2014	2015	2016
AllianceBernstein Multi-Manager Select	—	—	0.0	0.9	3.0
AllianzGI Retirement	6.3	4.3	5.7	0.0	0.0
BlackRock LifePath Dynamic	4.8	3.5	3.2	2.4	3.9
BlackRock LifePath Smart Beta	1.8	1.2	3.3	3.6	0.0
BMO Target Date Retirement Funds	0.0	0.0	1.4	1.3	3.0
DWS LifeCompass	1.0	0.9	4.1	—	—
Fidelity Advisor Freedom	7.1	3.9	0.9	0.7	1.7
Fidelity Freedom Index	7.2	4.1	1.2	1.2	1.3
Fidelity Freedom	6.8	3.8	0.9	0.7	1.7
Fidelity Multi-Manager	0.0	3.8	0.9	0.7	1.7
Franklin LifeSmart	0.0	0.0	1.0	1.1	1.7
Guidestone Funds MyDestination	0.0	2.7	2.7	2.7	0.0
Harbor Target Retirement	3.3	3.2	3.2	3.3	3.4
JPMorgan SmartRetirement Blend	0.2	0.2	0.2	0.0	0.1
JPMorgan SmartRetirement	0.2	0.2	0.2	0.0	0.2
KP RETIREMENT PATH	—	—	0.8	0.8	0.8
MassMutual RetireSMART	3.6	2.5	3.3	3.5	3.9
MFS Lifetime	2.6	2.8	2.6	2.7	2.5
PIMCO RealPathTM	9.4	9.2	6.9	2.6	3.0
PNC Target	3.9	2.4	1.6	2.5	2.6
Presidential Managed Risk	2.3	1.3	0.4	—	—
Russell LifePoints Target Date	4.3	4.4	2.4	2.7	2.8
State Farm Lifepath	0.0	3.7	3.4	3.0	0.0
Voya Index Solution	0.0	0.0	0.0	1.0	1.5
Voya Solution	1.9	0.0	0.0	0.9	1.6
Voya Target Retirement	0.0	0.0	0.0	1.0	1.5

Source: Morningstar, Inc. Data as of 12/31/2016.

A rough patch of performance may have scared some target-date managers away, but others have found it to be an opportunity to build their stakes. From January 2012 through December 2015, the Bloomberg Commodity Index lost 13.5% annualized compared with the 15.4% annualized gain for the S&P 500. In 2016, State Farm and Guidestone dropped their commodities funds altogether, contributing in the decline in the percentage of target-date series holding commodities funds. Others, such as Allianz, Fidelity, and PIMCO, have cut exposure significantly. However, as Exhibit 51 shows, some target-date managers kept their stakes and even added to them in some cases. The MassMutual RetireSmart series' exposure has increased each year since 2013.

More recently, emerging-markets debt funds have made their way into some target-date series, in part because of their diversification benefits and attractive yields compared with the prolonged low-yield environment in the U.S. Target-date managers can get exposure to emerging-markets debt through funds that focus on U.S.-dollar-denominated sovereigns and corporates—also referred to as hard-currency debt—or local-currency ones denominated in emerging-markets currencies. (Morningstar has separate categories for the two types of emerging-markets debt funds.) On average, over the past five

years, 27% of target-date series have allocated to a fund in the emerging-markets bond Morningstar Category and 7% have allocated to a fund in the emerging-markets local-currency bond Morningstar Category. Exhibit 52 and Exhibit 53 show the target-date series with exposure to those two categories over the past five years.

Exhibit 52 Target-Date Series' Exposure to Underlying Funds in the Emerging-Markets Bond Morningstar Category, 2012-16

Series Name	2012	2013	2014	2015	2016
AllianzGI Retirement	0.0	0.0	0.0	1.5	2.3
BMO Target Date Retirement Funds	0.0	0.9	1.0	0.8	3.0
ClearTrack	—	—	—	1.7	1.7
DWS LifeCompass	0.9	0.6	3.5	—	—
Fidelity Advisor Freedom	0.7	0.6	0.6	0.6	0.7
Fidelity Freedom	0.9	0.7	0.7	0.6	0.6
Fidelity Multi-Manager	0.0	0.7	0.6	0.6	0.6
Franklin LifeSmart	1.9	1.5	1.4	1.3	0.0
John Hancock Multi-Index Lifetime	—	0.0	0.3	0.7	0.9
John Hancock Multimanager Lifetime	0.0	0.3	0.7	0.7	1.0
JPMorgan SmartRetirement Blend	2.8	1.5	2.0	1.7	2.4
JPMorgan SmartRetirement	3.9	1.4	2.3	1.8	3.2
Legg Mason Target Retirement	2.3	2.1	—	—	—
MFS Lifetime	1.6	1.6	1.6	1.9	2.1
PIMCO RealPath™	2.8	5.2	5.3	1.7	0.0
T. Rowe Price Retirement	2.3	2.0	2.3	2.2	2.4
T. Rowe Price Target Retire	—	2.9	3.2	3.0	3.2
TIAA-CREF Lifecycle	0.0	0.0	0.6	1.0	1.2

Source: Morningstar, Inc. Data as of 12/31/2016.

Exhibit 53 Target-Date Series' Exposure to Underlying Funds in the Emerging-Markets Local-Currency Bond Morningstar Category, 2012-16

Series Name	2012	2013	2014	2015	2016
DWS LifeCompass	0.5	0.0	0.0	—	—
JPMorgan SmartRetirement Blend	0.0	0.1	0.5	0.3	0.2
JPMorgan SmartRetirement	0.0	0.0	0.4	0.3	0.1
MainStay Retirement	1.4	0.2	0.2	0.0	1.2
MFS Lifetime	0.0	0.0	0.0	1.1	1.2
PIMCO RealPath Blend	—	—	—	3.1	0.9
PIMCO RealPath™	0.0	0.0	0.0	1.6	1.3

Source: Morningstar, Inc. Data as of 12/31/2016.

Hard-currency emerging-markets debt funds are more prevalent in target-date series than their more volatile local-currency counterparts. However, some target-date managers have steered toward local-currency funds. For instance, PIMCO shifted its underlying emerging-markets debt fund exposure

completely to local-currency U.S.-dollar hedged ones over the past couple of years. Notably, the position sizes in local-currency funds are typically less than in U.S.-dollar-denominated funds.

The modest popularity of emerging-markets debt funds in target-date series can also be partially attributable to availability. Similar to the case of high-yield bonds mentioned earlier in this report, target-date managers focused on using passively managed investments exclusively have limited options in emerging-markets debt. Currently, only one passive option—Vanguard Emerging-Market Government Debt, which is focused on hard-currency bonds—is available. However, some target-date managers have simply chosen not to add the asset class.

Q: Are any new asset classes cropping up in target-date funds?
A: While REITs have long played a role in many target-date series, TIAA-CREF became the first to introduce private real estate into a mutual fund series of target-date funds.

TIAA-CREF made headlines when it added a direct real estate strategy to its Lifecycle series in August 2016. Publicly traded REITs have a role in most target-date series—65% of target-date series had an exposure to a fund in the real estate or global real estate Morningstar Categories as of the end of 2016—but this marked the first time direct real estate had made it into a target-date mutual fund. (Other managers, such as JPMorgan, allocate to direct real estate in the CIT version of their target-date series.)

Direct real estate can be expected to perform differently from REITs. Direct real estate is not as liquid as REITs. Physical buildings are typically valued quarterly, keeping the daily net asset value relatively stable, but the primary risk is ability to sell exposure if faced with significant outflows. TIAA-CREF intends to grow the exposure slowly, reaching 2.5% of the portfolios by June 2017 and topping out at 5.0% down the road. Conversely, REITs are often included in target-date series as a partial hedge against inflation but are often criticized for their correlation to equities. Exhibit 54 shows target-date series' aggregate exposure to funds from the real estate and global estate categories as of the end of 2016.

Exhibit 54 Target-Date Series' Exposure % to Underlying Funds in the Real Estate Morningstar Categories

Global Real Estate	**2016**
AllianceBernstein Multi-Manager Select	4.5
American Century One Choice	1.6
BlackRock LifePath Index	8.5
Great-West Lifetime Conservative	0.6
Great-West Lifetime	0.9
Guidestone Funds MyDestination	2.2
John Hancock Multimanager Lifetime	0.5
KP RETIREMENT PATH	0.8
MFS Lifetime	2.2
Principal Lifetime Hybrid	2.7
Principal LifeTime	1.7
Russell LifePoints Target Date	1.7
Schwab Target	3.7
State Street Target Retirement	1.2
Voya Index Solution	1.2

Real Estate	**2016**
BlackRock LifePath Smart Beta	8.0
ClearTrack	4.9
Fidelity Advisor Freedom	1.1
Fidelity Freedom	1.0
Fidelity Multi-Manager	0.5
Great-West Lifetime Conservative	1.0
Great-West Lifetime	1.3
John Hancock Multi-Index Lifetime	1.0
John Hancock Multi-Index Preservation	0.4
John Hancock Multimanager Lifetime	0.5
JPMorgan SmartRetirement Blend	4.0
JPMorgan SmartRetirement	3.8
KP RETIREMENT PATH	1.6
MassMutual RetireSMART	0.5
PIMCO RealPath	8.0
PNC Target	3.4
Principal LifeTime	0.6
Schwab Target Index	2.5
State Farm Lifepath	6.2
Voya Index Solution	1.2
Voya Target Retirement	1.3
Wells Fargo Dynamic Target	0.9

Source: Morningstar, Inc. Data as of 12/31/2016.

The Next Frontier

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Target-date funds have evolved significantly since they arrived on the scene in the early 1990s, and they can be expected to continue to do so as target-date managers attempt to establish an edge over one another. This section addresses the development of solutions designed to helping investors with retirement income—a subject on top of mind for many target-date managers.

► Where is the next frontier for target-date managers to explore?

Q: Where is the next frontier for target-date managers to explore?
A: Many prominent managers of target-date funds are also behind a variety of retirement-income strategies. These strategies have not made their way into flagship target-date series.

As more and more investors who rely on target-date funds for retirement reach and pass their target retirement date, they are tasked with translating accumulated savings into income. As a result, some asset managers have attempted to create solutions to assist retirees with their post-retirement investing and spending needs. The solutions have come in the form of income distribution or managed payout strategies that are intended to help investors manage their retirement spending. Despite being offered by many of the largest asset managers that also run target-date funds, these strategies haven't gained much traction.

Vanguard—the leader in target-date mutual fund assets under management—ventured into the managed payout space at the start of the great recession. Launched in mid-2008, Vanguard's original three managed payout funds, which targeted annual distributions of 3%, 5%, and 7%, struggled during the financial crisis as the funds' assets dropped considerably while the funds still sought to meet their target payouts, resulting in return of capital to investors. In 2014, Vanguard merged two funds into the existing Vanguard Managed Payout strategy, which targets a 4% distribution. As of December 2016, that fund had approximately $1.7 billion in assets.

Fidelity entered the managed payout space shortly before Vanguard, but its funds have also struggled to gain traction, prompting Fidelity to close them to new investors in January 2016. Fidelity's retirement-income strategies come under the Fidelity Advisor Income Replacement moniker. The series launched in 2007 and offers funds in two-year increments, ranging from 2016 to 2042. The fund with the longest investment horizon—designed for investors who expect to receive income until 2042—invests roughly 60% in equity, 30% in bonds, and 10% in cash and cash equivalents. The fund with the shortest time horizon invests in short-term government securities and cash equivalents. The funds are designed to receive an investor's lump sum of assets and then pay out a monthly distribution. Fidelity has not found the same success with its income-replacement funds as with its target-date funds. As of December 2016, the combined total assets across the series stood at $155 million compared with more than $190

billion in target-date funds. Fidelity closed the funds to new investors as it seeks to revamp them.

The limited traction of existing managed payout funds hasn't prevented other asset managers from joining the fray. In 2015, American Funds launched a series of three Retirement Income Portfolios, and later that year Franklin Templeton launched its Payout suite of funds. In late 2016, JPMorgan filed an initial prospectus for the JPMorgan SmartSpending 2050 fund. The offering will have the flexibility to invest in global equity, global fixed income, alternatives, and cash. JPMorgan will have discretion over the distribution payout, which may prevent the fund from having to return investor capital.

While asset managers have ventured into the retirement-income space, few have shown the conviction to link retirement-income strategies to their flagship target-date fund offering. Exhibit 55 shows target-date managers who also offer retirement-income strategies and the amount of assets in the strategies. In many cases, the same team that runs the target-date funds also manages the retirement-income strategies.

Exhibit 55 Target-Date Managers With Retirement-Income Strategies

Firm	Target-Date Assets USD Millions	Target-Date Inception (oldest)	Retirement-Income Funds	Retirement-Income Assets USD Millions	Retirement Income Inception
American Funds	53,637	2007	American Funds Retirement Income Portfolios	921	2015
BlackRock	11,679	2007	BlackRock CoRI Funds	55	2014
Fidelity	192,912	2003	Fidelity Income Replacement Funds	154	2007
Franklin	503	2006	Franklin Payout Funds	19	2015
Schwab	3,452	2005	Schwab Monthly Income Payout Funds	185	2008
Vanguard	280,332	2006	Vanguard Managed Payout	1,697	2008
Voya	5,317	2005	Voya Global Target Payment	464	2008

Source: Morningstar, Inc. Data as of 12/31/2016.
*Excludes target-risk funds and retirement-income funds that are part of a target-date series.

Annuities remain another option for retirees, but asset managers have struggled to incorporate them into their target-date series. In 2014 the U.S. Treasury issued guidance supporting plan sponsors to use deferred-income annuities within defined-contribution plans, but including annuities comes with its own set of complexities. Target-date managers would need to partner with an insurance provider to provide annuities. From an investor's standpoint, annuities could provide stable income, but concerns with fees, portability between record-keepers, and liquidity remain large obstacles.

An emerging retirement-income solution for investors is the concept of a "hybrid" default to allow for more customization for retirees. Within the past year, Empower Retirement and Fidelity--two of the largest defined-contribution plan record-keepers--launched the capability to combine target-date funds with their managed account offering. Under this approach, investors could start off in a target-date fund early in their careers and then transition into a personalized managed account as they near retirement. Whereas target-date funds rely primarily on an investor's age to decide the asset mix,

managed accounts can incorporate other individual-specific factors. Still, managed accounts generally come with added fees and require more involvement from investors than target-date funds.

Appendix 1

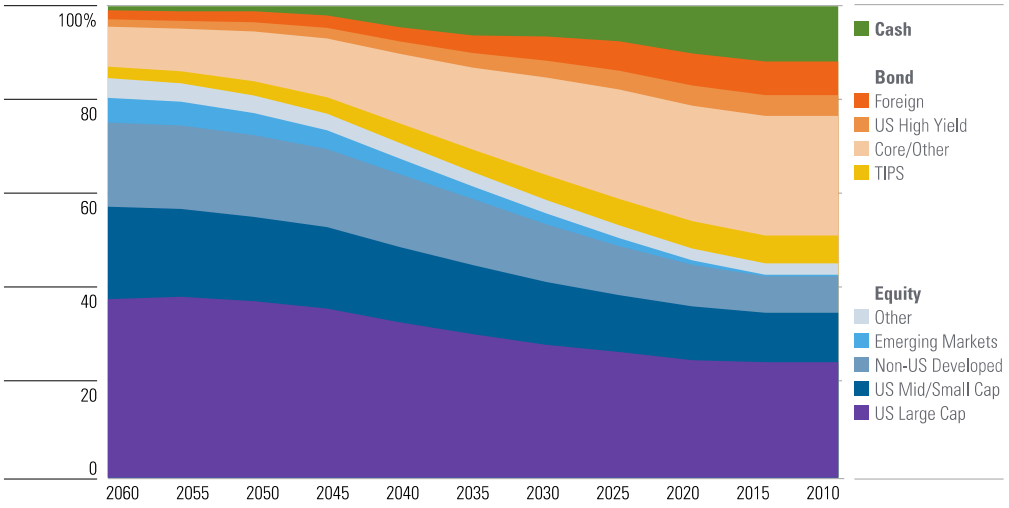
Appendix 1 Morningstar Analyst Ratings for Target-Date Fund Series

		Pillars				
		⊕ Positive	● Neutral	⊖ Negative		
Target-Date Series	Morningstar Analyst Rating	Process	People	Performance	Price	Parent
American Century One Choice	Bronze	⊕	⊕	⊕	●	●
American Funds Trgt Date Rtrmt	Silver	●	⊕	⊕	⊕	⊕
BlackRock LifePath Dynamic	Neutral	●	●	●	●	●
BlackRock LifePath Index	Gold	⊕	⊕	●	⊕	●
Fidelity Advisor Freedom	Bronze	⊕	⊕	●	●	⊕
Fidelity Freedom	Silver	⊕	⊕	●	●	⊕
Fidelity Freedom Index	Bronze	●	⊕	●	⊕	⊕
John Hancock Multi-Index Preservation	Neutral	●	⊕	●	⊕	●
John Hancock Multimanager Lifetime	Bronze	●	⊕	⊕	⊕	●
JPMorgan SmartRetirement	Silver	⊕	⊕	⊕	⊕	⊕
Manning & Napier Target	Bronze	⊕	⊕	●	●	●
MFS Lifetime	Bronze	●	⊕	⊕	●	⊕
Principal LifeTime	Bronze	⊕	⊕	●	⊖	●
Russell LifePoints Strategy	Neutral	●	●	⊖	●	●
Schwab Target	Neutral	●	⊕	⊕	●	⊕
State Farm Lifepath	Negative	●	●	⊖	⊖	●
T. Rowe Price Retirement	Silver	⊕	⊕	⊕	●	⊕
TIAA-CREF Lifecycle	Bronze	⊕	⊕	⊕	⊕	●
TIAA-CREF Lifecycle Index	Bronze	●	⊕	⊕	⊕	●
Vanguard Target Retirement	Gold	⊕	⊕	⊕	⊕	⊕
Voya Solution	Neutral	●	●	●	⊖	●
Wells Fargo DJ Target	Neutral	⊖	●	●	⊕	●

Source: Morningstar, Inc. Data as of 4/20/2017.

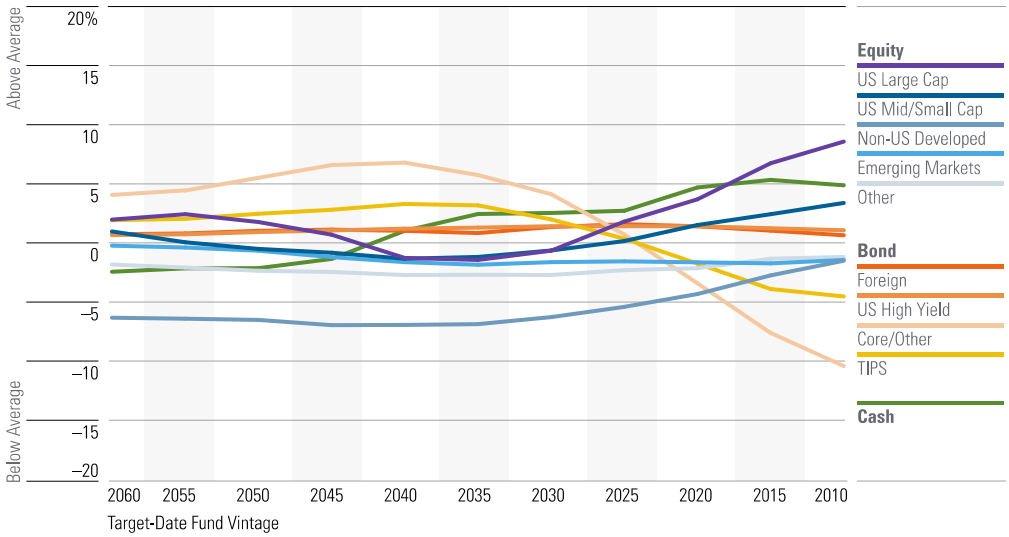
Appendix 2

Appendix 2 American Century One Choice Sub-Asset-Class Glide Path



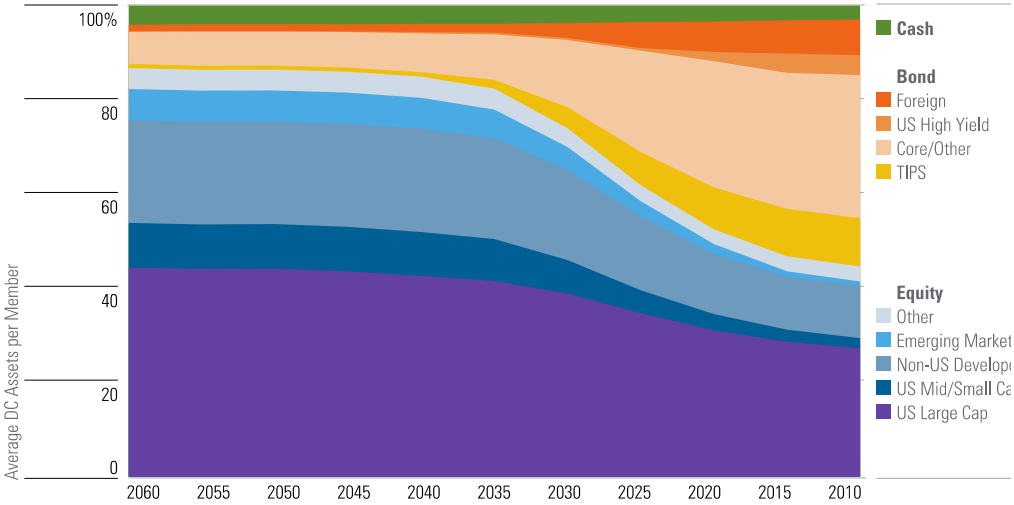
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: American Century One Choice vs. Industry Average



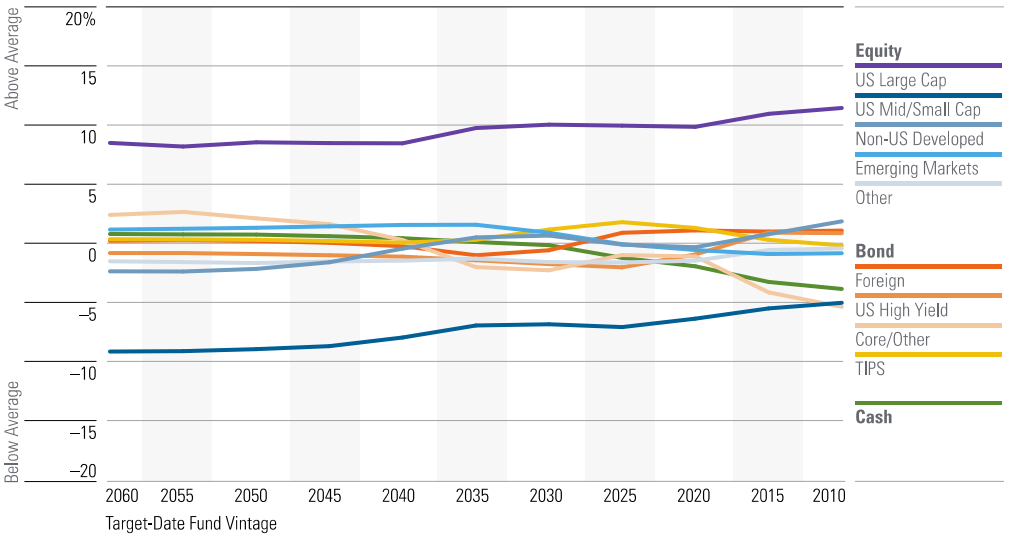
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 American Funds Target Retirement Sub-Asset-Class Glide Path



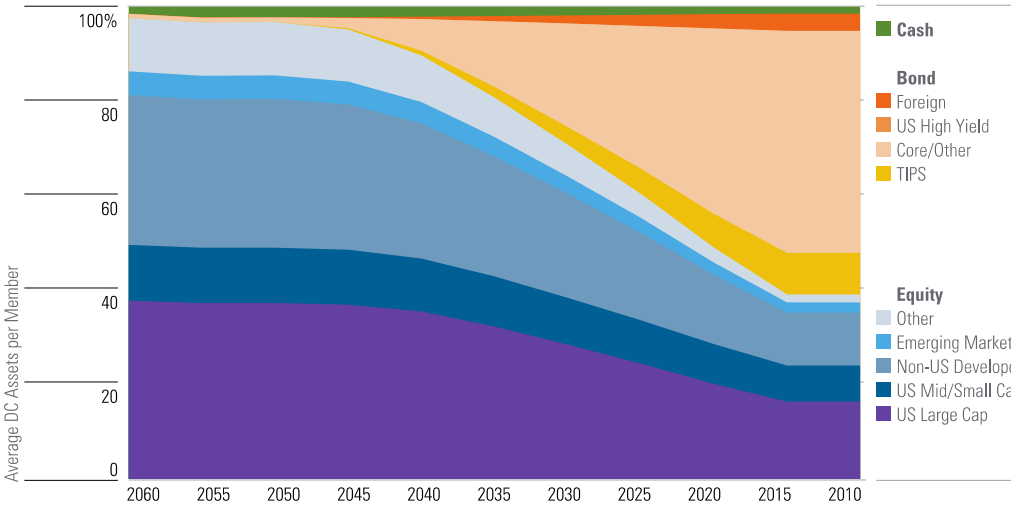
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: American Funds Target Retirement vs. Industry Average



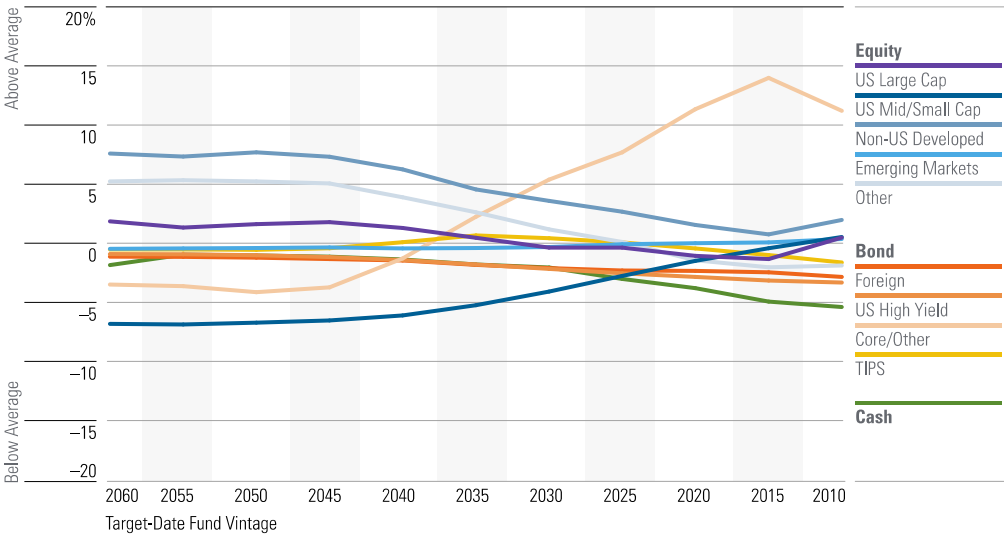
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 BlackRock LifePath Index Sub-Asset-Class Glide Path



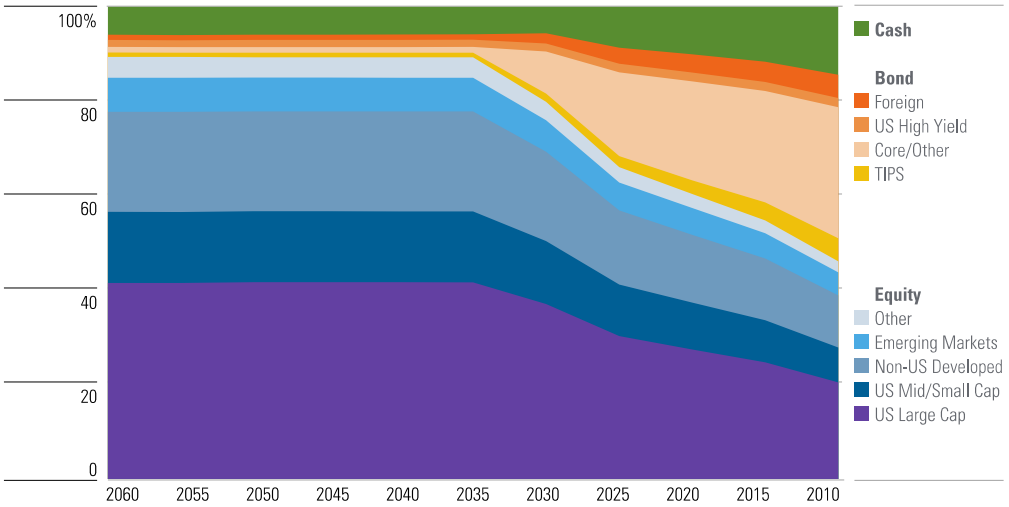
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: BlackRock LifePath Index vs. Industry Average



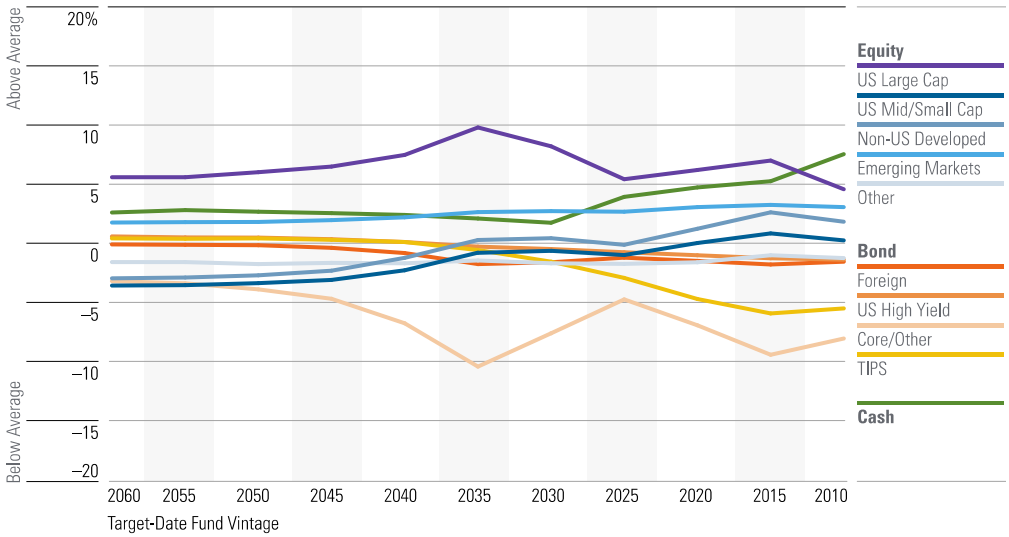
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Fidelity Advisor Freedom Sub-Asset-Class Glide Path



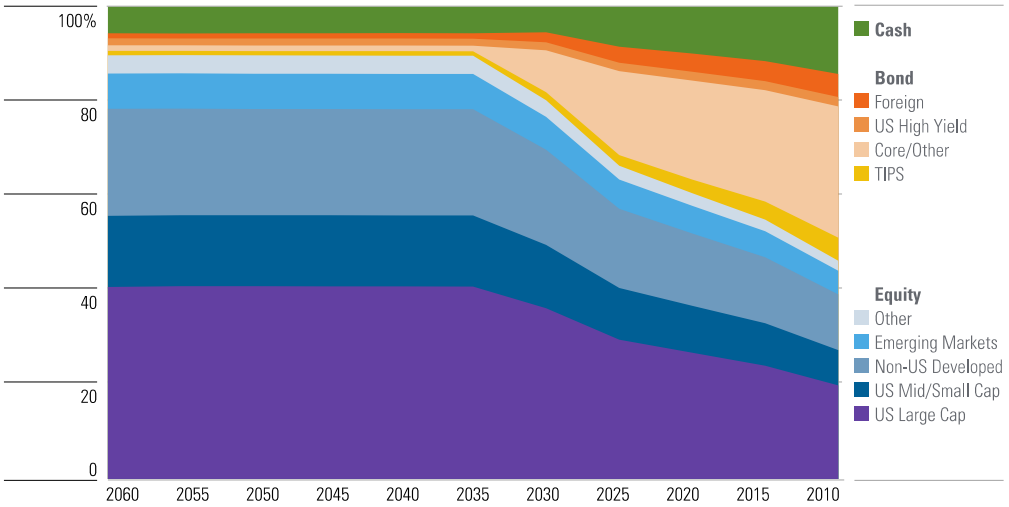
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: Fidelity Advisor Freedom vs. Industry Average



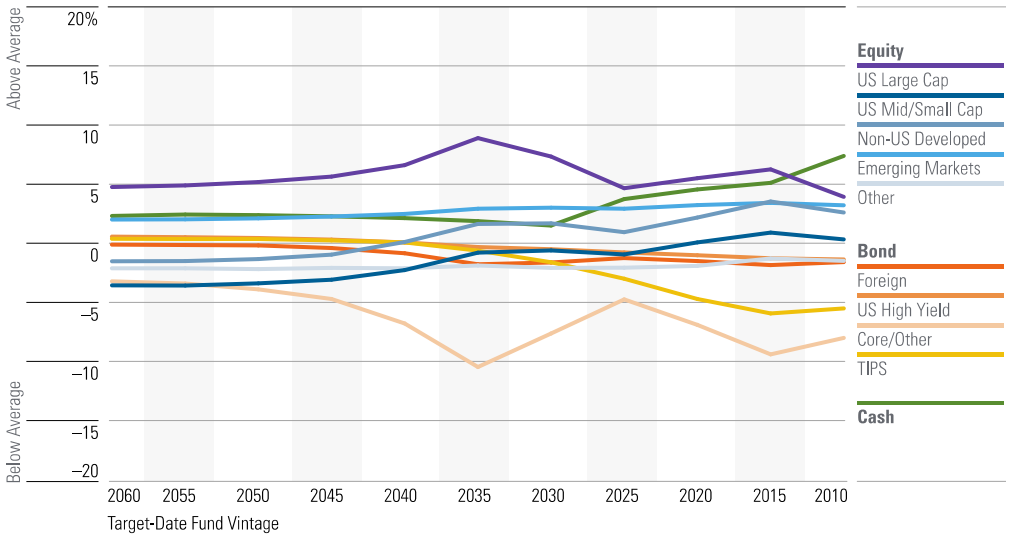
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Fidelity Freedom Sub-Asset-Class Glide Path



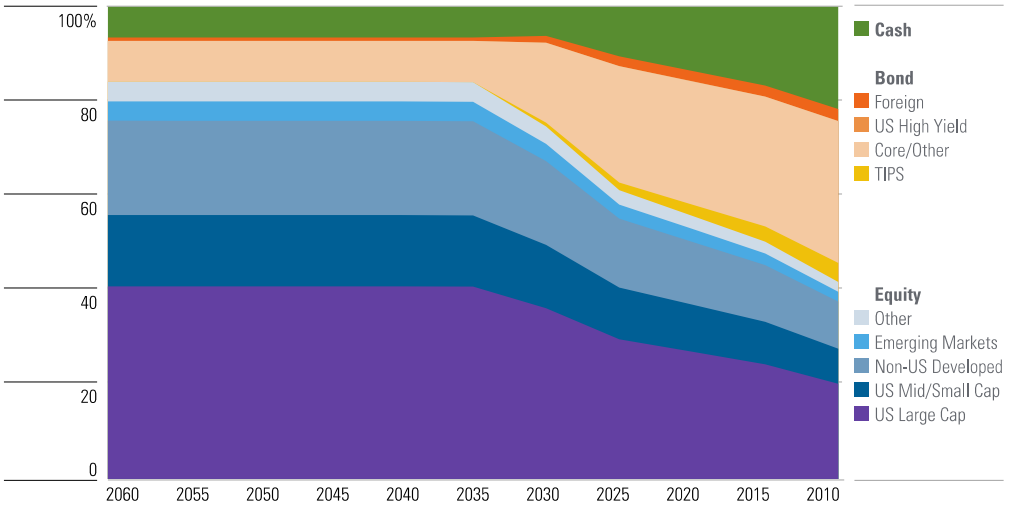
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: Fidelity Freedom vs. Industry Average



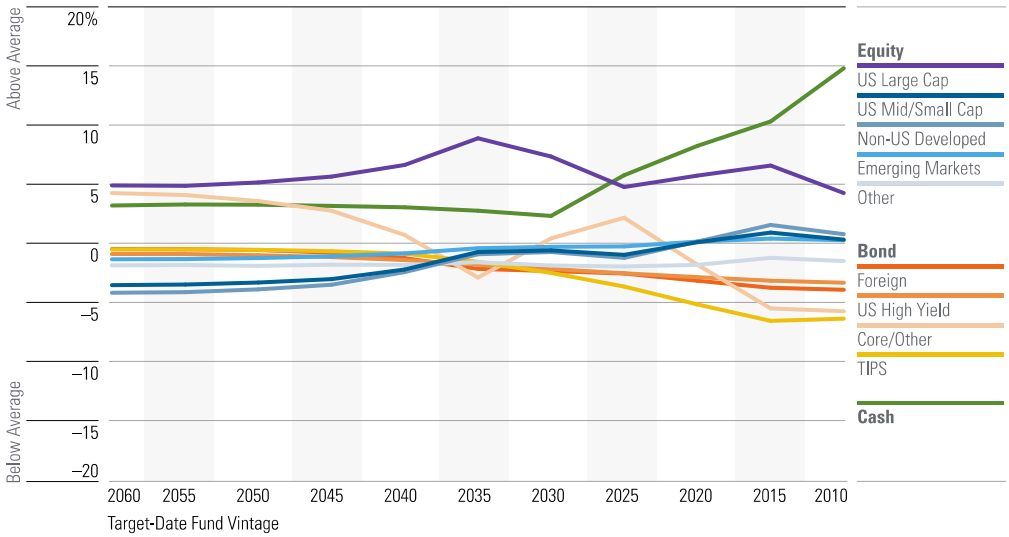
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Fidelity Freedom Index Sub-Asset-Class Glide Path



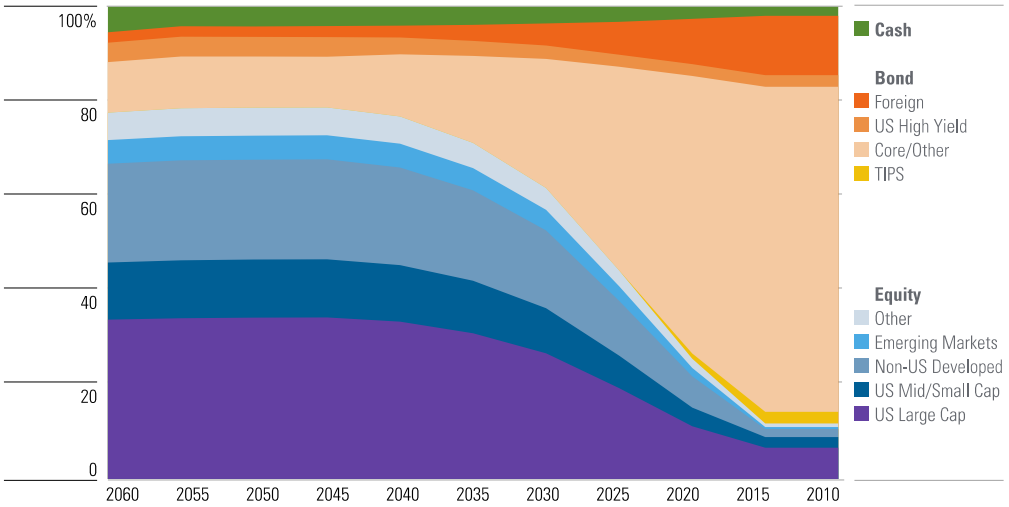
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: Fidelity Freedom Index vs. Industry Average



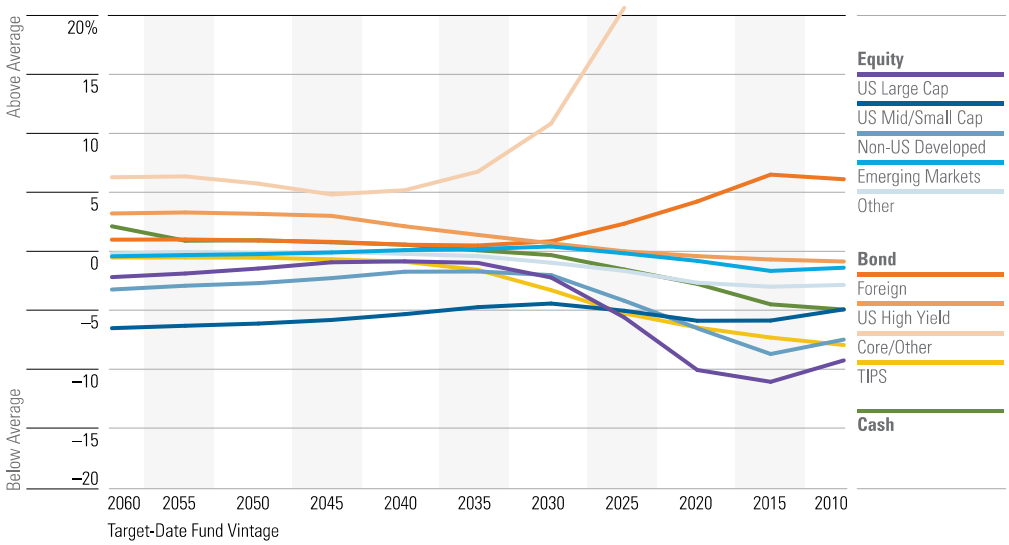
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 John Hancock Multi-Index Preservation Sub-Asset-Class Glide Path



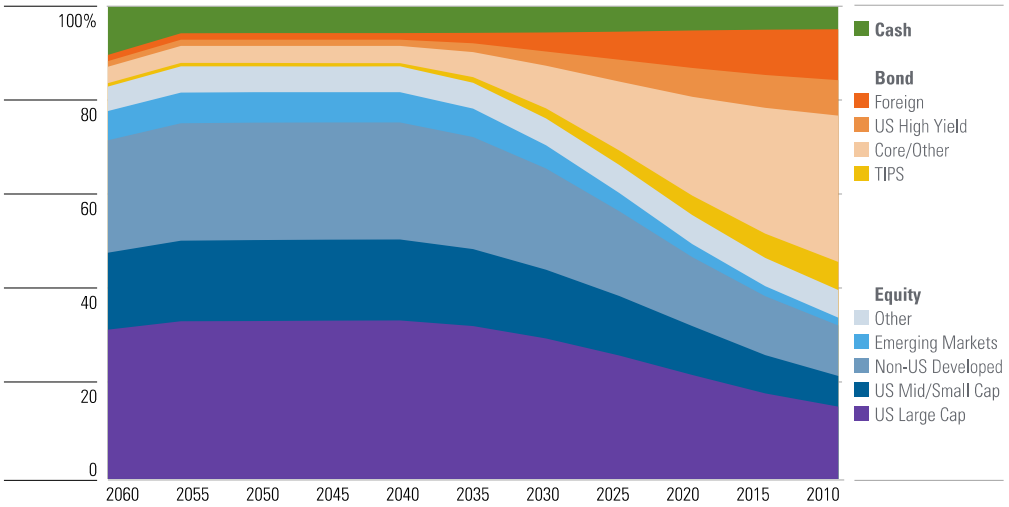
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: John Hancock Multi-Index Preservation vs. Industry Average



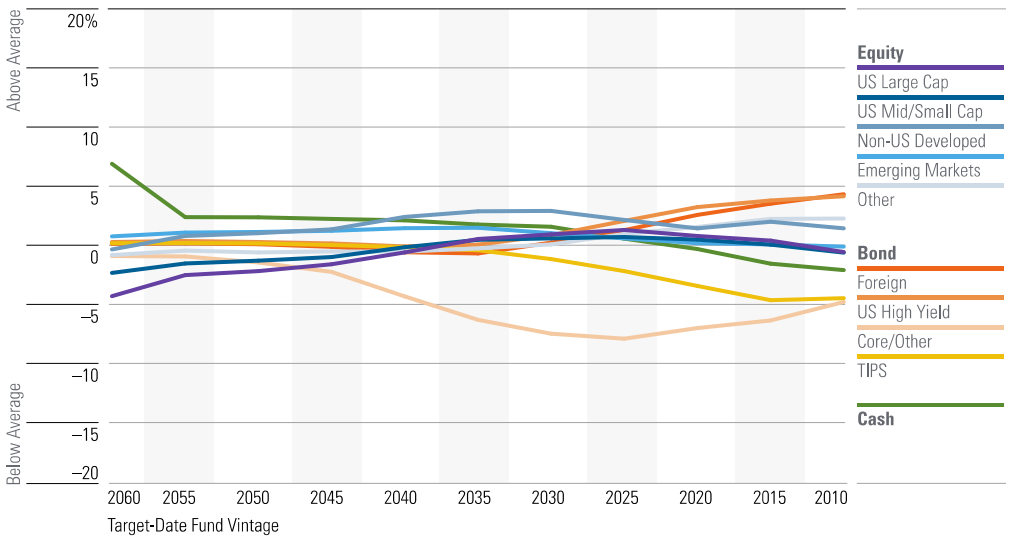
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 John Hancock Multimanager Lifetime Sub-Asset-Class Glide Path



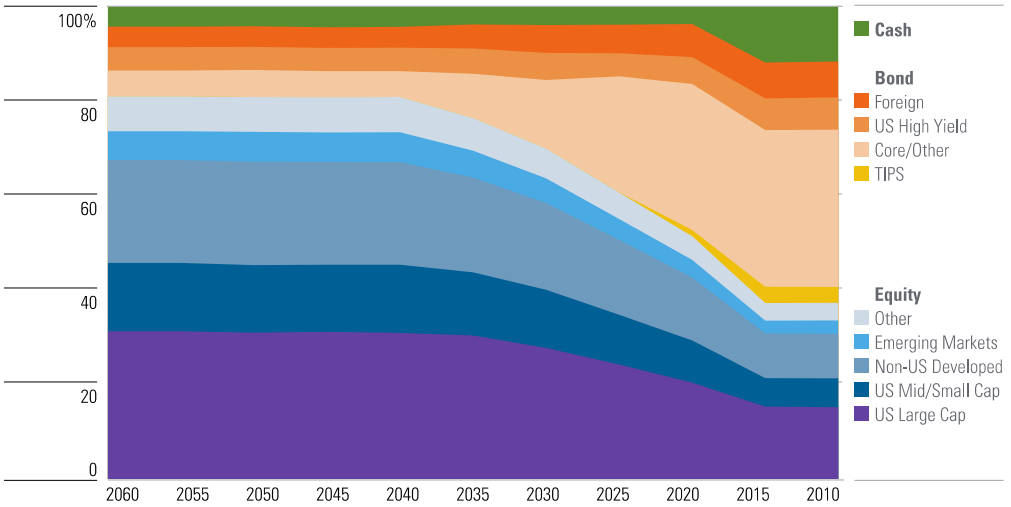
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: John Hancock Multimanager Lifetime vs. Industry Average



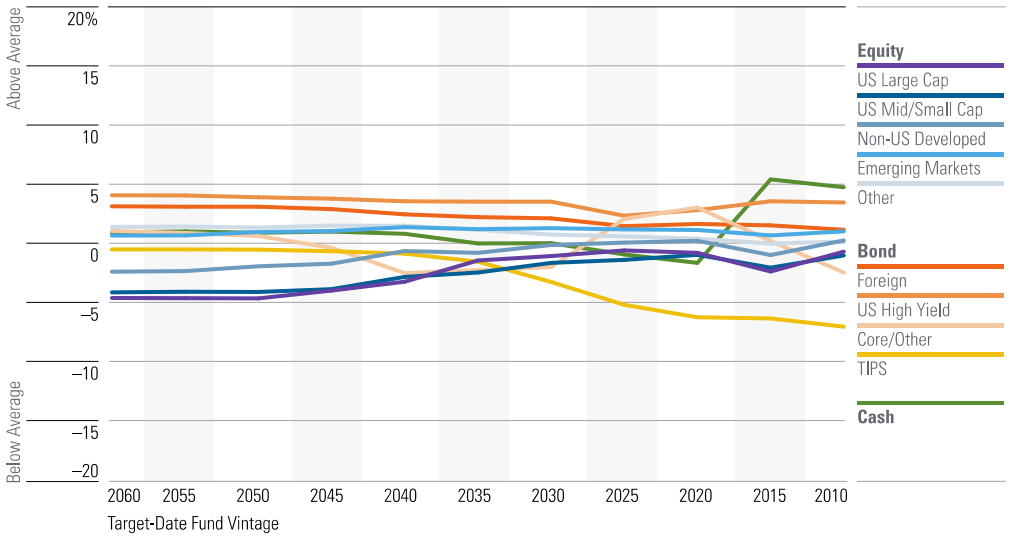
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 JPMorgan SmartRetirement Sub-Asset-Class Glide Path



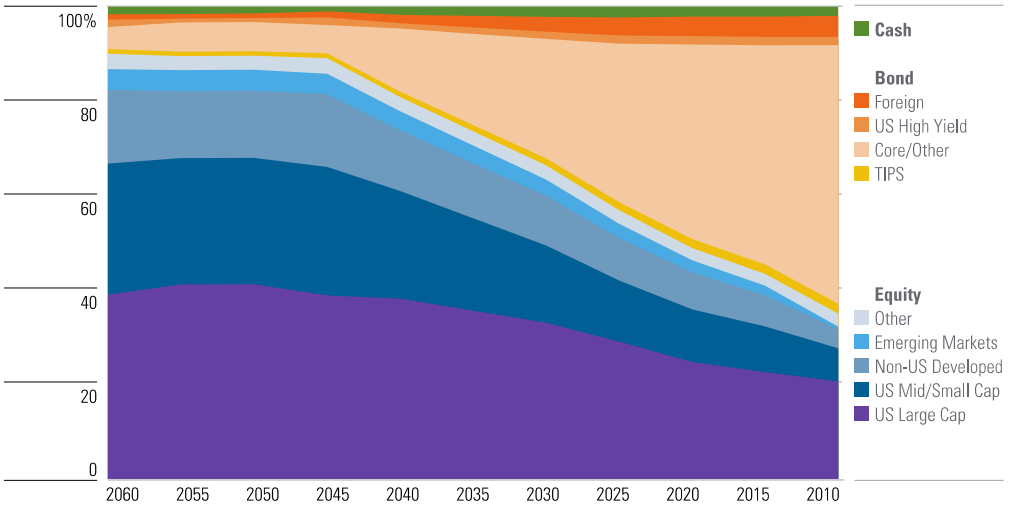
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: JPMorgan SmartRetirement vs. Industry Average



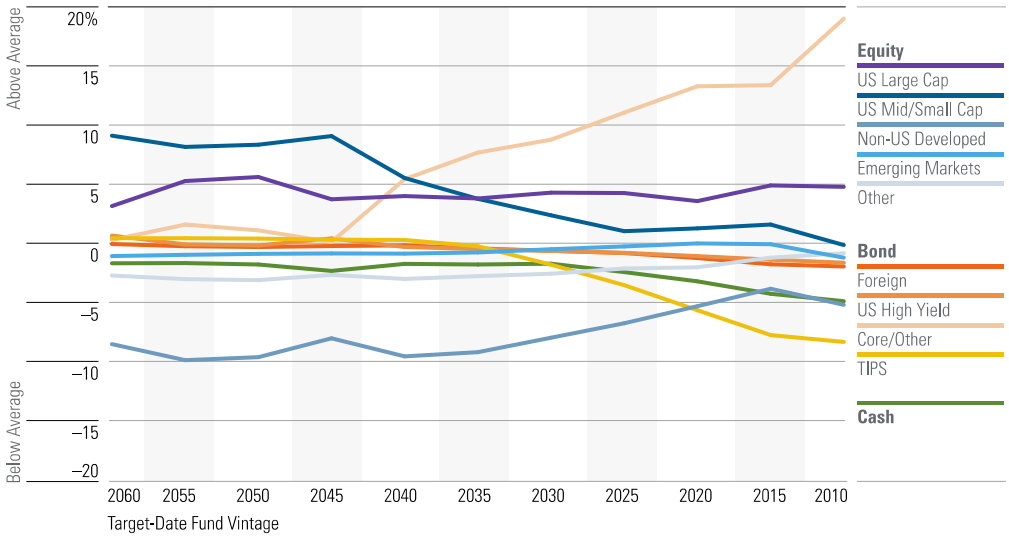
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Manning & Napier Target Sub-Asset-Class Glide Path



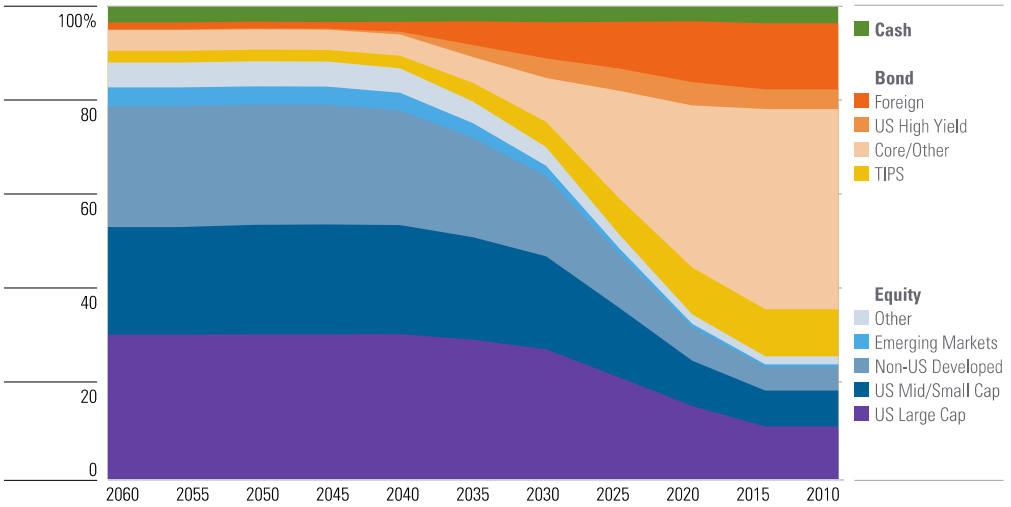
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: Manning & Napier Target vs. Industry Average



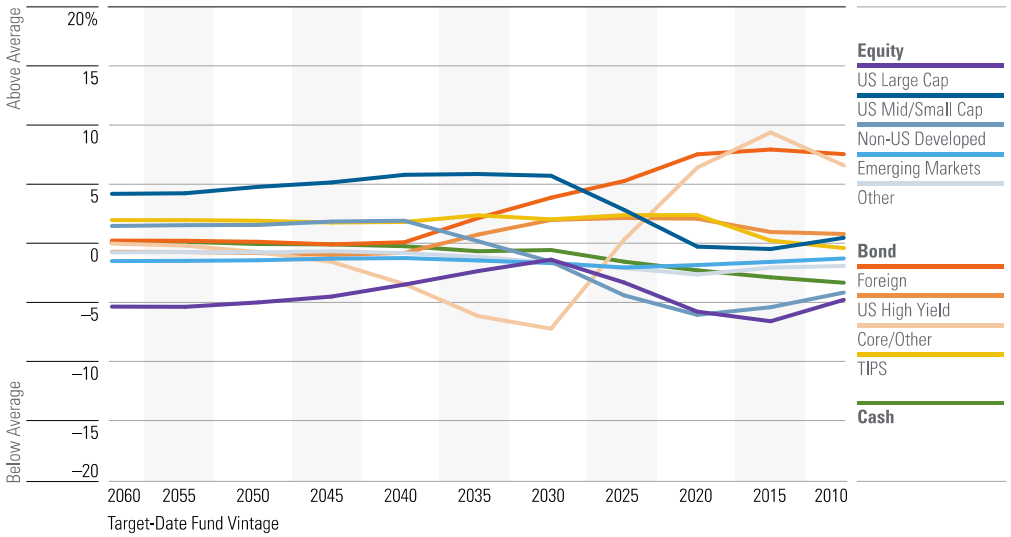
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 MFS Lifetime Sub-Asset-Class Glide Path



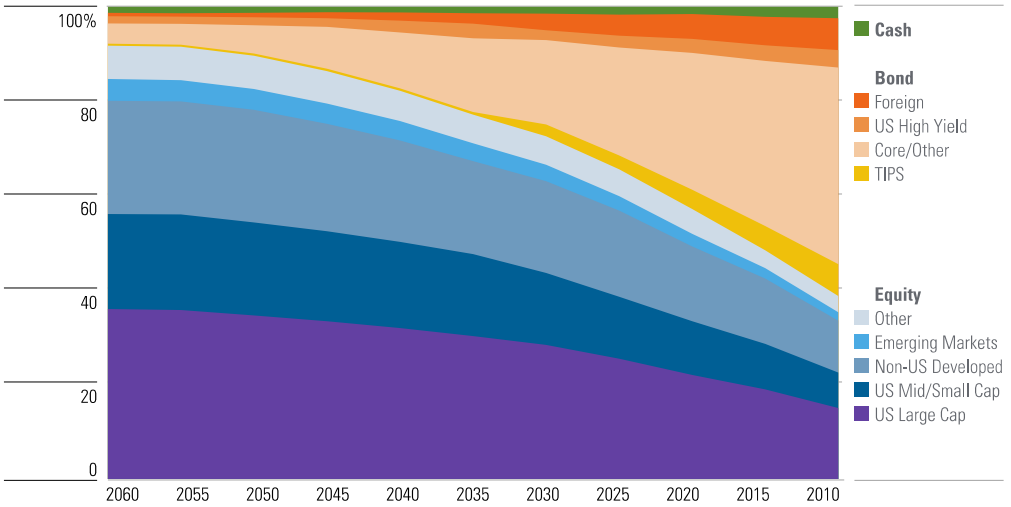
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: MFS Lifetime vs. Industry Average



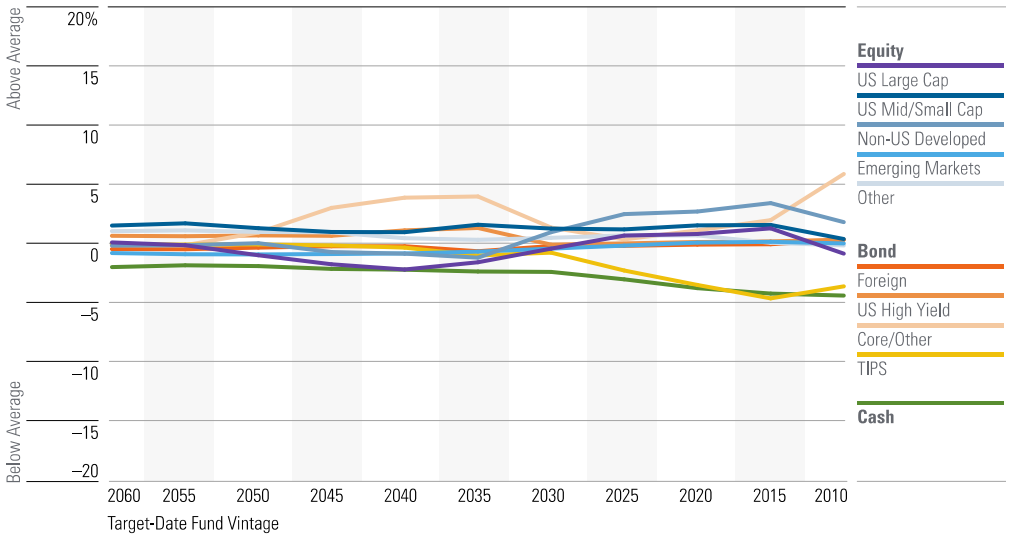
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Principal Lifetime Sub-Asset-Class Glide Path



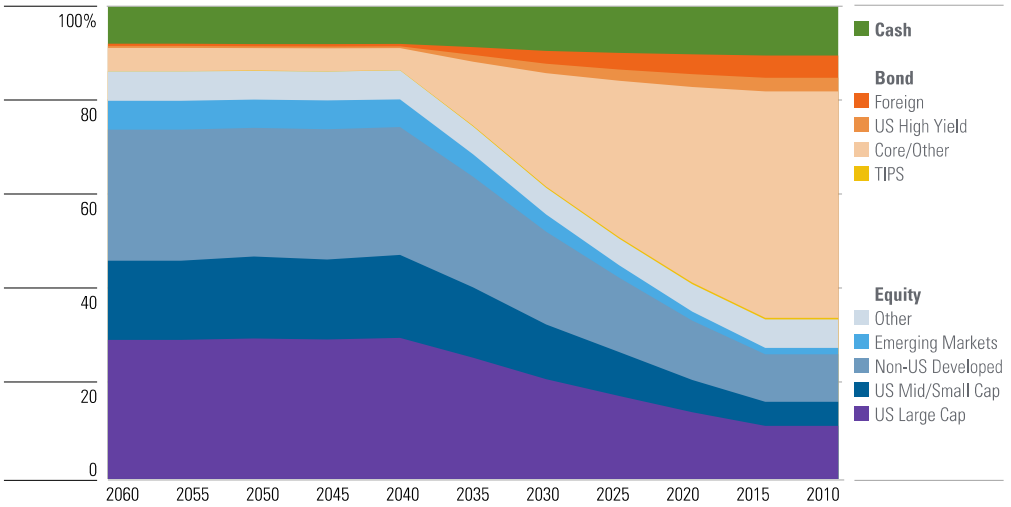
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: Principal Lifetime vs. Industry Average



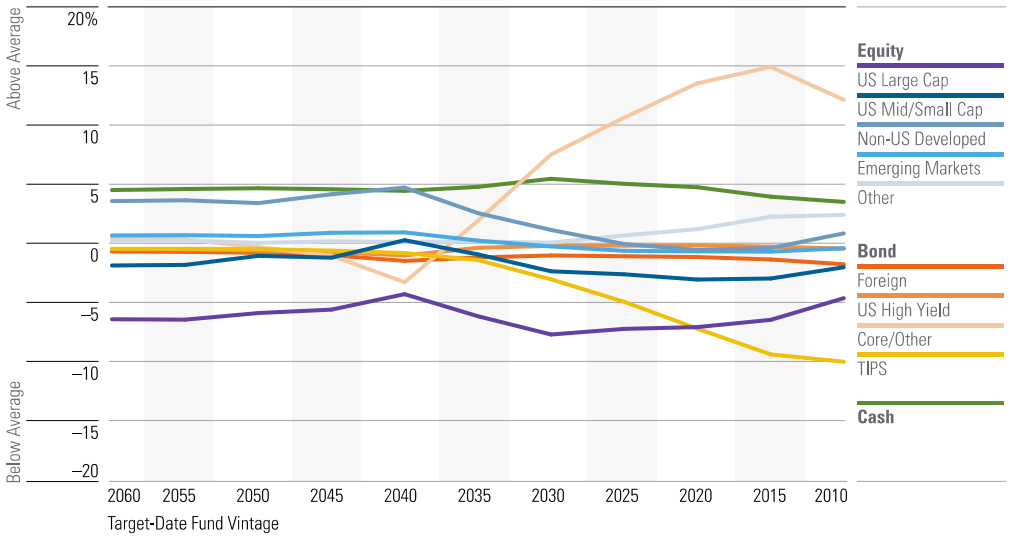
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Russell LifePoints Sub-Asset-Class Glide Path



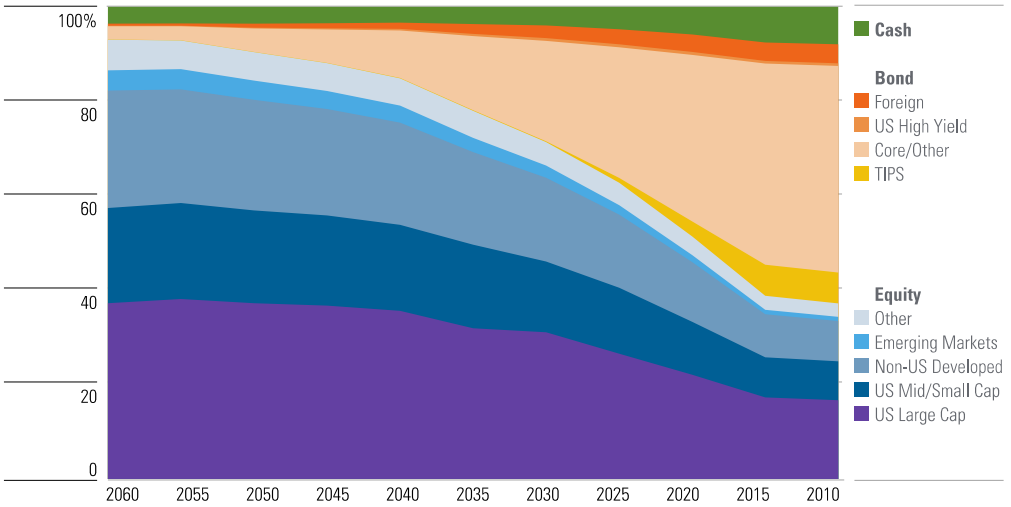
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: Russell LifePoints vs. Industry Average



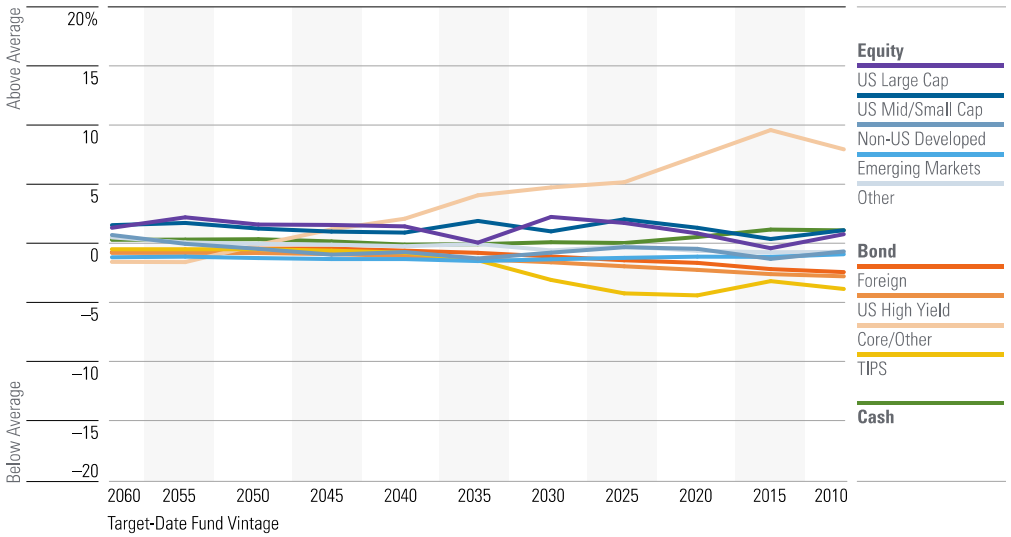
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Schwab Target Sub-Asset-Class Glide Path



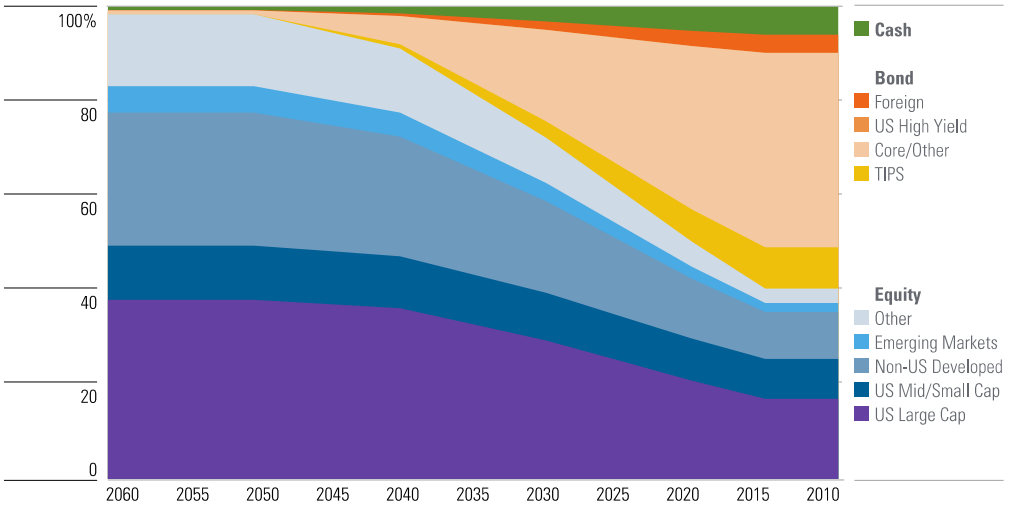
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: Schwab Target vs. Industry Average



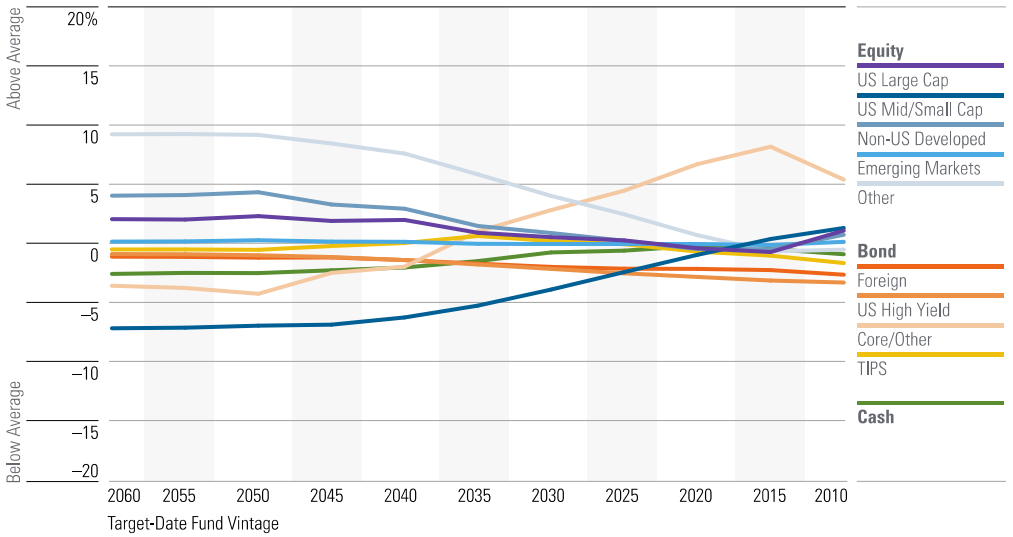
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 State Farm LifePath Sub-Asset-Class Glide Path



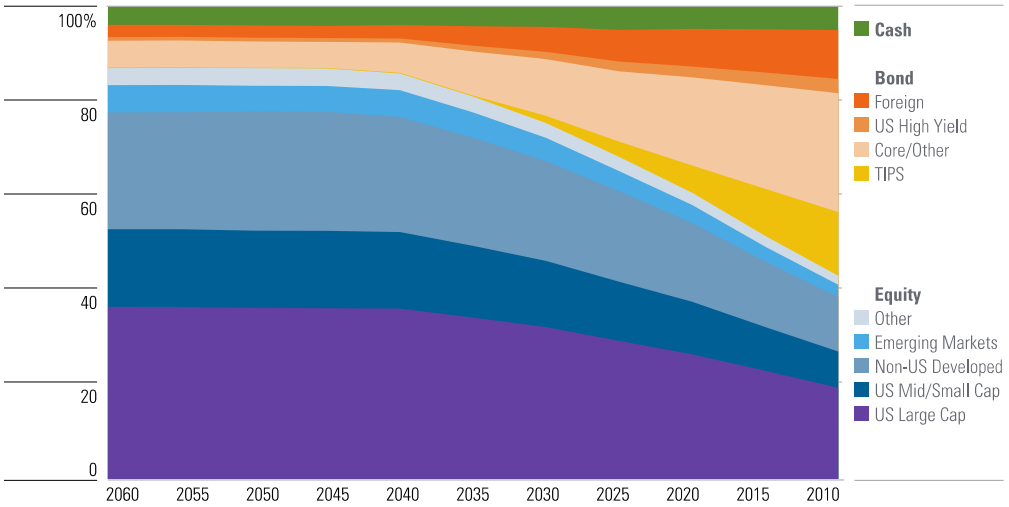
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: State Farm LifePath vs. Industry Average



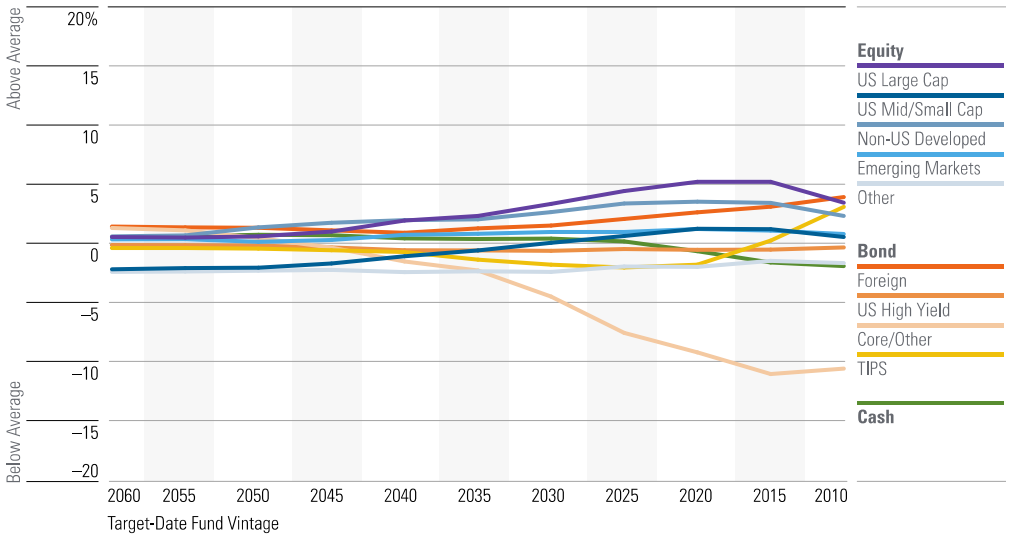
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 T. Rowe Price Retirement Sub-Asset-Class Glide Path



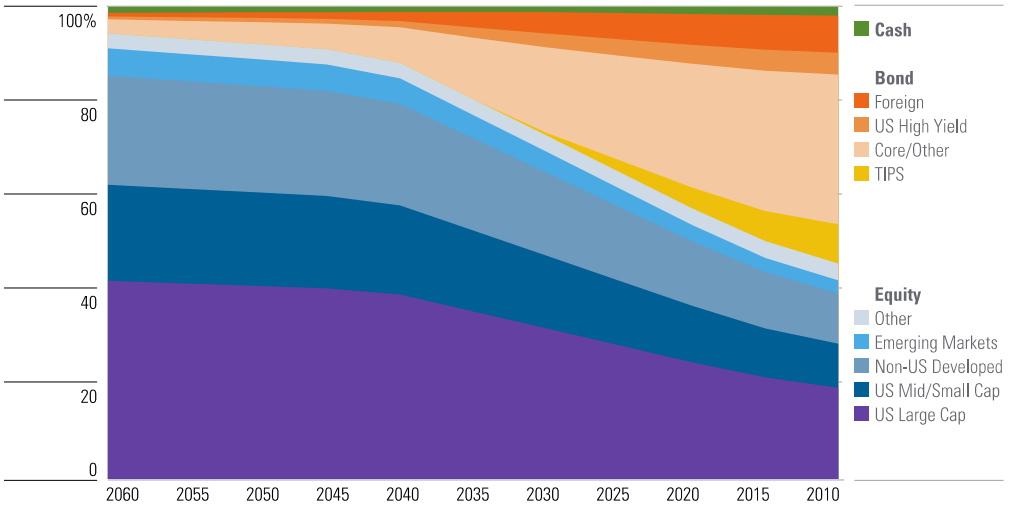
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: T. Rowe Price Retirement vs. Industry Average



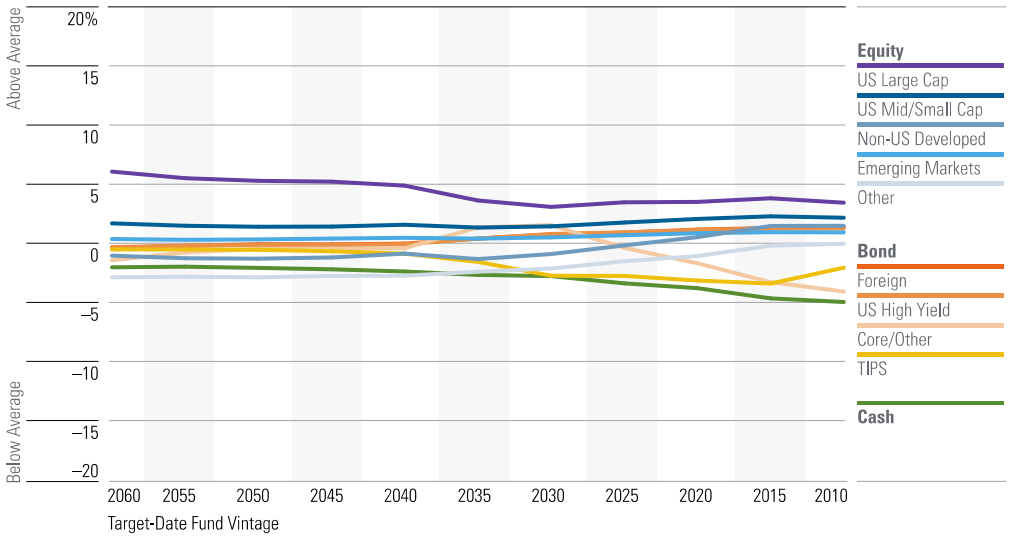
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 TIAA-CREF Lifecycle Sub-Asset-Class Glide Path



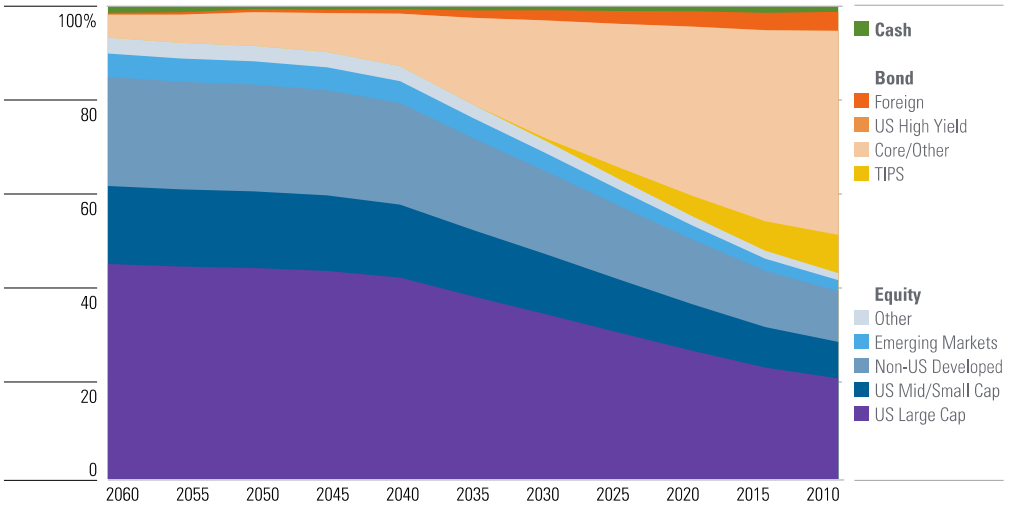
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: TIAA-CREF Lifecycle vs. Industry Average



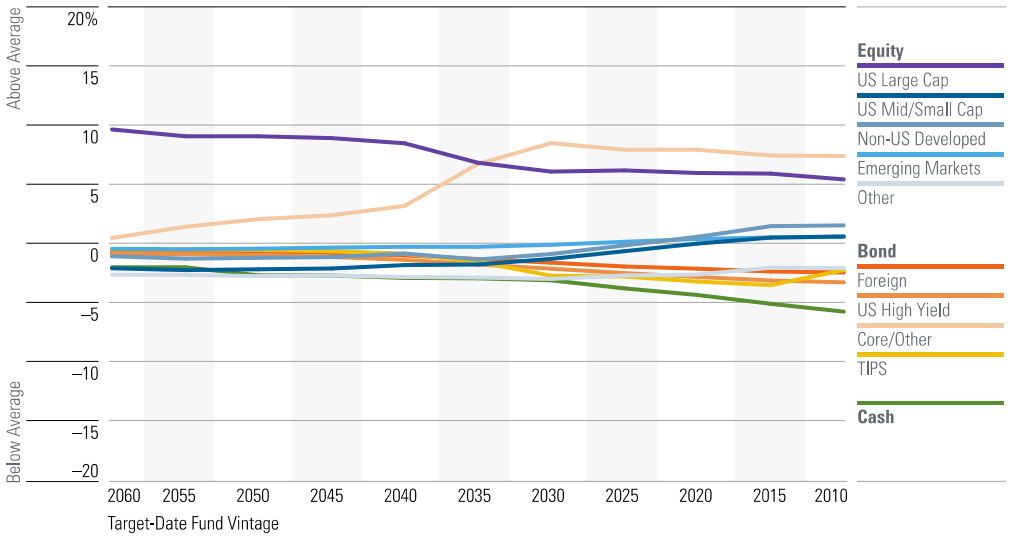
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 TIAA-CREF Lifecycle Index Sub-Asset-Class Glide Path



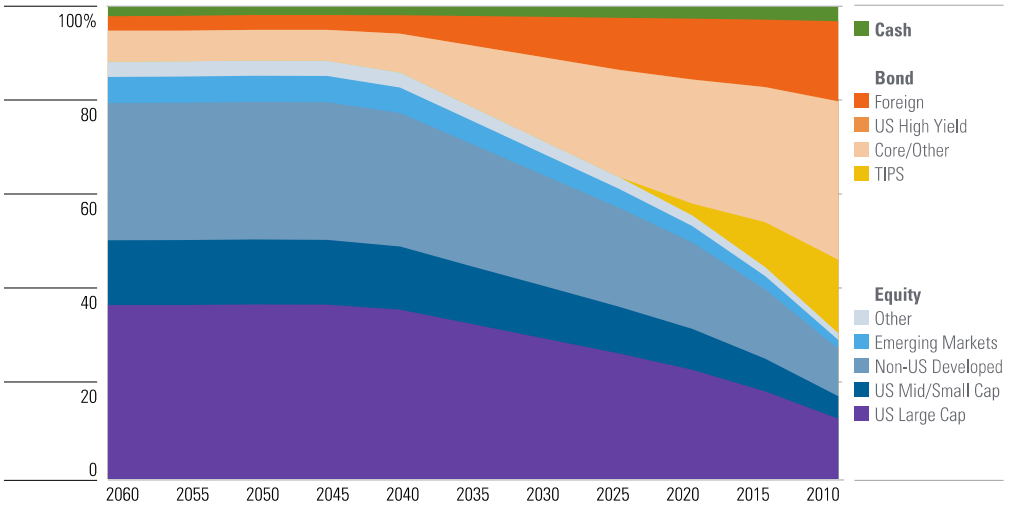
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: TIAA-CREF Lifecycle vs. Industry Average



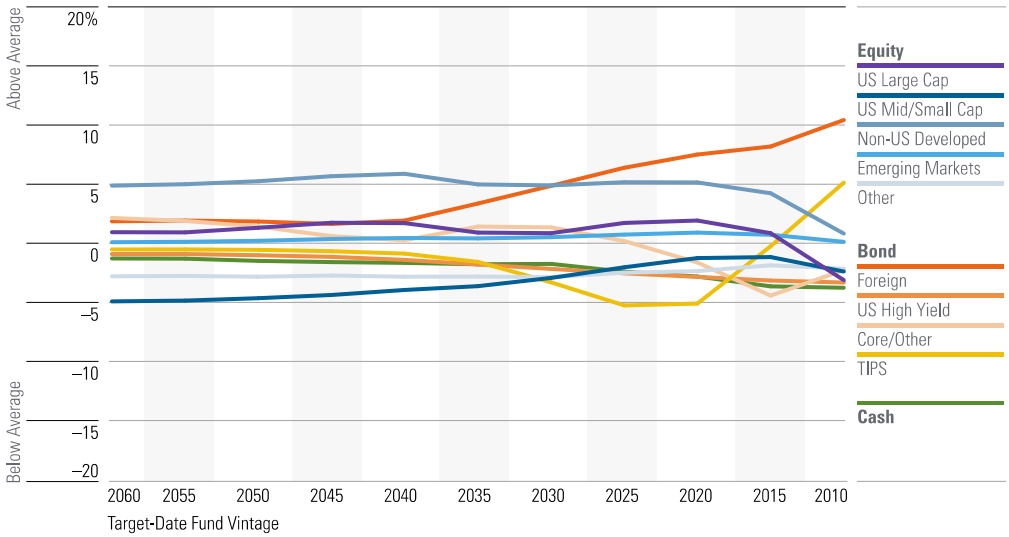
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Vanguard Target Retirement Sub-Asset-Class Glide Path



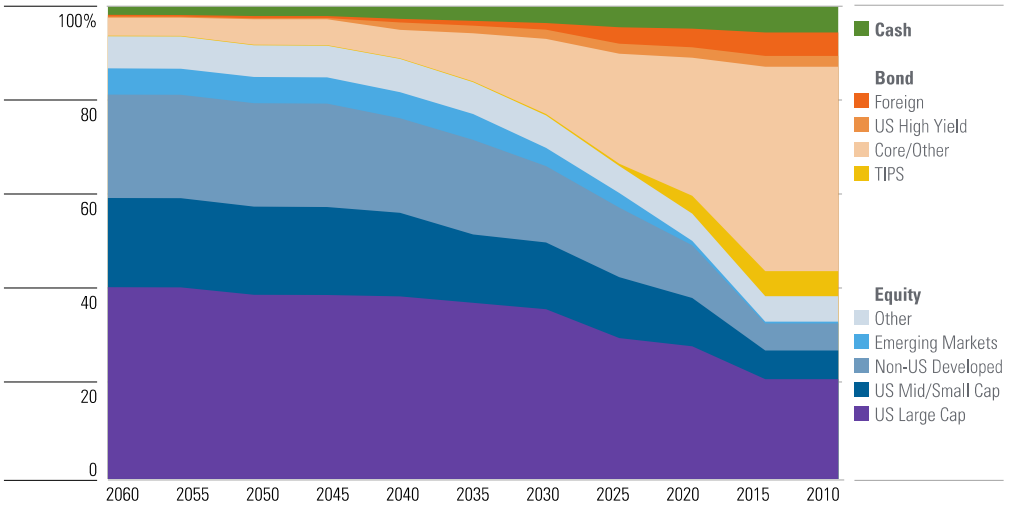
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: Vanguard Target Retirement vs. Industry Average



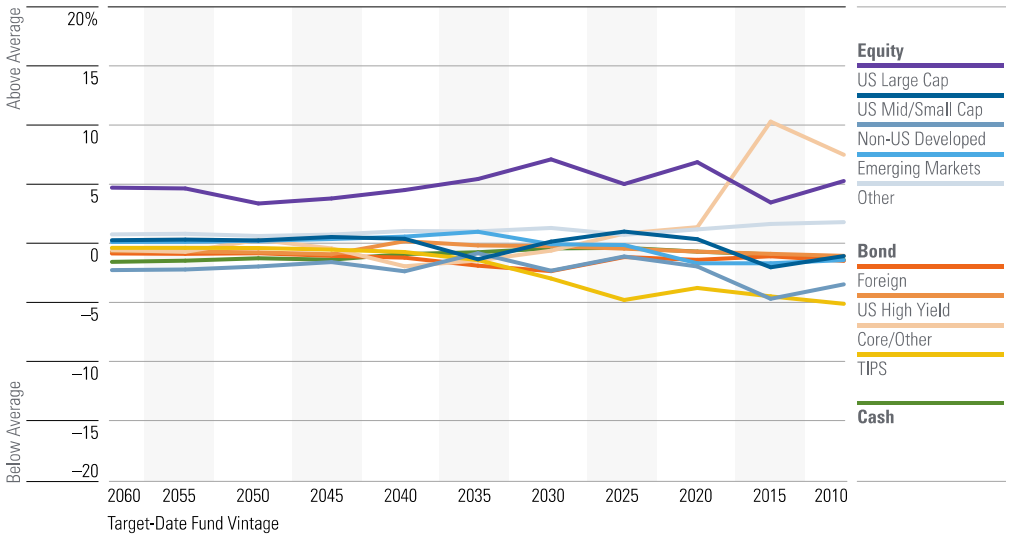
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Voya Solution Sub-Asset-Class Glide Path



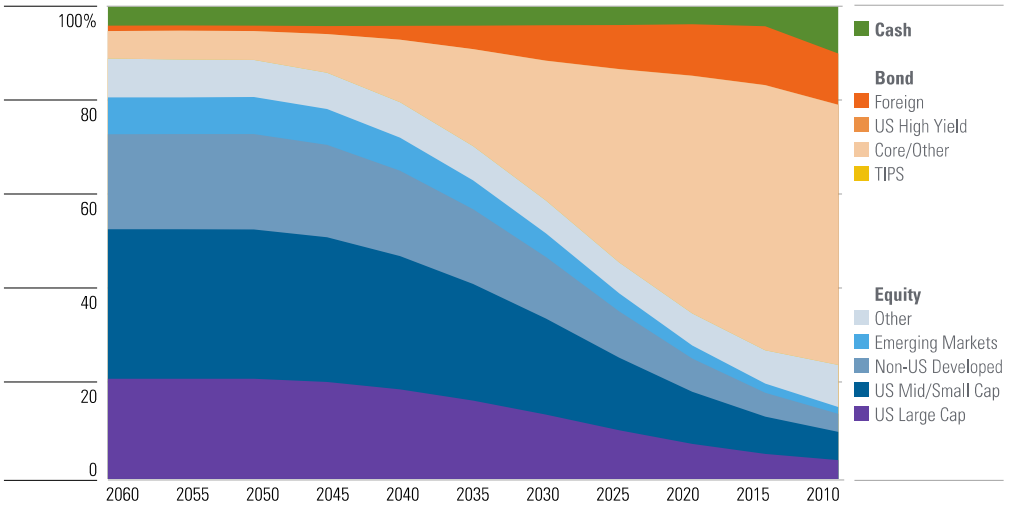
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: Voya Solution vs. Industry Average



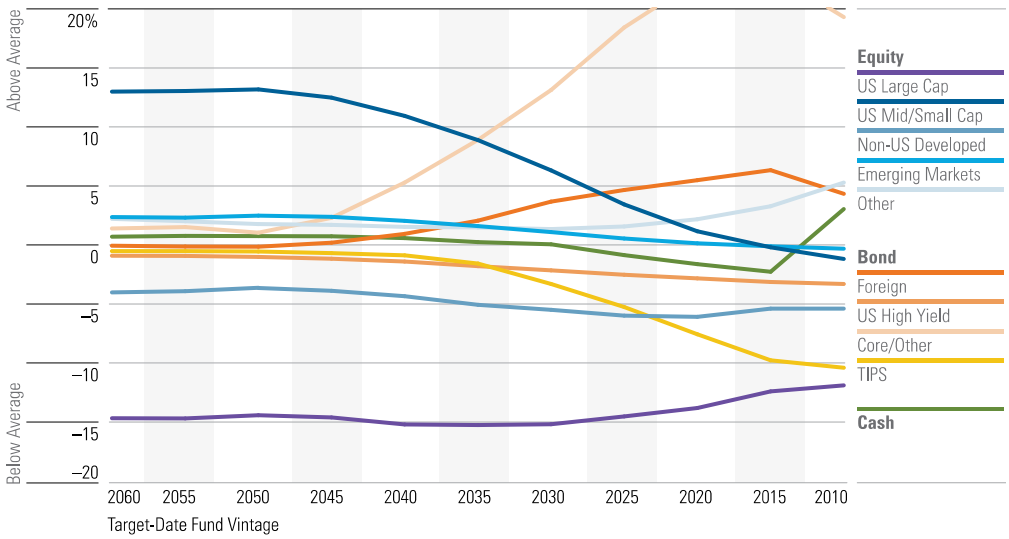
Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Wells Fargo Dow Jones Target Sub-Asset-Class Glide Path



Source: Morningstar, Inc. Data as of 12/31/2016.

Appendix 2 Sub-Asset-Class Glide Path Comparison: Wells Fargo Dow Jones Target vs. Industry Average



Source: Morningstar, Inc. Data as of 12/31/2016.

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