

S&P Target Date Scorecard

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Overview

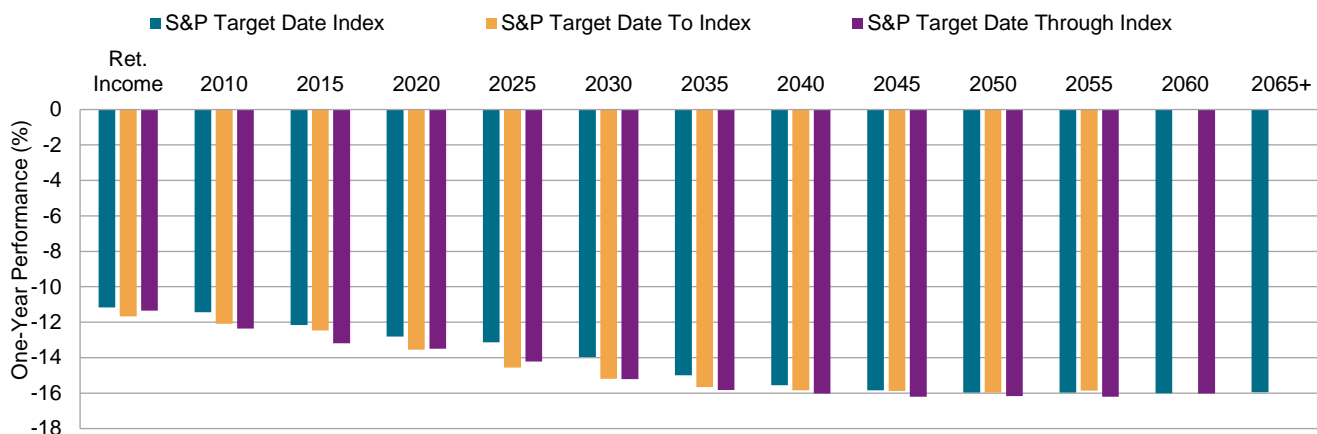
- The S&P Target Date[®] Scorecard provides performance comparisons and analytics covering the U.S. target date fund (TDF) universe.
- **The S&P Target Date Index Series is a consensus-driven, multi-asset benchmark for TDFs.** It is designed to be an accurate representation of TDFs in the U.S. market and to be the basis against which managers can assess their performance.
- The series is constructed from indices that represent the actual allocations of funds in the U.S. target date space.
- The assets used in the construction of the index series are all investable, and the weights are published in advance of the index series' rebalancing.
- **S&P Dow Jones Indices also produces S&P Target Date Style Indices.** The “To” style indices aim to reduce the impact of market drawdowns around the expected retirement date, while the “Through” style indices aim to mitigate longevity risk—the risk of outliving one’s assets in retirement.
- The series consists of 13 S&P Target Date Indices, 11 S&P Target Date “To” Indices and 12 S&P Target Date “Through” Indices. New index vintages are launched in five-year intervals.¹

¹ For more information on the construction of the S&P Target Date Index Series, please see Appendix II.

Performance Analysis

- 2022 was a distressing year for U.S. equity and fixed income markets. To combat persistent inflation, the Federal Reserve rose interest rates seven times between March and December 2022, for a cumulative hike of 400 bps.
- Large-cap U.S. equities fared the worst compared to their mid- and small-cap peers, with the [S&P 500[®]](#) posting -18.11% over the year, in comparison to the -13.06% and -16.10% of the [S&P MidCap 400[®]](#) and [S&P SmallCap 600[®]](#), respectively.
- International equities suffered the same fate, with the [S&P Developed Ex-U.S. BMI](#) and the [S&P Emerging BMI](#) returning -16.51% and -18.07%, respectively.
- As the Federal Reserve continued to raise rates throughout the year, yields on U.S. fixed income increased as well. The [S&P U.S. Aggregate Bond Index](#) declined 12.03%, the [S&P U.S. Treasury Inflation Protected Security \(TIPS\) Index](#) declined 10.50% and the [S&P 500 High Yield Corporate Bond Index](#) declined 11.71%.
- The only asset class in the S&P Target Date Index Series that was able to generate a positive returns was the [S&P U.S. Treasury Bond 0-1 Year Index](#), as U.S. Treasury bills became a viable asset class for many investors for the first time in several years. The index gained 0.52%.
- REITs, as represented by the [Dow Jones U.S. Select REIT Index](#), had the worst performance compared to any asset in the S&P Target Date Index Series, at -25.96%.
- Unsurprisingly, far-dated vintages of the S&P Target Date Index Series fared worse than near-dated vintages, due to higher weights to equity and lower weights to fixed income. Although both asset classes performed poorly in 2022, fixed income's relatively better performance mitigated some of the equity losses that dragged far-dated vintages down.
- Near-dated index vintages experienced lower volatility than their far-dated counterparts, with the retirement income vintage experiencing less than half of the volatility of the 2065+ vintage. However, on a one-year basis, risk-adjusted returns were more favorable for far-dated vintages due to relatively higher performance for each unit of risk incurred.

Exhibit 1: One-Year Index Performance



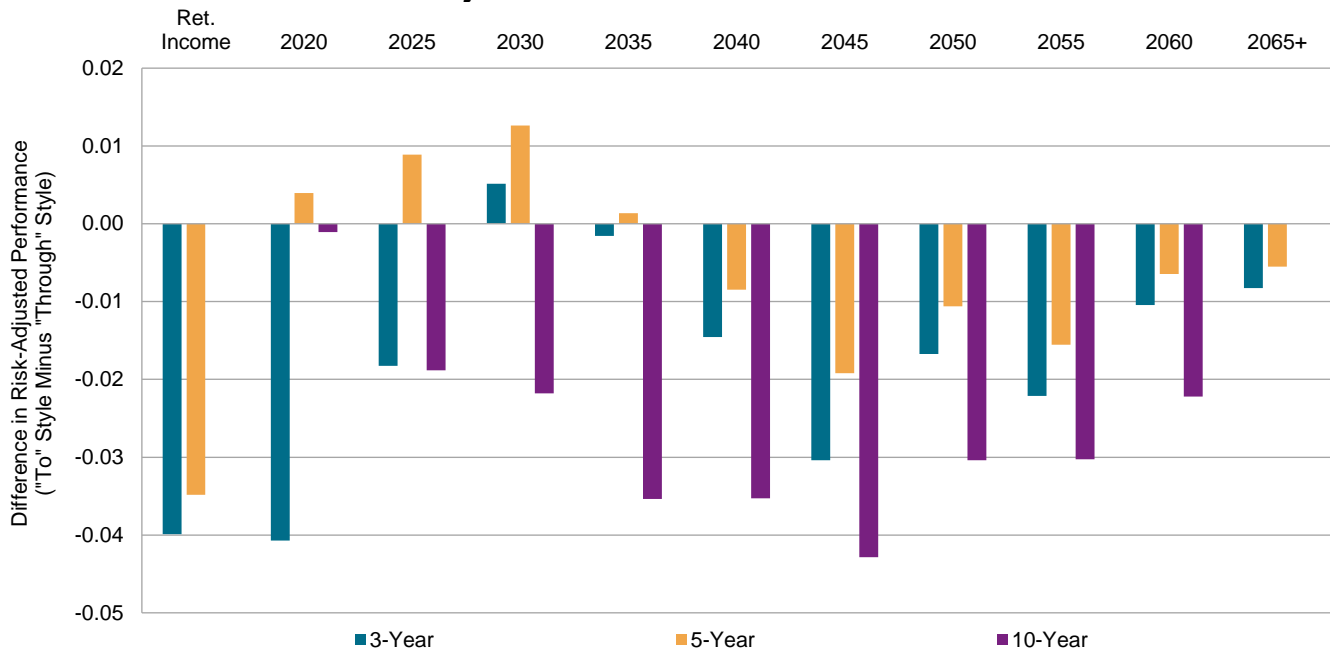
Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 2021, to Dec. 30, 2022. Index performance based on total return in USD. The S&P Target Date "To" 2010 was retired in May 2016. The S&P Target Date "Through" 2010 and S&P Target Date "To" 2015 Indices were retired in May 2022. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Exhibit 2: S&P Target Date Indices Risk/Return Overview

Period	Ret. Income	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065+
Performance (%)													
Q1 2022	-4.52	-4.48	-4.58	-4.72	-4.83	-4.93	-5.02	-5.03	-5.02	-5.02	-5.01	-5.02	-4.98
Q2 2022	-7.29	-7.96	-8.62	-9.33	-10.05	-11.21	-12.55	-13.50	-14.12	-14.39	-14.47	-14.48	-14.44
Q3 2022	-3.97	-4.07	-4.23	-4.59	-4.57	-4.98	-5.50	-5.83	-6.01	-6.07	-6.07	-6.09	-6.04
Q4 2022	4.50	5.00	5.19	5.77	6.34	7.27	8.31	9.17	9.77	10.01	10.11	10.12	10.03
1-Year	-11.17	-11.44	-12.16	-12.81	-13.13	-13.96	-14.99	-15.56	-15.84	-15.97	-15.97	-16.01	-15.95
3-Year	0.53	1.23	1.52	1.49	2.26	2.73	3.29	3.72	3.98	4.12	4.18	4.16	4.22
5-Year	2.33	2.82	3.07	3.14	3.75	4.17	4.63	4.97	5.16	5.26	5.31	5.35	5.38
10-Year	3.59	4.37	5.01	5.50	6.23	6.84	7.42	7.84	8.11	8.33	8.46	8.50	-
Annualized Volatility (%)													
1-Year	10.02	10.90	11.73	12.75	13.63	15.38	17.41	18.88	19.85	20.23	20.34	20.37	20.32
3-Year	8.33	9.24	10.20	11.15	12.59	14.40	16.35	17.70	18.52	18.89	19.06	19.09	19.08
5-Year	7.09	7.90	8.79	9.65	11.00	12.64	14.34	15.48	16.17	16.51	16.65	16.70	16.69
10-Year	5.56	6.32	7.15	7.94	9.00	10.21	11.44	12.29	12.83	13.15	13.30	13.36	-
Risk-Adjusted Performance													
1-Year	-1.11	-1.05	-1.04	-1.01	-0.96	-0.91	-0.86	-0.82	-0.80	-0.79	-0.78	-0.79	-0.79
3-Year	0.06	0.13	0.15	0.13	0.18	0.19	0.20	0.21	0.21	0.22	0.22	0.22	0.22
5-Year	0.33	0.36	0.35	0.33	0.34	0.33	0.32	0.32	0.32	0.32	0.32	0.32	0.32
10-Year	0.65	0.69	0.70	0.69	0.69	0.67	0.65	0.64	0.63	0.63	0.64	0.64	-

Source: S&P Dow Jones Indices LLC. Data as of Dec. 30, 2022. All figures are annualized, based on monthly total returns in USD. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 3: Difference in Risk-Adjusted Performance



Source: S&P Dow Jones Indices LLC. Data as of Dec. 30, 2022. Chart shows the difference in risk-adjusted performance between S&P Target Date To Indices and S&P Target Date Through Indices. Figures based on annualized returns and volatilities based on monthly total return figures. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

A Unique Scorecard for the Target Date Universe

The S&P Target Date Scorecard presents the performance of TDFs compared to appropriate benchmark indices. We consider all target date asset allocation policies to be active decisions, so we include funds that use passive underlying investments as well as active underlying investments. The scorecard covers target dates from retirement income to 2065 and beyond, and it has the following unique features.

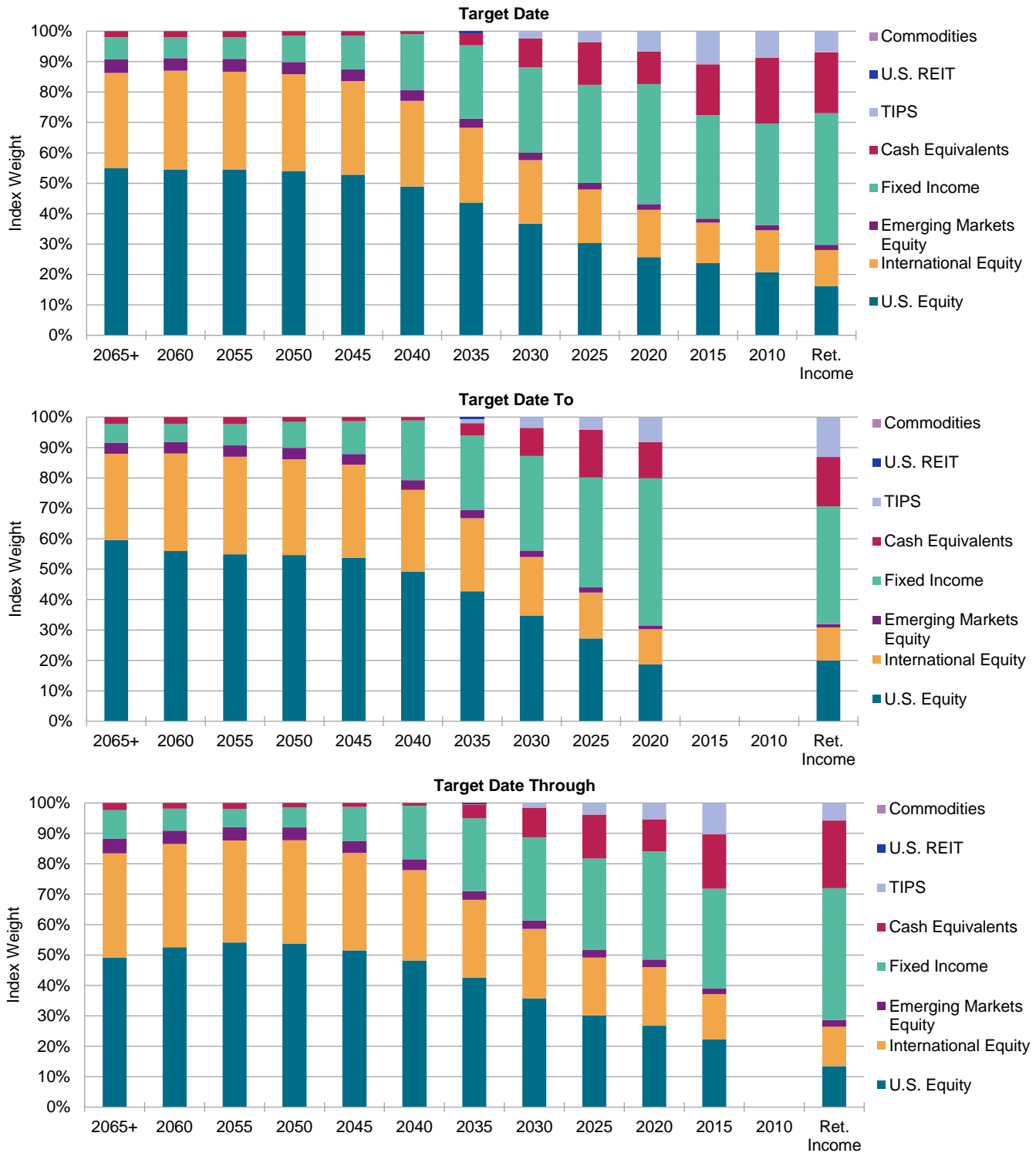
- **A Representative Target Date Benchmark:** The S&P Target Date Index² is the only consensus-driven target date benchmark offered by an independent index provider. Its asset class exposure and glide path are functions of market observations acquired from an annual survey of target date managers. The index currently includes target dates from retirement income through 2065+. The S&P Target Date To Retirement Income and S&P Target Date Through Retirement Income Index Series were launched in January 2015, and performance is incorporated as accumulated history becomes available.

² It is not possible to invest directly in an index. Indices are statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance.

- **Apples-to-Apples Comparison:** TDF returns are sometimes compared to popular asset class benchmarks such as the S&P 500 or Bloomberg Barclays U.S. Aggregate Bond Index. The S&P Target Date Scorecard avoids this pitfall by measuring a fund's returns against the returns of the benchmark that is most appropriate for each target date category.
- **Asset Allocation Risk Revealed:** Sometimes custom, multi-asset class benchmarks are used for comparison purposes. However, these benchmarks do not measure asset allocation risk, as they are typically set with asset class exposure selected by fund managers. They may lack transparency and may not be adjusted for changes in asset allocation policy over time. The report avoids these problems by referencing our consensus-driven target date benchmark that provides a representative proxy of asset allocation risk for each target date vintage.
- **Asset-Weighted Returns:** Average returns for a fund group are often calculated using only equal weighting, which results in the returns of a USD 10 billion fund affecting the average in the same manner as the returns of a USD 10 million fund. An accurate representation of how market participants fared in a particular period can be better ascertained by calculating weighted average returns, in which each fund's return is weighted by net assets. The S&P Target Date Scorecard shows both equal- and asset-weighted averages. Additionally, we now use all share classes to calculate average TDF returns and performance quartiles.
- **Data Cleaning:** Appropriate peer groups are built from underlying databases, so meaningful benchmark comparisons may be performed. TDFs with vintages of 2065 or beyond are compared with the [S&P Target Date 2065+ Index](#). TDFs with vintages that have already passed, such as 2005, are compared with the [S&P Target Date Retirement Income Index](#). Average TDF returns, both equal and asset weighted, are calculated using all share classes within each fund family in order to represent the aggregate experience of TDF shareholders. The S&P Target Date Scorecard offers the only comprehensive, periodic and publicly available source of such data. Reports are available at spglobal.com/spdji.

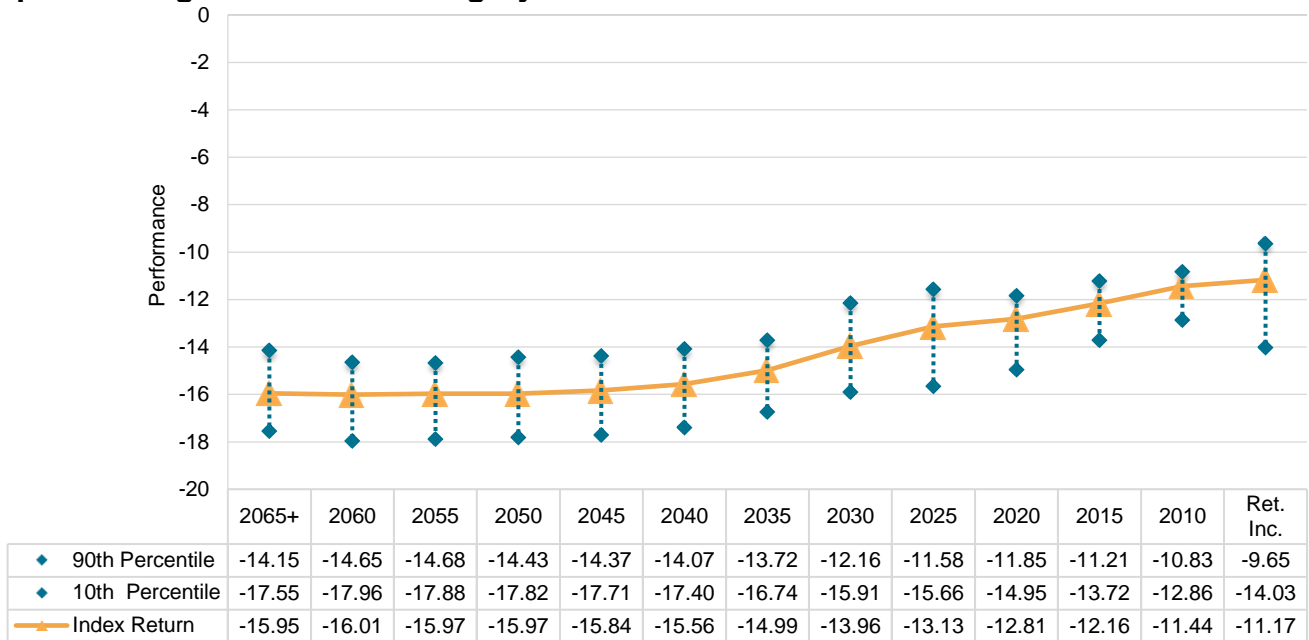
Reports

Report 1: S&P Target Date Benchmark Glide Path – Index Weights



Source: S&P Dow Jones Indices LLC. Data as of Dec. 30, 2022. Past performance is no guarantee of future results. The S&P Target Date To 2010 Index was retired in May 2016. The S&P Target Date Through 2010 and S&P Target Date To 2015 Indices were retired in May 2022. Charts are provided for illustrative purposes.

Report 2: Target Date Fund Category Performance



Source: S&P Dow Jones Indices LLC, FactSet. Data as of Dec. 30, 2022. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Report 3: Average TDF Performance

Category	One-Year (%)	Three-Year (Annualized, %)	Five-Year (Annualized, %)
Ret. Income TDFs (EW)	-11.63	0.52	2.26
Ret. Income TDFs (AW)	-12.01	0.44	2.31
S&P Target Date Ret. Income Index	-11.17	0.53	2.33
S&P Target Date To Ret. Income Index	-11.66	0.74	2.45
S&P Target Date Through Ret. Income Index	-11.34	1.07	2.72
2010 TDFs (EW)	-11.82	0.92	2.60
2010 TDFs (AW)	-11.44	1.34	2.87
S&P Target Date 2010 Index	-11.44	1.23	2.82
S&P Target Date To 2010 Index*	-	-	-
S&P Target Date Through 2010 Index*	-	-	-
2015 TDFs (EW)	-12.67	1.09	2.87
2015 TDFs (AW)	-12.34	1.58	3.15
S&P Target Date 2015 Index	-12.16	1.52	3.07
S&P Target Date To 2015 Index*	-	-	-
S&P Target Date Through 2015 Index	-12.35	1.69	3.25
2020 TDFs (EW)	-13.32	1.18	2.95
2020 TDFs (AW)	-13.17	1.63	3.34
S&P Target Date 2020 Index	-12.81	1.49	3.14
S&P Target Date To 2020 Index	-12.08	1.11	2.69
S&P Target Date Through 2020 Index	-13.18	1.96	3.56
2025 TDFs (EW)	-13.89	1.46	3.23
2025 TDFs (AW)	-14.07	1.92	3.63
S&P Target Date 2025 Index	-13.13	2.26	3.75
S&P Target Date To 2025 Index	-12.47	1.94	3.40
S&P Target Date Through 2025 Index	-13.50	2.57	4.05
2030 TDFs (EW)	-14.63	2.06	3.77
2030 TDFs (AW)	-14.91	2.37	4.07
S&P Target Date 2030 Index	-13.96	2.73	4.17
S&P Target Date To 2030 Index	-13.55	2.53	3.89
S&P Target Date Through 2030 Index	-14.22	2.80	4.34

*The S&P Target Date To 2010 was retired in May 2016. The S&P Target Date Through 2010 and S&P Target Date To 2015 Indices were retired in May 2022.

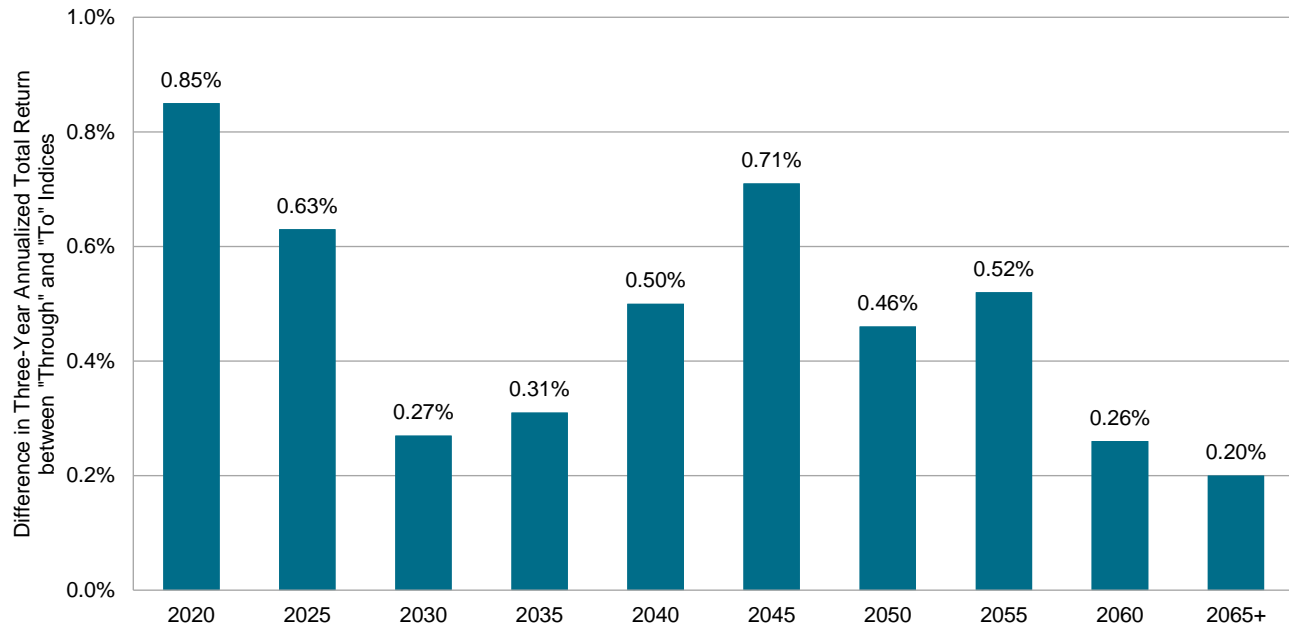
Source: S&P Dow Jones Indices LLC, FactSet. Data as of Dec. 30, 2022. "EW" represents equal weighted. "AW" represents asset weighted. See Appendix I for more information. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Report 3: Average Target Date Fund Performance (cont.)

Category	One-Year (%)	Three-Year (Annualized, %)	Five-Year (Annualized, %)
2035 TDFs (EW)	-15.59	2.67	4.28
2035 TDFs (AW)	-15.70	2.99	4.61
S&P Target Date 2035 Index	-14.99	3.29	4.63
S&P Target Date To 2035 Index	-14.56	3.05	4.35
S&P Target Date Through 2035 Index	-15.20	3.36	4.79
2040 TDFs (EW)	-16.06	3.11	4.64
2040 TDFs (AW)	-16.35	3.45	4.92
S&P Target Date 2040 Index	-15.56	3.72	4.97
S&P Target Date To 2040 Index	-15.19	3.31	4.61
S&P Target Date Through 2040 Index	-15.83	3.81	5.12
2045 TDFs (EW)	-16.41	3.45	4.90
2045 TDFs (AW)	-16.60	3.76	5.21
S&P Target Date 2045 Index	-15.84	3.98	5.16
S&P Target Date To 2045 Index	-15.65	3.53	4.83
S&P Target Date Through 2045 Index	-16.02	4.24	5.40
2050 TDFs (EW)	-16.60	3.57	4.99
2050 TDFs (AW)	-16.82	3.78	5.23
S&P Target Date 2050 Index	-15.97	4.12	5.26
S&P Target Date To 2050 Index	-15.84	3.82	5.01
S&P Target Date Through 2050 Index	-16.21	4.28	5.44
2055 TDFs (EW)	-16.70	3.68	5.07
2055 TDFs (AW)	-16.92	3.75	5.19
S&P Target Date 2055 Index	-15.97	4.18	5.31
S&P Target Date To 2055 Index	-15.88	3.81	5.02
S&P Target Date Through 2055 Index	-16.17	4.33	5.46
2060 TDFs (EW)	-16.68	3.66	5.13
2060 TDFs (AW)	-16.95	3.74	5.19
S&P Target Date 2060 Index	-16.01	4.16	5.35
S&P Target Date To 2060 Index	-15.97	4.04	5.20
S&P Target Date Through 2060 Index	-16.19	4.30	5.46
2065+ TDFs (EW)	-15.88	3.76	5.24
2065+ TDFs (AW)	-16.41	3.66	3.51
S&P Target Date 2065+ Index	-15.95	4.22	5.38
S&P Target Date To 2065+ Index	-15.86	4.19	5.30
S&P Target Date Through 2065+ Index	-16.03	4.39	5.51

Source: S&P Dow Jones Indices LLC, FactSet. Data as of Dec. 30, 2022. "EW" represents equal weighted. "AW" represents asset weighted. See Appendix I for more information. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Report 4: Difference in Three-Year Total Return Indices (Through Minus To) by Vintage



Source: S&P Dow Jones Indices LLC, FactSet. Data as of Dec. 30, 2022. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Report 5: Quartile Breakpoints of TDFs

Fund Category	25 th Percentile	Median	75 th Percentile
One-Year			
Ret. Income	-10.56	-11.90	-12.93
Target 2010	-11.12	-12.16	-12.48
Target 2015	-12.10	-12.83	-13.56
Target 2020	-12.65	-13.40	-14.30
Target 2025	-13.31	-14.30	-14.95
Target 2030	-13.98	-15.18	-15.76
Target 2035	-15.15	-15.91	-16.61
Target 2040	-15.55	-16.41	-17.09
Target 2045	-16.08	-16.80	-17.22
Target 2050	-16.09	-16.95	-17.56
Target 2055	-16.32	-16.93	-17.52
Target 2060	-16.19	-16.98	-17.60
Target 2065+	-16.17	-17.04	-17.29

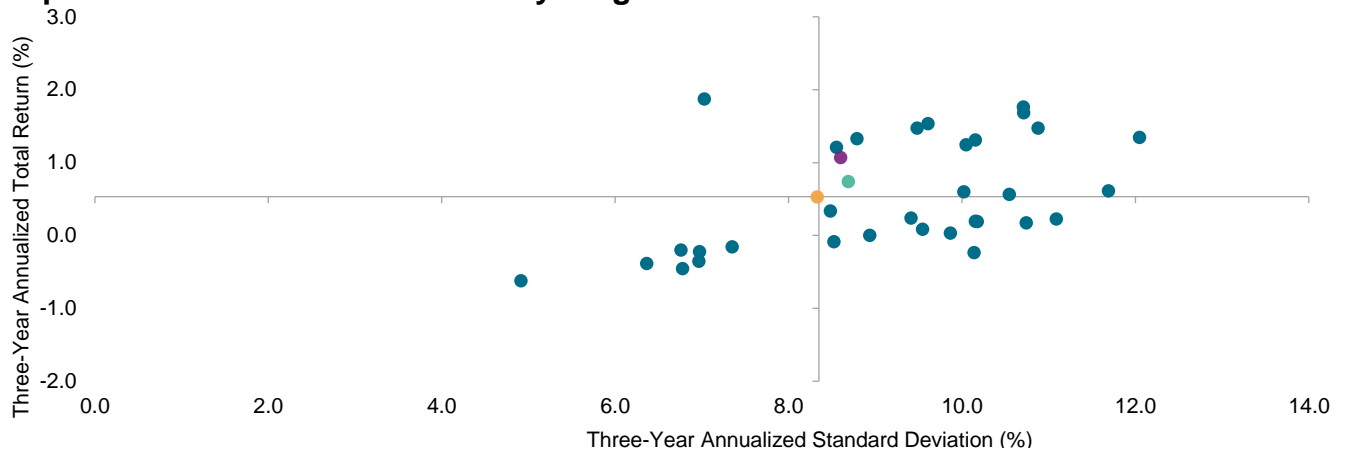
Source: S&P Dow Jones Indices LLC, FactSet. Data as of Dec. 30, 2022. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Report 5: Quartile Breakpoints of Target Date Funds (cont.)

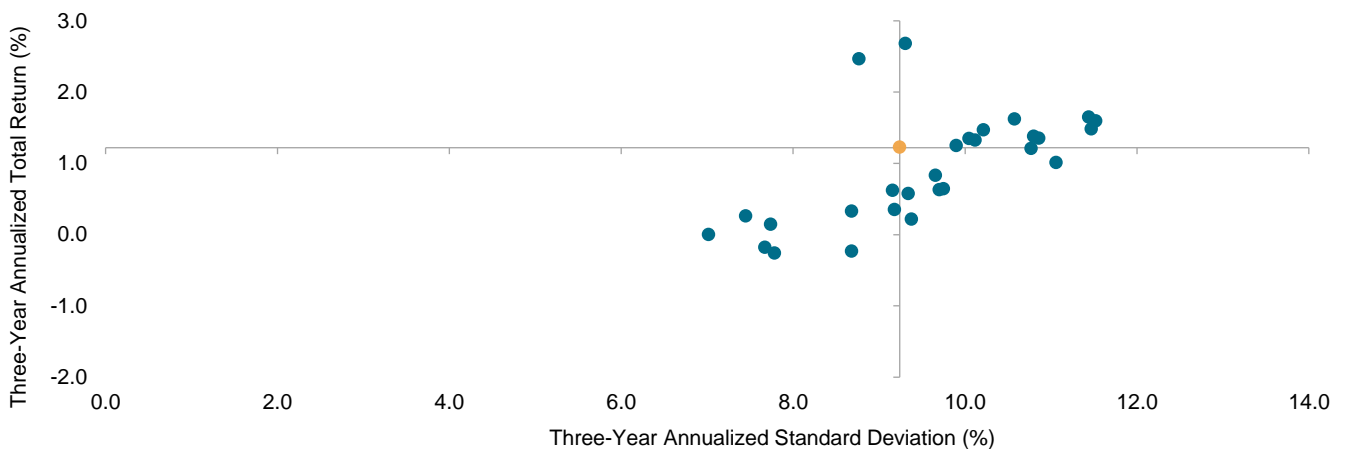
Fund Category	25 th Percentile	Median	75 th Percentile
Three-Year			
Ret. Income	1.31	0.23	-0.10
Target 2010	1.41	0.92	0.31
Target 2015	1.78	1.19	0.62
Target 2020	1.95	1.33	0.54
Target 2025	2.14	1.57	0.99
Target 2030	2.62	2.16	1.53
Target 2035	3.13	2.69	2.14
Target 2040	3.56	3.09	2.72
Target 2045	3.92	3.49	3.08
Target 2050	3.95	3.60	3.30
Target 2055	3.98	3.71	3.42
Target 2060	3.99	3.74	3.36
Target 2065+	3.95	3.78	3.47
Five-Year			
Ret. Income	2.87	2.27	1.75
Target 2010	3.03	2.76	2.12
Target 2015	3.16	2.88	2.59
Target 2020	3.49	3.13	2.62
Target 2025	3.75	3.43	2.94
Target 2030	4.18	3.82	3.32
Target 2035	4.64	4.36	3.84
Target 2040	4.96	4.67	4.37
Target 2045	5.20	4.94	4.55
Target 2050	5.22	5.06	4.72
Target 2055	5.34	5.13	4.85
Target 2060	5.33	5.20	5.03
Target 2065+	5.32	5.21	5.14

Source: S&P Dow Jones Indices LLC, FactSet. Data as of Dec. 30, 2022. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

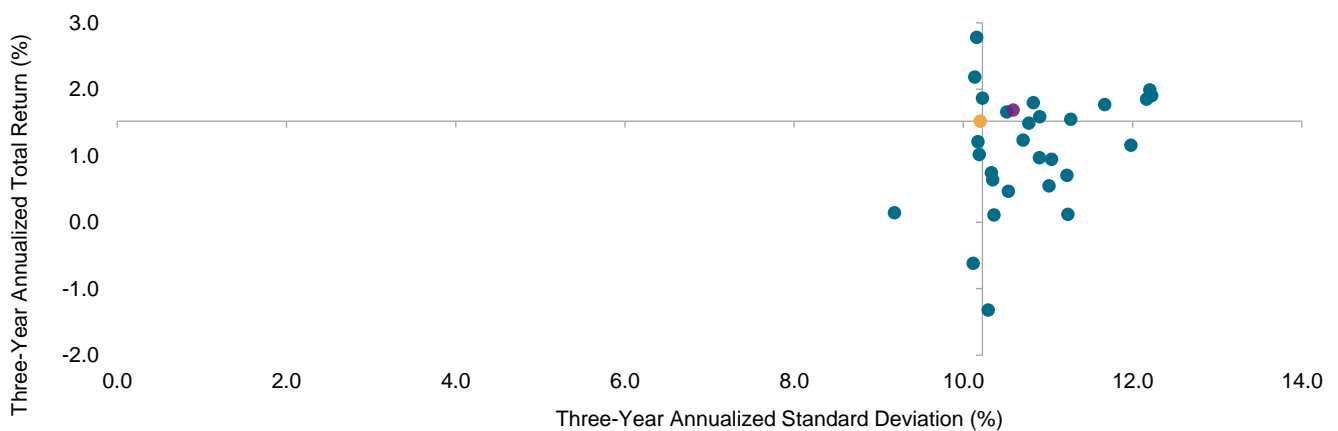
Report 6: Three-Year Risk/Return by Target Date



● Target Date Ret Inc ● S&P Target Date Ret Inc ● S&P Target Date To Ret Inc ● S&P Target Date Through Ret Inc



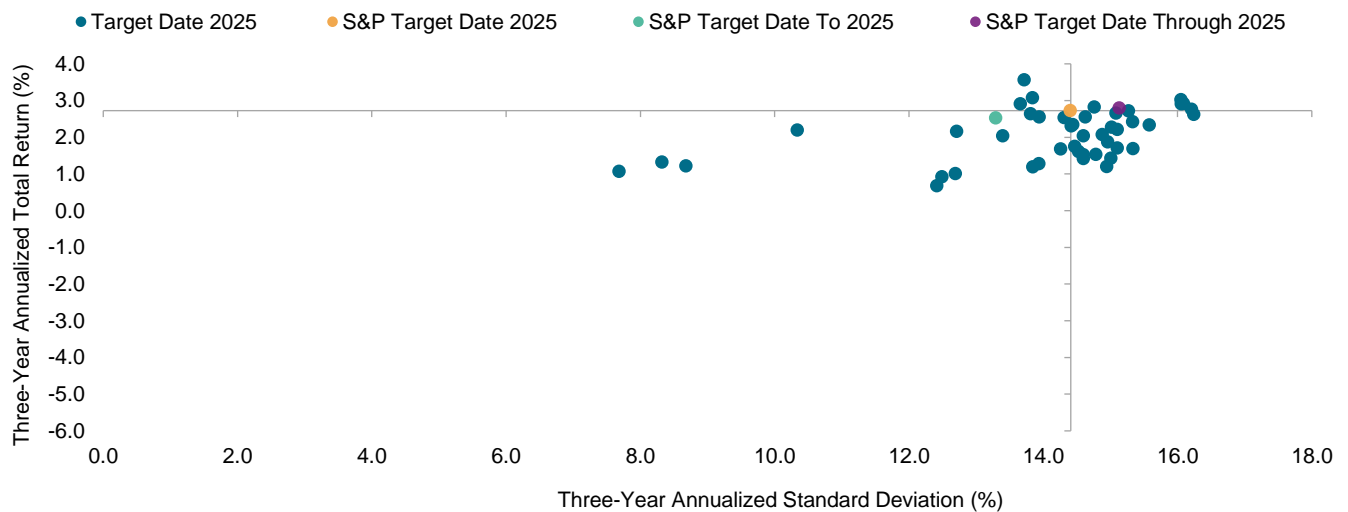
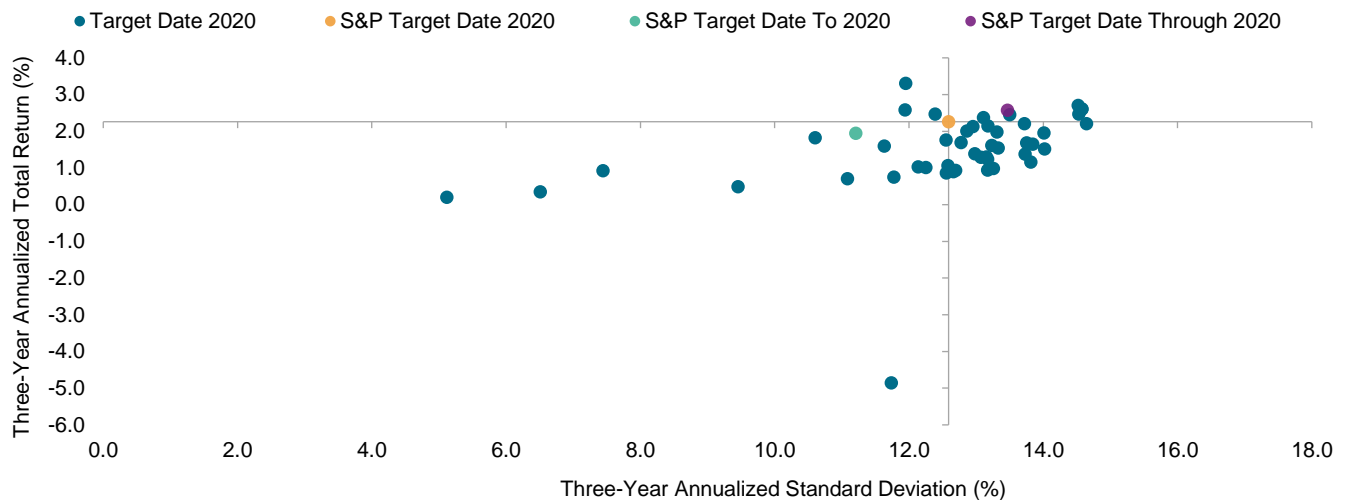
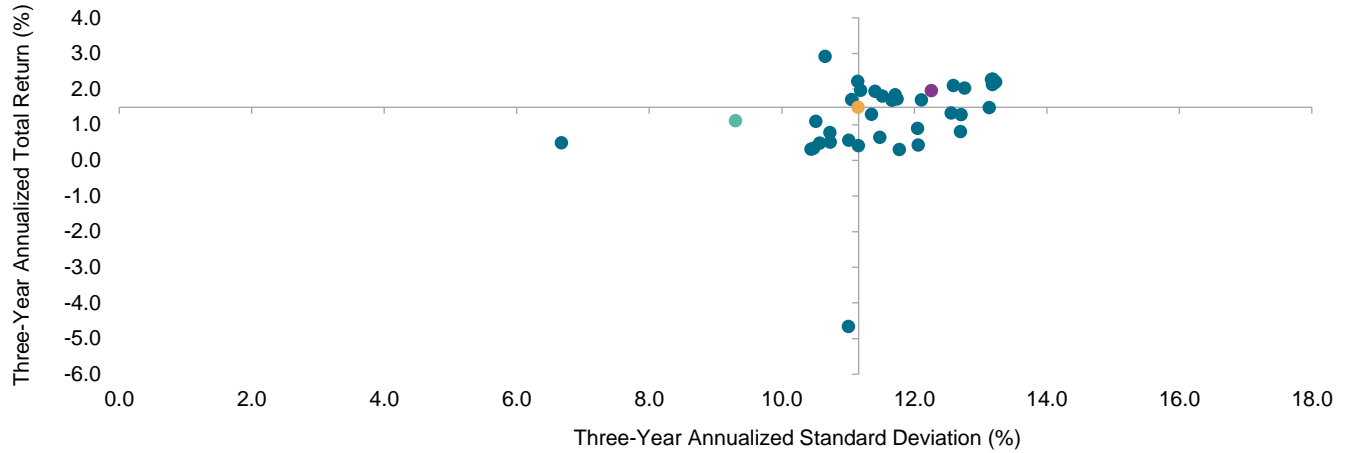
● Target Date 2010 ● S&P Target Date 2010



● Target Date 2015 ● S&P Target Date 2015 ● S&P Target Date Through 2015

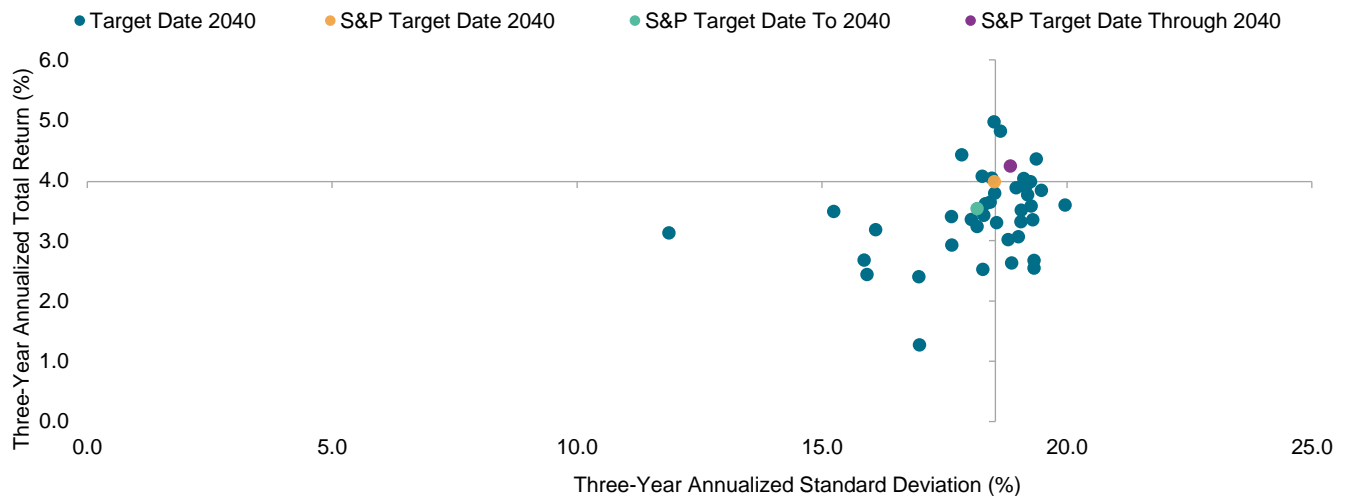
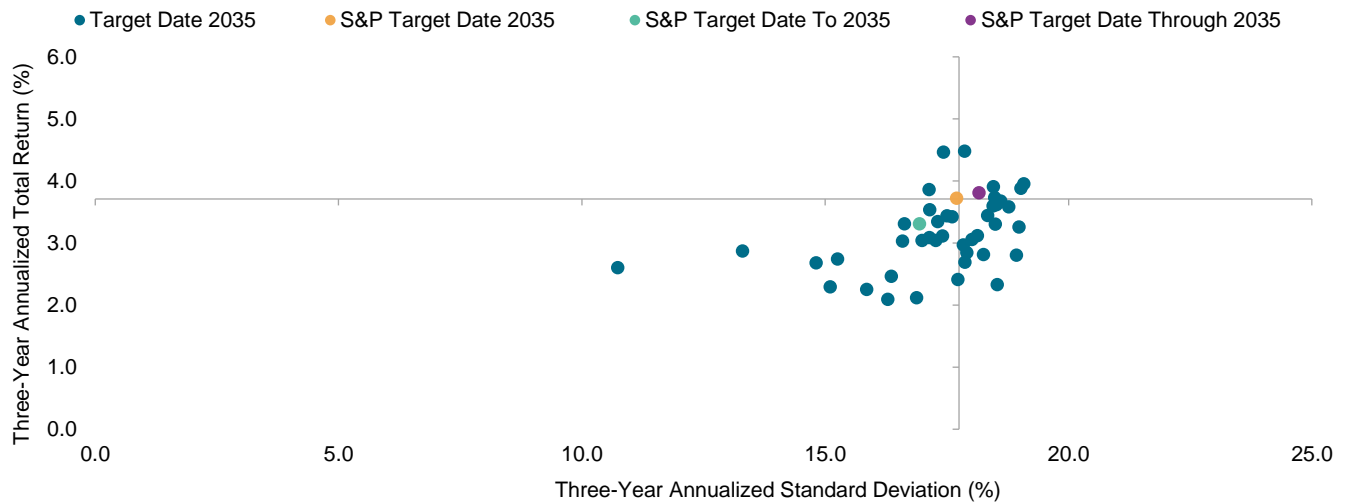
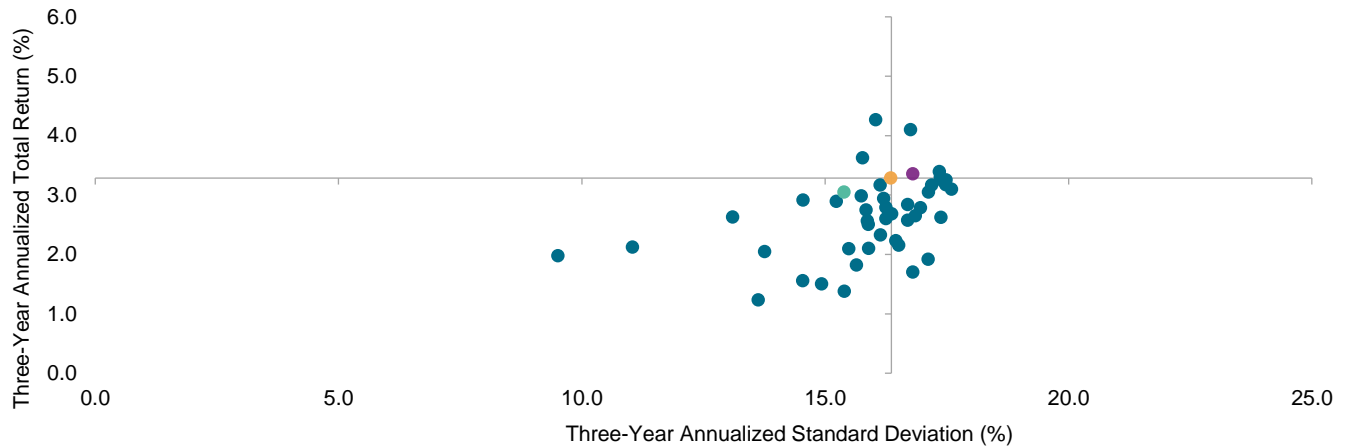
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Report 6: Three-Year Risk/Return by Target Date (cont.)



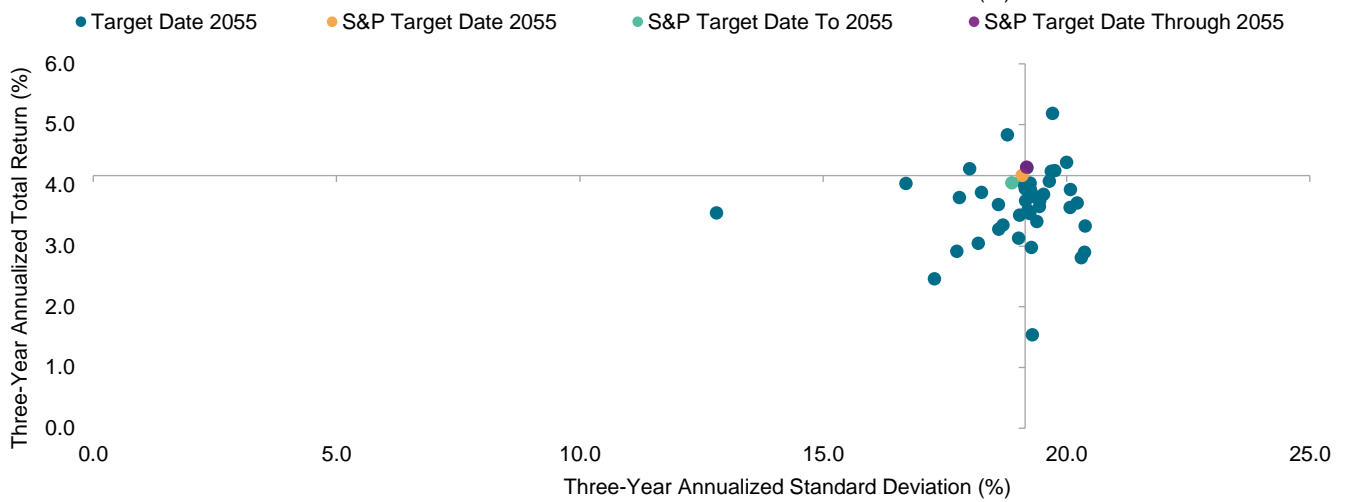
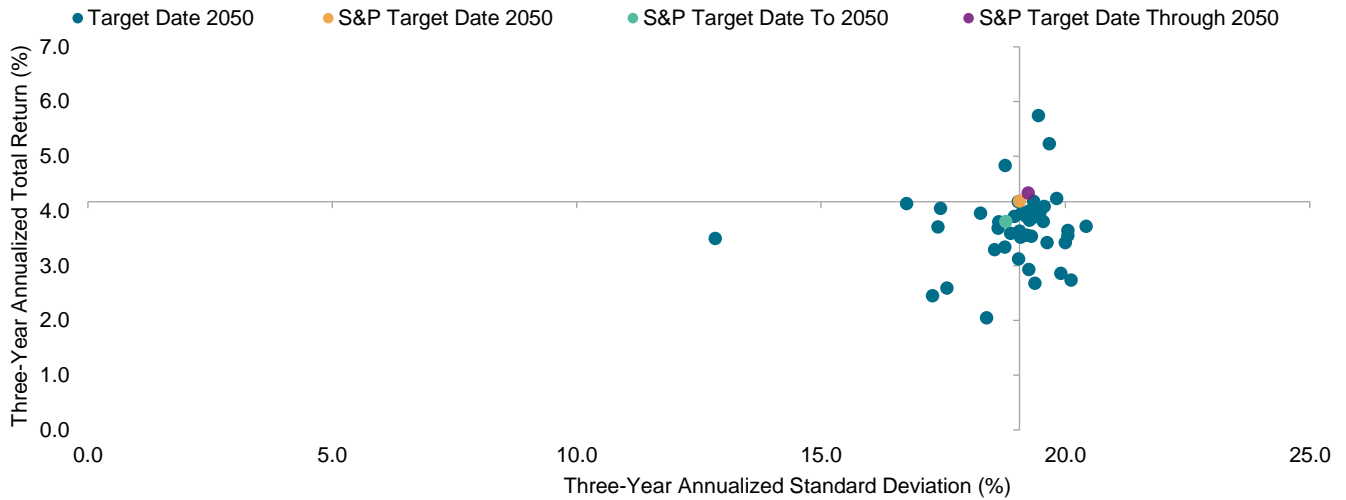
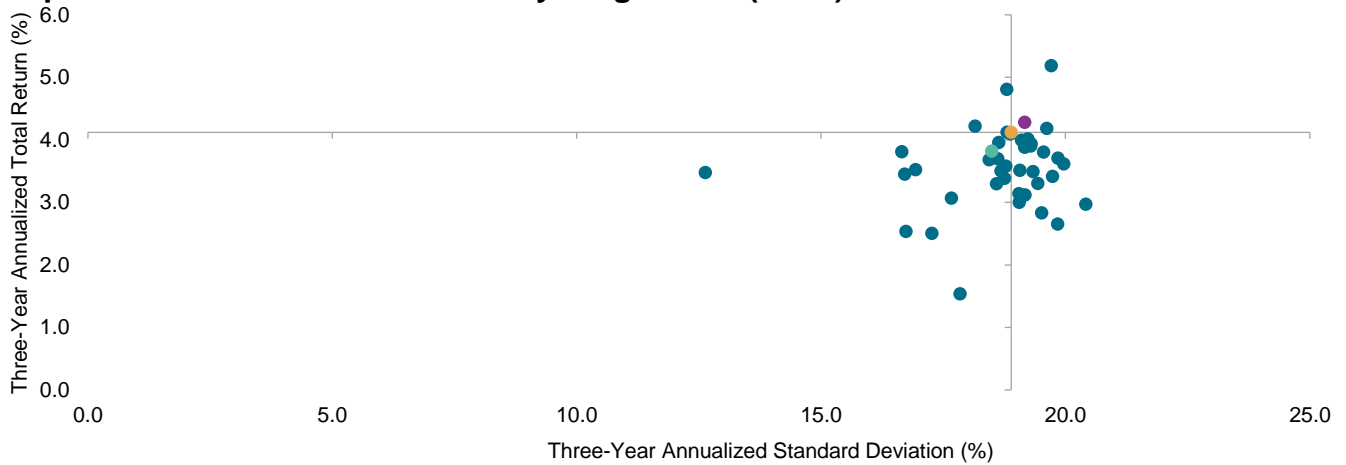
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Report 6: Three-Year Risk/Return by Target Date (cont.)



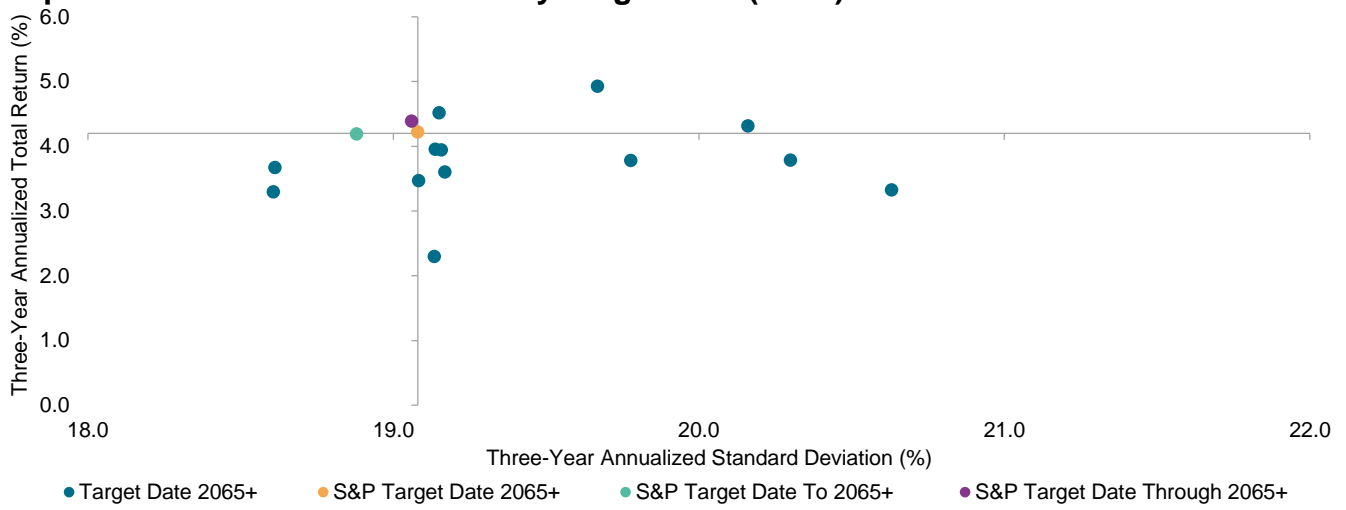
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Appendix I: Glossary

Equal-Weighted (EW) Average TDF Performance

Equal-weighted returns for a particular style category are determined by calculating a simple average return of all active share classes in that category in a specific month. The effects of sales charges, or loads, are not included.

Asset-Weighted (AW) Average TDF Performance

Asset-weighted returns for a particular style category are determined by calculating a weighted average return of all funds in that category in a specific month, with each fund's return weighted by its total net assets. The effects of sales charges, or loads, are not included.

Quartiles Breakpoints

The p^{th} percentile for a set of data is the value that is greater than or equal to $p\%$ of the data but less than or equal to $(100 - p)\%$ of the data. In other words, it is a value that divides the data into two parts: the lower $p\%$ of the values and the upper $(100 - p)\%$ of the values. The first quartile is the 75th percentile, meaning it is the value separating the elements of a population into the lower 75% and the upper 25%. The second quartile is the 50th percentile and the third quartile is the 25th percentile. Returns of all share classes, excluding loads, are used to calculate TDF category quartiles for specific time periods.

Appendix II: Index Construction

The S&P Target Date Index Series is a survey index that uses actual allocation data from U.S. TDFs to determine its allocation for each index vintage. The underlying database used for this survey is FactSet, which covers both U.S. target date mutual funds and collective investment trusts.

In the spring of each year, the index series undergoes a new survey. This survey, also referred to as the annual reconstitution, first pulls all U.S. TDF families with at least USD 100 million in AUMs, which will serve as the fund universe to determine eligible asset classes and weights for the index series. Fund holdings are taken from FactSet and supplemented by the latest Form N-Q from EDGAR. To determine the eligible asset classes from which the index series will be based upon, asset classes must pass one of two thresholds. For asset classes that already exist in the index series as of the most recent year (e.g., U.S. large-cap equities), at least 25% of funds in the survey must have an allocation to this asset class in order for it to remain eligible for inclusion. For new asset classes that are not included in the index as of the most recent year, this threshold would be 30%. Once the eligible asset classes are determined, they will be assigned a corresponding index that will be used to represent the asset class in the final S&P Target Date Indices. The eligible asset classes for the 2022 reconstitution are shown in Exhibit 4.

Exhibit 4: Asset Classes in the S&P Target Date Indices

Asset Class	Corresponding Index
U.S. Large-Cap Equity	S&P 500 TR
U.S. Mid-Cap Equity	S&P 400 TR
U.S. Small-Cap Equity	S&P 600 TR
International Equity	S&P Developed Ex-U.S. BMI NTR
Emerging Market Equity	S&P Emerging BMI NTR
U.S. REITs	Dow Jones U.S. Select REIT TR
International REITs	S&P Developed Ex-U.S. REIT NTR
Core Fixed Income	S&P U.S. Aggregate Bond Index TR
Cash Equivalents	S&P U.S. Treasury Bond 0-1 Year TR
TIPS	S&P US Treasury TIPS TR
High Yield Corporate Bonds	S&P 500 High Yield Corporate Bond Index
Commodities	S&P GSCI TR

Source: S&P Dow Jones Indices LLC, FactSet. Data as of Dec. 30, 2022. Table is provided for illustrative purposes.

However, just because an asset class is eligible for inclusion in the index does not mean that it will be included in every or any vintage of the S&P Target Date Index Series. The data go

through several more steps to reduce the impact of outliers and allocations that are determined to be too small for inclusion in order to accurately reflect the TDF landscape.

The next step in the index construction process is to separate TDFs into their peer groups based on their vintage. By looking at the weights of the target peer group, the 10th and 90th percentiles for each eligible asset class are determined. From here, the weights for each eligible asset class are winsorized at these percentiles to mitigate the influence of outliers on the weight of the final indices. For example, the 2040 peer group will calculate the percentiles for each of the 12 eligible asset classes. A majority of the funds in that peer group may have allocations to U.S. large-cap equities between the 10th and 90th percentile values, and their weights would not be adjusted. However, there may be a single fund where the U.S. large-cap equity allocation is in the 95th percentile. According to the index methodology, this value is too high, and therefore this fund's U.S. large-cap weight will be adjusted to the 90th percentile value.

Next, an average of these winsorized values are taken to determine the weights of each asset class in the vintage. Note that this is a simple winsorized average, which means it is not affected by the size of the funds in the survey. This simple average is done to give an equal representation to all funds in the survey. From the results in the previous step, an asset class must meet a minimum size requirement for inclusion in the final S&P Target Date Index. If it does not meet the minimum size, it will be excluded from the index. For asset classes that exist in the prior year's index, the weight must be at least 0.5%. For asset classes that did not exist in the prior year's index, the weight must be at least 1.5%. Once the ineligible asset classes are dropped, the remaining asset classes are scaled to 100%. These are the final weights of the subindices of S&P Target Date Index Series.

The new asset classes and subindex weights from the annual reconstitution are determined using data as of market close on the third Friday in April. The new weights of S&P Target Date Indices go into effect after the close on the last trading day in May. Throughout the month, the weights of the subindices drift freely. After the close on the last day of each month, the index is reweighted back to its most recent annual reconstitution weight in order to prevent too much change from the pre-determined weights.

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