

U.S. Persistence Scorecard

Contributors

Tim Edwards, PhD
Managing Director
Index Investment Strategy
tim.edwards@spglobal.com

Anu R. Ganti, CFA
Senior Director
Index Investment Strategy
anu.ganti@spglobal.com

Joe Nelesen, PhD
Senior Director
Index Investment Strategy
joseph.nelesen@spglobal.com

Davide Di Gioia
Chief SPIVA Engineer
Index Investment Strategy
davide.di.gioia@spglobal.com

Experience the
active vs. passive debate
on a global scale.

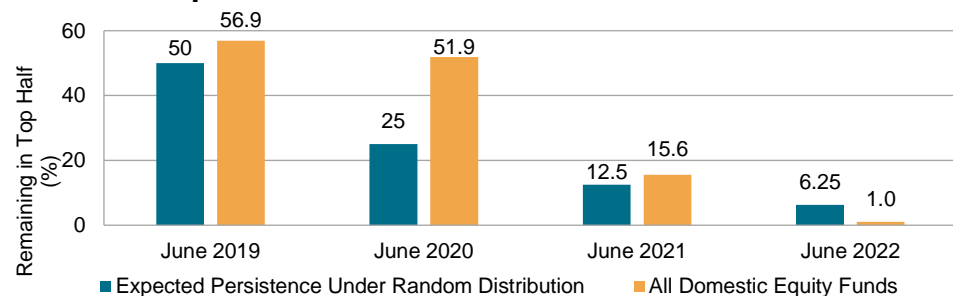
Summary

Can investment results be attributed to skill or luck? Genuine skill is more likely to persist, while luck is random and fleeting. Thus, one measure of skill is the consistency of a fund's performance relative to its peers. The Persistence Scorecard measures that consistency and shows that, **regardless of asset class or style focus, active management outperformance is typically relatively short-lived**, with few funds consistently outranking their peers.

The first half of 2022 saw the winds change materially for investors across asset classes, with active fund persistence decreasing in comparison to previous reports. Within each of our reported domestic equity categories, among all the funds whose performance placed them in the top quartile for the 12 months ending June 2020, **not a single fund managed to remain in the top quartile over the next two years** (see Report 1).

Exhibit 1 illustrates the evolution of top-half persistence statistics over time for all actively managed domestic equity funds (see Report 2), compared to what might be expected under a random distribution.¹

Exhibit 1: Top-Half Domestic Funds of Were Unlikely to Repeat Their Accomplishments over the Next Five Years



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

¹ The odds of a top-half fund in one year randomly staying in the top half over the next four years are $50\% * 50\% * 50\% * 50\% = 6.25\%$, or 1/16.

Register to receive our latest research, education, and commentary at
on.spdji.com/SignUp.

Report Highlights

- **Very few actively managed equity and fixed income funds managed to maintain consistent outperformance relative to their peers over the three- or five-year periods ending in June 2022.**
- Of the actively managed **equity** funds whose 12-month performance placed them in the top quartile of their respective category as of June 2020, **not a single fund maintained its top-quartile performance over the next two 12-month intervals.**
- **In 12 out of 17 reported fixed income categories, no actively managed fund managed to maintain top-quartile performance over three consecutive 12-month periods ending June 2022.** In 14 out of 17 categories, less than 25% of funds whose three-year performance placed them in the top *half* of their category as of June 2020 managed to maintain their record over the subsequent two years.
- Over a **five-year horizon**, it was statistically near impossible to find consistent outperformance. Among all actively managed funds whose performance over the 12 months ending June 2018 placed them in the top quartile within their respective category, **not one fund in any of our reported fixed income and equity categories remained in the top quartile in each of the four subsequent one-year periods ending in June 2022.**
- **Over discrete three- and five-year periods, there was some evidence of persistence in relative outperformance in fixed income categories, but less so in equities.** For purposes of comparison, 25% of top-quartile funds would be expected to remain in the top quartile in a subsequent period if performance was purely random. Our scorecard reports an unweighted average of 14% and 31% remaining in the top quartile, respectively, across equity and fixed income categories over the past two consecutive three-year periods, and equivalent figures of 18% and 30% over the past two consecutive five-year periods.
- **Poor performance continued to be a reliable indicator of future fund closures.** For example, of the actively managed domestic equity funds whose performance placed them in the bottom quartile of performance over the five-year period ending in June 2017, more than 29% were subsequently merged or liquidated over the next five years. In fact, in every reported equity category, and in all but two of our reported fixed income categories, **the worst-performing quartile over the previous five years saw the highest (or joint-highest) proportion of funds that were subsequently merged or liquidated over the next five years.**

About The Persistence Scorecard

The phrase “past performance is no guarantee of future results” (or some variation thereof) can be found in the fine print of most mutual fund literature. Yet many investors and advisors consider past performance and related metrics to be important factors in fund selection. So, does past performance really matter?

To answer this question, the semiannual S&P Persistence Scorecard tracks the degree to which historical relative performance is predictive of future relative performance. As in our widely followed SPIVA® Scorecards, the University of Chicago’s Center for Research in Security Prices (CRSP) Survivorship Bias Free Mutual Fund Database serves as our underlying data source. For a more detailed description of the Persistence Scorecard’s allocation of funds to appropriate categories, and how funds are screened and selected for inclusion, please see the corresponding SPIVA U.S. Mid-Year 2022 Scorecard.²

Key features of the S&P Persistence Scorecard include:

- **Historical rankings without survivorship bias:** For anyone making an investment decision, all funds available at the time of that decision are part of the initial opportunity set. Ignoring funds that liquidate or merge during a period of study biases measurements of persistence. Using the CRSP database, the S&P Persistence Scorecard ranks all funds available at each point in time and tracks the top-quartile and top-half performers over time.
- **Clean universe:** The mutual fund universe used in these reports comprises actively managed domestic U.S. equity funds. Index funds, sector funds and index-based dynamic (bull or bear) funds are excluded from the sample. To avoid double counting of multiple share classes, only the share class with the highest previous period return of each fund is used.
- **Transition matrices:** Transition matrices show the movements between quartiles and halves over non-overlapping three- and five-year periods. They also track the percentage of funds that have merged, liquidated, or changed style.³
- **Tracking reports of top performers:** The tracking reports show the percentage of funds that remain in the top-quartile or top-half rankings over consecutive three- and five-year periods.

² The latest and historical SPIVA Scorecards for each region can be found at <https://www.spglobal.com/spdji/en/research-insights/spiva/>

³ Starting with the U.S. Persistence Scorecard Year-End 2019, the style change calculation includes funds that changed fund categories at any point between the relevant start and end dates. Previously, this calculation was only checked if the fund category remained identical at the endpoints.

Reports

Report 1: Performance Persistence of Domestic Equity Funds over Three Consecutive 12-Month Periods

Fund Category	Fund Count at Start (June 2020)	Percentage Remaining in Top Quartile	
		June 2021	June 2022
Top Quartile			
All Domestic Funds	489	12.27	0.00
All Large-Cap Funds	163	20.86	0.00
All Mid-Cap Funds	63	14.29	0.00
All Small-Cap Funds	118	12.71	0.00
All Multi-Cap Funds	111	18.92	0.00
Fund Category	Fund Count at Start (June 2020)	Percentage Remaining in Top Half	
		June 2021	June 2022
Top Half			
All Domestic Funds	978	32.11	3.99
All Large-Cap Funds	326	50.92	3.68
All Mid-Cap Funds	130	25.38	3.08
All Small-Cap Funds	239	30.13	6.69
All Multi-Cap Funds	228	42.54	8.33

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

Report 2: Performance Persistence of Domestic Equity Funds over Five Consecutive 12-Month Periods

Fund Category	Fund Count at Start (June 2018)	Percentage Remaining in Top Quartile			
		June 2019	June 2020	June 2021	June 2022
Top Quartile					
All Domestic Funds	533	41.46	36.21	4.13	0.00
All Large-Cap Funds	187	36.90	33.16	3.74	0.00
All Mid-Cap Funds	67	44.78	34.33	0.00	0.00
All Small-Cap Funds	130	65.38	53.85	5.38	0.00
All Multi-Cap Funds	119	42.86	31.93	5.04	0.00
Fund Category	Fund Count at Start (June 2018)	Percentage Remaining in Top Half			
		June 2019	June 2020	June 2021	June 2022
Top Half					
All Domestic Funds	1067	56.89	51.92	15.56	1.03
All Large-Cap Funds	376	57.71	52.39	22.61	1.86
All Mid-Cap Funds	135	68.89	60.00	12.59	0.00
All Small-Cap Funds	261	67.43	57.09	14.18	1.15
All Multi-Cap Funds	229	63.76	54.15	21.83	2.62

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

Report 3: Three-Year Transition Matrix – Performance over Two Non-Overlapping Three-Year Periods (Based on Quartile)

Quartile	Fund Count at Start (June 2016-June 2019)	Three-Year Percentages at End (June 2019-June 2022)					
		1st Quartile (%)	2nd Quartile (%)	3rd Quartile (%)	4th Quartile (%)	Merged/ Liquidated (%)	Style Changed (%)
All Domestic Funds							
1st Quartile	495	15.56	13.33	17.78	30.10	6.67	16.57
2nd Quartile	495	20.81	15.35	13.94	12.12	11.72	26.06
3rd Quartile	495	13.74	23.03	15.96	8.69	15.15	23.43
4th Quartile	496	7.86	15.52	17.34	13.51	19.96	25.81
All Large-Cap Funds							
1st Quartile	181	18.23	15.47	16.02	29.83	7.18	13.26
2nd Quartile	180	23.33	24.44	13.89	4.44	7.78	26.11
3rd Quartile	181	17.68	17.68	21.55	6.63	10.50	25.97
4th Quartile	181	4.97	11.60	19.89	19.34	16.02	28.18
All Mid-Cap Funds							
1st Quartile	70	5.71	12.86	22.86	32.86	8.57	17.14
2nd Quartile	69	13.04	8.70	18.84	15.94	15.94	27.54
3rd Quartile	70	21.43	22.86	11.43	5.71	8.57	30.00
4th Quartile	70	15.71	10.00	18.57	4.29	24.29	27.14
All Small-Cap Funds							
1st Quartile	125	10.40	10.40	24.00	40.00	6.40	8.80
2nd Quartile	124	11.29	21.77	19.35	20.97	10.48	16.13
3rd Quartile	124	22.58	20.97	12.90	10.48	16.94	16.13
4th Quartile	125	23.20	16.00	10.40	6.40	24.80	19.20
All Multi-Cap Funds							
1st Quartile	123	17.89	9.76	11.38	21.95	8.13	30.89
2nd Quartile	122	18.03	18.85	13.11	8.20	13.93	27.87
3rd Quartile	122	9.84	15.57	19.67	10.66	18.03	26.23
4th Quartile	123	8.13	10.57	10.57	17.07	24.39	29.27

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

Report 4: Three-Year Transition Matrix – Performance over Two Non-Overlapping Three-Year Periods (Based on Halves)

Half	Fund Count at Start (June 2016-June 2019)	Three-Year Percentage at End (June 2019-June 2022)			
		Top Half (%)	Bottom Half (%)	Merged/Liquidated (%)	Style Changed (%)
All Domestic Funds					
Top Half	990	32.53	36.97	9.19	21.31
Bottom Half	991	30.07	27.75	17.56	24.62
All Large-Cap Funds					
Top Half	361	40.72	32.13	7.48	19.67
Bottom Half	362	25.97	33.70	13.26	27.07
All Mid-Cap Funds					
Top Half	139	20.14	45.32	12.23	22.30
Bottom Half	140	35.00	20.00	16.43	28.57
All Small-Cap Funds					
Top Half	249	26.91	52.21	8.43	12.45
Bottom Half	249	41.37	20.08	20.88	17.67
All Multi-Cap Funds					
Top Half	245	32.24	27.35	11.02	29.39
Bottom Half	245	22.04	28.98	21.22	27.76

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

Report 5: Five-Year Transition Matrix – Performance over Two Non-Overlapping Five-Year Periods (Based on Quartile)

Quartile	Fund Count at Start (June 2012-June 2017)	Five-Year Percentages at End (June 2017-June 2022)					
		1st Quartile (%)	2nd Quartile (%)	3rd Quartile (%)	4th Quartile (%)	Merged/Liquidated (%)	Style Changed (%)
All Domestic Funds							
1st Quartile	480	21.46	15.00	11.04	11.67	10.00	30.83
2nd Quartile	480	15.21	12.29	12.50	15.00	14.58	30.42
3rd Quartile	480	8.96	14.17	13.75	11.67	21.46	30.00
4th Quartile	480	8.96	9.38	10.42	11.25	29.38	30.63
All Large-Cap Funds							
1st Quartile	182	30.22	19.78	12.09	1.65	8.79	27.47
2nd Quartile	181	18.23	16.57	11.60	7.73	14.92	30.94
3rd Quartile	181	8.29	16.57	12.15	14.36	20.44	28.18
4th Quartile	182	8.24	9.34	13.74	19.78	21.98	26.92
All Mid-Cap Funds							
1st Quartile	67	14.93	13.43	13.43	17.91	4.48	35.82
2nd Quartile	66	16.67	10.61	16.67	10.61	16.67	28.79
3rd Quartile	66	7.58	12.12	13.64	7.58	28.79	30.30
4th Quartile	67	10.45	11.94	8.96	2.99	37.31	28.36
All Small-Cap Funds							
1st Quartile	116	12.07	24.14	20.69	14.66	11.21	17.24
2nd Quartile	115	15.65	10.43	24.35	21.74	12.17	15.65
3rd Quartile	116	15.52	13.79	9.48	17.24	18.10	25.86
4th Quartile	116	17.24	7.76	9.48	7.76	31.90	25.86
All Multi-Cap Funds							
1st Quartile	118	13.56	11.86	10.17	5.93	11.02	47.46
2nd Quartile	118	8.47	16.95	9.32	8.47	16.95	39.83
3rd Quartile	118	5.93	7.63	9.32	6.78	27.12	43.22
4th Quartile	119	4.20	8.40	5.88	11.76	30.25	39.50

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

Report 6: Five-Year Transition Matrix – Performance over Two Non-Overlapping Five-Year Periods (Based on Halves)

Half	Fund Count at Start (June 2012- June 2017)	Five-Year Percentages at End (June 2017-June 2022)			
		Top Half (%)	Bottom Half (%)	Merged/Liquidated (%)	Style Changed (%)
All Domestic Funds					
Top Half	960	31.98	25.10	12.29	30.63
Bottom Half	960	20.73	23.54	25.42	30.31
All Large-Cap Funds					
Top Half	363	42.42	16.53	11.85	29.20
Bottom Half	363	21.21	30.03	21.21	27.55
All Mid-Cap Funds					
Top Half	133	27.82	29.32	10.53	32.33
Bottom Half	133	21.05	16.54	33.08	29.32
All Small-Cap Funds					
Top Half	231	31.17	40.69	11.69	16.45
Bottom Half	232	27.16	21.98	25.00	25.86
All Multi-Cap Funds					
Top Half	236	25.42	16.95	13.98	43.64
Bottom Half	237	13.08	16.88	28.69	41.35

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

Report 7: Performance Persistence of Domestic Fixed Income Funds over Three Consecutive 12-Month Periods

Fund Category	Fund Count at Start (June 2020)	Percentage Remaining in Top Quartile	
		June 2021	June 2022
Top Quartile			
General Government Funds	9	0.00	0.00
Government Intermediate Funds	5	20.00	0.00
Government Short & Short-Intermediate Funds	7	28.57	0.00
General Investment-Grade Funds	18	11.11	0.00
Investment-Grade Intermediate Funds	33	6.06	0.00
Investment-Grade Short & Intermediate Funds	34	11.76	0.00
General Bond Funds	8	25.00	12.50
High Yield Funds	39	10.26	2.56

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

Report 7: Performance Persistence of Domestic Fixed Income Funds over Three Consecutive 12-Month Periods (cont.)

Fund Category	Fund Count at Start (June 2020)	Percentage Remaining in Top Quartile	
		June 2021	June 2022
Top Quartile			
Mortgage-Backed Securities Funds	12	8.33	8.33
Core Plus Bond Funds	19	21.05	0.00
Inflation-Linked Funds	11	27.27	0.00
Global Income Funds	24	12.50	4.17
Emerging Market Debt Funds	14	14.29	7.14
General Municipal Debt Funds	18	11.11	0.00
California Municipal Debt Funds	9	11.11	0.00
New York Municipal Debt Funds	7	14.29	0.00
Loan Participation Funds	14	7.14	0.00
Fund Category	Fund Count at Start (June 2020)	Percentage Remaining in Top Half	
		June 2021	June 2022
Top Half			
General Government Funds	17	29.41	29.41
Government Intermediate Funds	10	20.00	10.00
Government Short & Short-Intermediate Funds	13	46.15	38.46
General Investment-Grade Funds	37	40.54	2.70
Investment-Grade Intermediate Funds	66	37.88	12.12
Investment-Grade Short & Intermediate Funds	69	31.88	13.04
General Bond Funds	15	20.00	6.67
High Yield Funds	75	36.00	12.00
Mortgage-Backed Securities Funds	23	34.78	17.39
Core Plus Bond Funds	37	37.84	2.70
Inflation-Linked Funds	22	40.91	22.73
Global Income Funds	47	36.17	21.28
Emerging Market Debt Funds	28	39.29	28.57
General Municipal Debt Funds	36	25.00	5.56
California Municipal Debt Funds	16	37.50	0.00
New York Municipal Debt Funds	13	30.77	7.69
Loan Participation Funds	27	37.04	7.41

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

Report 8: Performance Persistence of Domestic Fixed Income Funds over Five Consecutive 12-Month Periods

Fund Category	Fund Count at Start (June 2018)	Percentage Remaining in Top Quartile			
		June 2019	June 2020	June 2021	June 2022
Top Quartile					
General Government Funds	13	15.38	7.69	0.00	0.00
Government Intermediate Funds	2	50.00	50.00	0.00	0.00
Government Short & Short-Intermediate Funds	8	12.50	0.00	0.00	0.00
General Investment-Grade Funds	21	4.76	0.00	0.00	0.00
Investment-Grade Intermediate Funds	36	25.00	5.56	2.78	0.00
Investment-Grade Short & Intermediate Funds	38	13.16	0.00	0.00	0.00
General Bond Funds	8	0.00	0.00	0.00	0.00
High Yield Funds	50	14.00	6.00	4.00	0.00
Mortgage-Backed Securities Funds	13	46.15	7.69	0.00	0.00
Core Plus Bond Funds	17	35.29	5.88	5.88	0.00
Inflation-Linked Funds	13	23.08	0.00	0.00	0.00
Global Income Funds	25	16.00	4.00	0.00	0.00
Emerging Market Debt Funds	13	23.08	0.00	0.00	0.00
General Municipal Debt Funds	18	27.78	5.56	5.56	0.00
California Municipal Debt Funds	8	50.00	12.50	12.50	0.00
New York Municipal Debt Funds	6	33.33	16.67	16.67	0.00
Loan Participation Funds	13	23.08	15.38	7.69	0.00
Fund Category	Fund Count at Start (June 2018)	Percentage Remaining in Top Half			
		June 2019	June 2020	June 2021	June 2022
Top Half					
General Government Funds	24	54.17	45.83	12.50	4.17
Government Intermediate Funds	4	50.00	25.00	0.00	0.00
Government Short & Short-Intermediate Funds	16	43.75	18.75	12.50	6.25
General Investment-Grade Funds	41	29.27	14.63	7.32	0.00
Investment-Grade Intermediate Funds	71	52.11	28.17	9.86	4.23
Investment-Grade Short & Intermediate Funds	75	38.67	12.00	4.00	4.00
General Bond Funds	16	25.00	12.50	12.50	6.25
High Yield Funds	99	43.43	27.27	12.12	3.03
Mortgage-Backed Securities Funds	25	60.00	28.00	12.00	8.00
Core Plus Bond Funds	35	42.86	17.14	5.71	0.00
Inflation-Linked Funds	26	42.31	30.77	11.54	3.85
Global Income Funds	49	46.94	36.73	14.29	12.24
Emerging Market Debt Funds	25	44.00	32.00	20.00	16.00
General Municipal Debt Funds	36	58.33	33.33	19.44	2.78
California Municipal Debt Funds	16	68.75	37.50	25.00	0.00
New York Municipal Debt Funds	12	33.33	16.67	8.33	0.00
Loan Participation Funds	25	52.00	32.00	12.00	4.00

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

Report 9: Three-Year Transition Matrix – Performance over Two Non-Overlapping Three-Year Periods (Based on Quartile)

Quartile	Fund Count at Start (June 2016-June 2019)	Three-Year Percentages at End (June 2019-June 2022)					
		1st Quartile (%)	2nd Quartile (%)	3rd Quartile (%)	4th Quartile (%)	Merged/Liquidated (%)	Style Changed (%)
General Government Funds							
1st Quartile	9	33.33	22.22	33.33	0.00	11.11	0.00
2nd Quartile	8	37.50	25.00	12.50	12.50	12.50	0.00
3rd Quartile	8	12.50	25.00	25.00	37.50	0.00	0.00
4th Quartile	9	11.11	11.11	11.11	44.44	22.22	0.00
Government Intermediate Funds							
1st Quartile	5	40.00	20.00	0.00	40.00	0.00	0.00
2nd Quartile	4	25.00	50.00	25.00	0.00	0.00	0.00
3rd Quartile	5	0.00	0.00	60.00	20.00	20.00	0.00
4th Quartile	5	20.00	20.00	0.00	40.00	20.00	0.00
Government Short & Short Intermediate Funds							
1st Quartile	8	37.50	25.00	0.00	0.00	12.50	25.00
2nd Quartile	8	12.50	12.50	25.00	25.00	12.50	12.50
3rd Quartile	8	0.00	25.00	50.00	25.00	0.00	0.00
4th Quartile	8	0.00	12.50	12.50	37.50	37.50	0.00
General Investment-Grade Funds							
1st Quartile	18	16.67	11.11	38.89	27.78	5.56	0.00
2nd Quartile	18	27.78	11.11	16.67	22.22	22.22	0.00
3rd Quartile	18	38.89	11.11	11.11	11.11	11.11	16.67
4th Quartile	19	0.00	31.58	10.53	26.32	21.05	10.53
Investment-Grade Intermediate Funds							
1st Quartile	33	27.27	21.21	21.21	21.21	6.06	3.03
2nd Quartile	33	12.12	18.18	33.33	18.18	15.15	3.03
3rd Quartile	33	18.18	27.27	18.18	30.30	6.06	0.00
4th Quartile	33	24.24	15.15	15.15	15.15	24.24	6.06
Investment-Grade Short & Intermediate Funds							
1st Quartile	34	23.53	26.47	26.47	20.59	2.94	0.00
2nd Quartile	34	14.71	26.47	20.59	29.41	8.82	0.00
3rd Quartile	34	23.53	20.59	11.76	23.53	14.71	5.88
4th Quartile	34	20.59	11.76	26.47	14.71	26.47	0.00
General Bond Funds							
1st Quartile	5	20.00	40.00	20.00	20.00	0.00	0.00
2nd Quartile	5	20.00	20.00	20.00	40.00	0.00	0.00
3rd Quartile	5	20.00	0.00	0.00	20.00	40.00	20.00
4th Quartile	6	33.33	16.67	33.33	0.00	16.67	0.00

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

Report 9: Three-Year Transition Matrix – Performance over Two Non-Overlapping Three-Year Periods (Based on Quartile) (cont.)

Quartile	Fund Count at Start (June 2016-June 2019)	Three-Year Percentages at End (June 2019-June 2022)					
		1st Quartile (%)	2nd Quartile (%)	3rd Quartile (%)	4th Quartile (%)	Merged/Liquidated (%)	Style Changed (%)
High Yield Funds							
1st Quartile	37	43.24	21.62	13.51	21.62	0.00	0.00
2nd Quartile	36	11.11	30.56	36.11	19.44	2.78	0.00
3rd Quartile	36	11.11	25.00	30.56	25.00	8.33	0.00
4th Quartile	37	27.03	16.22	13.51	27.03	16.22	0.00
Mortgage-Back Securities Funds							
1st Quartile	12	41.67	25.00	8.33	16.67	8.33	0.00
2nd Quartile	12	41.67	16.67	16.67	16.67	8.33	0.00
3rd Quartile	12	8.33	25.00	25.00	33.33	0.00	8.33
4th Quartile	13	7.69	15.38	38.46	30.77	7.69	0.00
Core Plus Bond Funds							
1st Quartile	18	27.78	5.56	22.22	33.33	0.00	11.11
2nd Quartile	17	23.53	17.65	35.29	17.65	5.88	0.00
3rd Quartile	17	17.65	41.18	11.76	23.53	5.88	0.00
4th Quartile	18	22.22	27.78	22.22	22.22	5.56	0.00
Inflation-Linked Funds							
1st Quartile	12	25.00	0.00	16.67	41.67	16.67	0.00
2nd Quartile	11	27.27	27.27	27.27	18.18	0.00	0.00
3rd Quartile	11	18.18	36.36	27.27	0.00	9.09	9.09
4th Quartile	12	16.67	25.00	8.33	33.33	16.67	0.00
Global Income Funds							
1st Quartile	20	45.00	10.00	5.00	25.00	15.00	0.00
2nd Quartile	20	15.00	40.00	20.00	10.00	15.00	0.00
3rd Quartile	20	25.00	20.00	40.00	5.00	10.00	0.00
4th Quartile	21	4.76	14.29	19.05	47.62	14.29	0.00
Emerging Market Debt Funds							
1st Quartile	14	35.71	14.29	21.43	28.57	0.00	0.00
2nd Quartile	13	15.38	38.46	23.08	15.38	7.69	0.00
3rd Quartile	14	28.57	14.29	28.57	21.43	7.14	0.00
4th Quartile	14	7.14	14.29	7.14	21.43	50.00	0.00

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

Report 9: Three-Year Transition Matrix – Performance over Two Non-Overlapping Three-Year Periods (Based on Quartile) (cont.)

Quartile	Fund Count at Start (June 2016-June 2019)	Three-Year Percentages at End (June 2019-June 2022)					
		1st Quartile (%)	2nd Quartile (%)	3rd Quartile (%)	4th Quartile (%)	Merged/Liquidated (%)	Style Changed (%)
General Municipal Debt Funds							
1st Quartile	18	33.33	27.78	5.56	33.33	0.00	0.00
2nd Quartile	17	11.76	41.18	23.53	17.65	0.00	5.88
3rd Quartile	18	27.78	16.67	27.78	22.22	0.00	5.56
4th Quartile	18	16.67	5.56	27.78	22.22	27.78	0.00
California Municipal Debt Funds							
1st Quartile	8	12.50	37.50	12.50	37.50	0.00	0.00
2nd Quartile	8	37.50	37.50	12.50	12.50	0.00	0.00
3rd Quartile	8	37.50	0.00	25.00	37.50	0.00	0.00
4th Quartile	8	12.50	0.00	37.50	12.50	25.00	12.50
New York Municipal Debt Funds							
1st Quartile	6	33.33	16.67	0.00	50.00	0.00	0.00
2nd Quartile	6	16.67	50.00	16.67	16.67	0.00	0.00
3rd Quartile	6	33.33	0.00	33.33	33.33	0.00	0.00
4th Quartile	7	14.29	14.29	42.86	0.00	28.57	0.00
Loan Participation Funds							
1st Quartile	12	25.00	16.67	33.33	16.67	8.33	0.00
2nd Quartile	12	33.33	0.00	33.33	25.00	8.33	0.00
3rd Quartile	12	25.00	41.67	0.00	33.33	0.00	0.00
4th Quartile	13	7.69	30.77	23.08	23.08	15.38	0.00

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

Report 10: Three-Year Transition Matrix – Performance over Two Non-Overlapping Three-Year Periods (Based on Halves)

Half	Fund Count at Start (June 2016-June 2019)	Three-Year Percentages at End (June 2019-June 2022)			
		Top Half (%)	Bottom Half (%)	Merged/Liquidated (%)	Style Changed (%)
General Government Funds					
Top Half	17	58.82	29.41	11.76	0.00
Bottom Half	17	29.41	58.82	11.76	0.00
Government Intermediate Funds					
Top Half	9	66.67	33.33	0.00	0.00
Bottom Half	10	20.00	60.00	20.00	0.00
Government Short & Short-Intermediate Funds					
Top Half	16	43.75	25.00	12.50	18.75
Bottom Half	16	18.75	62.50	18.75	0.00
General Investment-Grade Funds					
Top Half	36	33.33	52.78	13.89	0.00
Bottom Half	37	40.54	29.73	16.22	13.51
Investment-Grade Intermediate Funds					
Top Half	66	39.39	46.97	10.61	3.03
Bottom Half	66	42.42	39.39	15.15	3.03
Investment-Grade Short & Intermediate Funds					
Top Half	68	45.59	48.53	5.88	0.00
Bottom Half	68	38.24	38.24	20.59	2.94
General Bond Funds					
Top Half	10	50.00	50.00	0.00	0.00
Bottom Half	11	36.36	27.27	27.27	9.09
High Yield Funds					
Top Half	73	53.42	45.21	1.37	0.00
Bottom Half	73	39.73	47.95	12.33	0.00
Mortgage-Backed Securities Funds					
Top Half	24	62.50	29.17	8.33	0.00
Bottom Half	25	28.00	64.00	4.00	4.00

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

Report 10: Three-Year Transition Matrix – Performance over Two Non-Overlapping Three-Year Periods (Based on Halves) (cont.)

Half	Fund Count at Start (June 2016-June 2019)	Three-Year Percentages at End (June 2019-June 2022)			
		Top Half (%)	Bottom Half (%)	Merged/Liquidated (%)	Style Changed (%)
Core Plus Bond Funds					
Top Half	35	37.14	54.29	2.86	5.71
Bottom Half	35	54.29	40.00	5.71	0.00
Inflation-Linked Funds					
Top Half	23	39.13	52.17	8.70	0.00
Bottom Half	23	47.83	34.78	13.04	4.35
Global Income Funds					
Top Half	40	55.00	30.00	15.00	0.00
Bottom Half	41	31.71	56.10	12.20	0.00
Emerging Market Debt Funds					
Top Half	27	51.85	44.44	3.70	0.00
Bottom Half	28	32.14	39.29	28.57	0.00
General Municipal Debt Funds					
Top Half	35	57.14	40.00	0.00	2.86
Bottom Half	36	33.33	50.00	13.89	2.78
California Municipal Debt Funds					
Top Half	16	62.50	37.50	0.00	0.00
Bottom Half	16	25.00	56.25	12.50	6.25
New York Municipal Debt Funds					
Top Half	12	58.33	41.67	0.00	0.00
Bottom Half	13	30.77	53.85	15.38	0.00
Loan Participation Funds					
Top Half	24	37.50	54.17	8.33	0.00
Bottom Half	25	52.00	40.00	8.00	0.00

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

Report 11: Five-Year Transition Matrix – Performance over Two Non-Overlapping Five-Year Periods (Based on Quartile)

Quartile	Fund Count at Start (June 2012-June 2017)	Five-Year Percentages at End (June 2017-June 2022)					
		1st Quartile (%)	2nd Quartile (%)	3rd Quartile (%)	4th Quartile (%)	Merged/Liquidated (%)	Style Changed (%)
General Government Funds							
1st Quartile	13	15.38	23.08	7.69	23.08	15.38	15.38
2nd Quartile	13	15.38	0.00	23.08	23.08	0.00	38.46
3rd Quartile	13	15.38	15.38	7.69	15.38	15.38	30.77
4th Quartile	13	7.69	0.00	15.38	15.38	61.54	0.00
Government Intermediate Funds							
1st Quartile	3	33.33	33.33	0.00	0.00	33.33	0.00
2nd Quartile	2	50.00	0.00	0.00	50.00	0.00	0.00
3rd Quartile	3	0.00	33.33	33.33	0.00	0.00	33.33
4th Quartile	3	0.00	0.00	33.33	0.00	66.67	0.00
Government Short & Short-Intermediate Funds							
1st Quartile	8	37.50	25.00	25.00	0.00	12.50	0.00
2nd Quartile	7	14.29	14.29	14.29	14.29	14.29	28.57
3rd Quartile	8	12.50	25.00	12.50	25.00	12.50	12.50
4th Quartile	8	0.00	0.00	25.00	50.00	25.00	0.00
General Investment-Grade Funds							
1st Quartile	20	10.00	40.00	20.00	10.00	15.00	5.00
2nd Quartile	19	47.37	21.05	21.05	5.26	5.26	0.00
3rd Quartile	19	15.79	5.26	5.26	21.05	31.58	21.05
4th Quartile	20	5.00	5.00	15.00	25.00	35.00	15.00
Investment-Grade Intermediate Funds							
1st Quartile	30	30.00	23.33	23.33	6.67	13.33	3.33
2nd Quartile	30	23.33	13.33	16.67	23.33	20.00	3.33
3rd Quartile	30	13.33	13.33	16.67	26.67	23.33	6.67
4th Quartile	31	12.90	22.58	19.35	25.81	19.35	0.00
Investment-Grade Short & Intermediate Funds							
1st Quartile	32	25.00	34.38	18.75	9.38	12.50	0.00
2nd Quartile	31	25.81	3.23	25.81	16.13	22.58	6.45
3rd Quartile	31	12.90	29.03	12.90	22.58	22.58	0.00
4th Quartile	32	12.50	9.38	6.25	21.88	31.25	18.75
General Bond Funds							
1st Quartile	6	0.00	16.67	33.33	16.67	16.67	16.67
2nd Quartile	6	0.00	0.00	0.00	16.67	16.67	66.67
3rd Quartile	6	16.67	0.00	16.67	0.00	16.67	50.00
4th Quartile	7	14.29	0.00	14.29	14.29	28.57	28.57

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

Report 11: Five-Year Transition Matrix – Performance over Two Non-Overlapping Five-Year Periods (Based on Quartile) (cont.)

Quartile	Fund Count at Start (June 2012-June 2017)	Five-Year Percentages at End (June 2017-June 2022)					
		1st Quartile (%)	2nd Quartile (%)	1st Quartile (%)	4th Quartile (%)	Merged/Liquidated (%)	Style Changed (%)
High Yield Funds							
1st Quartile	40	27.50	15.00	20.00	12.50	7.50	17.50
2nd Quartile	39	7.69	35.90	17.95	15.38	2.56	20.51
3rd Quartile	39	28.21	10.26	17.95	20.51	10.26	12.82
4th Quartile	40	15.00	10.00	22.50	12.50	17.50	22.50
Mortgage-Backed Securities Funds							
1st Quartile	11	54.55	0.00	18.18	0.00	27.27	0.00
2nd Quartile	11	27.27	36.36	18.18	9.09	9.09	0.00
3rd Quartile	11	0.00	18.18	18.18	54.55	0.00	9.09
4th Quartile	12	0.00	16.67	25.00	16.67	33.33	8.33
Core Plus Bond Funds							
1st Quartile	16	31.25	12.50	18.75	25.00	0.00	12.50
2nd Quartile	15	26.67	20.00	20.00	20.00	13.33	0.00
3rd Quartile	15	6.67	40.00	26.67	13.33	6.67	6.67
4th Quartile	16	12.50	6.25	25.00	25.00	18.75	12.50
Inflation-Linked Funds							
1st Quartile	11	18.18	9.09	9.09	45.45	18.18	0.00
2nd Quartile	11	54.55	18.18	9.09	0.00	9.09	9.09
3rd Quartile	11	0.00	18.18	45.45	0.00	36.36	0.00
4th Quartile	11	0.00	18.18	9.09	36.36	36.36	0.00
Global Income Funds							
1st Quartile	21	38.10	4.76	9.52	4.76	4.76	38.10
2nd Quartile	21	19.05	23.81	14.29	23.81	19.05	0.00
3rd Quartile	21	23.81	19.05	33.33	4.76	19.05	0.00
4th Quartile	21	0.00	23.81	19.05	33.33	19.05	4.76
Emerging Market Debt Funds							
1st Quartile	7	14.29	0.00	28.57	28.57	28.57	0.00
2nd Quartile	7	28.57	42.86	0.00	0.00	28.57	0.00
3rd Quartile	7	28.57	14.29	28.57	14.29	14.29	0.00
4th Quartile	8	0.00	12.50	12.50	37.50	37.50	0.00
General Municipal Debt Funds							
1st Quartile	17	47.06	17.65	17.65	17.65	0.00	0.00
2nd Quartile	16	25.00	31.25	18.75	18.75	6.25	0.00
3rd Quartile	17	0.00	23.53	29.41	17.65	17.65	11.76
4th Quartile	17	5.88	5.88	11.76	29.41	41.18	5.88

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

Report 11: Five-Year Transition Matrix – Performance over Two Non-Overlapping Five-Year Periods (Based on Quartile) (cont.)

Quartile	Fund Count at Start (June 2012-June 2017)	Five-Year Percentages at End (June 2017-June 2022)					
		1st Quartile (%)	2nd Quartile (%)	1st Quartile (%)	4th Quartile (%)	Merged/Liquidated (%)	Style Changed (%)
California Municipal Debt Funds							
1st Quartile	8	50.00	0.00	25.00	25.00	0.00	0.00
2nd Quartile	8	12.50	25.00	12.50	37.50	12.50	0.00
3rd Quartile	8	25.00	37.50	12.50	12.50	12.50	0.00
4th Quartile	9	0.00	22.22	22.22	22.22	22.22	11.11
New York Municipal Debt Funds							
1st Quartile	6	66.67	16.67	16.67	0.00	0.00	0.00
2nd Quartile	6	16.67	33.33	0.00	33.33	16.67	0.00
3rd Quartile	6	0.00	33.33	33.33	16.67	16.67	0.00
4th Quartile	7	14.29	0.00	28.57	42.86	14.29	0.00
Loan Participation Funds							
1st Quartile	10	10.00	20.00	20.00	30.00	20.00	0.00
2nd Quartile	9	33.33	33.33	22.22	0.00	11.11	0.00
3rd Quartile	9	22.22	0.00	22.22	55.56	0.00	0.00
4th Quartile	10	20.00	30.00	20.00	10.00	20.00	0.00

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

Report 12: Five-Year Transition Matrix – Performance over Two Non-Overlapping Five-Year Periods (Based on Halves)

Half	Fund Count at Start (June 2012-June 2017)	Five-Year Percentages at End (June 2017-June 2022)			
		Top Half (%)	Bottom Half (%)	Merged/Liquidated (%)	Style Changed (%)
General Government Funds					
Top Half	26	26.92	38.46	7.69	26.92
Bottom Half	26	19.23	26.92	38.46	15.38
Government Intermediate Funds					
Top Half	5	60.00	20.00	20.00	0.00
Bottom Half	6	16.67	33.33	33.33	16.67
Government Short & Short-Intermediate Funds					
Top Half	15	46.67	26.67	13.33	13.33
Bottom Half	16	18.75	56.25	18.75	6.25
General Investment-Grade Funds					
Top Half	39	58.97	28.21	10.26	2.56
Bottom Half	39	15.38	33.33	33.33	17.95
Investment-Grade Intermediate Funds					
Top Half	60	45.00	35.00	16.67	3.33
Bottom Half	61	31.15	44.26	21.31	3.28

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

Report 12: Five-Year Transition Matrix – Performance over Two Non-Overlapping Five-Year Periods (Based on Halves) (cont.)

Half	Fund Count at Start (June 2012-June 2017)	Five-Year Percentages at End (June 2017-June 2022)			
		Top Half (%)	Bottom Half (%)	Merged/Liquidated (%)	Style Changed (%)
Investment-Grade Short & Intermediate Funds					
Top Half	63	44.44	34.92	17.46	3.17
Bottom Half	63	31.75	31.75	26.98	9.52
General Bond Funds					
Top Half	12	8.33	33.33	16.67	41.67
Bottom Half	13	15.38	23.08	23.08	38.46
High Yield Funds					
Top Half	79	43.04	32.91	5.06	18.99
Bottom Half	79	31.65	36.71	13.92	17.72
Mortgage-Backed Securities Funds					
Top Half	22	59.09	22.73	18.18	0.00
Bottom Half	23	17.39	56.52	17.39	8.70
Core Plus Bond Funds					
Top Half	31	45.16	41.94	6.45	6.45
Bottom Half	31	32.26	45.16	12.90	9.68
Inflation-Linked Funds					
Top Half	22	50.00	31.82	13.64	4.55
Bottom Half	22	18.18	45.45	36.36	0.00
Global Income Funds					
Top Half	42	42.86	26.19	11.90	19.05
Bottom Half	42	33.33	45.24	19.05	2.38
Emerging Market Debt Funds					
Top Half	14	42.86	28.57	28.57	0.00
Bottom Half	15	26.67	46.67	26.67	0.00
General Municipal Debt Funds					
Top Half	33	60.61	36.36	3.03	0.00
Bottom Half	34	17.65	44.12	29.41	8.82
California Municipal Debt Funds					
Top Half	16	43.75	50.00	6.25	0.00
Bottom Half	17	41.18	35.29	17.65	5.88
New York Municipal Debt Funds					
Top Half	12	66.67	25.00	8.33	0.00
Bottom Half	13	23.08	61.54	15.38	0.00
Loan Participation Funds					
Top Half	19	47.37	36.84	15.79	0.00
Bottom Half	19	36.84	52.63	10.53	0.00

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

General Disclaimer

© 2022 S&P Dow Jones Indices. All rights reserved. S&P, S&P 500, SPX, SPY, The 500, US500, US 30, S&P 100, S&P COMPOSITE 1500, S&P 400, S&P MIDCAP 400, S&P 600, S&P SMALLCAP 600, S&P GIVI, GLOBAL TITANS, DIVIDEND ARISTOCRATS, Select Sector, S&P MAESTRO, S&P PRISM, S&P STRIDE, GICS, SPIVA, SPDR, INDEXOLOGY, iTraxx, iBoxx, ABX, ADBI, CDX, CMBX, MBX, MCDX, PRIMEX, HHPI and SOVX are trademarks of S&P Global, Inc. ("S&P Global") or its affiliates. DOW JONES, DJIA, THE DOW and DOW JONES INDUSTRIAL AVERAGE are trademarks of Dow Jones Trademark Holdings LLC ("Dow Jones"). These trademarks together with others have been licensed to S&P Dow Jones Indices LLC. Redistribution or reproduction in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. This document does not constitute an offer of services in jurisdictions where S&P Dow Jones Indices LLC, S&P Global, Dow Jones or their respective affiliates (collectively "S&P Dow Jones Indices") do not have the necessary licenses. Except for certain custom index calculation services, all information provided by S&P Dow Jones Indices is impersonal and not tailored to the needs of any person, entity or group of persons. S&P Dow Jones Indices receives compensation in connection with licensing its indices to third parties and providing custom calculation services. Past performance of an index is not an indication or guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index may be available through investable instruments based on that index. S&P Dow Jones Indices does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P Dow Jones Indices makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P Dow Jones Indices LLC is not an investment advisor, and S&P Dow Jones Indices makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. S&P Dow Jones Indices is not an investment adviser, commodity trading advisor, commodity pool operator, broker dealer, fiduciary, promoter" (as defined in the Investment Company Act of 1940, as amended), "expert" as enumerated within 15 U.S.C. § 77k(a) or tax advisor. Inclusion of a security, commodity, crypto currency or other asset within an index is not a recommendation by S&P Dow Jones Indices to buy, sell, or hold such security, commodity, crypto currency or other asset, nor is it considered to be investment advice or commodity trading advice. Closing prices for S&P Dow Jones Indices' US benchmark indices are calculated by S&P Dow Jones Indices based on the closing price of the individual constituents of the index as set by their primary exchange. Closing prices are received by S&P Dow Jones Indices from one of its third party vendors and verified by comparing them with prices from an alternative vendor. The vendors receive the closing price from the primary exchanges. Real-time intraday prices are calculated similarly without a second verification.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof ("Content") may be modified, reverse-engineered, reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P Dow Jones Indices. The Content shall not be used for any unlawful or unauthorized purposes. S&P Dow Jones Indices and its third-party data providers and licensors (collectively "S&P Dow Jones Indices Parties") do not guarantee the accuracy, completeness, timeliness or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN "AS IS" BASIS. S&P DOW JONES INDICES PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Dow Jones Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

S&P Global keeps certain activities of its various divisions and business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain divisions and business units of S&P Global may have information that is not available to other business units. S&P Global has established policies and procedures to maintain the confidentiality of certain non-public information received in connection with each analytical process.

In addition, S&P Dow Jones Indices provides a wide range of services to, or relating to, many organizations, including issuers of securities, investment advisers, broker-dealers, investment banks, other financial institutions and financial intermediaries, and accordingly may receive fees or other economic benefits from those organizations, including organizations whose securities or services they may recommend, rate, include in model portfolios, evaluate or otherwise address.