

Does Past Performance Matter? The Persistence Scorecard

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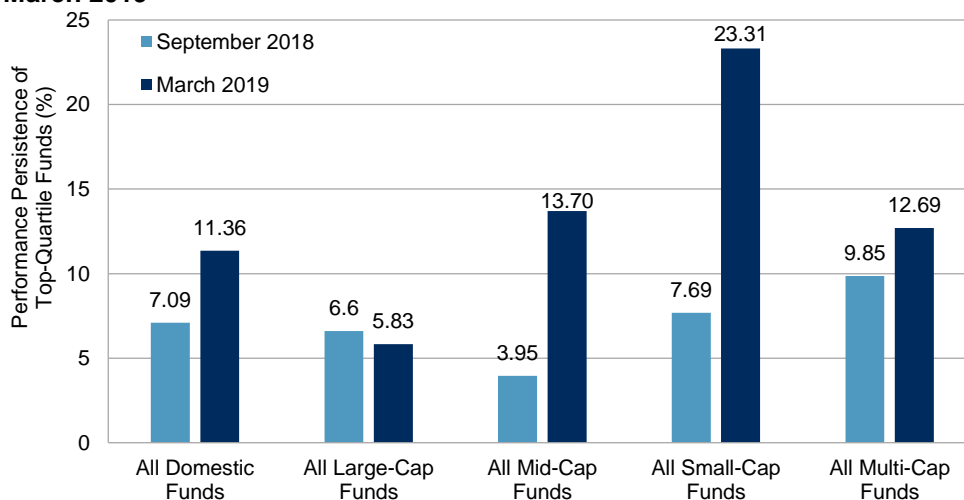
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SUMMARY OF RESULTS

- One key measure of successful active management lies in the ability of a manager or a strategy to outperform their peers repeatedly. Consistent success is the one way to differentiate a manager's luck from skill.
- **The S&P Persistence Scorecard shows that few funds consistently outperformed their peers;** 11.4% of domestic equity funds remained a top-quartile fund over the three-year period ending March 2019.
- **Smaller-cap equity funds recorded better performance persistence compared with results from six months prior;** 23.3% (versus 7.7%) and 13.7% (versus 4.0%) of small- and mid-cap funds, respectively, remained in the top quartile during the three-year period ending March 2019.
- **The ability of top-performing funds to maintain their status typically fell over longer horizons.** For example, zero large-, mid-, or multi-cap funds maintained their top-quartile status at the end of the five-year measurement period.

Exhibit 1: Performance Persistence Rose over the Three-Year Period Ending March 2019



Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. Chart is provided for illustrative purposes. Past performance is no guarantee of future results.

- **Top-performing funds were more likely to become the worst-performing funds than vice versa over the five-year horizon.** While 15.3% of bottom-quartile domestic equity funds moved to the top quartile, a greater percentage (31.5%) of top-quartile funds moved to the bottom quartile during the same period.
- **Fourth-quartile funds were most likely to be merged or liquidated in nearly every category.** This supports the view that underperformance typically precedes a fund's closure.
- **Top-quartile mortgage-backed securities funds offered the best performance persistence among fixed income funds;** 38.5% maintained their status during the three-year period ending March 2019.
- **A turnaround in the bond market's outlook appeared to wrong-foot many top-quartile fixed income managers.** While many top performers—as of March 2017—maintained their status the following year, there was a dramatic fall in persistence after March 2018.
- **Over longer horizons, the majority of fixed income categories showed no persistence.** Investment-grade intermediate funds (2.1%) and general municipal debt funds (10.53%) offered the exceptions over the five-year horizon.

ABOUT THE PERSISTENCE SCORECARD

The phrase “past performance is not an indicator of future outcomes” (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 consistency of top performers over consecutive 12-month periods and measures performance persistence through transition matrices. 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.

S&P Dow Jones Indices is one of the world's leading index providers, maintaining a wide variety of investable and benchmark indices to meet an array of investor needs. Our Global Research & Design team is dedicated to conducting unbiased, in-depth analysis on a broad range of topics and issues facing investors in today's marketplace. This scorecard highlights performance persistence over three and five consecutive 12-month periods and two non-overlapping three- and five-year periods.

Key features of the S&P Persistence Scorecard include the following.

- **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 University of Chicago's CRSP Survivorship Bias Free Mutual Fund Database, the S&P Persistence Scorecard ranks all funds available at each point in time and tracks the top-quartile and top-half performers throughout the time period.
- **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 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 two non-overlapping, three- and five-year periods. They also track the percentage of funds that have merged or liquidated. In addition, we monitor movements between capitalization levels. This helps us capture, for example, the conversion of some large-cap funds to mid- and small-cap funds.
- **Tracking reports of top performers:** The tracking reports show the percentages of funds that remain in the top-quartile or top-half rankings over consecutive three- and five-year periods.

REPORTS

Report 1: Performance Persistence of Domestic Equity Funds over Three Consecutive 12-Month Periods				
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2017)	PERCENTAGE REMAINING IN TOP QUARTILE		
		MARCH 2018		MARCH 2019
TOP QUARTILE				
All Domestic Funds	546	21.61		11.36
All Large-Cap Funds	206	17.96		5.83
All Mid-Cap Funds	73	23.29		13.70
All Small-Cap Funds	133	32.33		23.31
All Multi-Cap Funds	134	17.91		12.69
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2017)	PERCENTAGE REMAINING IN TOP HALF		
		MARCH 2018		MARCH 2019
TOP HALF				
All Domestic Funds	1090	42.11		27.43
All Large-Cap Funds	412	44.42		28.40
All Mid-Cap Funds	146	28.77		19.18
All Small-Cap Funds	265	43.02		31.70
All Multi-Cap Funds	267	40.82		27.72

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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					
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2015)	PERCENTAGE REMAINING IN TOP QUARTILE			
		MARCH 2016	MARCH 2017	MARCH 2018	MARCH 2019
TOP QUARTILE					
All Domestic Funds	569	35.33	1.93	0.88	0.70
All Large-Cap Funds	219	24.66	0.91	0.46	0.00
All Mid-Cap Funds	83	24.10	2.41	0.00	0.00
All Small-Cap Funds	133	15.79	2.26	1.50	0.75
All Multi-Cap Funds	134	26.12	5.97	0.00	0.00
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2015)	PERCENTAGE REMAINING IN TOP HALF			
		MARCH 2016	MARCH 2017	MARCH 2018	MARCH 2019
TOP HALF					
All Domestic Funds	1139	58.12	16.15	11.76	10.36
All Large-Cap Funds	438	56.62	23.29	16.89	13.24
All Mid-Cap Funds	167	41.32	11.38	1.80	1.80
All Small-Cap Funds	266	45.49	22.56	8.27	6.39
All Multi-Cap Funds	268	50.37	20.90	12.69	10.45

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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)							
ALL DOMESTIC FUNDS	FUND COUNT AT START (MARCH 2016)	THREE-YEAR PERCENTAGES AT END					
		1ST QUARTILE (%)	2ND QUARTILE (%)	3TH QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
1st Quartile	518	44.98	23.75	15.64	9.85	5.60	0.19
2nd Quartile	517	13.73	28.63	26.69	20.12	10.44	0.39
3rd Quartile	518	11.78	21.62	26.64	24.52	14.86	0.58
4th Quartile	517	15.67	11.99	17.21	31.53	22.05	1.55
ALL LARGE-CAP FUNDS							
1st Quartile	201	54.23	19.90	7.96	3.98	7.46	6.47
2nd Quartile	201	16.92	29.85	19.40	12.44	9.45	11.94
3rd Quartile	200	4.50	18.50	27.50	25.50	13.50	10.50
4th Quartile	201	0.50	8.46	21.39	34.33	23.88	11.44
ALL MID-CAP FUNDS							
1st Quartile	74	31.08	16.22	21.62	17.57	4.05	9.46
2nd Quartile	74	10.81	18.92	25.68	22.97	8.11	13.51
3rd Quartile	73	19.18	26.03	15.07	12.33	17.81	9.59
4th Quartile	74	13.51	12.16	12.16	20.27	24.32	17.57
ALL SMALL-CAP FUNDS							
1st Quartile	119	26.89	25.21	26.05	17.65	2.52	1.68
2nd Quartile	119	15.13	23.53	23.53	23.53	10.08	4.20
3rd Quartile	118	22.88	24.58	21.19	21.19	9.32	0.85
4th Quartile	119	21.85	13.45	15.97	24.37	21.85	2.52
ALL MULTI-CAP FUNDS							
1st Quartile	124	33.06	20.16	12.90	12.90	2.42	18.55
2nd Quartile	125	18.40	19.20	16.80	11.20	13.60	20.80
3rd Quartile	124	10.48	18.55	20.16	15.32	16.13	19.35
4th Quartile	124	4.03	8.06	16.13	26.61	26.61	18.55

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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)					
ALL DOMESTIC FUNDS	FUND COUNT AT START (MARCH 2016)	THREE-YEAR PERCENTAGES AT END			
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
Top Half	1035	55.56	36.14	8.02	0.29
Bottom Half	1035	30.53	49.95	18.45	1.06
ALL LARGE-CAP FUNDS					
Top Half	402	60.45	21.89	8.46	9.20
Bottom Half	401	15.96	54.36	18.70	10.97
ALL MID-CAP FUNDS					
Top Half	148	38.51	43.92	6.08	11.49
Bottom Half	147	35.37	29.93	21.09	13.61
ALL SMALL-CAP FUNDS					
Top Half	238	45.38	45.38	6.30	2.94
Bottom Half	237	41.35	41.35	15.61	1.69
ALL MULTI-CAP FUNDS					
Top Half	249	45.38	26.91	8.03	19.68
Bottom Half	248	20.56	39.11	21.37	18.95

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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)								
ALL DOMESTIC FUNDS	FUND COUNT AT START (MARCH 2014)	FIVE-YEAR PERCENTAGES AT END						STYLE CHANGED (%)
		1ST QUARTILE (%)	2ND QUARTILE (%)	3TH QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)		
1st Quartile	498	16.06	17.47	22.89	31.53	11.24	0.80	
2nd Quartile	498	21.29	21.49	20.28	22.29	14.26	0.40	
3rd Quartile	497	26.36	22.94	18.51	9.86	20.72	1.61	
4th Quartile	498	15.26	16.87	17.27	15.06	26.51	9.04	
ALL LARGE-CAP FUNDS								
1st Quartile	192	18.75	18.75	21.88	17.71	10.42	12.50	
2nd Quartile	192	22.40	17.71	12.50	16.15	16.67	14.58	
3rd Quartile	192	15.10	19.27	16.15	14.58	22.92	11.98	
4th Quartile	192	10.94	11.46	16.67	18.75	28.12	14.06	
ALL MID-CAP FUNDS								
1st Quartile	75	13.33	8.00	24.00	22.67	9.33	22.67	
2nd Quartile	74	18.92	16.22	20.27	13.51	9.46	21.62	
3rd Quartile	75	18.67	21.33	10.67	14.67	24.00	10.67	
4th Quartile	74	12.16	18.92	8.11	12.16	32.43	16.22	
ALL SMALL-CAP FUNDS								
1st Quartile	111	23.42	17.12	17.12	29.73	11.71	0.90	
2nd Quartile	111	26.13	18.02	22.52	12.61	17.12	3.60	
3rd Quartile	110	18.18	20.91	25.45	18.18	15.45	1.82	
4th Quartile	111	13.51	25.23	15.32	20.72	21.62	3.60	
ALL MULTI-CAP FUNDS								
1st Quartile	121	15.70	14.05	16.53	19.83	4.96	28.93	
2nd Quartile	120	19.17	15.83	20.83	14.17	10.00	20.00	
3rd Quartile	121	13.22	15.70	9.92	4.96	28.10	28.10	
4th Quartile	120	5.00	7.50	5.83	14.17	25.83	41.67	

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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)					
ALL DOMESTIC FUNDS	FUND COUNT AT START (MARCH 2014)	FIVE-YEAR PERCENTAGES AT END			
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
Top Half	996	38.15	48.49	12.75	0.60
Bottom Half	995	40.70	30.35	23.62	5.33
ALL LARGE-CAP FUNDS					
Top Half	384	38.80	34.11	13.54	13.54
Bottom Half	384	28.39	33.07	25.52	13.02
ALL MID-CAP FUNDS					
Top Half	149	28.19	40.27	9.40	22.15
Bottom Half	149	35.57	22.82	28.19	13.42
ALL SMALL-CAP FUNDS					
Top Half	222	42.34	40.99	14.41	2.25
Bottom Half	221	38.91	39.82	18.55	2.71
ALL MULTI-CAP FUNDS					
Top Half	241	32.37	35.68	7.47	24.48
Bottom Half	241	20.75	17.43	26.97	34.85

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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			
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2017)	PERCENTAGE REMAINING IN TOP QUARTILE	
		MARCH 2018	MARCH 2019
TOP QUARTILE			
Government Long Funds	14	28.57	7.14
Government Intermediate Funds	5	40.00	0.00
Government Short Funds	6	66.67	16.67
Investment-Grade Long Funds	22	45.45	0.00
Investment-Grade Intermediate Funds	49	55.10	12.24
Investment-Grade Short Funds	23	69.57	21.74
High Yield Funds	51	33.33	9.80
Mortgage-Backed Securities Funds	13	76.92	38.46
Global Income Funds	27	11.11	0.00
Emerging Markets Debt Funds	15	26.67	0.00
General Municipal Debt Funds	19	47.37	15.79
California Municipal Debt Funds	9	33.33	11.11
New York Municipal Debt Funds	7	28.57	14.29
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2017)	PERCENTAGE REMAINING IN TOP HALF	
		MARCH 2018	MARCH 2019
TOP HALF			
Government Long Funds	28	53.57	21.43
Government Intermediate Funds	10	60.00	20.00
Government Short Funds	12	58.33	33.33
Investment-Grade Long Funds	45	68.89	33.33
Investment-Grade Intermediate Funds	97	68.04	39.18
Investment-Grade Short Funds	45	82.22	51.11
High Yield Funds	103	66.02	32.04
Mortgage-Backed Securities Funds	27	70.37	48.15
Global Income Funds	54	25.93	5.56
Emerging Markets Debt Funds	30	46.67	23.33
General Municipal Debt Funds	39	56.41	28.21
California Municipal Debt Funds	17	58.82	35.29
New York Municipal Debt Funds	14	42.86	35.71

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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						
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2015)	PERCENTAGE REMAINING IN TOP QUARTILE				
		MARCH 2016	MARCH 2017	MARCH 2018	MARCH 2019	
TOP QUARTILE						
Government Long Funds	14	57.14	7.14	0.00	0.00	
Government Intermediate Funds	6	50.00	16.67	0.00	0.00	
Government Short Funds	7	42.86	0.00	0.00	0.00	
Investment-Grade Long Funds	23	30.43	8.70	4.35	0.00	
Investment-Grade Intermediate Funds	47	25.53	2.13	2.13	2.13	
Investment-Grade Short Funds	21	38.10	9.52	4.76	0.00	
High Yield Funds	49	53.06	2.04	2.04	0.00	
Mortgage-Backed Securities Funds	13	38.46	15.38	7.69	0.00	
Global Income Funds	26	7.69	0.00	0.00	0.00	
Emerging Markets Debt Funds	13	23.08	0.00	0.00	0.00	
General Municipal Debt Funds	19	52.63	31.58	21.05	10.53	
California Municipal Debt Funds	9	55.56	22.22	11.11	0.00	
New York Municipal Debt Funds	7	28.57	14.29	0.00	0.00	
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2015)	PERCENTAGE REMAINING IN TOP HALF				
		MARCH 2016	MARCH 2017	MARCH 2018	MARCH 2019	
TOP HALF						
Government Long Funds	29	65.52	24.14	17.24	13.79	
Government Intermediate Funds	12	58.33	33.33	25.00	16.67	
Government Short Funds	14	64.29	35.71	7.14	7.14	
Investment-Grade Long Funds	46	47.83	15.22	10.87	8.70	
Investment-Grade Intermediate Funds	94	48.94	17.02	15.96	12.77	
Investment-Grade Short Funds	41	63.41	36.59	29.27	24.39	
High Yield Funds	99	62.63	19.19	14.14	7.07	
Mortgage-Backed Securities Funds	26	57.69	34.62	23.08	19.23	
Global Income Funds	52	26.92	15.38	1.92	1.92	
Emerging Markets Debt Funds	25	64.00	28.00	12.00	8.00	
General Municipal Debt Funds	39	66.67	38.46	30.77	17.95	
California Municipal Debt Funds	18	77.78	55.56	44.44	27.78	
New York Municipal Debt Funds	14	64.29	28.57	21.43	21.43	

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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)							
GOVERNMENT LONG FUNDS	FUND COUNT AT START (MARCH 2016)	THREE-YEAR PERCENTAGES AT END					
		1ST QUARTILE (%)	2ND QUARTILE (%)	3TH QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
1st Quartile	14	42.86	28.57	14.29	7.14	7.14	0.00
2nd Quartile	14	14.29	21.43	42.86	21.43	0.00	0.00
3rd Quartile	14	14.29	21.43	21.43	21.43	0.00	21.43
4th Quartile	14	14.29	7.14	7.14	28.57	42.86	0.00
GOVERNMENT INTERMEDIATE FUNDS							
1st Quartile	5	60.00	20.00	20.00	0.00	0.00	0.00
2nd Quartile	5	0.00	20.00	20.00	20.00	20.00	20.00
3rd Quartile	4	0.00	0.00	50.00	25.00	25.00	0.00
4th Quartile	5	20.00	40.00	0.00	40.00	0.00	0.00
GOVERNMENT SHORT FUNDS							
1st Quartile	6	33.33	50.00	16.67	0.00	0.00	0.00
2nd Quartile	7	28.57	14.29	42.86	0.00	0.00	14.29
3rd Quartile	6	33.33	16.67	33.33	0.00	16.67	0.00
4th Quartile	6	0.00	0.00	0.00	83.33	16.67	0.00
INVESTMENT-GRADE LONG FUNDS							
1st Quartile	21	33.33	33.33	23.81	4.76	4.76	0.00
2nd Quartile	20	25.00	15.00	25.00	15.00	10.00	10.00
3rd Quartile	21	19.05	23.81	38.10	19.05	0.00	0.00
4th Quartile	20	10.00	10.00	0.00	45.00	15.00	20.00
INVESTMENT-GRADE INTERMEDIATE FUNDS							
1st Quartile	45	35.56	31.11	8.89	15.56	8.89	0.00
2nd Quartile	46	21.74	19.57	36.96	13.04	6.52	2.17
3rd Quartile	45	15.56	24.44	28.89	17.78	11.11	2.22
4th Quartile	45	13.33	11.11	11.11	40.00	22.22	2.22
INVESTMENT-GRADE SHORT FUNDS							
1st Quartile	18	38.89	33.33	16.67	5.56	5.56	0.00
2nd Quartile	19	10.53	31.58	36.84	10.53	10.53	0.00
3rd Quartile	18	27.78	16.67	27.78	27.78	0.00	0.00
4th Quartile	18	16.67	11.11	5.56	50.00	16.67	0.00
HIGH YIELD FUNDS							
1st Quartile	44	20.45	20.45	11.36	45.45	2.27	0.00
2nd Quartile	45	13.33	24.44	37.78	20.00	4.44	0.00
3rd Quartile	44	15.91	29.55	20.45	15.91	15.91	2.27
4th Quartile	44	38.64	13.64	15.91	6.82	25.00	0.00

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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.)							
MORTGAGE- BACKED SECURITIES FUNDS	FUND COUNT AT START (MARCH 2016)	THREE-YEAR PERCENTAGES AT END					
		1ST QUARTILE (%)	2ND QUARTILE (%)	3TH QUARTILE (%)	4TH QUARTILE (%)	MERGED/ LIQUIDATED (%)	STYLE CHANGED (%)
1st Quartile	12	41.67	41.67	0.00	8.33	8.33	0.00
2nd Quartile	12	41.67	25.00	25.00	8.33	0.00	0.00
3rd Quartile	11	0.00	9.09	27.27	36.36	18.18	9.09
4th Quartile	12	0.00	16.67	33.33	33.33	16.67	0.00
GLOBAL INCOME FUNDS							
1st Quartile	23	30.43	26.09	30.43	8.70	4.35	0.00
2nd Quartile	23	8.70	17.39	34.78	30.43	4.35	4.35
3rd Quartile	23	17.39	26.09	13.04	21.74	17.39	4.35
4th Quartile	23	26.09	17.39	4.35	21.74	30.43	0.00
EMERGING MARKETS DEBT FUNDS							
1st Quartile	9	0.00	33.33	11.11	22.22	33.33	0.00
2nd Quartile	9	22.22	22.22	33.33	11.11	11.11	0.00
3rd Quartile	8	37.50	12.50	12.50	25.00	12.50	0.00
4th Quartile	9	22.22	11.11	11.11	22.22	33.33	0.00
GENERAL MUNICIPAL DEBT FUNDS							
1st Quartile	18	55.56	33.33	11.11	0.00	0.00	0.00
2nd Quartile	18	27.78	22.22	33.33	5.56	11.11	0.00
3rd Quartile	18	0.00	22.22	27.78	38.89	11.11	0.00
4th Quartile	18	0.00	5.56	11.11	38.89	22.22	22.22
CALIFORNIA MUNICIPAL DEBT FUNDS							
1st Quartile	9	44.44	33.33	11.11	0.00	11.11	0.00
2nd Quartile	9	22.22	11.11	55.56	11.11	0.00	0.00
3rd Quartile	9	22.22	33.33	11.11	33.33	0.00	0.00
4th Quartile	9	0.00	22.22	11.11	44.44	11.11	11.11
NEW YORK MUNICIPAL DEBT FUNDS							
1st Quartile	7	42.86	28.57	14.29	0.00	0.00	14.29
2nd Quartile	7	14.29	42.86	28.57	14.29	0.00	0.00
3rd Quartile	6	0.00	33.33	33.33	33.33	0.00	0.00
4th Quartile	7	28.57	0.00	14.29	42.86	14.29	0.00

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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)					
GOVERNMENT LONG FUNDS	FUND COUNT AT START (MARCH 2016)	THREE-YEAR PERCENTAGES AT END			
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
Top Half	28	53.57	42.86	3.57	0.00
Bottom Half	28	28.57	39.29	21.43	10.71
GOVERNMENT INTERMEDIATE FUNDS					
Top Half	10	50.00	30.00	10.00	10.00
Bottom Half	9	33.33	55.56	11.11	0.00
GOVERNMENT SHORT FUNDS					
Top Half	13	61.54	30.77	0.00	7.69
Bottom Half	12	25.00	58.33	16.67	0.00
INVESTMENT-GRADE LONG FUNDS					
Top Half	41	53.66	34.15	7.32	4.88
Bottom Half	41	31.71	51.22	7.32	9.76
INVESTMENT-GRADE INTERMEDIATE FUNDS					
Top Half	91	53.85	37.36	7.69	1.1
Bottom Half	90	32.22	48.89	16.67	2.22
INVESTMENT-GRADE SHORT FUNDS					
Top Half	37	56.76	35.14	8.11	0.00
Bottom Half	36	36.11	55.56	8.33	0.00
HIGH YIELD FUNDS					
Top Half	89	39.33	57.30	3.37	0.00
Bottom Half	88	48.86	29.55	20.45	1.14
MORTGAGE-BACKED SECURITIES FUNDS					
Top Half	24	75.00	20.83	4.17	0.00
Bottom Half	23	13.04	65.22	17.39	4.35
GLOBAL INCOME FUNDS					
Top Half	46	41.30	52.17	4.35	2.17
Bottom Half	46	43.48	30.43	23.91	2.17
EMERGING MARKETS DEBT FUNDS					
Top Half	18	38.89	38.89	22.22	0.00
Bottom Half	17	41.18	35.29	23.53	0.00
GENERAL MUNICIPAL DEBT FUNDS					
Top Half	36	69.44	25.00	5.56	0.00
Bottom Half	36	13.89	58.33	16.67	11.11
CALIFORNIA MUNICIPAL DEBT FUNDS					
Top Half	18	55.56	38.89	5.56	0.00
Bottom Half	18	38.89	50.00	5.56	5.56
NEW YORK MUNICIPAL DEBT FUNDS					
Top Half	14	64.29	28.57	0.00	7.14
Bottom Half	13	30.77	61.54	7.69	0.00

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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)							
GOVERNMENT LONG FUNDS	FUND COUNT AT START (MARCH 2014)	FIVE-YEAR PERCENTAGES AT END					
		1ST QUARTILE (%)	2ND QUARTILE (%)	3TH QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
1st Quartile	13	53.85	0.00	15.38	7.69	15.38	7.69
2nd Quartile	14	21.43	42.86	14.29	14.29	7.14	0.00
3rd Quartile	13	0.00	23.08	30.77	15.38	23.08	7.69
4th Quartile	13	0.00	7.69	15.38	38.46	38.46	0.00
GOVERNMENT INTERMEDIATE FUNDS							
1st Quartile	6	50.00	16.67	0.00	16.67	16.67	0.00
2nd Quartile	5	20.00	40.00	0.00	0.00	20.00	20.00
3rd Quartile	6	0.00	16.67	33.33	0.00	50.00	0.00
4th Quartile	5	0.00	0.00	20.00	60.00	20.00	0.00
GOVERNMENT SHORT FUNDS							
1st Quartile	7	28.57	57.14	14.29	0.00	0.00	0.00
2nd Quartile	7	28.57	14.29	14.29	0.00	42.86	0.00
3rd Quartile	7	14.29	0.00	14.29	28.57	28.57	14.29
4th Quartile	7	0.00	0.00	14.29	42.86	28.57	14.29
INVESTMENT-GRADE LONG FUNDS							
1st Quartile	21	47.62	14.29	14.29	4.76	4.76	14.29
2nd Quartile	20	20.00	25.00	20.00	10.00	10.00	15.00
3rd Quartile	21	4.76	14.29	23.81	38.10	14.29	4.76
4th Quartile	20	0.00	25.00	15.00	20.00	20.00	20.00
INVESTMENT-GRADE INTERMEDIATE FUNDS							
1st Quartile	45	42.22	22.22	11.11	6.67	8.89	8.89
2nd Quartile	44	15.91	25.00	22.73	4.55	20.45	11.36
3rd Quartile	45	8.89	20.00	26.67	22.22	17.78	4.44
4th Quartile	44	2.27	2.27	9.09	36.36	20.45	29.55
INVESTMENT-GRADE SHORT FUNDS							
1st Quartile	13	30.77	23.08	15.38	23.08	7.69	0.00
2nd Quartile	13	38.46	38.46	15.38	0.00	7.69	0.00
3rd Quartile	13	7.69	15.38	30.77	38.46	7.69	0.00
4th Quartile	13	7.69	7.69	15.38	23.08	38.46	7.69
HIGH YIELD FUNDS							
1st Quartile	36	19.44	22.22	25.00	25.00	5.56	2.78
2nd Quartile	36	19.44	16.67	16.67	19.44	27.78	0.00
3rd Quartile	35	28.57	34.29	17.14	11.43	5.71	2.86
4th Quartile	36	16.67	11.11	25.00	27.78	19.44	0.00

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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.)							
MORTGAGE- BACKED SECURITIES FUNDS	FUND COUNT AT START (MARCH 2014)	FIVE-YEAR PERCENTAGES AT END					
		1ST QUARTILE (%)	2ND QUARTILE (%)	3TH QUARTILE (%)	4TH QUARTILE (%)	MERGED/ LIQUIDATED (%)	STYLE CHANGED (%)
1st Quartile	12	58.33	16.67	16.67	8.33	0.00	0.00
2nd Quartile	12	8.33	41.67	0.00	25.00	16.67	8.33
3rd Quartile	12	0.00	8.33	25.00	16.67	41.67	8.33
4th Quartile	12	8.33	8.33	25.00	25.00	25.00	8.33
GLOBAL INCOME FUNDS							
1st Quartile	16	37.50	25.00	12.50	0.00	18.75	6.25
2nd Quartile	16	25.00	25.00	18.75	12.50	18.75	0.00
3rd Quartile	16	12.50	12.50	37.50	18.75	6.25	12.50
4th Quartile	16	0.00	18.75	6.25	43.75	31.25	0.00
EMERGING MARKETS DEBT FUNDS							
1st Quartile	4	25.00	50.00	0.00	25.00	0.00	0.00
2nd Quartile	3	0.00	0.00	33.33	0.00	66.67	0.00
3rd Quartile	4	50.00	0.00	25.00	25.00	0.00	0.00
4th Quartile	3	0.00	33.33	0.00	33.33	33.33	0.00
GENERAL MUNICIPAL DEBT FUNDS							
1st Quartile	17	58.82	17.65	5.88	0.00	5.88	11.76
2nd Quartile	16	18.75	37.50	31.25	6.25	0.00	6.25
3rd Quartile	17	5.88	23.53	29.41	17.65	23.53	0.00
4th Quartile	16	0.00	0.00	18.75	56.25	12.50	12.50
CALIFORNIA MUNICIPAL DEBT FUNDS							
1st Quartile	9	55.56	22.22	22.22	0.00	0.00	0.00
2nd Quartile	8	25.00	62.50	12.50	0.00	0.00	0.00
3rd Quartile	9	11.11	11.11	33.33	22.22	11.11	11.11
4th Quartile	8	0.00	0.00	12.50	75.00	12.50	0.00
NEW YORK MUNICIPAL DEBT FUNDS							
1st Quartile	7	42.86	42.86	14.29	0.00	0.00	0.00
2nd Quartile	6	16.67	16.67	16.67	16.67	16.67	16.67
3rd Quartile	7	28.57	14.29	14.29	14.29	28.57	0.00
4th Quartile	6	0.00	0.00	50.00	50.00	0.00	0.00

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. 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)					
GOVERNMENT LONG FUNDS	FUND COUNT AT START (MARCH 2014)	FIVE-YEAR PERCENTAGES AT END			
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
Top Half	27	59.26	25.93	11.11	3.70
Bottom Half	26	15.38	50.00	30.77	3.85
GOVERNMENT INTERMEDIATE FUNDS					
Top Half	11	63.64	9.09	18.18	9.09
Bottom Half	11	9.09	54.55	36.36	0.00
GOVERNMENT SHORT FUNDS					
Top Half	14	64.29	14.29	21.43	0.00
Bottom Half	14	7.14	50.00	28.57	14.29
INVESTMENT-GRADE LONG FUNDS					
Top Half	41	53.66	24.39	7.32	14.63
Bottom Half	41	21.95	48.78	17.07	12.20
INVESTMENT-GRADE INTERMEDIATE FUNDS					
Top Half	89	52.81	22.47	14.61	10.11
Bottom Half	89	16.85	47.19	19.10	16.85
INVESTMENT-GRADE SHORT FUNDS					
Top Half	26	65.38	26.92	7.69	0.00
Bottom Half	26	19.23	53.85	23.08	3.85
HIGH YIELD FUNDS					
Top Half	72	38.89	43.06	16.67	1.39
Bottom Half	71	45.07	40.85	12.68	1.41
MORTGAGE-BACKED SECURITIES FUNDS					
Top Half	24	62.50	25.00	8.33	4.17
Bottom Half	24	12.50	45.83	33.33	8.33
GLOBAL INCOME FUNDS					
Top Half	32	56.25	21.88	18.75	3.12
Bottom Half	32	21.88	53.12	18.75	6.25
EMERGING MARKETS DEBT FUNDS					
Top Half	7	42.86	28.57	28.57	0.00
Bottom Half	7	42.86	42.86	14.29	0.00
GENERAL MUNICIPAL DEBT FUNDS					
Top Half	33	66.67	21.21	3.03	9.09
Bottom Half	33	15.15	60.61	18.18	6.06
CALIFORNIA MUNICIPAL DEBT FUNDS					
Top Half	17	82.35	17.65	0.00	0.00
Bottom Half	17	11.76	70.59	11.76	5.88
NEW YORK MUNICIPAL DEBT FUNDS					
Top Half	13	61.54	23.08	7.69	7.69
Bottom Half	13	23.08	61.54	15.38	0.00

Source: S&P Dow Jones Indices LLC, CRSP. Data as of March 29, 2019. Table is provided for illustrative purposes. Past performance is no guarantee of future results.

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