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Does Past Performance Matter? The Persistence Scorecard

SUMMARY OF RESULTS

- When it comes to the active versus passive debate, one of the key measurements of successful active management lies in the ability of a manager or a strategy to deliver above-average returns consistently over multiple periods. Demonstrating the ability to outperform peers repeatedly can be one way to differentiate a manager's luck from skill.
- According to the S&P Persistence Scorecard, relatively few funds can consistently stay at the top. Out of 568 domestic equity funds that were in the top quartile as of March 2015, only 1.94% managed to stay in the top quartile at the end of March 2017. Furthermore, 0.92% of the large-cap funds, 2.38% of the mid-cap funds, and 2.26% of the small-cap funds remained in the top quartile.
- For the three-year period that ended in March 2017, persistence figures for funds in the top half were equally unfavorable. Over three consecutive 12-month periods, 23.45% of large-cap funds, 11.38% of mid-cap funds, and 22.10% of small-cap funds maintained a top-half ranking.
- An inverse relationship generally exists between the measurement time horizon and the ability of top-performing funds to maintain their status. It is worth noting that no large-cap, mid-cap, or small-cap funds managed to remain in the top quartile at the end of the five-year measurement period. This figure paints a negative picture regarding long-term persistence in mutual fund returns.
- Similarly, only 4.03% of large-cap funds, 5.88% of mid-cap funds, and 5.75% of small-cap funds maintained top-half performance over five consecutive 12-month periods. Random expectations would suggest a repeat rate of 6.25%.

- The transition matrices are designed to track the performance of top- and bottom-quintile performers over subsequent time periods. The data show a stronger likelihood for the best-performing funds to become the worst-performing funds than vice versa. Of 370 funds that were in the bottom quartile, 17.84% moved to the top quartile over the five-year horizon, while 27.57% of the 370 funds that were in the top quartile moved to the bottom quartile during the same period.
- Our research also suggests that there is consistency in the death rate of bottom-quartile funds. Across all market cap categories and all periods studied, fourth-quartile funds had a much higher rate of being merged or liquidated. The five-year transition matrix shows that 24.46% of large-cap funds, 17.31% of mid-cap funds, and 26.74% of small-cap funds in the fourth quartile disappeared.
- Compared with domestic equity funds, there was a higher level of performance persistence among the top-quartile fixed income funds over the three-year period ending March 2017. Government Short, Global Income, and Emerging Markets funds were the only categories in which the results showed no performance persistence.
- Over the five-year measurement horizon, the results show a lack of persistence among nearly all the top-quartile fixed income categories, with a few exceptions. Funds investing in short-term government bonds, long-term investment-grade bonds, mortgage-backed securities, general municipal debt, and California municipal debt were the only groups in which a noticeable level of persistence was observed.

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, due to either force of habit or conviction, 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 on a continuous basis, the S&P Persistence Scorecard, released twice per year, tracks the consistency of top performers over yearly consecutive 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-year 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. Nevertheless, in their persistence calculations, analysts often limit their sample to funds that continue to exist over the complete time period examined, ranking only the survivors. If that happens, funds that liquidate or merge during a period of study are disregarded, biasing 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. This approach accounts for all initially available funds.
- **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.

EXHIBITS

Exhibit 1: Performance Persistence of Domestic Equity Funds Over Three Consecutive 12-Month Periods				
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2015)	PERCENTAGE REMAINING IN TOP QUARTILE		
		MARCH 2016	MARCH 2017	
TOP QUARTILE				
All Domestic Funds	568	34.86	1.94	
Large-Cap Funds	217	23.96	0.92	
Mid-Cap Funds	84	25.00	2.38	
Small-Cap Funds	133	15.79	2.26	
Multi-Cap Funds	134	25.37	5.97	
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2015)	PERCENTAGE REMAINING IN TOP HALF		
		MARCH 2016	MARCH 2017	
TOP HALF				
All Domestic Funds	1137	58.05	16.01	
Large-Cap Funds	435	56.55	23.45	
Mid-Cap Funds	167	41.92	11.38	
Small-Cap Funds	267	45.69	22.10	
Multi-Cap Funds	268	50.00	20.52	

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 2: Performance Persistence of Domestic Equity Funds Over Five Consecutive 12-Month Periods					
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2013)	PERCENTAGE REMAINING IN TOP QUARTILE			
		MARCH 2014	MARCH 2015	MARCH 2016	MARCH 2017
TOP QUARTILE					
All Domestic Funds	585	25.64	4.10	0.51	0.34
Large-Cap Funds	223	19.73	3.14	1.35	0.00
Mid-Cap Funds	85	18.82	5.88	0.00	0.00
Small-Cap Funds	130	23.08	4.62	0.00	0.00
Multi-Cap Funds	147	19.73	4.76	0.68	0.00
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2013)	PERCENTAGE REMAINING IN TOP HALF			
		MARCH 2014	MARCH 2015	MARCH 2016	MARCH 2017
TOP HALF					
All Domestic Funds	1173	48.68	21.14	9.12	3.67
Large-Cap Funds	447	42.06	14.54	7.38	4.03
Mid-Cap Funds	170	45.29	20.00	11.18	5.88
Small-Cap Funds	261	46.36	23.37	11.11	5.75
Multi-Cap Funds	295	41.69	18.64	6.78	4.41

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 3: Three-Year Transition Matrix—Performance Over Two Non-Overlapping Three-Year Periods (Based on Quartiles)							
ALL DOMESTIC FUNDS	NO. OF FUNDS AT START (MARCH 2014)	THREE-YEAR PERCENTAGES AT END					
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
1st Quartile	528	31.82	26.33	20.27	17.61	3.98	0.00
2nd Quartile	529	25.33	26.28	22.68	17.39	7.75	0.57
3rd Quartile	528	18.37	20.45	24.24	20.83	13.45	2.65
4th Quartile	528	10.04	12.69	18.37	29.73	21.02	8.14
LARGE-CAP FUNDS							
1st Quartile	202	32.18	23.76	18.81	13.37	4.95	6.93
2nd Quartile	203	16.75	23.15	21.18	14.29	10.84	13.79
3rd Quartile	202	17.82	14.85	19.31	26.73	13.86	7.43
4th Quartile	202	10.89	15.84	18.32	23.27	22.28	9.41
MID-CAP FUNDS							
1st Quartile	79	18.99	20.25	24.05	16.46	5.06	15.19
2nd Quartile	80	27.50	20.00	16.25	10.00	11.25	15.00
3rd Quartile	79	20.25	18.99	21.52	18.99	5.06	15.19
4th Quartile	79	5.06	11.39	10.13	25.32	21.52	26.58
SMALL-CAP FUNDS							
1st Quartile	119	23.53	30.25	18.49	22.69	3.36	1.68
2nd Quartile	120	25.00	25.00	27.50	15.00	6.67	0.83
3rd Quartile	119	22.69	18.49	26.89	20.17	9.24	2.52
4th Quartile	119	15.97	13.45	14.29	29.41	23.53	3.36
MULTI-CAP FUNDS							
1st Quartile	128	28.13	26.56	17.19	14.06	2.34	11.72
2nd Quartile	127	26.77	18.90	16.54	19.69	3.94	14.17
3rd Quartile	128	7.81	17.19	19.53	10.94	15.63	28.91
4th Quartile	127	3.94	3.94	13.39	22.05	20.47	36.22

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 4: Three-Year Transition Matrix—Performance Over Two Non-Overlapping Three-Year Periods (Based on Halves)					
ALL DOMESTIC FUNDS	NO. OF FUNDS AT START (MARCH 2014)	THREE-YEAR PERCENTAGES AT END			
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
Top Half	1057	54.87	38.98	5.87	0.28
Bottom Half	1056	30.78	46.59	17.23	5.40
LARGE-CAP FUNDS					
Top Half	405	47.90	33.83	7.90	10.37
Bottom Half	404	29.70	43.81	18.07	8.42
MID-CAP FUNDS					
Top Half	159	43.40	33.33	8.18	15.09
Bottom Half	158	27.85	37.97	13.29	20.89
SMALL-CAP FUNDS					
Top Half	239	51.88	41.84	5.02	1.26
Bottom Half	238	35.29	45.38	16.39	2.94
MULTI-CAP FUNDS					
Top Half	255	50.20	33.73	3.14	12.94
Bottom Half	255	16.47	32.94	18.04	32.55

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 5: Five-Year Transition Matrix—Performance Over Two Non-Overlapping Five-Year Periods (Based on Quartiles)							
ALL DOMESTIC FUNDS	NO. OF FUNDS AT START (MARCH 2012)	FIVE-YEAR PERCENTAGES AT END					
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
1st Quartile	370	22.43	17.84	20.54	27.57	11.08	0.54
2nd Quartile	370	20.00	19.46	19.19	20.54	19.46	1.35
3rd Quartile	369	16.53	18.16	21.95	15.99	22.22	5.15
4th Quartile	370	17.84	21.62	15.14	12.70	29.19	3.51
LARGE-CAP FUNDS							
1st Quartile	139	20.14	14.39	16.55	20.86	15.11	12.95
2nd Quartile	140	17.86	16.43	10.71	17.86	22.86	14.29
3rd Quartile	139	14.39	15.11	17.99	15.11	24.46	12.95
4th Quartile	139	9.35	16.55	16.55	7.91	24.46	25.18
MID-CAP FUNDS							
1st Quartile	52	15.38	11.54	17.31	19.23	17.31	19.23
2nd Quartile	52	7.69	11.54	17.31	17.31	19.23	26.92
3rd Quartile	52	17.31	17.31	13.46	9.62	25.00	17.31
4th Quartile	52	17.31	15.38	9.62	9.62	17.31	30.77
SMALL-CAP FUNDS							
1st Quartile	86	13.95	25.58	20.93	26.74	10.47	2.33
2nd Quartile	86	18.60	22.09	16.28	29.07	9.30	4.65
3rd Quartile	86	22.09	13.95	24.42	11.63	24.42	3.49
4th Quartile	86	24.42	17.44	16.28	11.63	26.74	3.49
MULTI-CAP FUNDS							
1st Quartile	93	21.51	11.83	12.90	17.20	9.68	26.88
2nd Quartile	92	8.70	15.22	17.39	15.22	14.13	29.35
3rd Quartile	93	7.53	15.05	15.05	9.68	26.88	25.81
4th Quartile	92	15.22	10.87	7.61	10.87	35.87	19.57

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 6: Five-Year Transition Matrix—Performance Over Two Non-Overlapping Five-Year Periods (Based on Halves)						
ALL DOMESTIC FUNDS	NO. OF FUNDS AT START (MARCH 2012)	FIVE-YEAR PERCENTAGES AT END				
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/ LIQUIDATED (%)	STYLE CHANGED (%)	
Top Half	740	39.86	43.92	15.27	0.95	
Bottom Half	739	37.08	32.88	25.71	4.33	
LARGE-CAP FUNDS						
Top Half	279	34.41	32.97	19.00	13.62	
Bottom Half	278	27.70	28.78	24.46	19.06	
MID-CAP FUNDS						
Top Half	104	23.08	35.58	18.27	23.08	
Bottom Half	104	33.65	21.15	21.15	24.04	
SMALL-CAP FUNDS						
Top Half	172	40.12	46.51	9.88	3.49	
Bottom Half	172	38.95	31.98	25.58	3.49	
MULTI-CAP FUNDS						
Top Half	185	28.65	31.35	11.89	28.11	
Bottom Half	185	24.32	21.62	31.35	22.70	

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 7: Performance Persistence of Domestic Fixed Income Funds Over Three Consecutive 12-Month Periods			
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2015)	PERCENTAGE REMAINING IN TOP QUARTILE (%)	
		MARCH 2016	MARCH 2017
TOP QUARTILE			
Government Long Funds	14	50.00	7.14
Government Intermediate Funds	6	50.00	16.67
Government Short Funds	7	42.86	0.00
Investment-Grade Long Funds	23	30.43	8.70
Investment-Grade Intermediate Funds	47	23.40	2.13
Investment-Grade Short Funds	21	38.10	9.52
High-Yield Funds	50	54.00	2.00
Mortgage-Backed Securities Funds	13	38.46	15.38
Global Income Funds	26	7.69	0.00
Emerging Markets Debt Funds	13	23.08	0.00
General Municipal Debt Funds	19	57.89	42.11
California Municipal Debt Funds	9	55.56	22.22
New York Municipal Debt Funds	7	28.57	14.29
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2015)	PERCENTAGE REMAINING IN TOP HALF (%)	
		MARCH 2016	MARCH 2017
TOP HALF			
Government Long Funds	29	65.52	20.69
Government Intermediate Funds	12	58.33	33.33
Government Short Funds	13	61.54	38.46
Investment-Grade Long Funds	47	48.94	17.02
Investment-Grade Intermediate Funds	94	50.00	18.09
Investment-Grade Short Funds	41	60.98	36.59
High-Yield Funds	99	62.63	21.21
Mortgage-Backed Securities Funds	26	57.69	38.46
Global Income Funds	52	28.85	15.38
Emerging Markets Debt Funds	25	64.00	28.00
General Municipal Debt Funds	39	66.67	38.46
California Municipal Debt Funds	18	77.78	55.56
New York Municipal Debt Funds	14	64.29	35.71

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 8: Performance Persistence of Domestic Fixed Income Funds Over Five Consecutive 12-Month Periods						
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2013)	PERCENTAGE REMAINING IN TOP QUARTILE (%)				
		MARCH 2014	MARCH 2015	MARCH 2016	MARCH 2017	
TOP QUARTILE						
Government Long Funds	15	13.33	0.00	0.00	0.00	
Government Intermediate Funds	6	0.00	0.00	0.00	0.00	
Government Short Funds	7	28.57	28.57	14.29	14.29	
Investment-Grade Long Funds	26	57.69	30.77	3.85	3.85	
Investment-Grade Intermediate Funds	60	21.67	10.00	1.67	0.00	
Investment-Grade Short Funds	14	35.71	28.57	0.00	0.00	
High-Yield Funds	46	56.52	8.70	0.00	0.00	
Mortgage-Backed Securities Funds	14	64.29	35.71	7.14	7.14	
Global Income Funds	22	18.18	4.55	0.00	0.00	
Emerging Markets Debt Funds	7	28.57	0.00	0.00	0.00	
General Municipal Debt Funds	19	21.05	10.53	10.53	10.53	
California Municipal Debt Funds	9	33.33	11.11	11.11	11.11	
New York Municipal Debt Funds	7	28.57	14.29	14.29	0.00	
MUTUAL FUND CATEGORY	FUND COUNT AT START (MARCH 2013)	PERCENTAGE REMAINING IN TOP HALF (%)				
		MARCH 2014	MARCH 2015	MARCH 2016	MARCH 2017	
TOP HALF						
Government Long Funds	30	36.67	20.00	13.33	10.00	
Government Intermediate Funds	12	41.67	25.00	16.67	8.33	
Government Short Funds	14	57.14	42.86	35.71	28.57	
Investment-Grade Long Funds	53	75.47	47.17	13.21	7.55	
Investment-Grade Intermediate Funds	120	39.17	25.00	9.17	7.50	
Investment-Grade Short Funds	28	71.43	50.00	35.71	35.71	
High-Yield Funds	92	69.57	22.83	10.87	6.52	
Mortgage-Backed Securities Funds	28	60.71	50.00	28.57	21.43	
Global Income Funds	45	55.56	44.44	11.11	4.44	
Emerging Markets Debt Funds	14	57.14	35.71	35.71	14.29	
General Municipal Debt Funds	38	47.37	28.95	15.79	10.53	
California Municipal Debt Funds	17	52.94	41.18	35.29	23.53	
New York Municipal Debt Funds	14	50.00	35.71	28.57	21.43	

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 9: Three-Year Transition Matrix Over Two Non-Overlapping Three-Year Periods (Based on Quartiles)							
MUTUAL FUND CATEGORY	NO. OF FUNDS AT START (MARCH 2014)	THREE-YEAR PERCENTAGES AT END					
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
GOVERNMENT LONG FUNDS							
1st Quartile	14	78.57	14.29	7.14	0.00	0.00	0.00
2nd Quartile	14	7.14	42.86	21.43	21.43	7.14	0.00
3rd Quartile	14	0.00	28.57	42.86	7.14	21.43	0.00
4th Quartile	14	0.00	7.14	14.29	57.14	21.43	0.00
GOVERNMENT INTERMEDIATE FUNDS							
1st Quartile	6	66.67	16.67	0.00	0.00	16.67	0.00
2nd Quartile	5	20.00	40.00	20.00	0.00	20.00	0.00
3rd Quartile	6	0.00	16.67	33.33	33.33	16.67	0.00
4th Quartile	5	0.00	0.00	40.00	40.00	20.00	0.00
GOVERNMENT SHORT FUNDS							
1st Quartile	7	71.43	28.57	0.00	0.00	0.00	0.00
2nd Quartile	7	0.00	28.57	14.29	0.00	42.86	14.29
3rd Quartile	6	0.00	16.67	50.00	16.67	16.67	0.00
4th Quartile	7	0.00	0.00	14.29	57.14	14.29	14.29
INVESTMENT-GRADE LONG FUNDS							
1st Quartile	22	50.00	13.64	18.18	4.55	0.00	13.64
2nd Quartile	22	27.27	31.82	22.73	4.55	0.00	13.64
3rd Quartile	21	4.76	19.05	38.10	33.33	4.76	0.00
4th Quartile	22	4.55	18.18	9.09	40.91	9.09	18.18
INVESTMENT-GRADE INTERMEDIATE FUNDS							
1st Quartile	48	45.83	25.00	10.42	8.33	2.08	8.33
2nd Quartile	47	21.28	44.68	10.64	2.13	14.89	6.38
3rd Quartile	48	10.42	6.25	39.58	20.83	16.67	6.25
4th Quartile	47	0.00	2.13	17.02	46.81	4.26	29.79
INVESTMENT-GRADE SHORT FUNDS							
1st Quartile	14	50.00	21.43	28.57	0.00	0.00	0.00
2nd Quartile	14	14.29	28.57	28.57	28.57	0.00	0.00
3rd Quartile	13	15.38	30.77	30.77	23.08	0.00	0.00
4th Quartile	14	7.14	7.14	0.00	35.71	35.71	14.29
HIGH-YIELD FUNDS							
1st Quartile	41	46.34	21.95	12.20	17.07	2.44	0.00
2nd Quartile	41	24.39	19.51	31.71	12.20	12.20	0.00
3rd Quartile	40	12.50	32.50	20.00	25.00	10.00	0.00
4th Quartile	41	7.32	19.51	26.83	36.59	7.32	2.44

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 9: Three-Year Transition Matrix Over Two Non-Overlapping Three-Year Periods (Based on Quartiles) (cont.)

MUTUAL FUND CATEGORY	NO. OF FUNDS AT START (MARCH 2014)	THREE-YEAR PERCENTAGES AT END					
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
MORTGAGE-BACKED SECURITIES FUNDS							
1st Quartile	13	46.15	38.46	15.38	0.00	0.00	0.00
2nd Quartile	14	14.29	28.57	14.29	21.43	0.00	21.43
3rd Quartile	13	7.69	7.69	30.77	30.77	23.08	0.00
4th Quartile	13	15.38	7.69	23.08	30.77	15.38	7.69
GLOBAL INCOME FUNDS							
1st Quartile	19	63.16	26.32	5.26	0.00	0.00	5.26
2nd Quartile	19	26.32	21.05	42.11	10.53	0.00	0.00
3rd Quartile	19	0.00	26.32	31.58	21.05	15.79	5.26
4th Quartile	19	63.16	26.32	5.26	0.00	0.00	5.26
EMERGING MARKETS DEBT FUNDS							
1st Quartile	5	60.00	20.00	20.00	0.00	0.00	0.00
2nd Quartile	5	20.00	40.00	20.00	20.00	0.00	0.00
3rd Quartile	4	0.00	25.00	50.00	25.00	0.00	0.00
4th Quartile	5	0.00	20.00	0.00	40.00	20.00	20.00
GENERAL MUNICIPAL DEBT FUNDS							
1st Quartile	18	55.56	27.78	11.11	5.56	0.00	0.00
2nd Quartile	17	35.29	29.41	17.65	0.00	0.00	17.65
3rd Quartile	18	0.00	33.33	44.44	11.11	11.11	0.00
4th Quartile	17	0.00	0.00	17.65	76.47	0.00	5.88
CALIFORNIA MUNICIPAL DEBT FUNDS							
1st Quartile	9	55.56	22.22	11.11	0.00	0.00	11.11
2nd Quartile	8	25.00	37.50	25.00	12.50	0.00	0.00
3rd Quartile	9	11.11	33.33	22.22	22.22	11.11	0.00
4th Quartile	8	0.00	0.00	37.50	62.50	0.00	0.00
NEW YORK MUNICIPAL DEBT FUNDS							
1st Quartile	7	42.86	42.86	14.29	0.00	0.00	0.00
2nd Quartile	7	28.57	28.57	28.57	14.29	0.00	0.00
3rd Quartile	6	16.67	16.67	16.67	33.33	16.67	0.00
4th Quartile	7	14.29	0.00	42.86	42.86	0.00	0.00

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 10: Three-Year Transition Matrix Over Two Non-Overlapping Three-Year Periods (Based on Halves)						
MUTUAL FUND CATEGORY	NO. OF FUNDS AT START (MARCH 2014)	THREE-YEAR PERCENTAGES AT END				
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/ LIQUIDATED (%)	STYLE CHANGED (%)	
GOVERNMENT LONG FUNDS						
Top Half	28	71.43	25.00	3.57	0.00	
Bottom Half	28	17.86	60.71	21.43	0.00	
GOVERNMENT INTERMEDIATE FUNDS						
Top Half	11	72.73	9.09	18.18	0.00	
Bottom Half	11	9.09	72.73	18.18	0.00	
GOVERNMENT SHORT FUNDS						
Top Half	14	64.29	7.14	21.43	7.14	
Bottom Half	13	7.69	69.23	15.38	7.69	
INVESTMENT-GRADE LONG FUNDS						
Top Half	44	61.36	25.00	0.00	13.64	
Bottom Half	43	23.26	60.47	6.98	9.30	
INVESTMENT-GRADE INTERMEDIATE FUNDS						
Top Half	95	68.42	15.79	8.42	7.37	
Bottom Half	95	9.47	62.11	10.53	17.89	
INVESTMENT-GRADE SHORT FUNDS						
Top Half	28	57.14	42.86	0.00	0.00	
Bottom Half	27	29.63	44.44	18.52	7.41	
HIGH-YIELD FUNDS						
Top Half	82	56.10	36.59	7.32	0.00	
Bottom Half	81	35.80	54.32	8.64	1.23	
MORTGAGE-BACKED SECURITIES FUNDS						
Top Half	27	62.96	25.93	0.00	11.11	
Bottom Half	26	19.23	57.69	19.23	3.85	
GLOBAL INCOME FUNDS						
Top Half	38	68.42	28.95	0.00	2.63	
Bottom Half	38	21.05	60.53	13.16	5.26	
EMERGING MARKETS DEBT FUNDS						
Top Half	10	70.00	30.00	0.00	0.00	
Bottom Half	9	22.22	55.56	11.11	11.11	
GENERAL MUNICIPAL DEBT FUNDS						
Top Half	35	74.29	17.14	0.00	8.57	
Bottom Half	35	17.14	74.29	5.71	2.86	
CALIFORNIA MUNICIPAL DEBT FUNDS						
Top Half	17	70.59	23.53	0.00	5.88	
Bottom Half	17	23.53	70.59	5.88	0.00	
NEW YORK MUNICIPAL DEBT FUNDS						
Top Half	14	71.43	28.57	0.00	0.00	
Bottom Half	13	23.08	69.23	7.69	0.00	

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 11: Five-Year Transition Matrix Over Two Non-Overlapping Five-Year Periods (Based on Quartiles)

MUTUAL FUND CATEGORY	NO. OF FUNDS AT START (MARCH 2012)	FIVE-YEAR PERCENTAGES AT END					
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)
GOVERNMENT LONG FUNDS							
1st Quartile	9	55.56	11.11	22.22	0.00	0.00	11.11
2nd Quartile	9	11.11	33.33	11.11	22.22	22.22	0.00
3rd Quartile	8	0.00	25.00	12.50	37.50	12.50	12.50
4th Quartile	9	11.11	11.11	33.33	22.22	22.22	0.00
GOVERNMENT INTERMEDIATE FUNDS							
1st Quartile	7	28.57	28.57	14.29	0.00	28.57	0.00
2nd Quartile	7	28.57	0.00	28.57	14.29	28.57	0.00
3rd Quartile	6	0.00	33.33	0.00	16.67	33.33	16.67
4th Quartile	7	0.00	14.29	14.29	28.57	42.86	0.00
GOVERNMENT SHORT FUNDS							
1st Quartile	8	50.00	12.50	12.50	0.00	12.50	12.50
2nd Quartile	8	0.00	25.00	12.50	12.50	37.50	12.50
3rd Quartile	7	14.29	0.00	0.00	28.57	42.86	14.29
4th Quartile	8	0.00	25.00	25.00	25.00	12.50	12.50
INVESTMENT-GRADE LONG FUNDS							
1st Quartile	8	50.00	12.50	12.50	0.00	12.50	12.50
2nd Quartile	8	0.00	25.00	12.50	12.50	37.50	12.50
3rd Quartile	7	14.29	0.00	0.00	28.57	42.86	14.29
4th Quartile	8	0.00	25.00	25.00	25.00	12.50	12.50
INVESTMENT-GRADE INTERMEDIATE FUNDS							
1st Quartile	39	17.95	12.82	15.38	2.56	12.82	38.46
2nd Quartile	38	13.16	23.68	18.42	2.63	21.05	21.05
3rd Quartile	39	10.26	10.26	15.38	25.64	25.64	12.82
4th Quartile	38	18.42	10.53	10.53	26.32	15.79	18.42
INVESTMENT-GRADE SHORT FUNDS							
1st Quartile	14	42.86	28.57	28.57	0.00	0.00	0.00
2nd Quartile	14	0.00	28.57	21.43	35.71	14.29	0.00
3rd Quartile	13	15.38	15.38	15.38	23.08	30.77	0.00
4th Quartile	14	21.43	14.29	14.29	21.43	14.29	14.29
HIGH-YIELD FUNDS							
1st Quartile	25	40.00	24.00	12.00	8.00	12.00	4.00
2nd Quartile	25	16.00	36.00	24.00	20.00	4.00	0.00
3rd Quartile	24	12.50	8.33	37.50	25.00	12.50	4.17
4th Quartile	25	20.00	16.00	16.00	32.00	12.00	4.00

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 11: Five-Year Transition Matrix Over Two Non-Overlapping Five-Year Periods (Based on Quartiles) (cont.)							
MUTUAL FUND CATEGORY	NO. OF FUNDS AT START (MARCH 2012)	FIVE-YEAR PERCENTAGES AT END					MERGED/ LIQUIDATED (%)
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)		
MORTGAGE-BACKED SECURITIES FUNDS							
1st Quartile	11	36.36	18.18	36.36	0.00	0.00	
2nd Quartile	11	0.00	18.18	27.27	27.27	27.27	
3rd Quartile	11	9.09	18.18	9.09	45.45	0.00	
4th Quartile	11	36.36	27.27	9.09	9.09	9.09	
GLOBAL INCOME FUNDS							
1st Quartile	9	22.22	22.22	33.33	11.11	11.11	
2nd Quartile	10	30.00	20.00	20.00	20.00	10.00	
3rd Quartile	9	0.00	33.33	11.11	11.11	22.22	
4th Quartile	9	22.22	11.11	11.11	33.33	11.11	
EMERGING MARKETS DEBT FUNDS							
1st Quartile	4	50.00	25.00	0.00	25.00	0.00	
2nd Quartile	4	25.00	25.00	25.00	25.00	0.00	
3rd Quartile	3	0.00	66.67	33.33	0.00	0.00	
4th Quartile	4	0.00	0.00	25.00	25.00	25.00	
GENERAL MUNICIPAL DEBT FUNDS							
1st Quartile	16	12.50	25.00	18.75	31.25	12.50	
2nd Quartile	16	25.00	31.25	31.25	0.00	12.50	
3rd Quartile	16	12.50	12.50	12.50	31.25	18.75	
4th Quartile	16	37.50	12.50	25.00	18.75	0.00	
CALIFORNIA MUNICIPAL DEBT FUNDS							
1st Quartile	8	12.50	12.50	25.00	25.00	12.50	
2nd Quartile	9	33.33	11.11	33.33	22.22	0.00	
3rd Quartile	8	0.00	37.50	25.00	37.50	0.00	
4th Quartile	8	50.00	37.50	0.00	12.50	0.00	
NEW YORK MUNICIPAL DEBT FUNDS							
1st Quartile	7	14.29	42.86	28.57	14.29	0.00	
2nd Quartile	7	0.00	14.29	28.57	42.86	14.29	
3rd Quartile	6	33.33	16.67	16.67	33.33	0.00	
4th Quartile	7	42.86	14.29	14.29	0.00	28.57	

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Exhibit 12: Five-Year Transition Matrix Over Two Non-Overlapping Five-Year Periods (Based on Halves)						
MUTUAL FUND CATEGORY	NO. OF FUNDS AT START (MARCH 2012)	FIVE-YEAR PERCENTAGES AT END				
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/ LIQUIDATED (%)	STYLE CHANGED (%)	
GOVERNMENT LONG FUNDS						
Top Half	18	55.56	27.78	11.11	5.56	
Bottom Half	17	23.53	52.94	17.65	5.88	
GOVERNMENT INTERMEDIATE FUNDS						
Top Half	14	42.86	28.57	28.57	0.00	
Bottom Half	13	23.08	30.77	38.46	7.69	
GOVERNMENT SHORT FUNDS						
Top Half	16	43.75	18.75	25.00	12.50	
Bottom Half	15	20.00	40.00	26.67	13.33	
INVESTMENT-GRADE LONG FUNDS						
Top Half	31	45.16	22.58	6.45	25.81	
Bottom Half	30	23.33	46.67	13.33	16.67	
INVESTMENT-GRADE INTERMEDIATE FUNDS						
Top Half	77	33.77	19.48	16.88	29.87	
Bottom Half	77	24.68	38.96	20.78	15.58	
INVESTMENT-GRADE SHORT FUNDS						
Top Half	28	50.00	42.86	7.14	0.00	
Bottom Half	27	33.33	37.04	22.22	7.41	
HIGH YIELD FUNDS						
Top Half	50	58.00	32.00	8.00	2.00	
Bottom Half	49	28.57	55.10	12.24	4.08	
MORTGAGE-BACKED SECURITIES FUNDS						
Top Half	22	36.36	45.45	13.64	4.55	
Bottom Half	22	45.45	36.36	4.55	13.64	
GLOBAL INCOME FUNDS						
Top Half	19	47.37	42.11	10.53	0.00	
Bottom Half	18	33.33	33.33	16.67	16.67	
EMERGING MARKETS DEBT FUNDS						
Top Half	8	62.50	37.50	0.00	0.00	
Bottom Half	7	28.57	42.86	14.29	14.29	
GENERAL MUNICIPAL DEBT FUNDS						
Top Half	32	46.88	40.63	12.50	0.00	
Bottom Half	32	37.50	43.75	9.38	9.38	
CALIFORNIA MUNICIPAL DEBT FUNDS						
Top Half	17	35.29	52.94	5.88	5.88	
Bottom Half	16	62.50	37.50	0.00	0.00	
NEW YORK MUNICIPAL DEBT FUNDS						
Top Half	14	35.71	57.14	7.14	0.00	
Bottom Half	13	53.85	30.77	15.38	0.00	

Source: S&P Dow Jones Indices LLC. Data for periods ending March 31, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

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