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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 is the only proven 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 631 domestic equity funds that were in the top quartile as of September 2014, only 2.85% managed to stay in the top quartile at the end of September 2016. Furthermore, 2.46% of the large-cap funds, 2.20% of the mid-cap funds, and 3.36% of the small-cap funds remained in the top quartile.
- For the three-year period that ended in September 2016, persistence figures for funds in the top half were equally unfavorable. Over three consecutive 12-month periods, 18.07% of large-cap funds, 22.95% of mid-cap funds, and 20.88% 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 less than 1% of large-cap funds and no 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 the lack of long-term persistence in mutual fund returns.
- Similarly, only 4.47% of large-cap funds, 3.68% of mid-cap funds, and 9.27% 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 428 funds that were in the bottom quartile, 18.69% moved to the top quartile over the five-year horizon, while 27.80% of the 428 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 28.30% of large-cap funds, 23.73% of mid-cap funds, and 29.70% of small-cap funds in the fourth quartile disappeared.
- While much has been written about the persistence of equity funds, there is little research on the persistence of fixed income funds. In March 2015, we initiated a fixed income persistence section.
- 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 September 2016. Global income funds was the only category 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 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 (SEPTEMBER 2014)	PERCENTAGE REMAINING IN TOP QUARTILE	
		SEPTEMBER 2015	SEPTEMBER 2016
TOP QUARTILE			
All Domestic Funds	631	21.24	2.85
Large-Cap Funds	244	21.72	2.46
Mid-Cap Funds	91	17.58	2.20
Small-Cap Funds	149	18.12	3.36
Multi-Cap Funds	147	25.85	4.08
MUTUAL FUND CATEGORY	FUND COUNT AT START (SEPTEMBER 2014)	PERCENTAGE REMAINING IN TOP HALF	
		SEPTEMBER 2015	SEPTEMBER 2016
TOP HALF			
All Domestic Funds	1261	43.38	19.90
Large-Cap Funds	487	45.79	18.07
Mid-Cap Funds	183	39.89	22.95
Small-Cap Funds	297	43.43	20.88
Multi-Cap Funds	294	47.28	24.49

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. 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 (SEPTEMBER 2012)	PERCENTAGE REMAINING IN TOP QUARTILE			
		SEPTEMBER 2013	SEPTEMBER 2014	SEPTEMBER 2015	SEPTEMBER 2016
TOP QUARTILE					
All Domestic Funds	660	40.61	3.48	0.30	0.00
Large-Cap Funds	246	33.33	10.57	0.81	0.81
Mid-Cap Funds	95	43.16	16.84	3.16	0.00
Small-Cap Funds	151	39.07	9.93	1.32	0.00
Multi-Cap Funds	168	29.76	7.74	0.00	0.00
MUTUAL FUND CATEGORY	FUND COUNT AT START (SEPTEMBER 2012)	PERCENTAGE REMAINING IN TOP HALF			
		SEPTEMBER 2013	SEPTEMBER 2014	SEPTEMBER 2015	SEPTEMBER 2016
TOP HALF					
All Domestic Funds	1320	55.45	18.18	5.91	2.35
Large-Cap Funds	492	54.27	30.08	10.16	4.47
Mid-Cap Funds	190	56.32	32.11	8.95	3.68
Small-Cap Funds	302	59.60	29.47	15.89	9.27
Multi-Cap Funds	336	50.60	24.40	10.12	7.14

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. 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 (SEPTEMBER 2013)	THREE-YEAR PERCENTAGES AT END						
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)	TOTAL (%)
1st Quartile	588	15.82	19.39	24.32	34.69	5.61	0.17	100
2nd Quartile	588	32.31	22.79	21.09	15.48	7.82	0.51	100
3rd Quartile	588	24.49	26.70	21.43	15.65	10.88	0.85	100
4th Quartile	588	13.78	17.35	19.56	20.41	19.22	9.69	100
LARGE-CAP FUNDS								
1st Quartile	222	38.74	18.47	17.57	11.26	5.86	8.11	100
2nd Quartile	221	17.65	21.72	23.53	18.55	9.95	8.60	100
3rd Quartile	222	10.36	25.68	18.47	25.23	13.51	6.76	100
4th Quartile	221	12.22	12.67	19.46	23.53	19.00	13.12	100
MID-CAP FUNDS								
1st Quartile	87	17.24	17.24	18.39	26.44	4.60	16.09	100
2nd Quartile	87	28.74	24.14	11.49	13.79	6.90	14.94	100
3rd Quartile	87	18.39	20.69	21.84	17.24	10.34	11.49	100
4th Quartile	87	8.05	11.49	20.69	14.94	20.69	24.14	100
SMALL-CAP FUNDS								
1st Quartile	134	22.39	20.90	24.63	29.10	2.24	0.75	100
2nd Quartile	135	24.44	26.67	25.19	15.56	8.15	0.00	100
3rd Quartile	134	21.64	22.39	20.15	21.64	11.94	2.24	100
4th Quartile	134	20.15	17.91	18.66	21.64	14.93	6.72	100
MULTI-CAP FUNDS								
1st Quartile	145	24.14	24.14	13.79	17.24	4.14	16.55	100
2nd Quartile	146	25.34	19.86	20.55	12.33	5.48	16.44	100
3rd Quartile	145	11.72	16.55	16.55	13.79	15.86	25.52	100
4th Quartile	145	4.14	4.14	14.48	21.38	17.24	38.62	100

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. 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 (SEPTEMBER 2013)	THREE-YEAR PERCENTAGES AT END				
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)	TOTAL (%)
Top Half	1176	45.15	47.79	6.72	0.34	100
Bottom Half	1176	41.16	38.52	15.05	5.27	100
LARGE-CAP FUNDS						
Top Half	443	48.31	35.44	7.90	8.35	100
Bottom Half	443	30.47	43.34	16.25	9.93	100
MID-CAP FUNDS						
Top Half	174	43.68	35.06	5.75	15.52	100
Bottom Half	174	29.31	37.36	15.52	17.82	100
SMALL-CAP FUNDS						
Top Half	269	47.21	47.21	5.20	0.37	100
Bottom Half	268	41.04	41.04	13.43	4.48	100
MULTI-CAP FUNDS						
Top Half	291	46.74	31.96	4.81	16.49	100
Bottom Half	290	18.28	33.10	16.55	32.07	100

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. 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 (SEPTEMBER 2011)	FIVE-YEAR PERCENTAGES AT END						
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)	TOTAL (%)
1st Quartile	428	20.09	18.93	20.56	27.80	10.75	1.87	100
2nd Quartile	429	18.41	20.05	18.65	21.21	17.25	4.43	100
3rd Quartile	428	19.16	18.46	19.16	14.49	24.77	3.97	100
4th Quartile	428	18.69	18.93	17.76	12.85	28.04	3.74	100
LARGE-CAP FUNDS								
1st Quartile	159	20.13	17.61	16.35	22.01	10.69	13.21	100
2nd Quartile	160	21.25	13.75	15.00	16.88	20.00	13.13	100
3rd Quartile	159	15.09	15.09	16.98	15.72	26.42	10.69	100
4th Quartile	159	7.55	17.61	15.09	9.43	28.30	22.01	100
MID-CAP FUNDS								
1st Quartile	59	13.56	15.25	16.95	20.34	13.56	20.34	100
2nd Quartile	59	13.56	15.25	16.95	16.95	15.25	22.03	100
3rd Quartile	59	16.95	15.25	15.25	13.56	23.73	15.25	100
4th Quartile	59	15.25	13.56	10.17	8.47	23.73	28.81	100
SMALL-CAP FUNDS								
1st Quartile	101	15.84	16.83	23.76	33.66	4.95	4.95	100
2nd Quartile	102	12.75	25.49	22.55	21.57	13.73	3.92	100
3rd Quartile	101	22.77	17.82	16.83	16.83	20.79	4.95	100
4th Quartile	101	27.72	18.81	14.85	6.93	29.70	1.98	100
MULTI-CAP FUNDS								
1st Quartile	109	15.60	13.76	17.43	15.60	11.93	25.69	100
2nd Quartile	109	9.17	12.84	12.84	15.60	21.10	28.44	100
3rd Quartile	108	9.26	12.04	11.11	12.04	23.15	32.41	100
4th Quartile	109	15.60	11.93	8.26	6.42	31.19	26.61	100

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. 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 (SEPTEMBER 2011)	FIVE-YEAR PERCENTAGES AT END				
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)	TOTAL (%)
Top Half	857	38.74	44.11	14.00	3.15	100
Bottom Half	856	37.62	32.13	26.40	3.86	100
LARGE-CAP FUNDS						
Top Half	319	36.36	35.11	15.36	13.17	100
Bottom Half	318	27.67	28.62	27.36	16.35	100
MID-CAP FUNDS						
Top Half	118	28.81	35.59	14.41	21.19	100
Bottom Half	118	30.51	23.73	23.73	22.03	100
SMALL-CAP FUNDS						
Top Half	203	35.47	50.74	9.36	4.43	100
Bottom Half	202	43.56	27.72	25.25	3.47	100
MULTI-CAP FUNDS						
Top Half	218	25.69	30.73	16.51	27.06	100
Bottom Half	217	24.42	18.89	27.19	29.49	100

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. 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 (SEPTEMBER 2014)	PERCENTAGE REMAINING IN TOP QUARTILE (%)	
		SEPTEMBER 2015	SEPTEMBER 2016
TOP QUARTILE			
Government Long Funds	15	53.33	53.33
Government Intermediate Funds	7	42.86	42.86
Government Short Funds	9	33.33	22.22
Investment-Grade Long Funds	24	20.83	16.67
Investment-Grade Intermediate Funds	58	29.31	13.79
Investment-Grade Short Funds	23	43.48	21.74
High-Yield Funds	54	16.67	3.70
Mortgage-Backed Securities Funds	14	28.57	14.29
Global Income Funds	30	46.67	0.00
Emerging Markets Debt Funds	15	46.67	6.67
General Municipal Debt Funds	20	55.00	45.00
California Municipal Debt Funds	9	55.56	44.44
New York Municipal Debt Funds	7	28.57	28.57
MUTUAL FUND CATEGORY	FUND COUNT AT START (SEPTEMBER 2014)	PERCENTAGE REMAINING IN TOP HALF (%)	
		SEPTEMBER 2015	SEPTEMBER 2016
TOP HALF			
Government Long Funds	31	64.52	54.84
Government Intermediate Funds	13	69.23	69.23
Government Short Funds	19	57.89	42.11
Investment-Grade Long Funds	48	37.50	22.92
Investment-Grade Intermediate Funds	117	52.14	41.03
Investment-Grade Short Funds	46	52.17	36.96
High-Yield Funds	108	37.04	21.30
Mortgage-Backed Securities Funds	29	65.52	55.17
Global Income Funds	60	55.00	16.67
Emerging Markets Debt Funds	29	68.97	37.93
General Municipal Debt Funds	41	63.41	51.22
California Municipal Debt Funds	18	72.22	61.11
New York Municipal Debt Funds	14	78.57	50.00

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. 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 (SEPTEMBER 2012)	PERCENTAGE REMAINING IN TOP QUARTILE (%)			
		SEPTEMBER 2013	SEPTEMBER 2014	SEPTEMBER 2015	SEPTEMBER 2016
TOP QUARTILE					
Government Long Funds	16	12.50	0.00	0.00	0.00
Government Intermediate Funds	8	12.50	0.00	0.00	0.00
Government Short Funds	10	30.00	30.00	10.00	0.00
Investment-Grade Long Funds	28	39.29	17.86	0.00	0.00
Investment-Grade Intermediate Funds	70	21.43	10.00	4.29	2.86
Investment-Grade Short Funds	18	55.56	27.78	5.56	5.56
High-Yield Funds	51	49.02	25.49	5.88	1.96
Mortgage-Backed Securities Funds	16	56.25	43.75	18.75	12.50
Global Income Funds	29	44.83	31.03	13.79	0.00
Emerging Markets Debt Funds	9	33.33	11.11	0.00	0.00
General Municipal Debt Funds	19	31.58	15.79	10.53	10.53
California Municipal Debt Funds	9	22.22	11.11	11.11	11.11
New York Municipal Debt Funds	7	14.29	0.00	0.00	0.00
MUTUAL FUND CATEGORY	FUND COUNT AT START (SEPTEMBER 2012)	PERCENTAGE REMAINING IN TOP HALF (%)			
		SEPTEMBER 2013	SEPTEMBER 2014	SEPTEMBER 2015	SEPTEMBER 2016
TOP HALF					
Government Long Funds	32	37.50	21.88	15.63	15.63
Government Intermediate Funds	16	31.25	25.00	12.50	6.25
Government Short Funds	21	52.38	38.10	23.81	23.81
Investment-Grade Long Funds	56	57.14	39.29	12.50	5.36
Investment-Grade Intermediate Funds	140	31.43	21.43	7.86	7.14
Investment-Grade Short Funds	36	75.00	52.78	30.56	19.44
High-Yield Funds	102	60.78	44.12	15.69	9.80
Mortgage-Backed Securities Funds	33	57.58	39.39	33.33	30.30
Global Income Funds	57	52.63	45.61	21.05	8.77
Emerging Markets Debt Funds	18	50.00	33.33	27.78	27.78
General Municipal Debt Funds	39	43.59	30.77	17.95	17.95
California Municipal Debt Funds	17	35.29	29.41	23.53	17.65
New York Municipal Debt Funds	15	40.00	33.33	13.33	6.67

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. 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 (SEPTEMBER 2013)	THREE-YEAR PERCENTAGES AT END						
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)	TOTAL (%)
GOVERNMENT LONG FUNDS								
1st Quartile	15	60.00	20.00	6.67	6.67	0.00	6.67	100
2nd Quartile	15	6.67	46.67	26.67	13.33	6.67	0.00	100
3rd Quartile	14	14.29	7.14	28.57	28.57	21.43	0.00	100
4th Quartile	15	6.67	6.67	26.67	33.33	20.00	6.67	100
GOVERNMENT INTERMEDIATE FUNDS								
1st Quartile	7	57.14	28.57	0.00	0.00	14.29	0.00	100
2nd Quartile	7	28.57	28.57	28.57	0.00	14.29	0.00	100
3rd Quartile	7	0.00	28.57	28.57	28.57	14.29	0.00	100
4th Quartile	7	0.00	0.00	14.29	57.14	28.57	0.00	100
GOVERNMENT SHORT FUNDS								
1st Quartile	9	55.56	33.33	11.11	0.00	0.00	0.00	100
2nd Quartile	9	22.22	33.33	11.11	0.00	33.33	0.00	100
3rd Quartile	9	0.00	0.00	55.56	11.11	22.22	11.11	100
4th Quartile	9	0.00	0.00	0.00	55.56	22.22	22.22	100
INVESTMENT-GRADE LONG FUNDS								
1st Quartile	24	45.83	29.17	4.17	8.33	0.00	12.50	100
2nd Quartile	25	32.00	28.00	20.00	12.00	0.00	8.00	100
3rd Quartile	24	4.17	20.83	41.67	25.00	4.17	4.17	100
4th Quartile	24	0.00	8.33	16.67	37.50	12.50	25.00	100
INVESTMENT-GRADE INTERMEDIATE FUNDS								
1st Quartile	55	40.00	23.64	16.36	5.45	1.82	12.73	100
2nd Quartile	55	25.45	30.91	20.00	7.27	7.27	9.09	100
3rd Quartile	54	7.41	22.22	24.07	18.52	16.67	11.11	100
4th Quartile	55	3.64	0.00	16.36	45.45	12.73	21.82	100
INVESTMENT-GRADE SHORT FUNDS								
1st Quartile	17	41.18	29.41	17.65	11.76	0.00	0.00	100
2nd Quartile	16	31.25	31.25	25.00	6.25	0.00	6.25	100
3rd Quartile	17	5.88	23.53	35.29	11.76	17.65	5.88	100
4th Quartile	16	6.25	6.25	6.25	56.25	18.75	6.25	100
HIGH-YIELD FUNDS								
1st Quartile	44	27.27	22.73	15.91	31.82	2.27	0.00	100
2nd Quartile	44	25.00	34.09	22.73	13.64	4.55	0.00	100
3rd Quartile	44	27.27	20.45	31.82	13.64	6.82	0.00	100
4th Quartile	44	13.64	15.91	22.73	34.09	11.36	2.27	100

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. 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 (SEPTEMBER 2013)	THREE-YEAR PERCENTAGES AT END						
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)	TOTAL (%)
MORTGAGE-BACKED SECURITIES FUNDS								
1st Quartile	15	60.00	20.00	20.00	0.00	0.00	0.00	100
2nd Quartile	14	21.43	21.43	28.57	21.43	0.00	7.14	100
3rd Quartile	15	0.00	20.00	20.00	20.00	26.67	13.33	100
4th Quartile	14	0.00	14.29	14.29	35.71	28.57	7.14	100
GLOBAL INCOME FUNDS								
1st Quartile	23	47.83	13.04	0.00	26.09	4.35	8.70	100
2nd Quartile	23	30.43	30.43	21.74	8.70	8.70	0.00	100
3rd Quartile	23	0.00	39.13	34.78	8.70	17.39	0.00	100
4th Quartile	23	4.35	4.35	26.09	39.13	21.74	4.35	100
EMERGING MARKETS DEBT FUNDS								
1st Quartile	6	50.00	33.33	0.00	16.67	0.00	0.00	100
2nd Quartile	6	33.33	16.67	33.33	16.67	0.00	0.00	100
3rd Quartile	6	16.67	50.00	16.67	16.67	0.00	0.00	100
4th Quartile	6	0.00	0.00	33.33	50.00	0.00	16.67	100
GENERAL MUNICIPAL DEBT FUNDS								
1st Quartile	18	44.44	22.22	22.22	0.00	0.00	11.11	100
2nd Quartile	18	22.22	61.11	5.56	5.56	0.00	5.56	100
3rd Quartile	17	17.65	5.88	52.94	17.65	5.88	0.00	100
4th Quartile	18	5.56	5.56	11.11	66.67	5.56	5.56	100
CALIFORNIA MUNICIPAL DEBT FUNDS								
1st Quartile	9	55.56	11.11	22.22	11.11	0.00	0.00	100
2nd Quartile	8	12.50	37.50	25.00	25.00	0.00	0.00	100
3rd Quartile	9	0.00	22.22	44.44	33.33	0.00	0.00	100
4th Quartile	8	37.50	25.00	12.50	25.00	0.00	0.00	100
NEW YORK MUNICIPAL DEBT FUNDS								
1st Quartile	7	28.57	57.14	14.29	0.00	0.00	0.00	100
2nd Quartile	6	0.00	16.67	50.00	33.33	0.00	0.00	100
3rd Quartile	7	42.86	0.00	28.57	28.57	0.00	0.00	100
4th Quartile	6	16.67	33.33	0.00	33.33	16.67	0.00	100

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 31, 2016. 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 (SEPTEMBER 2013)	THREE-YEAR PERCENTAGES AT END				
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)	TOTAL (%)
GOVERNMENT LONG FUNDS						
Top Half	30	66.67	26.67	3.33	3.33	100
Bottom Half	29	17.24	58.62	20.69	3.45	100
GOVERNMENT INTERMEDIATE FUNDS						
Top Half	14	71.43	14.29	14.29	0.00	100
Bottom Half	14	14.29	64.29	21.43	0.00	100
GOVERNMENT SHORT FUNDS						
Top Half	18	72.22	11.11	16.67	0.00	100
Bottom Half	18	0.00	61.11	22.22	16.67	100
INVESTMENT-GRADE LONG FUNDS						
Top Half	49	67.35	22.45	0.00	10.20	100
Bottom Half	48	16.67	60.42	8.33	14.58	100
INVESTMENT-GRADE INTERMEDIATE FUNDS						
Top Half	110	60.00	24.55	4.55	10.91	100
Bottom Half	109	16.51	52.29	14.68	16.51	100
INVESTMENT-GRADE SHORT FUNDS						
Top Half	33	66.67	30.30	0.00	3.03	100
Bottom Half	33	21.21	54.55	18.18	6.06	100
HIGH-YIELD FUNDS						
Top Half	88	54.55	42.05	3.41	0.00	100
Bottom Half	88	38.64	51.14	9.09	1.14	100
MORTGAGE-BACKED SECURITIES FUNDS						
Top Half	29	62.07	34.48	0.00	3.45	100
Bottom Half	29	17.24	44.83	27.59	10.34	100
GLOBAL INCOME FUNDS						
Top Half	46	60.87	28.26	6.52	4.35	100
Bottom Half	46	23.91	54.35	19.57	2.17	100
EMERGING MARKETS DEBT FUNDS						
Top Half	12	66.67	33.33	0.00	0.00	100
Bottom Half	12	33.33	58.33	0.00	8.33	100
GENERAL MUNICIPAL DEBT FUNDS						
Top Half	36	75.00	16.67	0.00	8.33	100
Bottom Half	35	17.14	74.29	5.71	2.86	100
CALIFORNIA MUNICIPAL DEBT FUNDS						
Top Half	17	58.82	41.18	0.00	0.00	100
Bottom Half	17	41.18	58.82	0.00	0.00	100
NEW YORK MUNICIPAL DEBT FUNDS						
Top Half	13	53.85	46.15	0.00	0.00	100
Bottom Half	13	46.15	46.15	7.69	0.00	100

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. 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 (SEPTEMBER 2011)	FIVE-YEAR PERCENTAGES AT END							
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)	MERGED/ LIQUIDATED (%)	STYLE CHANGED (%)	TOTAL (%)	
GOVERNMENT LONG FUNDS									
1st Quartile	10	50.00	10.00	20.00	0.00	10.00	10.00	100	
2nd Quartile	9	11.11	33.33	22.22	11.11	22.22	0.00	100	
3rd Quartile	10	0.00	30.00	10.00	40.00	10.00	10.00	100	
4th Quartile	9	11.11	0.00	11.11	22.22	55.56	0.00	100	
GOVERNMENT INTERMEDIATE FUNDS									
1st Quartile	10	30.00	30.00	0.00	0.00	30.00	10.00	100	
2nd Quartile	9	22.22	11.11	22.22	22.22	22.22	0.00	100	
3rd Quartile	10	0.00	10.00	20.00	0.00	60.00	10.00	100	
4th Quartile	9	11.11	0.00	22.22	33.33	11.11	22.22	100	
GOVERNMENT SHORT FUNDS									
1st Quartile	9	33.33	33.33	11.11	0.00	11.11	11.11	100	
2nd Quartile	9	11.11	22.22	22.22	22.22	22.22	0.00	100	
3rd Quartile	9	11.11	0.00	0.00	22.22	44.44	22.22	100	
4th Quartile	9	11.11	0.00	33.33	11.11	33.33	11.11	100	
INVESTMENT-GRADE LONG FUNDS									
1st Quartile	19	47.37	26.32	0.00	5.26	10.53	10.53	100	
2nd Quartile	18	0.00	16.67	22.22	11.11	5.56	44.44	100	
3rd Quartile	19	10.53	10.53	21.05	31.58	10.53	15.79	100	
4th Quartile	18	5.56	11.11	16.67	16.67	5.56	44.44	100	
INVESTMENT-GRADE INTERMEDIATE FUNDS									
1st Quartile	47	12.77	17.02	21.28	0.00	6.38	42.55	100	
2nd Quartile	47	14.89	14.89	14.89	6.38	31.91	17.02	100	
3rd Quartile	46	10.87	17.39	15.22	28.26	13.04	15.22	100	
4th Quartile	47	19.15	8.51	6.38	23.40	21.28	21.28	100	
INVESTMENT-GRADE SHORT FUNDS									
1st Quartile	17	23.53	23.53	35.29	0.00	11.76	5.88	100	
2nd Quartile	16	6.25	12.50	18.75	56.25	6.25	0.00	100	
3rd Quartile	17	17.65	29.41	11.76	5.88	35.29	0.00	100	
4th Quartile	16	31.25	12.50	6.25	18.75	18.75	12.50	100	
HIGH-YIELD FUNDS									
1st Quartile	29	34.48	27.59	20.69	13.79	3.45	0.00	100	
2nd Quartile	29	24.14	27.59	24.14	17.24	6.90	0.00	100	
3rd Quartile	29	6.90	17.24	24.14	41.38	6.90	3.45	100	
4th Quartile	29	20.69	17.24	17.24	13.79	24.14	6.90	100	

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept.30, 2016. 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 (SEPTEMBER 2011)	FIVE-YEAR PERCENTAGES AT END						
		1ST QUARTILE (%)	2ND QUARTILE (%)	3RD QUARTILE (%)	4TH QUARTILE (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)	TOTAL (%)
MORTGAGE-BACKED SECURITIES FUNDS								
1st Quartile	13	30.77	23.08	30.77	7.69	0.00	7.69	100
2nd Quartile	13	7.69	23.08	15.38	30.77	23.08	0.00	100
3rd Quartile	12	0.00	16.67	25.00	33.33	8.33	16.67	100
4th Quartile	13	38.46	15.38	7.69	7.69	23.08	7.69	100
GLOBAL INCOME FUNDS								
1st Quartile	13	15.38	38.46	15.38	15.38	15.38	0.00	100
2nd Quartile	14	28.57	7.14	21.43	7.14	21.43	14.29	100
3rd Quartile	13	7.69	23.08	15.38	23.08	23.08	7.69	100
4th Quartile	13	15.38	0.00	15.38	23.08	15.38	30.77	100
EMERGING MARKETS DEBT FUNDS								
1st Quartile	5	60.00	0.00	40.00	0.00	0.00	0.00	100
2nd Quartile	5	20.00	40.00	0.00	40.00	0.00	0.00	100
3rd Quartile	5	0.00	20.00	40.00	20.00	20.00	0.00	100
4th Quartile	5	0.00	40.00	0.00	20.00	20.00	20.00	100
GENERAL MUNICIPAL DEBT FUNDS								
1st Quartile	16	12.50	25.00	25.00	25.00	12.50	0.00	100
2nd Quartile	16	12.50	37.50	12.50	12.50	18.75	6.25	100
3rd Quartile	15	13.33	13.33	33.33	26.67	6.67	6.67	100
4th Quartile	16	50.00	6.25	18.75	18.75	0.00	6.25	100
CALIFORNIA MUNICIPAL DEBT FUNDS								
1st Quartile	8	12.50	12.50	37.50	25.00	12.50	0.00	100
2nd Quartile	9	22.22	11.11	22.22	44.44	0.00	0.00	100
3rd Quartile	8	0.00	37.50	37.50	25.00	0.00	0.00	100
4th Quartile	8	62.50	37.50	0.00	0.00	0.00	0.00	100
NEW YORK MUNICIPAL DEBT FUNDS								
1st Quartile	7	14.29	14.29	42.86	28.57	0.00	0.00	100
2nd Quartile	7	0.00	42.86	42.86	14.29	0.00	0.00	100
3rd Quartile	6	16.67	33.33	0.00	33.33	16.67	0.00	100
4th Quartile	7	57.14	0.00	0.00	14.29	28.57	0.00	100

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. 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 (SEPTEMBER 2011)	FIVE-YEAR PERCENTAGES AT END				
		TOP HALF (%)	BOTTOM HALF (%)	MERGED/LIQUIDATED (%)	STYLE CHANGED (%)	TOTAL (%)
GOVERNMENT LONG FUNDS						
Top Half	19	52.63	26.32	15.79	5.26	100
Bottom Half	19	21.05	42.11	31.58	5.26	100
GOVERNMENT INTERMEDIATE FUNDS						
Top Half	19	47.37	21.05	26.32	5.26	100
Bottom Half	19	10.53	36.84	36.84	15.79	100
GOVERNMENT SHORT FUNDS						
Top Half	18	50.00	27.78	16.67	5.56	100
Bottom Half	18	11.11	33.33	38.89	16.67	100
INVESTMENT-GRADE LONG FUNDS						
Top Half	37	45.95	18.92	8.11	27.03	100
Bottom Half	37	18.92	43.24	8.11	29.73	100
INVESTMENT-GRADE INTERMEDIATE FUNDS						
Top Half	94	29.79	21.28	19.15	29.79	100
Bottom Half	93	27.96	36.56	17.20	18.28	100
INVESTMENT-GRADE SHORT FUNDS						
Top Half	33	33.33	54.55	9.09	3.03	100
Bottom Half	33	45.45	21.21	27.27	6.06	100
HIGH YIELD FUNDS						
Top Half	58	56.90	37.93	5.17	0.00	100
Bottom Half	58	31.03	48.28	15.52	5.17	100
MORTGAGE-BACKED SECURITIES FUNDS						
Top Half	26	42.31	42.31	11.54	3.85	100
Bottom Half	25	36.00	36.00	16.00	12.00	100
GLOBAL INCOME FUNDS						
Top Half	27	44.44	29.63	18.52	7.41	100
Bottom Half	26	23.08	38.46	19.23	19.23	100
EMERGING MARKETS DEBT FUNDS						
Top Half	10	60.00	40.00	0.00	0.00	100
Bottom Half	10	30.00	40.00	20.00	10.00	100
GENERAL MUNICIPAL DEBT FUNDS						
Top Half	32	43.75	37.50	15.63	3.13	100
Bottom Half	31	41.94	48.39	3.23	6.45	100
CALIFORNIA MUNICIPAL DEBT FUNDS						
Top Half	17	29.41	64.71	5.88	0.00	100
Bottom Half	16	68.75	31.25	0.00	0.00	100
NEW YORK MUNICIPAL DEBT FUNDS						
Top Half	14	35.71	64.29	0.00	0.00	100
Bottom Half	13	53.85	23.08	23.08	0.00	100

Source: S&P Dow Jones Indices LLC. Data for periods ending Sept. 30, 2016. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

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