

## Persistence Scorecard: Does Past Performance Matter?

### SUMMARY

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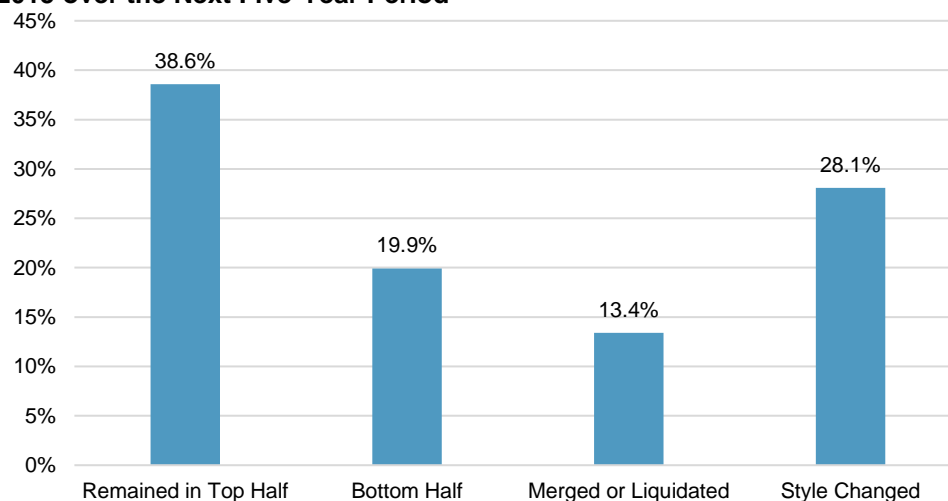
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Do investment results come from skill or luck? Genuine skill is likely to persist, while luck is random and fleeting. Thus, one measure of active management skill is the consistency of a fund's performance relative to its peers.

The Persistence Scorecard attempts to distinguish luck from skill by measuring the consistency of active managers' success. This report shows that, **regardless of asset class or style focus, active management outperformance is typically short-lived**, with few fund managers consistently outperforming their cohorts.

For example, of the domestic equity funds that finished in the top half in terms of cumulative returns for the period from June 2010 to June 2015, 38.6% replicated that accomplishment during the period from June 2015 to June 2020. In fact, **it was more likely for a top-half fund to close its doors or change its style (41.5% combined) than repeat its performance in the top half** (see Report 6).

#### Exhibit 1: Outcomes of the Top-Half Domestic Funds from June 2010 to June 2015 over the Next Five-Year Period



Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. Chart is provided for illustrative purposes. Past performance is no guarantee of future results.

At first glance, there were some signs of performance persistence when narrowing the measurement intervals to consider annual consistency. Of the top-quartile domestic equity funds in June 2018, 35.5% managed to stay in the top quartile annually through June 2020 (see Report 1).

However, this persistence was inconsistent and decayed over time. Rewinding the clock two years, just 1.6% of domestic equity funds in the top quartile as of June 2016 maintained that status annually through June 2020. Widening the filter to funds in the top half, 15.8% of domestic equity funds maintained that status in each of the next four years (see Report 2).

Some statistically minded readers might note that these numbers are better than what would be expected if fund performance was randomly distributed. For example, the odds that a fund could remain in the top quartile for four consecutive years might be calculated as  $(25\%)^4 = 0.39\%$ , and the 1.6% referenced above is substantially better than that. While the persistence report may not prove that fund performance is completely random, from a practical or decision-making perspective, it reinforces the notion that choosing between active funds on the basis of previous outperformance is a misguided strategy. After all, there remains a 98.4% chance that a top-quartile fund will not stay in the top quartile for the next four years.

There were few patterns to be found among equity funds, as the non-repeatable distribution of fund performance over various time frames covered large-, mid-, small-, and multi-cap focused funds. One salient illustration of the lack of persistence was that **none of the 71 top-quartile mid-cap funds from June 2016 remained in the top quartile annually through June 2020** (see Report 2).

Unsurprisingly, **one pattern that did hold across equity funds was the tendency of the poorest-performing funds to close**. Of the funds whose performance landed in the fourth quartile, roughly one-quarter closed over the subsequent three-year window and one-third did so over five years. Funds that avoided this fate often only managed to do so by changing styles. For instance, within fourth-quartile multi-cap funds from June 2010 to June 2015, a combined 69.3% (30.7% closed, 38.6% changed style) likely sparked unpleasant conversations within asset allocators' investment committees through June 2020 (see Reports 3 and 5).

Fixed income funds similarly showed little evidence for consistent annual outperformance over longer periods. **In 8 of the 13 categories considered, no top-quartile fund from June 2016 maintained that status annually through June 2020**. In six categories, no top quartile fund from June 2018 could repeat that performance for even the next two years (see Report 8).

Transition matrices showed slightly more fixed income fund persistence. Over the three-year horizon from 2017 to 2020, the most likely or joint most likely outcome for top quartile funds in 11 of the 13 categories was to remain in the top quartile. In 5 of the 13 categories, this outcome occurred for 50% or more of top quartile funds. Similar results existed over the five-year window. However, in many fixed income fund categories, fewer than 20 funds qualified within each quartile, perhaps leading to small sample size effects (see Report 9).

One notable lack of fixed income persistence came from Global Income Funds, where just 1.9% of funds maintained top half status annually from June 2016 to June 2020. Similarly, just 20.8% retained their top quartile status in the three-year transition matrix and 17.6% in the five-year analysis, the second lowest of any category for both periods (see Reports 8, 9, and 11).

## 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. The 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:

- **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 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 non-overlapping three- and five-year periods. They also track the percentage of funds that have merged or liquidated. In addition, we monitor movements across capitalization levels. This helps us capture, for example, the conversion of some large-cap funds to mid- and small-cap funds.
  - Starting with the 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 only checked if the fund category remained identical at the endpoints.
- **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.

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.

## REPORTS

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

| FUND CATEGORY       | FUND COUNT AT START<br>(JUNE 2018) | PERCENTAGE REMAINING IN TOP QUARTILE |           |
|---------------------|------------------------------------|--------------------------------------|-----------|
|                     |                                    | JUNE 2019                            | JUNE 2020 |
| <b>TOP QUARTILE</b> |                                    |                                      |           |
| All Domestic Funds  | 529                                | 40.45                                | 35.54     |
| All Large-Cap Funds | 185                                | 36.22                                | 31.89     |
| All Mid-Cap Funds   | 66                                 | 42.42                                | 33.33     |
| All Small-Cap Funds | 130                                | 65.38                                | 54.62     |
| All Multi-Cap Funds | 117                                | 43.59                                | 32.48     |
| FUND CATEGORY       | FUND COUNT AT START<br>(JUNE 2018) | PERCENTAGE REMAINING IN TOP HALF     |           |
|                     |                                    | JUNE 2019                            | JUNE 2020 |
| <b>TOP HALF</b>     |                                    |                                      |           |
| All Domestic Funds  | 1,059                              | 57.13                                | 52.22     |
| All Large-Cap Funds | 372                                | 58.06                                | 52.69     |
| All Mid-Cap Funds   | 132                                | 68.94                                | 61.36     |
| All Small-Cap Funds | 260                                | 68.08                                | 57.69     |
| All Multi-Cap Funds | 225                                | 63.56                                | 53.33     |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. 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<br>(JUNE 2016) | PERCENTAGE REMAINING IN TOP QUARTILE |           |           |           |
|---------------------|------------------------------------|--------------------------------------|-----------|-----------|-----------|
|                     |                                    | JUNE 2017                            | JUNE 2018 | JUNE 2019 | JUNE 2020 |
| <b>TOP QUARTILE</b> |                                    |                                      |           |           |           |
| All Domestic Funds  | 556                                | 10.07                                | 4.50      | 2.16      | 1.62      |
| All Large-Cap Funds | 207                                | 6.28                                 | 1.93      | 0.97      | 0.97      |
| All Mid-Cap Funds   | 71                                 | 8.45                                 | 2.82      | 1.41      | 0.00      |
| All Small-Cap Funds | 128                                | 15.63                                | 7.03      | 5.47      | 4.69      |
| All Multi-Cap Funds | 124                                | 15.32                                | 4.03      | 2.42      | 0.81      |
| FUND CATEGORY       | FUND COUNT AT START<br>(JUNE 2016) | PERCENTAGE REMAINING IN TOP HALF     |           |           |           |
|                     |                                    | JUNE 2017                            | JUNE 2018 | JUNE 2019 | JUNE 2020 |
| <b>TOP HALF</b>     |                                    |                                      |           |           |           |
| All Domestic Funds  | 1,111                              | 34.56                                | 23.13     | 16.74     | 15.75     |
| All Large-Cap Funds | 409                                | 32.52                                | 22.74     | 12.71     | 11.25     |
| All Mid-Cap Funds   | 142                                | 38.03                                | 19.01     | 17.61     | 16.20     |
| All Small-Cap Funds | 255                                | 41.18                                | 18.04     | 12.94     | 9.02      |
| All Multi-Cap Funds | 246                                | 39.02                                | 30.89     | 21.14     | 18.70     |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. 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 2017) | THREE-YEAR PERCENTAGES AT END (JUNE 2020) |                  |                  |                  |                       |                   |
|  |                                 | 1ST QUARTILE (%)                          | 2ND QUARTILE (%) | 3RD QUARTILE (%) | 4TH QUARTILE (%) | MERGED/LIQUIDATED (%) | STYLE CHANGED (%) |
| <b>ALL DOMESTIC FUNDS</b>  |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 510                             | 40.59                                     | 22.35            | 8.63             | 5.10             | 5.88                  | 17.45             |
| 2nd Quartile   | 509                             | 10.02                                     | 24.17            | 18.27            | 15.32            | 11.20                 | 21.02             |
| 3rd Quartile   | 509                             | 11.79                                     | 10.81            | 17.88            | 22.79            | 13.56                 | 23.18             |
| 4th Quartile   | 510                             | 6.47                                      | 8.24             | 18.24            | 18.24            | 23.73                 | 25.10             |
| <b>ALL LARGE-CAP FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 193                             | 58.55                                     | 18.13            | 6.22             | 1.55             | 3.11                  | 12.44             |
| 2nd Quartile   | 193                             | 12.44                                     | 29.53            | 17.62            | 9.84             | 11.40                 | 19.17             |
| 3rd Quartile   | 193                             | 4.66                                      | 11.40            | 20.21            | 25.39            | 12.95                 | 25.39             |
| 4th Quartile   | 193                             | 2.07                                      | 8.81             | 18.65            | 28.50            | 23.32                 | 18.65             |
| <b>ALL MID-CAP FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 68                              | 26.47                                     | 32.35            | 14.71            | 8.82             | 2.94                  | 14.71             |
| 2nd Quartile   | 68                              | 22.06                                     | 13.24            | 19.12            | 14.71            | 10.29                 | 20.59             |
| 3rd Quartile   | 68                              | 17.65                                     | 2.94             | 17.65            | 13.24            | 17.65                 | 30.88             |
| 4th Quartile   | 69                              | 5.80                                      | 14.49            | 14.49            | 13.04            | 26.09                 | 26.09             |
| <b>ALL SMALL-CAP FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 124                             | 25.81                                     | 29.84            | 19.35            | 5.65             | 6.45                  | 12.90             |
| 2nd Quartile   | 124                             | 19.35                                     | 13.71            | 20.97            | 26.61            | 9.68                  | 9.68              |
| 3rd Quartile   | 124                             | 16.94                                     | 12.90            | 20.97            | 16.94            | 16.94                 | 15.32             |
| 4th Quartile   | 125                             | 13.60                                     | 8.80             | 11.20            | 20.00            | 24.80                 | 21.60             |
| <b>ALL MULTI-CAP FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 124                             | 28.23                                     | 12.10            | 11.29            | 7.26             | 10.48                 | 30.65             |
| 2nd Quartile   | 124                             | 11.29                                     | 25.00            | 12.10            | 12.90            | 11.29                 | 27.42             |
| 3rd Quartile   | 124                             | 8.06                                      | 12.10            | 14.52            | 15.32            | 12.10                 | 37.90             |
| 4th Quartile   | 125                             | 5.60                                      | 7.20             | 23.20            | 11.20            | 20.80                 | 32.00             |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. 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 2017) | THREE-YEAR PERCENTAGES AT END (JUNE 2020) |                 |                       |                   |
|  |                                 | TOP HALF (%)                              | BOTTOM HALF (%) | MERGED/LIQUIDATED (%) | STYLE CHANGED (%) |
| <b>ALL DOMESTIC FUNDS</b>  |                                 |   |                 |                       |                   |
| Top Half   | 1,019                           | 48.58                                     | 23.65           | 8.54                  | 19.23             |
| Bottom Half  | 1,019                           | 18.65                                     | 38.57           | 18.65                 | 24.14             |
| <b>ALL LARGE-CAP FUNDS</b>   |                                 |   |                 |                       |                   |
| Top Half   | 386                             | 59.33                                     | 17.62           | 7.25                  | 15.80             |
| Bottom Half  | 386                             | 13.47                                     | 46.37           | 18.13                 | 22.02             |
| <b>ALL MID-CAP FUNDS</b>   |                                 |   |                 |                       |                   |
| Top Half   | 136                             | 47.06                                     | 28.68           | 6.62                  | 17.65             |
| Bottom Half  | 137                             | 20.44                                     | 29.20           | 21.90                 | 28.47             |
| <b>ALL SMALL-CAP FUNDS</b>   |                                 |   |                 |                       |                   |
| Top Half   | 248                             | 44.35                                     | 36.29           | 8.06                  | 11.29             |
| Bottom Half  | 249                             | 26.10                                     | 34.54           | 20.88                 | 18.47             |
| <b>ALL MULTI-CAP FUNDS</b>   |                                 |   |                 |                       |                   |
| Top Half   | 248                             | 38.31                                     | 21.77           | 10.89                 | 29.03             |
| Bottom Half  | 249                             | 16.47                                     | 32.13           | 16.47                 | 34.94             |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. 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 2015) | FIVE-YEAR PERCENTAGES AT END (JUNE 2020) |                  |                  |                  |                       |                   |
|  |                                 | 1ST QUARTILE (%)                         | 2ND QUARTILE (%) | 3RD QUARTILE (%) | 4TH QUARTILE (%) | MERGED/LIQUIDATED (%) | STYLE CHANGED (%) |
| <b>ALL DOMESTIC FUNDS</b>  |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile   | 485                             | 30.10                                    | 15.26            | 9.90             | 10.10            | 10.31                 | 24.33             |
| 2nd Quartile   | 484                             | 15.70                                    | 16.12            | 9.30             | 10.54            | 16.53                 | 31.82             |
| 3rd Quartile   | 484                             | 8.68                                     | 15.08            | 12.81            | 12.81            | 23.55                 | 27.07             |
| 4th Quartile   | 485                             | 4.74                                     | 8.66             | 16.70            | 11.13            | 29.48                 | 29.28             |
| <b>ALL LARGE-CAP FUNDS</b>   |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile   | 184                             | 42.93                                    | 13.59            | 5.98             | 1.63             | 13.59                 | 22.28             |
| 2nd Quartile   | 184                             | 17.39                                    | 23.37            | 8.15             | 10.33            | 15.22                 | 25.54             |
| 3rd Quartile   | 184                             | 9.24                                     | 14.67            | 14.13            | 15.76            | 26.09                 | 20.11             |
| 4th Quartile   | 184                             | 1.63                                     | 9.78             | 19.02            | 20.11            | 22.28                 | 27.17             |
| <b>ALL MID-CAP FUNDS</b>   |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile   | 72                              | 29.17                                    | 15.28            | 9.72             | 11.11            | 8.33                  | 26.39             |
| 2nd Quartile   | 72                              | 19.44                                    | 11.11            | 5.56             | 4.17             | 12.50                 | 47.22             |
| 3rd Quartile   | 72                              | 5.56                                     | 8.33             | 15.28            | 11.11            | 30.56                 | 29.17             |
| 4th Quartile   | 72                              | 5.56                                     | 8.33             | 9.72             | 8.33             | 34.72                 | 33.33             |
| <b>ALL SMALL-CAP FUNDS</b>   |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile   | 115                             | 37.39                                    | 20.87            | 8.70             | 7.83             | 10.43                 | 14.78             |
| 2nd Quartile   | 114                             | 14.04                                    | 16.67            | 18.42            | 15.79            | 19.30                 | 15.79             |
| 3rd Quartile   | 114                             | 10.53                                    | 10.53            | 21.05            | 13.16            | 18.42                 | 26.32             |
| 4th Quartile   | 115                             | 3.48                                     | 11.30            | 14.78            | 16.52            | 32.17                 | 21.74             |
| <b>ALL MULTI-CAP FUNDS</b>   |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile   | 114                             | 18.42                                    | 9.65             | 10.53            | 5.26             | 10.53                 | 45.61             |
| 2nd Quartile   | 114                             | 10.53                                    | 15.79            | 9.65             | 7.89             | 12.28                 | 43.86             |
| 3rd Quartile   | 114                             | 3.51                                     | 15.79            | 10.53            | 12.28            | 26.32                 | 31.58             |
| 4th Quartile   | 114                             | 3.51                                     | 5.26             | 14.91            | 7.02             | 30.70                 | 38.60             |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. 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 2015) | FIVE-YEAR PERCENTAGES AT END (JUNE 2020) |                 |                       |                   |
|  |                                 | TOP HALF (%)                             | BOTTOM HALF (%) | MERGED/LIQUIDATED (%) | STYLE CHANGED (%) |
| <b>ALL DOMESTIC FUNDS</b>  |                                 |  |                 |                       |                   |
| Top Half   | 969                             | 38.60                                    | 19.92           | 13.42                 | 28.07             |
| Bottom Half  | 969                             | 18.58                                    | 26.73           | 26.52                 | 28.17             |
| <b>ALL LARGE-CAP FUNDS</b>   |                                 |  |                 |                       |                   |
| Top Half   | 368                             | 48.64                                    | 13.04           | 14.40                 | 23.91             |
| Bottom Half  | 368                             | 17.66                                    | 34.51           | 24.18                 | 23.64             |
| <b>ALL MID-CAP FUNDS</b>   |                                 |  |                 |                       |                   |
| Top Half   | 144                             | 37.50                                    | 15.28           | 10.42                 | 36.81             |
| Bottom Half  | 144                             | 13.89                                    | 22.22           | 32.64                 | 31.25             |
| <b>ALL SMALL-CAP FUNDS</b>   |                                 |  |                 |                       |                   |
| Top Half   | 229                             | 44.54                                    | 25.33           | 14.85                 | 15.28             |
| Bottom Half  | 229                             | 17.90                                    | 32.75           | 25.33                 | 24.02             |
| <b>ALL MULTI-CAP FUNDS</b>   |                                 |  |                 |                       |                   |
| Top Half   | 228                             | 27.19                                    | 16.67           | 11.40                 | 44.74             |
| Bottom Half  | 228                             | 14.04                                    | 22.37           | 28.51                 | 35.09             |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. Table is provided for illustrative purposes. Past performance is no guarantee of future results.



| <b>Report 7: Performance Persistence of Domestic Fixed Income Funds over Three Consecutive 12-Month Periods</b> |  |   |                  |
|---|--|---|------------------|
| <b>FUND CATEGORY</b>  | <b>FUND COUNT AT START<br/>(JUNE 2018)</b> | <b>PERCENTAGE REMAINING IN TOP QUARTILE</b> |                  |
|   |  | <b>JUNE 2019</b>                            | <b>JUNE 2020</b> |
| <b>TOP QUARTILE</b>   |  |   |                  |
| Government Long Funds   | 13   | 7.69  | 7.69             |
| Government Intermediate Funds   | 4  | 0.00  | 0.00             |
| Government Short Funds  | 6  | 0.00  | 0.00             |
| Investment-Grade Long Funds   | 21   | 0.00  | 0.00             |
| Investment-Grade Intermediate Funds   | 49   | 18.37                                       | 6.12             |
| Investment-Grade Short Funds  | 24   | 20.83                                       | 0.00             |
| High Yield Funds  | 49   | 14.29                                       | 6.12             |
| Mortgage-Backed Securities Funds  | 12   | 41.67                                       | 0.00             |
| Global Income Funds   | 25   | 16.00                                       | 8.00             |
| Emerging Markets Debt Funds   | 13   | 23.08                                       | 0.00             |
| General Municipal Debt Funds  | 18   | 27.78                                       | 5.56             |
| California Municipal Debt Funds   | 8  | 50.00                                       | 12.50            |
| New York Municipal Debt Funds   | 6  | 33.33                                       | 16.67            |
| <b>FUND CATEGORY</b>  | <b>FUND COUNT AT START<br/>(JUNE 2018)</b> | <b>PERCENTAGE REMAINING IN TOP HALF</b>     |                  |
|   |  | <b>JUNE 2019</b>                            | <b>JUNE 2020</b> |
| <b>TOP HALF</b>   |  |   |                  |
| Government Long Funds   | 25   | 56.00                                       | 48.00            |
| Government Intermediate Funds   | 8  | 25.00                                       | 25.00            |
| Government Short Funds  | 12   | 41.67                                       | 25.00            |
| Investment-Grade Long Funds   | 41   | 26.83                                       | 14.63            |
| Investment-Grade Intermediate Funds   | 97   | 45.36                                       | 32.99            |
| Investment-Grade Short Funds  | 47   | 36.17                                       | 8.51             |
| High Yield Funds  | 98   | 41.84                                       | 24.49            |
| Mortgage-Backed Securities Funds  | 24   | 58.33                                       | 29.17            |
| Global Income Funds   | 49   | 46.94                                       | 36.73            |
| Emerging Markets Debt Funds   | 25   | 44.00                                       | 32.00            |
| General Municipal Debt Funds  | 36   | 58.33                                       | 30.56            |
| California Municipal Debt Funds   | 16   | 62.50                                       | 31.25            |
| New York Municipal Debt Funds   | 12   | 33.33                                       | 16.67            |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. Table is provided for illustrative purposes. Past performance is no guarantee of future results.

| <b>Report 8: Performance Persistence of Domestic Fixed Income Funds over Five Consecutive 12-Month Periods</b> |  |   |                  |                  |                  |  |
|--|--|---|------------------|------------------|------------------|--|
| <b>FUND CATEGORY</b>   | <b>FUND COUNT AT START<br/>(JUNE 2016)</b> | <b>PERCENTAGE REMAINING IN TOP QUARTILE</b> |                  |                  |                  |  |
|  |  | <b>JUNE 2017</b>                            | <b>JUNE 2018</b> | <b>JUNE 2019</b> | <b>JUNE 2020</b> |  |
| <b>TOP QUARTILE</b>  |  |   |                  |                  |                  |  |
| Government Long Funds  | 13   | 7.69  | 7.69             | 0.00             | 0.00             |  |
| Government Intermediate Funds  | 5  | 0.00  | 0.00             | 0.00             | 0.00             |  |
| Government Short Funds   | 6  | 16.67                                       | 16.67            | 0.00             | 0.00             |  |
| Investment-Grade Long Funds  | 20   | 20.00                                       | 5.00             | 0.00             | 0.00             |  |
| Investment-Grade Intermediate Funds  | 42   | 11.90                                       | 7.14             | 7.14             | 4.76             |  |
| Investment-Grade Short Funds   | 22   | 36.36                                       | 22.73            | 9.09             | 0.00             |  |
| High Yield Funds   | 51   | 9.80  | 5.88             | 1.96             | 1.96             |  |
| Mortgage-Backed Securities Funds   | 13   | 23.08                                       | 15.38            | 7.69             | 0.00             |  |
| Global Income Funds  | 27   | 3.70  | 0.00             | 0.00             | 0.00             |  |
| Emerging Markets Debt Funds  | 14   | 28.57                                       | 7.14             | 0.00             | 0.00             |  |
| General Municipal Debt Funds   | 20   | 35.00                                       | 30.00            | 10.00            | 5.00             |  |
| California Municipal Debt Funds  | 9  | 22.22                                       | 22.22            | 22.22            | 11.11            |  |
| New York Municipal Debt Funds  | 7  | 42.86                                       | 42.86            | 28.57            | 14.29            |  |
| <b>FUND CATEGORY</b>   | <b>FUND COUNT AT START<br/>(JUNE 2016)</b> | <b>PERCENTAGE REMAINING IN TOP HALF</b>     |                  |                  |                  |  |
|  |  | <b>JUNE 2017</b>                            | <b>JUNE 2018</b> | <b>JUNE 2019</b> | <b>JUNE 2020</b> |  |
| <b>TOP HALF</b>  |  |   |                  |                  |                  |  |
| Government Long Funds  | 25   | 36.00                                       | 24.00            | 16.00            | 16.00            |  |
| Government Intermediate Funds  | 9  | 22.22                                       | 11.11            | 0.00             | 0.00             |  |
| Government Short Funds   | 12   | 50.00                                       | 41.67            | 25.00            | 8.33             |  |
| Investment-Grade Long Funds  | 42   | 52.38                                       | 21.43            | 16.67            | 9.52             |  |
| Investment-Grade Intermediate Funds  | 88   | 37.50                                       | 23.86            | 19.32            | 12.50            |  |
| Investment-Grade Short Funds   | 43   | 51.16                                       | 37.21            | 18.60            | 6.98             |  |
| High Yield Funds   | 101  | 34.65                                       | 20.79            | 14.85            | 7.92             |  |
| Mortgage-Backed Securities Funds   | 24   | 58.33                                       | 45.83            | 33.33            | 16.67            |  |
| Global Income Funds  | 53   | 28.30                                       | 9.43             | 1.89             | 1.89             |  |
| Emerging Markets Debt Funds  | 28   | 57.14                                       | 32.14            | 21.43            | 14.29            |  |
| General Municipal Debt Funds   | 39   | 41.03                                       | 33.33            | 23.08            | 15.38            |  |
| California Municipal Debt Funds  | 18   | 27.78                                       | 27.78            | 27.78            | 16.67            |  |
| New York Municipal Debt Funds  | 13   | 38.46                                       | 38.46            | 23.08            | 15.38            |  |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. 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 2017) | THREE-YEAR PERCENTAGES AT END (JUNE 2020) |                  |                  |                  |                       |                   |
|  |                                 | 1ST QUARTILE (%)                          | 2ND QUARTILE (%) | 3RD QUARTILE (%) | 4TH QUARTILE (%) | MERGED/LIQUIDATED (%) | STYLE CHANGED (%) |
| <b>GOVERNMENT LONG FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 14                              | 64.29                                     | 14.29            | 0.00             | 0.00             | 14.29                 | 7.14              |
| 2nd Quartile   | 13                              | 7.69                                      | 38.46            | 23.08            | 0.00             | 0.00                  | 30.77             |
| 3rd Quartile   | 14                              | 0.00                                      | 14.29            | 14.29            | 21.43            | 7.14                  | 42.86             |
| 4th Quartile   | 14                              | 0.00                                      | 0.00             | 21.43            | 35.71            | 28.57                 | 14.29             |
| <b>GOVERNMENT INTERMEDIATE FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 5                               | 20.00                                     | 40.00            | 20.00            | 0.00             | 0.00                  | 20.00             |
| 2nd Quartile   | 4                               | 75.00                                     | 25.00            | 0.00             | 0.00             | 0.00                  | 0.00              |
| 3rd Quartile   | 5                               | 0.00                                      | 20.00            | 40.00            | 40.00            | 0.00                  | 0.00              |
| 4th Quartile   | 5                               | 0.00                                      | 0.00             | 20.00            | 40.00            | 40.00                 | 0.00              |
| <b>GOVERNMENT SHORT FUNDS</b>  |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 6                               | 33.33                                     | 16.67            | 16.67            | 0.00             | 16.67                 | 16.67             |
| 2nd Quartile   | 6                               | 0.00                                      | 50.00            | 33.33            | 0.00             | 0.00                  | 16.67             |
| 3rd Quartile   | 6                               | 16.67                                     | 0.00             | 33.33            | 16.67            | 16.67                 | 16.67             |
| 4th Quartile   | 7                               | 14.29                                     | 0.00             | 0.00             | 42.86            | 42.86                 | 0.00              |
| <b>INVESTMENT-GRADE LONG FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 21                              | 52.38                                     | 33.33            | 4.76             | 4.76             | 4.76                  | 0.00              |
| 2nd Quartile   | 20                              | 30.00                                     | 10.00            | 20.00            | 25.00            | 10.00                 | 5.00              |
| 3rd Quartile   | 21                              | 4.76                                      | 33.33            | 9.52             | 23.81            | 9.52                  | 19.05             |
| 4th Quartile   | 21                              | 0.00                                      | 9.52             | 33.33            | 23.81            | 23.81                 | 9.52              |
| <b>INVESTMENT-GRADE INTERMEDIATE FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 45                              | 42.22                                     | 28.89            | 13.33            | 8.89             | 6.67                  | 0.00              |
| 2nd Quartile   | 45                              | 26.67                                     | 35.56            | 26.67            | 2.22             | 6.67                  | 2.22              |
| 3rd Quartile   | 45                              | 13.33                                     | 20.00            | 31.11            | 20.00            | 13.33                 | 2.22              |
| 4th Quartile   | 45                              | 4.44                                      | 2.22             | 15.56            | 51.11            | 20.00                 | 6.67              |
| <b>INVESTMENT-GRADE SHORT FUNDS</b>  |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 21                              | 28.57                                     | 28.57            | 14.29            | 19.05            | 9.52                  | 0.00              |
| 2nd Quartile   | 21                              | 33.33                                     | 33.33            | 23.81            | 4.76             | 0.00                  | 4.76              |
| 3rd Quartile   | 21                              | 33.33                                     | 28.57            | 19.05            | 9.52             | 9.52                  | 0.00              |
| 4th Quartile   | 22                              | 0.00                                      | 0.00             | 31.82            | 36.36            | 13.64                 | 18.18             |
| <b>HIGH YIELD FUNDS</b>  |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 46                              | 39.13                                     | 19.57            | 10.87            | 17.39            | 0.00                  | 13.04             |
| 2nd Quartile   | 46                              | 19.57                                     | 17.39            | 15.22            | 13.04            | 6.52                  | 28.26             |
| 3rd Quartile   | 46                              | 8.70                                      | 17.39            | 21.74            | 23.91            | 10.87                 | 17.39             |
| 4th Quartile   | 46                              | 10.87                                     | 10.87            | 15.22            | 17.39            | 13.04                 | 32.61             |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. 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 (2014-2016) | THREE-YEAR PERCENTAGES AT END (2017-2019) |                  |                  |                  |                       |                   |
|  |                                 | 1ST QUARTILE (%)                          | 2ND QUARTILE (%) | 3RD QUARTILE (%) | 4TH QUARTILE (%) | MERGED/LIQUIDATED (%) | STYLE CHANGED (%) |
| <b>MORTGAGE-BACKED SECURITIES FUNDS</b>  |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 12                              | 33.33                                     | 16.67            | 16.67            | 25.00            | 8.33                  | 0.00              |
| 2nd Quartile   | 11                              | 36.36                                     | 27.27            | 27.27            | 9.09             | 0.00                  | 0.00              |
| 3rd Quartile   | 11                              | 18.18                                     | 36.36            | 9.09             | 9.09             | 27.27                 | 0.00              |
| 4th Quartile   | 12                              | 0.00                                      | 8.33             | 33.33            | 33.33            | 16.67                 | 8.33              |
| <b>GLOBAL INCOME FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 24                              | 20.83                                     | 20.83            | 12.50            | 8.33             | 4.17                  | 33.33             |
| 2nd Quartile   | 23                              | 43.48                                     | 8.70             | 17.39            | 13.04            | 17.39                 | 0.00              |
| 3rd Quartile   | 24                              | 20.83                                     | 25.00            | 12.50            | 20.83            | 16.67                 | 4.17              |
| 4th Quartile   | 24                              | 4.17                                      | 20.83            | 20.83            | 33.33            | 16.67                 | 4.17              |
| <b>EMERGING MARKETS DEBT FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 12                              | 33.33                                     | 8.33             | 8.33             | 33.33            | 16.67                 | 0.00              |
| 2nd Quartile   | 12                              | 33.33                                     | 33.33            | 16.67            | 0.00             | 16.67                 | 0.00              |
| 3rd Quartile   | 12                              | 0.00                                      | 16.67            | 25.00            | 25.00            | 25.00                 | 8.33              |
| 4th Quartile   | 13                              | 7.69                                      | 15.38            | 15.38            | 15.38            | 38.46                 | 7.69              |
| <b>GENERAL MUNICIPAL DEBT FUNDS</b>  |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 18                              | 61.11                                     | 11.11            | 16.67            | 5.56             | 5.56                  | 0.00              |
| 2nd Quartile   | 17                              | 23.53                                     | 41.18            | 29.41            | 5.88             | 0.00                  | 0.00              |
| 3rd Quartile   | 18                              | 0.00                                      | 33.33            | 33.33            | 22.22            | 11.11                 | 0.00              |
| 4th Quartile   | 18                              | 5.56                                      | 5.56             | 5.56             | 50.00            | 22.22                 | 11.11             |
| <b>CALIFORNIA MUNICIPAL DEBT FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 8                               | 50.00                                     | 25.00            | 25.00            | 0.00             | 0.00                  | 0.00              |
| 2nd Quartile   | 8                               | 37.50                                     | 25.00            | 25.00            | 0.00             | 12.50                 | 0.00              |
| 3rd Quartile   | 8                               | 12.50                                     | 25.00            | 12.50            | 25.00            | 25.00                 | 0.00              |
| 4th Quartile   | 9                               | 0.00                                      | 11.11            | 22.22            | 66.67            | 0.00                  | 0.00              |
| <b>NEW YORK MUNICIPAL DEBT FUNDS</b>   |                                 |   |                  |                  |                  |                       |                   |
| 1st Quartile   | 6                               | 50.00                                     | 33.33            | 16.67            | 0.00             | 0.00                  | 0.00              |
| 2nd Quartile   | 6                               | 16.67                                     | 16.67            | 33.33            | 16.67            | 16.67                 | 0.00              |
| 3rd Quartile   | 6                               | 16.67                                     | 33.33            | 16.67            | 33.33            | 0.00                  | 0.00              |
| 4th Quartile   | 7                               | 14.29                                     | 0.00             | 28.57            | 42.86            | 14.29                 | 0.00              |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. 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 2017) | THREE-YEAR PERCENTAGES AT END (JUNE 2020) |                 |                       |                   |
|   |                                 | TOP HALF (%)                              | BOTTOM HALF (%) | MERGED/LIQUIDATED (%) | STYLE CHANGED (%) |
| <b>GOVERNMENT LONG FUNDS</b>  |                                 |   |                 |                       |                   |
| Top Half  | 27                              | 62.96                                     | 11.11           | 7.41                  | 18.52             |
| Bottom Half   | 28                              | 7.14                                      | 46.43           | 17.86                 | 28.57             |
| <b>GOVERNMENT INTERMEDIATE FUNDS</b>  |                                 |   |                 |                       |                   |
| Top Half  | 9                               | 77.78                                     | 11.11           | 0.00                  | 11.11             |
| Bottom Half   | 10                              | 10.00                                     | 70.00           | 20.00                 | 0.00              |
| <b>GOVERNMENT SHORT FUNDS</b>   |                                 |   |                 |                       |                   |
| Top Half  | 12                              | 50.00                                     | 25.00           | 8.33                  | 16.67             |
| Bottom Half   | 13                              | 15.38                                     | 46.15           | 30.77                 | 7.69              |
| <b>INVESTMENT-GRADE LONG FUNDS</b>  |                                 |   |                 |                       |                   |
| Top Half  | 41                              | 63.41                                     | 26.83           | 7.32                  | 2.44              |
| Bottom Half   | 42                              | 23.81                                     | 45.24           | 16.67                 | 14.29             |
| <b>INVESTMENT-GRADE INTERMEDIATE FUNDS</b>  |                                 |   |                 |                       |                   |
| Top Half  | 90                              | 66.67                                     | 25.56           | 6.67                  | 1.11              |
| Bottom Half   | 90                              | 20.00                                     | 58.89           | 16.67                 | 4.44              |
| <b>INVESTMENT-GRADE SHORT FUNDS</b>   |                                 |   |                 |                       |                   |
| Top Half  | 42                              | 61.90                                     | 30.95           | 4.76                  | 2.38              |
| Bottom Half   | 43                              | 30.23                                     | 48.84           | 11.63                 | 9.30              |
| <b>HIGH YIELD FUNDS</b>   |                                 |   |                 |                       |                   |
| Top Half  | 92                              | 47.83                                     | 28.26           | 3.26                  | 20.65             |
| Bottom Half   | 92                              | 23.91                                     | 39.13           | 11.96                 | 25.00             |
| <b>MORTGAGE-BACKED SECURITIES FUNDS</b>   |                                 |   |                 |                       |                   |
| Top Half  | 23                              | 56.52                                     | 39.13           | 4.35                  | 0.00              |
| Bottom Half   | 23                              | 30.43                                     | 43.48           | 21.74                 | 4.35              |
| <b>GLOBAL INCOME FUNDS</b>  |                                 |   |                 |                       |                   |
| Top Half  | 47                              | 46.81                                     | 25.53           | 10.64                 | 17.02             |
| Bottom Half   | 48                              | 35.42                                     | 43.75           | 16.67                 | 4.17              |
| <b>EMERGING MARKETS DEBT FUNDS</b>  |                                 |   |                 |                       |                   |
| Top Half  | 24                              | 54.17                                     | 29.17           | 16.67                 | 0.00              |
| Bottom Half   | 25                              | 20.00                                     | 40.00           | 32.00                 | 8.00              |
| <b>GENERAL MUNICIPAL DEBT FUNDS</b>   |                                 |   |                 |                       |                   |
| Top Half  | 35                              | 68.57                                     | 28.57           | 2.86                  | 0.00              |
| Bottom Half   | 36                              | 22.22                                     | 55.56           | 16.67                 | 5.56              |
| <b>CALIFORNIA MUNICIPAL DEBT FUNDS</b>  |                                 |   |                 |                       |                   |
| Top Half  | 16                              | 68.75                                     | 25.00           | 6.25                  | 0.00              |
| Bottom Half   | 17                              | 23.53                                     | 64.71           | 11.76                 | 0.00              |
| <b>NEW YORK MUNICIPAL DEBT FUNDS</b>  |                                 |   |                 |                       |                   |
| Top Half  | 12                              | 58.33                                     | 33.33           | 8.33                  | 0.00              |
| Bottom Half   | 13                              | 30.77                                     | 61.54           | 7.69                  | 0.00              |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. 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 2015) | FIVE-YEAR PERCENTAGES AT END (JUNE 2020) |                  |                  |                  |                       |                   |
|   |                                 | 1ST QUARTILE (%)                         | 2ND QUARTILE (%) | 3RD QUARTILE (%) | 4TH QUARTILE (%) | MERGED/LIQUIDATED (%) | STYLE CHANGED (%) |
| <b>GOVERNMENT LONG FUNDS</b>  |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 13                              | 61.54                                    | 7.69             | 0.00             | 0.00             | 15.38                 | 15.38             |
| 2nd Quartile  | 13                              | 7.69                                     | 30.77            | 30.77            | 0.00             | 7.69                  | 23.08             |
| 3rd Quartile  | 13                              | 0.00                                     | 15.38            | 23.08            | 15.38            | 0.00                  | 46.15             |
| 4th Quartile  | 13                              | 0.00                                     | 0.00             | 0.00             | 53.85            | 46.15                 | 0.00              |
| <b>GOVERNMENT INTERMEDIATE FUNDS</b>  |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 6                               | 50.00                                    | 16.67            | 0.00             | 0.00             | 16.67                 | 16.67             |
| 2nd Quartile  | 5                               | 20.00                                    | 20.00            | 0.00             | 0.00             | 60.00                 | 0.00              |
| 3rd Quartile  | 5                               | 0.00                                     | 40.00            | 0.00             | 40.00            | 20.00                 | 0.00              |
| 4th Quartile  | 6                               | 0.00                                     | 0.00             | 66.67            | 16.67            | 16.67                 | 0.00              |
| <b>GOVERNMENT SHORT FUNDS</b>   |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 7                               | 28.57                                    | 14.29            | 28.57            | 0.00             | 28.57                 | 0.00              |
| 2nd Quartile  | 6                               | 16.67                                    | 33.33            | 0.00             | 0.00             | 16.67                 | 33.33             |
| 3rd Quartile  | 6                               | 0.00                                     | 0.00             | 50.00            | 16.67            | 33.33                 | 0.00              |
| 4th Quartile  | 7                               | 14.29                                    | 0.00             | 0.00             | 42.86            | 28.57                 | 14.29             |
| <b>INVESTMENT-GRADE LONG FUNDS</b>  |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 20                              | 65.00                                    | 5.00             | 10.00            | 0.00             | 5.00                  | 15.00             |
| 2nd Quartile  | 20                              | 20.00                                    | 35.00            | 15.00            | 15.00            | 5.00                  | 10.00             |
| 3rd Quartile  | 20                              | 5.00                                     | 25.00            | 15.00            | 25.00            | 20.00                 | 10.00             |
| 4th Quartile  | 20                              | 0.00                                     | 15.00            | 10.00            | 35.00            | 20.00                 | 20.00             |
| <b>INVESTMENT-GRADE INTERMEDIATE FUNDS</b>  |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 40                              | 40.00                                    | 27.50            | 15.00            | 10.00            | 7.50                  | 0.00              |
| 2nd Quartile  | 40                              | 22.50                                    | 27.50            | 27.50            | 0.00             | 17.50                 | 5.00              |
| 3rd Quartile  | 40                              | 12.50                                    | 20.00            | 27.50            | 15.00            | 20.00                 | 5.00              |
| 4th Quartile  | 40                              | 0.00                                     | 7.50             | 10.00            | 52.50            | 25.00                 | 5.00              |
| <b>INVESTMENT-GRADE SHORT FUNDS</b>   |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 17                              | 47.06                                    | 11.76            | 11.76            | 17.65            | 11.76                 | 0.00              |
| 2nd Quartile  | 17                              | 11.76                                    | 17.65            | 29.41            | 17.65            | 23.53                 | 0.00              |
| 3rd Quartile  | 17                              | 11.76                                    | 35.29            | 29.41            | 17.65            | 5.88                  | 0.00              |
| 4th Quartile  | 17                              | 11.76                                    | 11.76            | 5.88             | 17.65            | 41.18                 | 11.76             |
| <b>HIGH YIELD FUNDS</b>   |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 38                              | 21.05                                    | 18.42            | 18.42            | 18.42            | 13.16                 | 10.53             |
| 2nd Quartile  | 38                              | 21.05                                    | 18.42            | 18.42            | 7.89             | 13.16                 | 21.05             |
| 3rd Quartile  | 38                              | 28.95                                    | 15.79            | 23.68            | 15.79            | 10.53                 | 5.26              |
| 4th Quartile  | 38                              | 7.89                                     | 10.53            | 13.16            | 23.68            | 26.32                 | 18.42             |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. 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 2015) | FIVE-YEAR PERCENTAGES AT END (JUNE 2020) |                  |                  |                  |                       |                   |
|   |                                 | 1ST QUARTILE (%)                         | 2ND QUARTILE (%) | 3RD QUARTILE (%) | 4TH QUARTILE (%) | MERGED/LIQUIDATED (%) | STYLE CHANGED (%) |
| <b>MORTGAGE-BACKED SECURITIES FUNDS</b>   |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 11                              | 54.55                                    | 27.27            | 18.18            | 0.00             | 0.00                  | 0.00              |
| 2nd Quartile  | 11                              | 9.09                                     | 18.18            | 27.27            | 18.18            | 18.18                 | 9.09              |
| 3rd Quartile  | 11                              | 0.00                                     | 27.27            | 27.27            | 27.27            | 18.18                 | 0.00              |
| 4th Quartile  | 12                              | 16.67                                    | 0.00             | 8.33             | 25.00            | 25.00                 | 25.00             |
| <b>GLOBAL INCOME FUNDS</b>  |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 17                              | 17.65                                    | 11.76            | 11.76            | 17.65            | 11.76                 | 29.41             |
| 2nd Quartile  | 16                              | 31.25                                    | 18.75            | 25.00            | 18.75            | 6.25                  | 0.00              |
| 3rd Quartile  | 16                              | 12.50                                    | 31.25            | 6.25             | 31.25            | 12.50                 | 6.25              |
| 4th Quartile  | 17                              | 11.76                                    | 17.65            | 23.53            | 5.88             | 17.65                 | 23.53             |
| <b>EMERGING MARKETS DEBT FUNDS</b>  |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 4                               | 0.00                                     | 0.00             | 50.00            | 25.00            | 25.00                 | 0.00              |
| 2nd Quartile  | 4                               | 25.00                                    | 25.00            | 0.00             | 50.00            | 0.00                  | 0.00              |
| 3rd Quartile  | 4                               | 25.00                                    | 0.00             | 25.00            | 0.00             | 50.00                 | 0.00              |
| 4th Quartile  | 5                               | 40.00                                    | 40.00            | 0.00             | 20.00            | 0.00                  | 0.00              |
| <b>GENERAL MUNICIPAL DEBT FUNDS</b>   |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 17                              | 58.82                                    | 11.76            | 5.88             | 11.76            | 5.88                  | 5.88              |
| 2nd Quartile  | 16                              | 25.00                                    | 37.50            | 25.00            | 0.00             | 12.50                 | 0.00              |
| 3rd Quartile  | 17                              | 0.00                                     | 29.41            | 35.29            | 17.65            | 11.76                 | 5.88              |
| 4th Quartile  | 17                              | 0.00                                     | 5.88             | 17.65            | 47.06            | 23.53                 | 5.88              |
| <b>CALIFORNIA MUNICIPAL DEBT FUNDS</b>  |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 9                               | 55.56                                    | 11.11            | 22.22            | 11.11            | 0.00                  | 0.00              |
| 2nd Quartile  | 8                               | 25.00                                    | 25.00            | 12.50            | 0.00             | 25.00                 | 12.50             |
| 3rd Quartile  | 8                               | 12.50                                    | 50.00            | 25.00            | 12.50            | 0.00                  | 0.00              |
| 4th Quartile  | 9                               | 0.00                                     | 0.00             | 22.22            | 55.56            | 22.22                 | 0.00              |
| <b>NEW YORK MUNICIPAL DEBT FUNDS</b>  |                                 |  |                  |                  |                  |                       |                   |
| 1st Quartile  | 6                               | 50.00                                    | 16.67            | 0.00             | 0.00             | 16.67                 | 16.67             |
| 2nd Quartile  | 6                               | 50.00                                    | 16.67            | 33.33            | 0.00             | 0.00                  | 0.00              |
| 3rd Quartile  | 6                               | 0.00                                     | 33.33            | 16.67            | 50.00            | 0.00                  | 0.00              |
| 4th Quartile  | 7                               | 0.00                                     | 14.29            | 42.86            | 28.57            | 14.29                 | 0.00              |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. 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 2015) | FIVE-YEAR PERCENTAGES AT END (JUNE 2020) |                 |                       |                   |
|   |                                 | TOP HALF (%)                             | BOTTOM HALF (%) | MERGED/LIQUIDATED (%) | STYLE CHANGED (%) |
| <b>GOVERNMENT LONG FUNDS</b>  |                                 |  |                 |                       |                   |
| Top Half  | 26                              | 53.85                                    | 15.38           | 11.54                 | 19.23             |
| Bottom Half   | 26                              | 7.69                                     | 46.15           | 23.08                 | 23.08             |
| <b>GOVERNMENT INTERMEDIATE FUNDS</b>  |                                 |  |                 |                       |                   |
| Top Half  | 11                              | 54.55                                    | 0.00            | 36.36                 | 9.09              |
| Bottom Half   | 11                              | 18.18                                    | 63.64           | 18.18                 | 0.00              |
| <b>GOVERNMENT SHORT FUNDS</b>   |                                 |  |                 |                       |                   |
| Top Half  | 13                              | 46.15                                    | 15.38           | 23.08                 | 15.38             |
| Bottom Half   | 13                              | 7.69                                     | 53.85           | 30.77                 | 7.69              |
| <b>INVESTMENT-GRADE LONG FUNDS</b>  |                                 |  |                 |                       |                   |
| Top Half  | 40                              | 62.50                                    | 20.00           | 5.00                  | 12.50             |
| Bottom Half   | 40                              | 22.50                                    | 42.50           | 20.00                 | 15.00             |
| <b>INVESTMENT-GRADE INTERMEDIATE FUNDS</b>  |                                 |  |                 |                       |                   |
| Top Half  | 80                              | 58.75                                    | 26.25           | 12.50                 | 2.50              |
| Bottom Half   | 80                              | 20.00                                    | 52.50           | 22.50                 | 5.00              |
| <b>INVESTMENT-GRADE SHORT FUNDS</b>   |                                 |  |                 |                       |                   |
| Top Half  | 34                              | 44.12                                    | 38.24           | 17.65                 | 0.00              |
| Bottom Half   | 34                              | 35.29                                    | 35.29           | 23.53                 | 5.88              |
| <b>HIGH YIELD FUNDS</b>   |                                 |  |                 |                       |                   |
| Top Half  | 76                              | 39.47                                    | 31.58           | 13.16                 | 15.79             |
| Bottom Half   | 76                              | 31.58                                    | 38.16           | 18.42                 | 11.84             |
| <b>MORTGAGE-BACKED SECURITIES FUNDS</b>   |                                 |  |                 |                       |                   |
| Top Half  | 22                              | 54.55                                    | 31.82           | 9.09                  | 4.55              |
| Bottom Half   | 23                              | 21.74                                    | 43.48           | 21.74                 | 13.04             |
| <b>GLOBAL INCOME FUNDS</b>  |                                 |  |                 |                       |                   |
| Top Half  | 33                              | 39.39                                    | 36.36           | 9.09                  | 15.15             |
| Bottom Half   | 33                              | 36.36                                    | 33.33           | 15.15                 | 15.15             |
| <b>EMERGING MARKETS DEBT FUNDS</b>  |                                 |  |                 |                       |                   |
| Top Half  | 8                               | 25.00                                    | 62.50           | 12.50                 | 0.00              |
| Bottom Half   | 9                               | 55.56                                    | 22.22           | 22.22                 | 0.00              |
| <b>GENERAL MUNICIPAL DEBT FUNDS</b>   |                                 |  |                 |                       |                   |
| Top Half  | 33                              | 66.67                                    | 21.21           | 9.09                  | 3.03              |
| Bottom Half   | 34                              | 17.65                                    | 58.82           | 17.65                 | 5.88              |
| <b>CALIFORNIA MUNICIPAL DEBT FUNDS</b>  |                                 |  |                 |                       |                   |
| Top Half  | 17                              | 58.82                                    | 23.53           | 11.76                 | 5.88              |
| Bottom Half   | 17                              | 29.41                                    | 58.82           | 11.76                 | 0.00              |
| <b>NEW YORK MUNICIPAL DEBT FUNDS</b>  |                                 |  |                 |                       |                   |
| Top Half  | 12                              | 66.67                                    | 16.67           | 8.33                  | 8.33              |
| Bottom Half   | 13                              | 23.08                                    | 69.23           | 7.69                  | 0.00              |

Source: S&P Dow Jones Indices LLC, CRSP. Data as of June 30, 2020. Table is provided for illustrative purposes. Past performance is no guarantee of future results.



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