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# Do Winners Repeat with Style?

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Preliminary  
Comments Welcome

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## **Abstract**

Several studies have found that considerable persistence exists in mutual fund performance. We study this phenomenon in fund managers who achieve superior performance, after adjusting for the investment style of the fund. Our data of domestic equity mutual funds indicates that winning funds do repeat good performance. Style-adjusted alphas are evaluated on both an absolute and relative basis. The highest persistence is exhibited by funds whose alpha is greater than 10% and also by funds whose alpha ranks in the top 5% of the sample.

## Introduction

The idea that mutual funds exhibit persistence in performance is one that has been debated by researchers for some time. The study by Jensen [1968] contended that past mutual fund performance was not indicative of future performance. Hendricks, Patel and Zeckhauser [1993] found at least some evidence of persistence, as did Goetzmann and Brown [1995]. Most investors would like to believe that historical mutual fund performance is indicative of future results. Inconsistency in fund performance makes selecting successful mutual funds a challenging task for both the individual investor and the investment advisor. The aim of this study is to determine if there is a way in which investors can discern whether a fund is likely to perform well in the future, given the past performance of the fund. If an investor is able to locate a winning fund this year, is that fund likely to do well again next year? In essence, do winning mutual funds repeat? This question was originally answered in a study by Goetzmann and Ibbotson [1994]. The study revealed that past mutual fund returns and relative rankings are useful in predicting future performance. This article extends and updates that work by adjusting fund performance for the style of the fund.

In order to truly determine the manager's value-added, it is necessary to measure the skill of a manager against a benchmark that adjusts for the style of the fund. Simply measuring fund performance against a market benchmark, such as the S&P 500, will not provide useful results since much of the performance of the fund can be attributed to the capitalization or investment objective of the fund, rather than manager skill. Any persistence found in fund performance could be due to the behavior of the asset classes that the fund represents rather than the behavior of the manager himself.

Using a database of open-end, domestic equity mutual funds, we find that there exists persistence in mutual fund performance, even after adjusting for the style of the fund. A style adjustment is made by using returns-based style analysis to construct customized benchmarks that best explain the fund's return characteristics<sup>1</sup>. Any over- or underperformance versus the stylized benchmark can be called style-adjusted alpha, a measure of value-added manager skill that is not attributable to the style of the fund. Funds are analyzed on both an absolute and relative basis to determine if winners do repeat with style.

## **Data**

The data used comes from Weisenberger and includes most U.S. domestic equity funds. Investment objectives are determined primarily by the description in the fund prospectus. The data includes the investment objectives of growth, growth and income, aggressive growth, equity income, mid-cap and small-cap funds. It does not include asset allocation, balanced, fixed income, convertible, international, global, or micro-cap funds.

Additionally, sector funds have been excluded, as their return behavior is not explained well using returns-based style analysis and the general market benchmarks used in this study. Because three years of data is required to reliably determine fund style using returns based style analysis, funds that have less than three years of data history have also been excluded. To mitigate survivorship bias, funds that died over the time period have been included in the sample, along with funds that have been merged or liquidated during the analysis period<sup>2</sup>. Monthly total returns are used, over the period from January 1975 to December 2000. Returns are net of management fees, but do not include the applicable loads.

## Winners Defined

Central to this work is the basis for defining a mutual fund as a winner. Winning funds are defined based on the fund's value added over a stylized benchmark, called the fund's style-adjusted alpha. Returns-based style analysis is used to construct the customized benchmark, which identifies the weights in passive indices that would be necessary to mimic the fund's return stream over a specified period<sup>3</sup>. The indices used for this analysis are chosen to represent asset classes that exhaustively cover the fund's investable universe. The seven asset classes are: large-cap growth equity, large-cap value equity, small-cap growth equity, small-cap value equity, international equity, aggregate fixed income and cash. The corresponding indices are: S&P Barra Growth Index, S&P Barra Value Index, BGI Small-Cap Growth Index, BGI Small-Cap Value Index, MSCI EAFE Index, Lehman Brothers Government/Credit Index, and Salomon Brothers U.S. 30-day T-Bill. The style analysis results provide coefficients to a constrained regression that can be interpreted as style weights. The portfolio of indices, weighted by their style weights, represent a reasonable passive alternative to the fund's active management that provides the same exposure to the chosen asset classes. As a fund's style may change over time, rolling 36-month periods are used to determine the customized benchmark for each period. The customized benchmark return is:

$$r_{b,t} = \sum_{i=1}^7 w_i r_{i,t} \quad (1)$$

where  $r_{b,t}$  is the return of the customized benchmark in month  $t$ ,  $7$  indicates the number of passive indices chosen to represent the asset classes,  $w_i$  represents the coefficient to index  $i$  over the 36 months prior to  $t$  as calculated by returns based style analysis, and  $r_{i,t}$  is the return to index  $i$  in month  $t$ .

For each month, the fund's excess return over the customized benchmark return is calculated to determine style-adjusted alpha, or value-added over the style-adjusted benchmark. The following equation shows this calculation:

$$\alpha_{fund,t} = r_{fund,t} - r_{b,t} \quad (2)$$

where  $\alpha_{fund,t}$  is the fund's value-added over the customized benchmark for the month t,  $r_{fund,t}$  is the return of the fund in month t, and  $r_{b,t}$  is the return of the customized benchmark in month t. Because 36 months of data is required to create the customized benchmark, the first alpha that is calculated is for January 1978. The benchmark created for January 1978 is based on a regression that uses data from January 1975 to December 1977. At the end of January 1978, the manager return is compared to the benchmark return to determine alpha. In this manner, rolling, forward out-of-sample alphas are calculated for each month from January 1978 to December 2000. The monthly style-adjusted alphas are then compounded into a single, annualized style-adjusted alpha each calendar year.

Winners are first defined on an absolute basis by determining whether they have achieved an alpha greater than a pre-defined percentage return. The second analysis looks at funds on a relative basis by ranking all funds by alpha and evaluating their relative ranking. Funds are defined as either winners or losers in an initial evaluation period and then re-evaluated as being winners or losers in a subsequent period. The results have been examined to determine whether winners repeat, after adjusting for style.

## Simple Results

This first section looks at simple results where the funds are split into either positive and negative alphas, or top half and bottom half ranked performance.

### Simple Absolute Alpha Results

The first analysis evaluates performance on an absolute basis by identifying funds whose alpha is positive in the initial one-year evaluation period and determining whether they also have a positive alpha in the subsequent year. Those funds that have a positive style-adjusted alpha in both periods can be said to exhibit persistence in performance, even after adjusting for style. Two weighting schemes are used to evaluate the percentage of funds repeating and the average alpha of the initial winners in the subsequent period. The first scheme equally weights all funds in the sample, the second equally weights the years. The latter acknowledges that the draws are not independent and are conditional on the year that is being examined.

Exhibit 1 displays the results: when winners are defined as having a positive alpha in both the initial and subsequent periods, 54% of winners repeat when funds are equally weighted, and 55% of winners repeat when years are equally weighted. Frequency indicators are also displayed. In 12 of the 22 years, there is a majority with positive alpha. In 15 of the 22 years, the average alpha of the initial winners in the subsequent period is positive. Over the period, the average alpha is 1.51% (1.40%), when funds (or years) are equally weighted. The total number of initial period winners is 7,754. The results show that when mutual fund performance is evaluated by absolute style-adjusted alpha, winning mutual funds do repeat.



## Simple Relative Ranking Results

The second analysis evaluates performance on a relative basis by ranking funds based on style-adjusted alpha. Relative rank is first determined in the initial one-year evaluation period. The sample is split into the top half and bottom half of performers. Funds whose alpha ranks in the top half in the initial period and again in the subsequent period are defined as winners who exhibit persistence. Again, two weighting schemes are used to evaluate the percentage of winners repeating and the average alpha of in the subsequent period. Exhibit 2 displays the findings when funds are examined on a relative basis. 54% (55%) of winners repeat and there are 17 years in which the majority of winners repeat. In 14 of the 22 years, the average alpha of initial winners in the subsequent period is positive, and over the period the average alpha is 1.50% (1.30%). The total number of initial period winners is 8,042<sup>4</sup>.

We see that even when winners are evaluated on a relative basis, winners do repeat after adjusting for the style of the fund. The question now arises as to whether these results can be intensified. Intensified results define winners using a more stringent criteria.

## Intensified Results

Again, we divide the analysis into absolute and relative performance. The results from the previous section are intensified by narrowing the definition of a winner in the initial evaluation period.

## Intensified Absolute Alpha Results

When evaluating performance on an absolute basis, winners now must have an alpha in the initial period greater than some pre-defined percentage return greater than 0%. As before, the fund must have a positive alpha in the subsequent one-year period to be called a repeat winner.

The results are displayed in Exhibit 3. As the definition of an initial winner becomes more restrictive, the overall trend for the percentage of winners repeating is favorable. For example, when winners are defined as those funds with an initial period alpha greater than 1%, the percentage of winners repeating is 55% (56%), when funds (or years) are equally weighted. When winners are defined as those funds with an initial period alpha greater than 5%, the percentage of winners repeating increases to 59% (61%). The best results are obtained when winners are defined as those funds with an alpha greater than 10% in the initial period. The percentage of winners repeating in this case is 62% (65%).

The overall trend of the average alphas in the subsequent one-year period also improves when winners are defined more stringently. Exhibit 4 shows that when initial winners are defined as those funds with an initial period alpha greater than 1% per year, the average alpha of those initial winners during the subsequent period is 1.74% (1.59%). When the definition of a winner becomes even more restrictive, the results become more favorable. Funds whose initial alpha is greater than 5% have a subsequent year average alpha of 3.02% (2.55%). Again, the most outstanding results are found when winners are defined as having an initial alpha greater than 10% per year.

Frequency measures of the alpha results are displayed in Exhibit 5. For funds whose style-adjusted alpha is greater than 1% in the initial period, the subsequent year average alpha is positive and there is a majority with positive alpha in 15 of the 22 years evaluated. Again, the results improve when initial winners are defined more restrictively. For example, when winners are defined as funds whose initial alpha is greater than 5%, there is a majority with positive alpha in 16 of the 22 years, and there are 17 years when the subsequent average alpha is positive.

The absolute strategy that is most successful in predicting future fund performance is the one that identifies funds whose alpha is greater than 10% versus a stylized benchmark over the initial one-year period. The results for this group are displayed in Exhibit 6. For this group, 62% (65%) of winners repeat. A majority of winners repeat in 16 of the 22 years analyzed, and the average alpha is positive in 14 years, indicating high consistency in the persistence. The average alpha of this group in the subsequent period is 4.29% (3.13%). As displayed in Exhibit 7, the dispersion around the composite 62% (65%) is quite large, with the percentage of winners repeating being as high as 100% in one year and hovering at or above 80% in 6 of the years. There are another 6 years, on the other hand, when the percentage of winners repeating falls below 50%.

Exhibit 8 displays the average alpha for this group of funds, year by year. Though the average alpha over the entire period is 4.29% (3.13%), the graph shows that the range of subsequent alphas is large. Subsequent alpha falls to just under 2% in 1984 and 1988, and reaches above 11% in 1982, 1991 and 1999.

## Intensified Relative Ranking Results

When examined on a relative basis, the results again can be intensified. Exhibit 9 displays the results of narrowing the definition of a winner in the initial one-year evaluation period. As before, in the subsequent period, funds are required to have a style-adjusted alpha that ranks in the top half of the sample. As the top percentile ranking that is required to be defined as a winner becomes more restrictive, the overall trend of the percentage of winners that show persistence improves. For example, when the top 40% of funds are examined, 56% (56%) of winners repeat. When the top decile are examined, the percentage of winners repeating increases to 61% (63%).

The same overall trend is seen in the subsequent average alpha of initial winners. Exhibit 10 indicates that funds whose alpha ranks in the top 40% of the sample in the initial period have a subsequent average alpha of 1.86% (1.57%). When the initial period requirement is made more restrictive and funds are required to rank in the top decile, the subsequent average alpha rises to 3.41% (3.08%).

Frequency measures of the relative results are displayed in Exhibit 11. For funds whose initial period style-adjusted alpha ranks in the top 40% of the sample, the subsequent average alpha is positive and the majority rank in the top half in 16 of the 22 years evaluated. The results are also favorable when a more stringent criteria for being a winner is applied. When initial winners are defined as those funds whose alpha ranks in the top decile of the sample, the subsequent average alpha is positive and the majority rank in the top half in 17 of the 22 years.

The most consistently successful relative strategy is choosing funds that are in the top 5% over a one-year period. Further intensification may help, but the results are somewhat mixed. Exhibit 12 shows that 64% (65%) of winners repeat in the top 5% and the persistence occurs in 17 of the 22 years analyzed. The subsequent year average alpha is 4.49% (3.63%), and there are 16 years when the subsequent average alpha is positive. Exhibit 13 shows the percentage of winners repeating year by year. A majority repeat in all but 5 years, and for many years a high preponderance of the funds repeat with top half performance. Exhibit 14 indicates that the subsequent average alpha for this group is negative in only 6 years and never falls below -5%. Average alpha reaches 17.12% in 1999, but it is clear that a majority of the time average alpha falls in the 0-5% range. These results indicate that investors who invest in the top 5% of funds, when ranked by style-adjusted alpha, can reasonably expect their fund to repeat good performance and that their fund may return an alpha in the 0-5% range in the next year.

## **Conclusion**

It is clear from these results that the phenomenon of persistence in mutual fund performance does exist in domestic equity funds, even after adjusting for the style of the fund. Persistence exists whether funds are evaluated on an absolute scale, or using relative ranking. On an absolute basis, defining winners loosely as having a positive alpha in both the initial and subsequent one-year periods provides favorable results with 54% (55%) of winners repeating, when funds (or years) are equally weighted. As the definition of a winner is made more restrictive, the percentage of winners repeating increases. The best absolute alpha results are obtained when funds are required to have an initial alpha greater than 10%. In this case, the percentage of winners repeating reaches 62% (65%).

Similarly, when measured on a relative basis, defining winners loosely as those funds that rank in the top half of the sample in both the initial and subsequent periods provides favorable results with 54% (55%) of winners repeating. As the definition is made more restrictive for the initial period, subsequent results improve. The most consistent results are obtained by identifying funds that rank in the top 5%, in that 64% (65%) of these funds repeat with top half performance. More restrictive definitions of initial winners give mixed results. This is not too surprising, however, since the very top performing funds are not likely to be very diversified and may provide less reliable performance.

## Exhibits

### Exhibit 1. Repeat Performers as Measured by Absolute Performance

<b>Subsequent Performance</b>	<b>Initial Alpha &gt; 0%</b>
Composite Percent Winners (Positive Alpha): Funds Equally Weighted	54%
Composite Percent Winners (Positive Alpha): Years Equally Weighted	55%
Years with Average Positive Alpha (win-loss-tie)	15-7
Years with Majority Positive Alpha (win-loss-tie)	12-8-2
Composite Alpha: Funds Equally Weighted	1.51%
Composite Alpha: Years Equally Weighted	1.40%
Total Number of Initial Winners (Positive Alpha) Across the Years	7,754

**Exhibit 2. Repeat Performers as Measured by Relative Performance**

<b>Subsequent Performance</b>	<b>Initial Rank: Top Half</b>
Composite Percent Winners (Rank in Top Half): Funds Equally Weighted	54%
Composite Percent Winners (Rank in Top Half): Years Equally Weighted	55%
Years with Average Positive Alpha (win-loss-tie)	14-8
Years with Majority in Top Half (win-loss-tie)	17-5
Composite Alpha: Funds Equally Weighted	1.50%
Composite Alpha: Years Equally Weighted	1.30%
Total Number of Initial Winners (Rank in Top Half) Across the Years	8,042



Exhibit 3. Top Performers: Percent of Funds with Positive Alpha in Subsequent Year 1979-2000

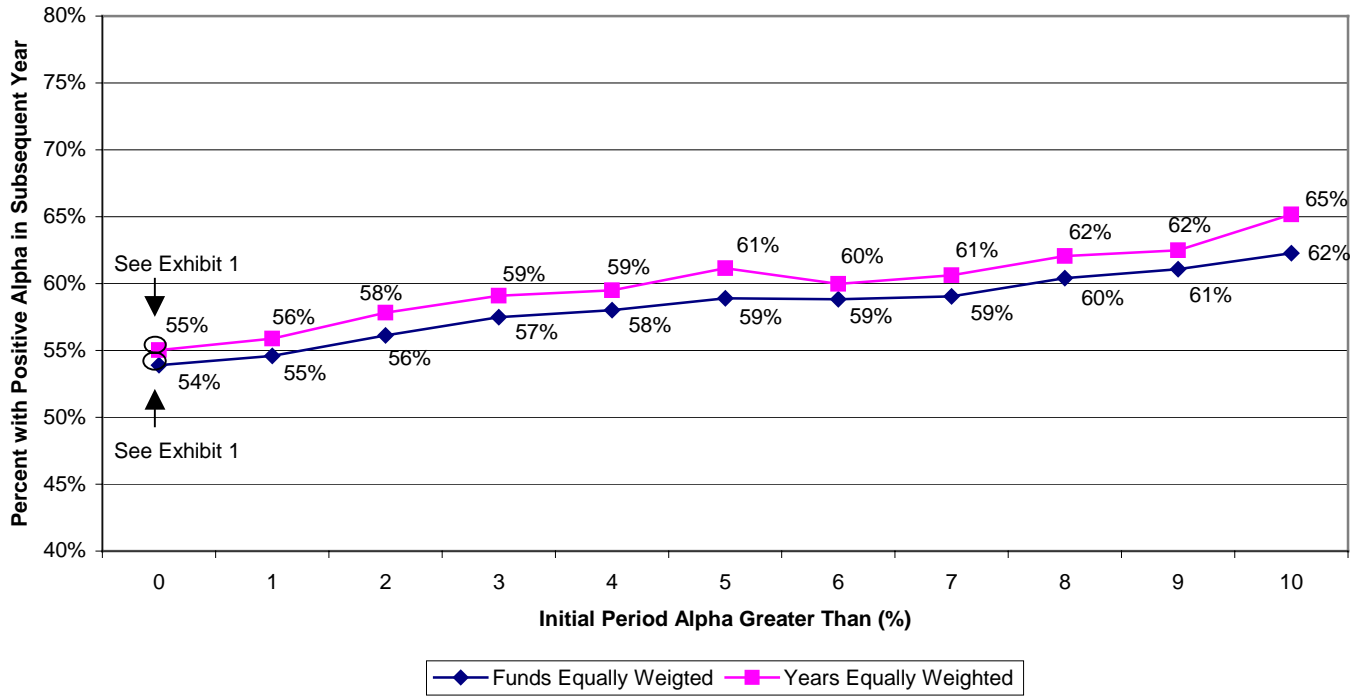
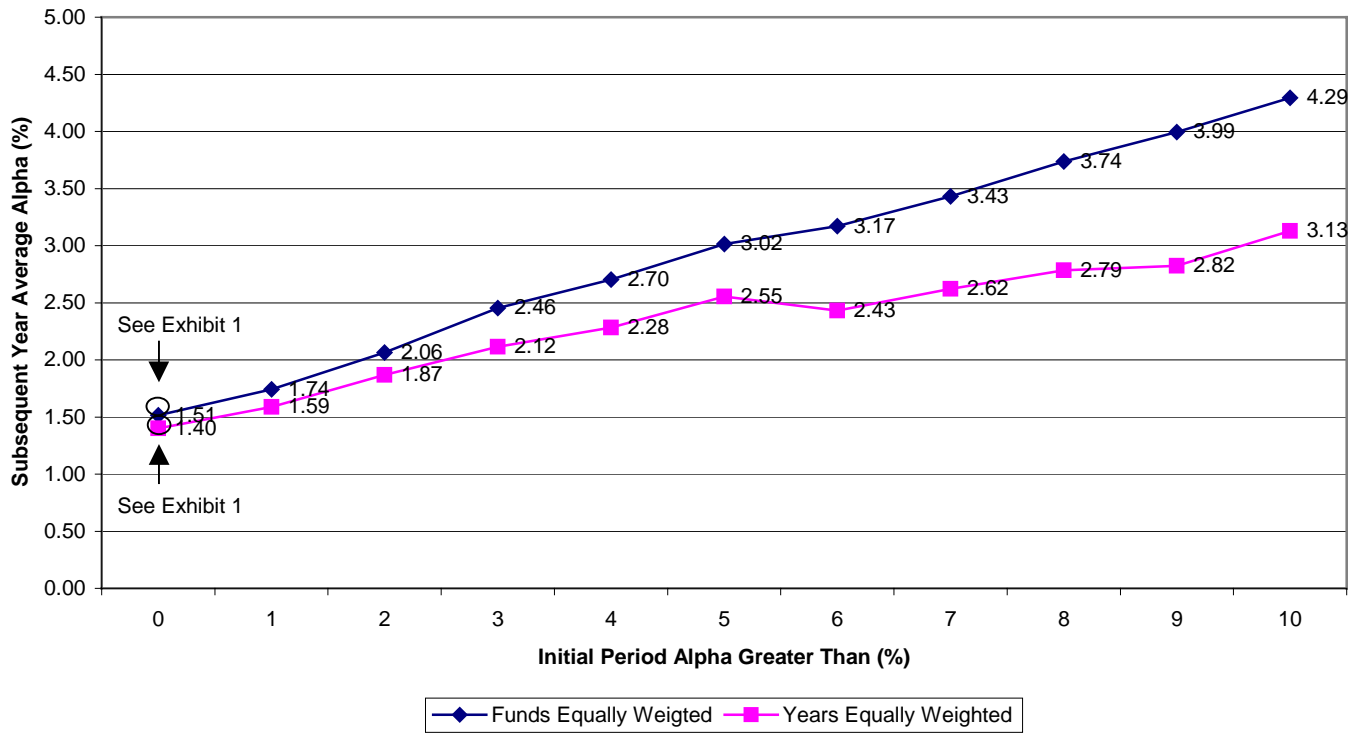


Exhibit 4. Top Performers: Subsequent Year Average Alpha 1979-2000



**Exhibit 5. Absolute Performance Results**

Initial Winner: Alpha Greater Than	Subsequent Performance		Total Number of Initial Winners Across the Years
	Years with Average Positive Alpha (win-loss-tie)	Years with Majority Positive Alpha (win-loss-tie)	
0%	15-7	12-8-2	7,754
1%	15-7	15-6-1	6,512
2%	16-6	16-6	5,405
3%	16-6	15-7	4,453
4%	16-6	16-6	3,691
5%	17-5	16-6	3,103
6%	17-5	15-6-1	2,568
7%	17-5	17-5	2,183
8%	17-5	16-6	1,894
9%	15-7	17-5	1,608
10%	14-8	16-6	1,362

**Exhibit 6. Selected Absolute Strategy: Initial Alpha > 10%**

<b>Subsequent Performance</b>	<b>Initial Alpha &gt; 10%</b>
Composite Percent Winners (Positive Alpha): Funds Equally Weighted	62%
Composite Percent Winners (Positive Alpha): Years Equally Weighted	65%
Years with Average Positive Alpha (win-loss-tie)	14-8
Years with Majority Positive Alpha (win-loss-tie)	16-6
Composite Alpha: Funds Equally Weighted	4.29%
Composite Alpha: Years Equally Weighted	3.13%
Total Number of Initial Winners (Positive Alpha) Across the Years	1,362

Exhibit 7. Initial Period Alpha Greater Than 10%

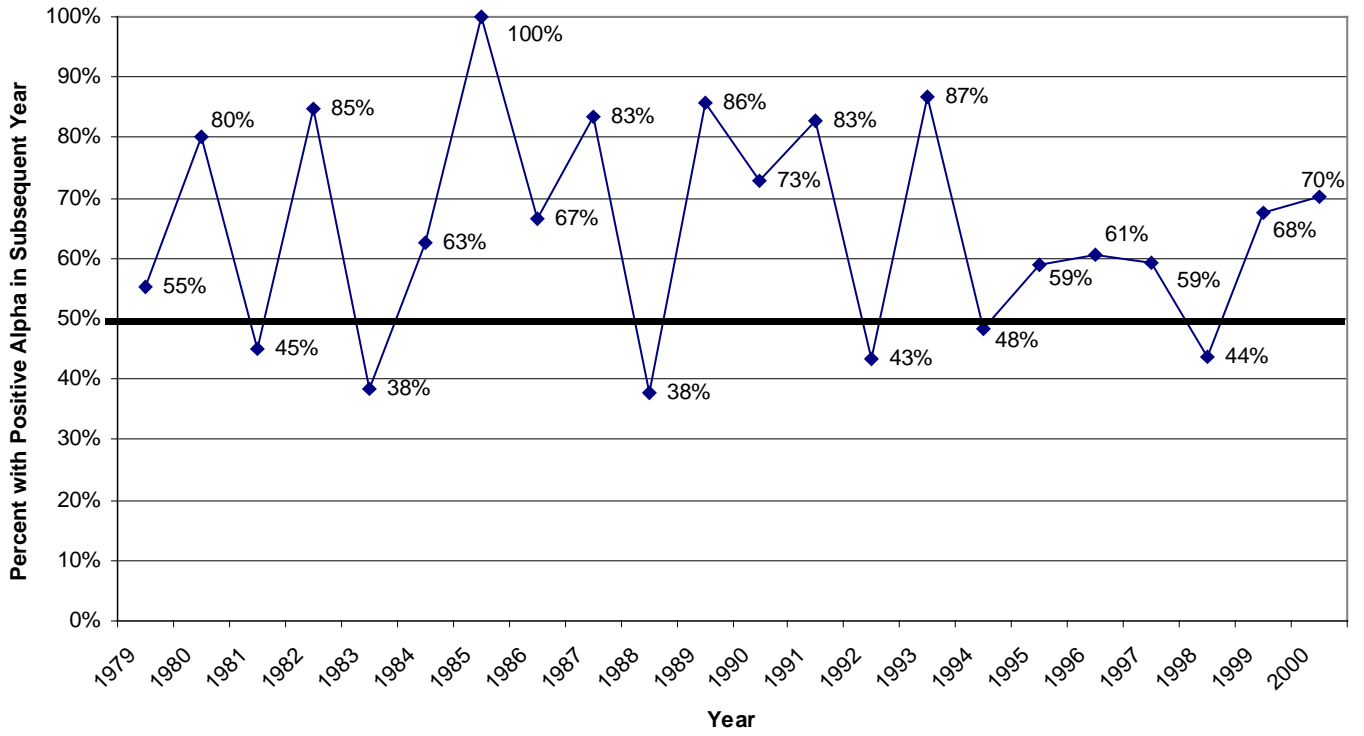


Exhibit 8. Initial Period Alpha Greater Than 10%

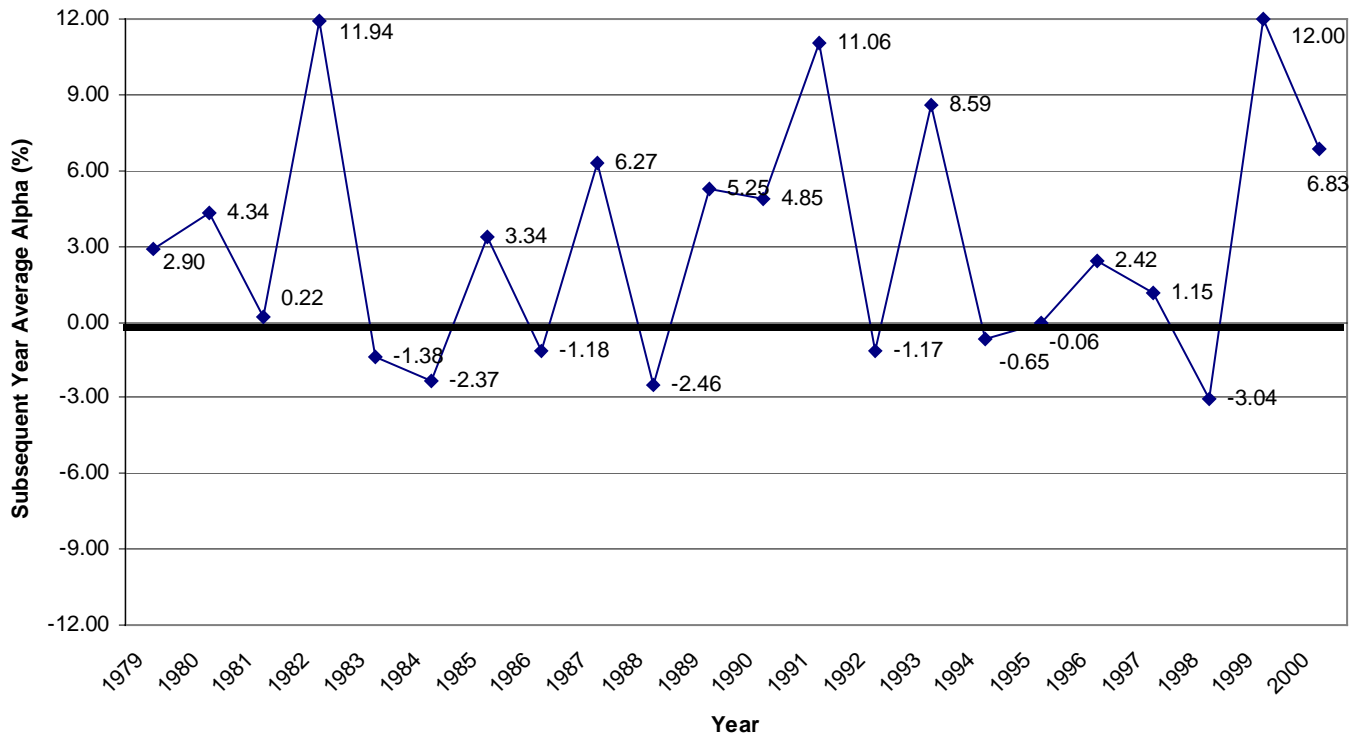
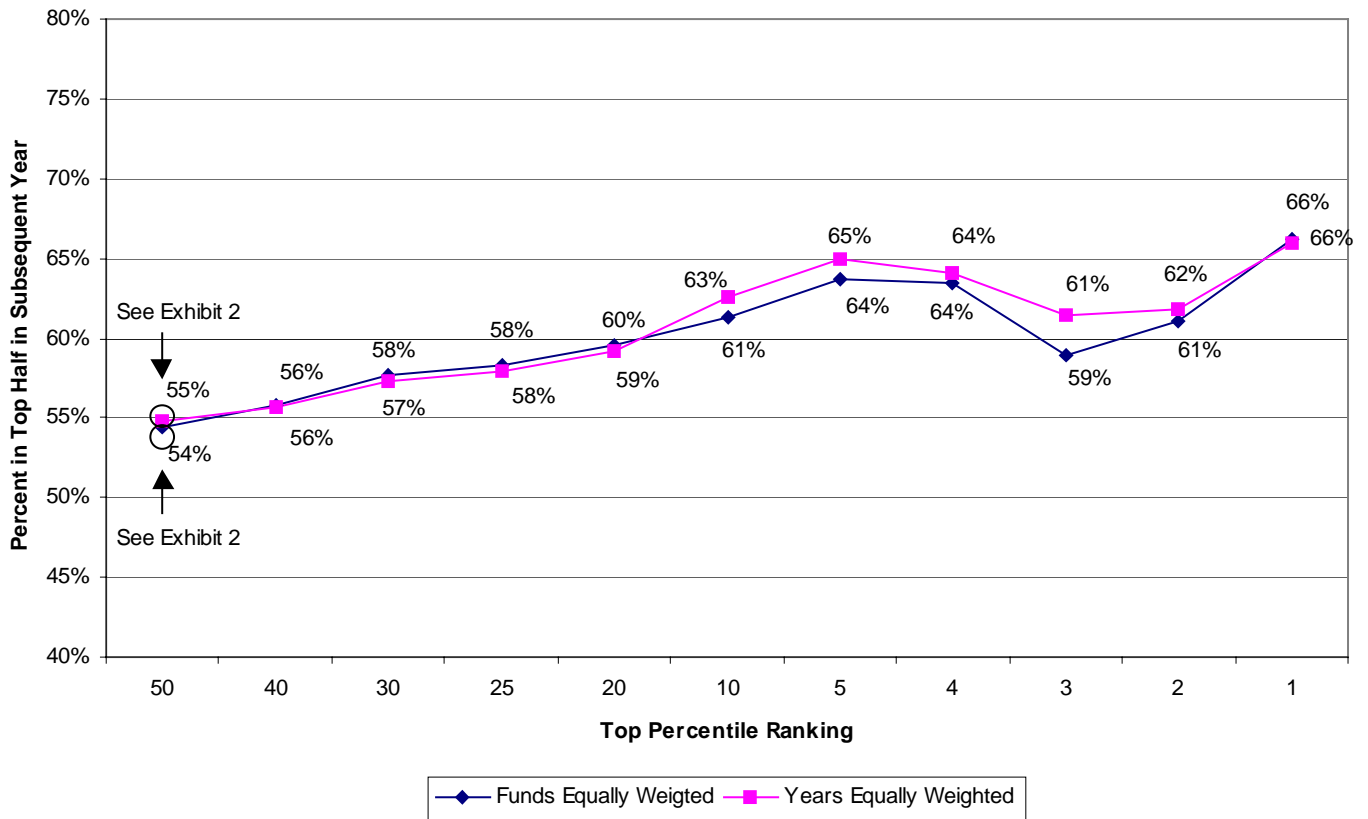
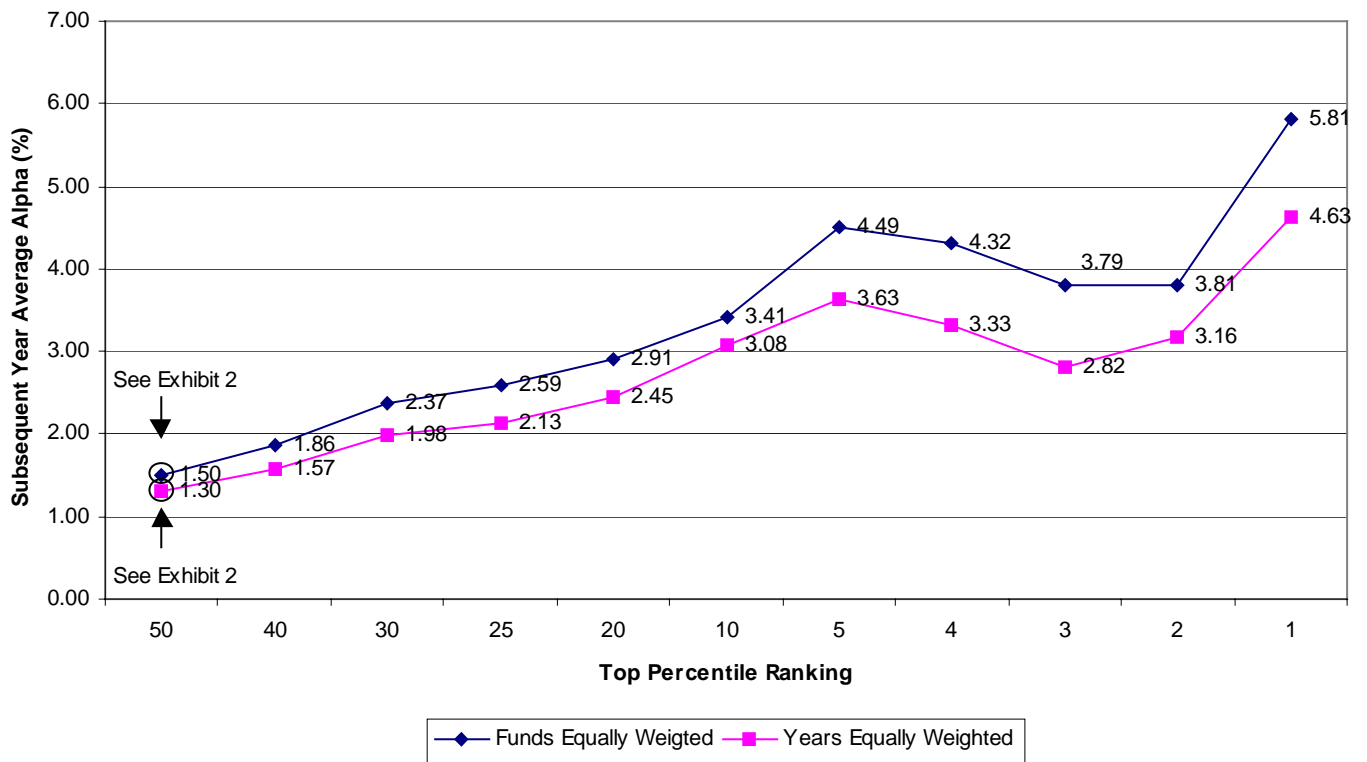


Exhibit 9. Top Performers: Percent of Funds in Top Half in Subsequent Year 1979-2000



**Exhibit 10. Top Performers: Subsequent Year Average Alpha 1979-2000**





**Exhibit 11. Relative Performance Results**

Initial Winner: Top Percentile Ranking	Subsequent Performance		Total Number of Initial Winners Across the Years
	Years with Average Positive Alpha (win-loss-tie)	Years with Majority in Top Half (win-loss-tie)	
50%	14-8	17-5	8,042
40%	16-6	16-5-1	6,437
30%	16-6	15-7	4,827
25%	16-6	15-7	4,020
20%	16-6	15-6-1	3,221
10%	17-5	17-5	1,607
5%	16-6	17-5	805
4%	16-6	16-6	644
3%	16-6	13-6-3	455
2%	13-9	13-8-1	321
1%	15-7	15-6-1	160

**Exhibit 12. Selected Relative Strategy: Initial Rank in Top 5%**

<b>Subsequent Relative Performance</b>	<b>Initial Rank in Top 5%</b>
Composite Percent Winners (Rank in Top Half): Funds Equally Weighted	64%
Composite Percent Winners (Rank in Top Half): Years Equally Weighted	65%
Years with Average Positive Alpha (win-loss-tie)	16-6
Years with Majority in Top Half (win-loss-tie)	17-5
Composite Alpha: Funds Equally Weighted	4.49%
Composite Alpha: Years Equally Weighted	3.63%
Total Number of Initial Winners (Rank in Top Half) Across the Years	805

Exhibit 13. Initial Period Top 5%

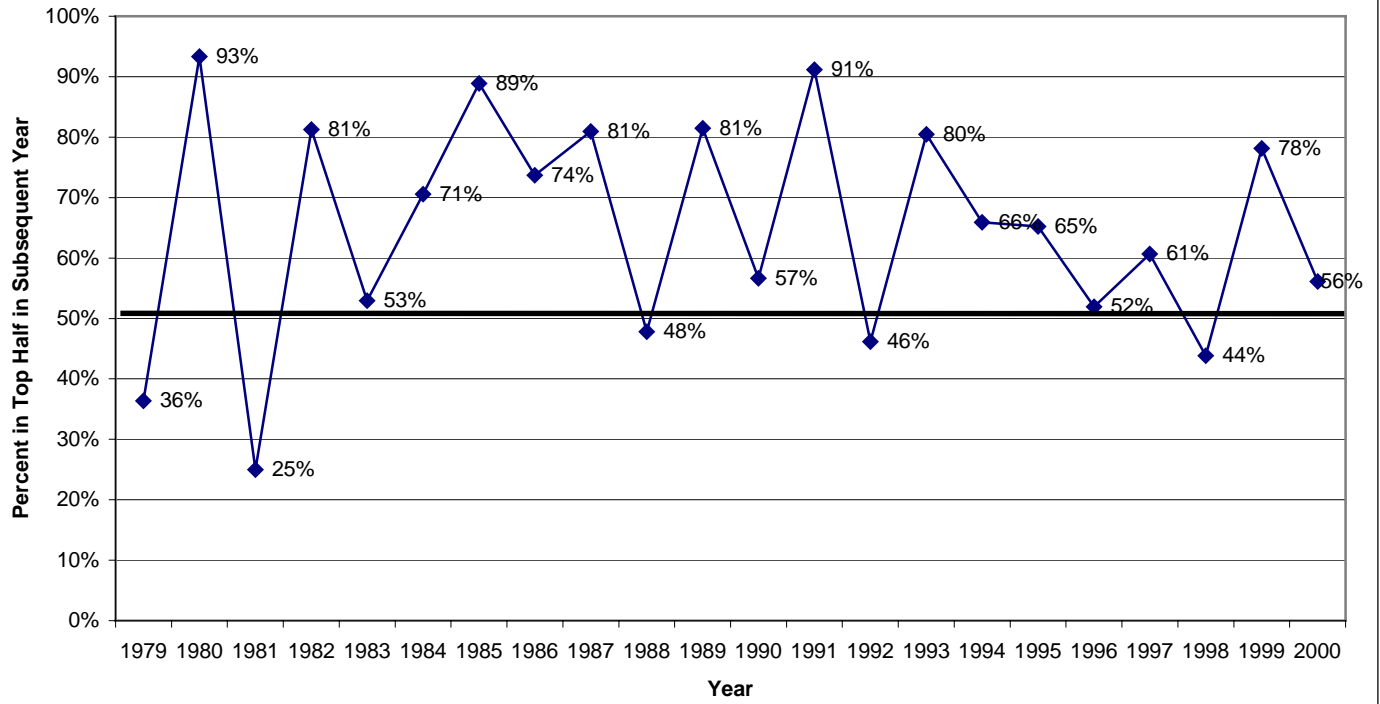
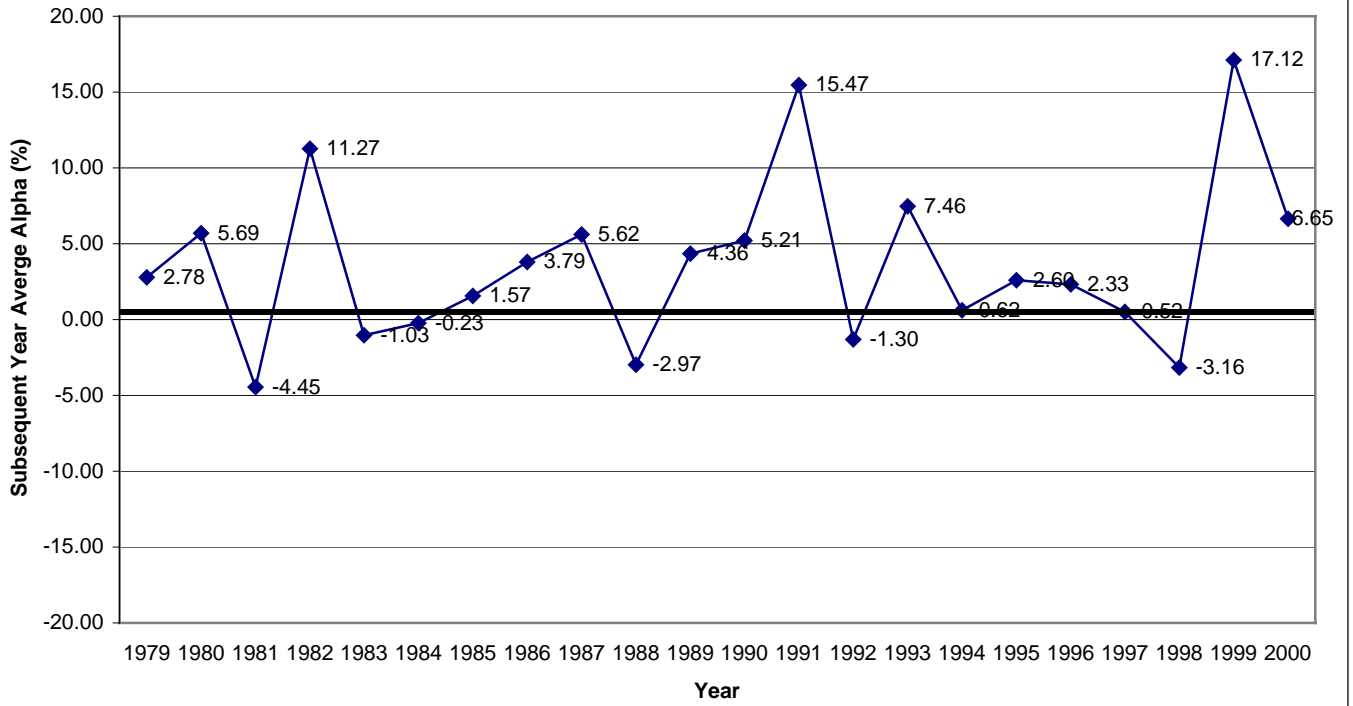


Exhibit 14. Initial Period Top 5%



## Endnotes

The authors thank Daniel Kleynerman for help with data management.

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<sup>1</sup> Returns-based style analysis was developed by Sharpe [1992].

<sup>2</sup> We cannot entirely eliminate all the sources of survivorship bias because some funds die during the subsequent (out of sample) year when they might have been included in our analysis.

<sup>3</sup> Returns-based style analysis is a method used to examine the performance of a fund in relation to a number of benchmarks. Style analysis does not show the actual holdings of the fund. The return behavior of a fund is measured and attributed to any number of selected benchmarks. Ideally, the set of benchmarks should fully reflect the investing universe, but be mutually exclusive. Returns-based style analysis is a quadratic programming approach similar to a multiple regression. This approach incorporates two constraints: first, coefficients must sum to 100 percent and second, coefficients must be positive. Negative coefficients can be interpreted as short positions in asset classes. This type of strategy is rarely used by the funds examined, and prohibiting these coefficients provides better, more usable results.

<sup>4</sup> Note that the number of funds ranked in the top half (8,042) is greater than the number of funds with positive alphas (7,754) from the previous section. This is because some of the top half ranked funds had negative alphas.

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