Short-Run and Long-Run Persistence in Mutual Funds

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The goal of mutual fund selection is to improve an investor's odds of earning a good return on investment. And investors can make more informed choices if they understand the relationship between past and future fund performance.

Many researchers have presented evidence of short-run persistence in equity mutual fund returns. Some of these results are criticized as subject to a survivorship bias (see Brown et al. [1992]). More recent work on fund persistence, however, uses only survivorship bias-free samples.

Goetzmann and Ibbotson [1994] examine 728 Ibbotson Associates and Morningstar mutual funds, and find that past returns and relative rankings are useful in predicting future returns and rankings. Elton, Gruber, and Blake [1996] and Gruber [1996] replicate the Goetzmann and Ibbotson findings in an investigation of Wiesenberger's Mutual Funds Panorama.

Other researchers, however, have been able to confirm the presence of performance persistence only over specific periods of time. Malkiel [1995] examines all Lipper Analytic Services equity mutual funds from 1971 through 1991, and finds persistence during the 1970s, but not the 1980s. Brown and Goetzmann [1995] use 829 Wiesenberger mutual funds, and confirm that persistence depends on the time period under study.

Carhart [1997] examines the CRSP Survivor-Bias Free U.S. Mutual Fund Database to show that persistence in mutual fund performance is attributable partly to common factors in stock returns and investment expenses.

To study persistence in relative performance in equity mutual funds from period to period, researchers customarily:

1. Group funds on the basis of previous year performance.
2. Hold the funds for a subsequent period of at least one year.
3. Compare the funds for performance during that subsequent year.

The premise of our research is that if mutual fund performance persists in the short run, it should also persist in the long run. Our rationale is straightforward. If current-year performance persists into the next year, and next-year performance persists into the subsequent year, then current-year performance must influence subsequent-year performance. The implication is that investors can benefit by selecting mutual funds on the basis of both lagged short- and long-run performance.

Our results confirm this notion by establishing that mutual funds with strong short- and long-run performance have strong subsequent-year performance.

EXHIBIT 1

Classification of Funds by One-Year and Three-Year Lagged Performance

Classification		One-Year Lagged Performance		
		Loser	Middle	Winner
Three-Year Lagged Performance	Loser	LTL	LTM	LTW
	Middle	MTL	MTM	MTW
	Winner	WTL	WTM	WTW

DATA AND FUND CLASSIFICATION BY PERFORMANCE

To test the validity of our proposition, we employ the January 1961 through June 2000 monthly equity fund returns from the CRSP Survivor-Bias Free U.S. Mutual Fund Database. The sample consists of 3,316 funds, including 1,068 aggressive growth funds, 1,021 growth and income funds, and 1,227 long-run growth funds. We include defunct funds until they disappear from the database.

Before measuring and comparing fund performance, we apply the Carhart [1997] model to adjust for risk. A fund's risk-adjusted performance is based on the intercept (Jensen's alpha) of Carhart's model, which is based on four factors:¹

1. Excess return on a value-weighted aggregated market proxy.
2. Difference between the returns of small-cap and large-cap stock portfolios.
3. Difference between the returns of growth and value stock portfolios.
4. Difference between the returns of past winner and past loser stock portfolios.

We group the mutual funds according to a combination of their one-year and three-year lagged alphas. At a given time, the one-year and three-year alphas are based on data from the three-year period ending one and three years ago, respectively. For example, the one-year lagged alpha for January 1, 1966, would be calculated using data from the three-year period January 1, 1963–December 31, 1965. Similarly, the three-year lagged alpha for January 1, 1966, would be calculated using data from the

three-year period January 1, 1961–December 31, 1963. For each lagged alpha, we define three categories: loser (0–33rd percentile), middle (34th–66th percentile), and winner (67th–100th percentile).

Exhibit 1 shows the portfolios derived from the one-year and three-year alpha categories (loser, middle, and winner). There are nine portfolios, each associated with one of the $3 \times 3 = 9$ combinations. Each portfolio is assigned a three-letter code xTy , where x denotes three-year lagged performance (L = loser, M = middle, W = winner), and y denotes one-year lagged performance. For example, the LTM portfolio consists of funds that are three-year lagged losers ($x = L$) and one-year lagged middles ($y = M$). A similar classification is used by Elton, Gruber, and Blake [1993], who construct ten fund portfolios based on the one-year lagged alpha.

Exhibit 2 presents time series averages based on the annual cross-sectional statistics of the funds in each of the nine portfolios. The first column shows the total net asset value. At \$467.2 million and \$179.5 million, respectively, the MTM and LTW portfolios have the highest and lowest asset values.

The second column shows the average turnover. The highest and lowest turnover rates are in the LTL and MTM portfolios. The low turnover among MTM funds can be attributed to the high asset value of the MTM portfolio, since turnover is defined as the minimum of either aggregate purchases of securities or aggregate sales of securities, divided by the average total asset value.

The third column shows the average total load. At 4.726% and 4.163%, the MTM and WTL portfolios have the highest and lowest total loads.

The last column displays the average expense ratio. The LTW average expense ratio is the highest (1.027%), and the MTM average expense ratio is the lowest (0.877%).

EXHIBIT 2

Summary Statistics for Nine Sample Portfolios

Portfolios	Average Total Net Asset (Millions)	Average Turnover Rate (%)	Average Total Load (%)	Average Expense Ratio (%)
LTL	225.156	79.427	4.312	0.991
LTM	288.531	68.186	4.357	0.934
LTW	179.530	72.745	4.243	1.027
MTL	301.182	70.222	4.557	0.921
MTM	467.246	61.986	4.726	0.877
MTW	338.263	69.444	4.292	0.962
WTL	311.326	73.653	4.163	1.005
WTM	338.012	67.534	4.474	0.928
WTW	330.807	73.423	4.313	0.999

ANALYSIS

We hold these constructed portfolios for one year and calculate the equally weighted average monthly returns for each portfolio. After iterating the procedure for the years 1966 through 2000, we can compare performance of the nine portfolios. Once again, we use Jensen's alpha from Carhart's four-factor model to characterize portfolio performance.

Exhibit 3 compares the realized mean returns and Jensen's alphas across portfolios. Panel A compares the funds classified by past short- and long-run performance. The first column shows the realized mean returns. The LTW, MTW, and WTW portfolios record much higher realized mean returns than the other six portfolios; the WTW portfolio posts the highest mean return (1.1124%). While the LTW and MTW mean returns exceed 1%, they are lower than the WTW mean returns. The mean returns of the other six portfolios are all lower than 1%.

The standard deviations (shown in parentheses) vary with the mean returns; portfolios with high realized mean returns tended to exhibit high standard deviations. Thus, it is not surprising that the LTW standard deviation is the highest.

The second column in Panel A shows Jensen's alphas. The LTW, MTW, and WTW alphas exceed those of the other portfolios; the largest by far is the WTW alpha (0.2151%). The LTL and MTL portfolios have negative alphas. These results imply that subsequent-year performance is predicted not only by past short-run perfor-

mance, but also by past long-run performance.

Robust standard errors for the Jensen's alphas in Exhibit 3 are given in parentheses.² The errors tell us that the LTW, MTW, and WTW alphas are different from zero at the 5% significance level.

The last column provides 95% robust confidence intervals for the Jensen's alphas. We conclude from the confidence intervals that the WTW alpha is significantly higher than the LTL and MTL alphas, and that the LTW alpha is significantly higher than the MTL alpha.

Panel B of Exhibit 3 compares the average subsequent-year performance of funds based only on past short-run performance. Both the realized mean returns and Jensen's alphas of the winner portfolio are higher than those of the loser and middle portfolios. Moreover, only the winner alpha is significantly different from zero. The one-year lagged loser portfolio exhibits the lowest realized mean return and Jensen's alpha. The robust confidence intervals in the last column show the winner alpha is significantly higher than the loser alpha.

These findings are in keeping with several earlier studies of short-run persistence, such as Carhart [1997], Elton, Gruber, and Blake [1996], Goetzmann and Ibbotson [1994], and Hendricks, Patel, and Zeckhauser [1993].

Panel C of Exhibit 3 compares the average subsequent-year performance of the funds based only on past long-run performance. The means exhibit the same general behavior as in Panel B. The three-year lagged winner has the highest realized mean return, and the three-year lagged loser the lowest.

EXHIBIT 3

Subsequent-Year Realized Mean Returns and Jensen's Alphas

Panel A: Combined Past Short-Run and Long-Run Performance

Portfolio	Mean (%)	Jensen's Alpha (%)	95% Confidence Interval
LTL	0.8782 (4.5998)	-0.0174 (0.0589)	-0.00133 0.00098
LTM	0.9778 (4.0992)	0.0777 (0.0409)	-0.00002 0.00158
LTW	1.0447 (4.7996)	0.1847 (0.0700)*	0.00048 0.00322
MTL	0.8786 (4.5043)	-0.0727 (0.0533)	-0.00177 0.00032
MTM	0.9956 (4.1699)	0.0280 (0.0335)	-0.00038 0.00094
MTW	1.0286 (4.3772)	0.1207 (0.0502)*	0.00022 0.00219
WTL	0.9358 (4.5282)	0.0171 (0.0592)	-0.00099 0.00133
WTM	0.9938 (4.4395)	0.0601 (0.0345)	-0.00007 0.00128
WTW	1.1124 (4.5709)	0.2151 (0.0475)*	0.00122 0.00308

Panel B: One-Year Lagged Jensen's Alpha Fund Classification

Portfolio	Mean (%)	Jensen's Alpha (%)	95% Confidence Interval
Loser	0.8975 (4.4971)	-0.0243 (0.0444)	-0.00111 0.00063
Middle	0.9891 (4.2114)	0.0553 (0.0269)	0.00003 0.00108
Winner	1.0658 (4.5362)	0.1735 (0.0445)*	0.00086 0.00261

Panel C: Three-Year Lagged Jensen's Alpha Fund Classification

Portfolio	Mean (%)	Jensen's Alpha (%)	95% Confidence Interval
Loser	0.9669 (4.4425)	0.0817 (0.0420)	-0.00001 0.00164
Middle	0.9676 (4.3144)	0.0254 (0.0335)	-0.00040 0.00091
Winner	1.0179 (4.4678)	0.0974 (0.0357)*	0.00027 0.00167

* Values are different from zero at the 5% significance level.

The Jensen's alpha results are mixed. Although the winner portfolio remains the top performer (0.0974%), the middle and loser portfolios swap positions, so that the loser becomes second-best (0.0254%), and the middle becomes the worst (0.0817%). This pattern can be explained in terms of the Panel A results, where the LTW alpha (0.1847%) far exceeds the MTW alpha (0.1207%). In the following year, the three-year lagged winner alpha is higher than the three-year lagged middle and loser alphas. The differences between the alphas of the three portfolios in Panel C are not significant, however.

MUTUAL FUND SELECTION ACCORDING TO PRIOR PERFORMANCE

Numerous studies provide evidence of short-run persistence in mutual funds. If current-year performance

persists into the next year, and next year's performance persists into the subsequent year, then previous-year performance must influence subsequent-year performance. When we categorize funds on the basis of both short- and long-run performance (one-year and three-year lagged alphas), we show that funds with strong both short- and long-run performance significantly outperform funds with weak both short- and long-run performance.

We conclude that investors can benefit from selecting mutual funds on the basis of both short- and long-run performance.

ENDNOTES

¹Thanks to Kenneth French for providing these data.

²The robust standard errors are estimated following Newey and West [1987]. The lag on sample autocovariances is set to 4.

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