PERSISTENCE IN MUTUAL FUND RETURNS: AN EXAMINATION OF U.S. GROWTH MUTUAL FUNDS FROM 1988-1996

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ABSTRACT

There have been a number of studies examining whether mutual fund performance persists. Researchers using various models of regression analysis report conflicting findings. This study proposes a simpler approach – a direct annual examination of whether a fund beat the market proxy or not. As per prior research, the S&P 500 is chosen to represent the market. The sample consists of 943 mutual funds over the nine-year study period, with a low of 186 funds in 1988 to a high of 636 funds in 1996. A look at one-year persistence shows both outperformance and underperformance from 1989 to 1996. It is seen that the percentage repeat winners exceeds repeat losers in 6 out of 8 years, the exceptions being 1990 and 1996. This result supports the earlier findings of a "hot hands" phenomenon reported by Hendricks, Patel and Zeckhauser (1993) and Goetzmann and Ibbotson (1994). The two years when losers are greater in repeat percentage, 1990 and 1996, are preceded by years in which the market benchmark had very high returns. The implication is two-fold: losers in really good years, on average, are far more likely to repeat their performance, and winners in really good years are less likely to repeat their performance. While survivorship bias is acknowledged, an examination of the 186 funds that have returns for the entire study period shows that 4 funds achieved a nine-year winning streak. The winning performance is still evident after adjusting for risk. The percentage of funds that have a perfect winning record are far higher than would be expected assuming that mutual fund performance is a random occurrence.

Keywords: Equity Growth Mutual Funds, Performance, Performance Persistence, Winners and Losers, Outperformance, Underperformance

1. INTRODUCTION

There has been much debate about mutual fund performance - especially about the persistence of excess returns. Recent articles on one hand suggest performance does not persist, except in the very short-term (Carhart, 1997), while others demonstrate performance persists such that past performance can be a predictor of future performance (Gruber, 1996), (Elton, Gruber and Blake, 1996).

Prior research tests performance of samples of mutual funds, typically concentrating on common stock mutual funds. In measuring performance, studies control for the differences in objectives and assets held by the funds by including indices as control variables in the model (Gruber, 1996), (Carhart, 1997).

Research on persistence in performance has examined samples of mutual funds in various ways. These studies control for differences in objectives by including appropriate control variables in the regression analysis. Also, the tests are made more robust by using conditional performance evaluation and including net cash flow on a sector-wide basis (Ferson and Warther, 1996), (Gruber, 1996).

This study, however, proposes a simpler approach. The performance and the persistence of mutual fund performance is determined by whether a fund outperforms or underperforms a chosen market benchmark on an annual basis. The sample is examined over the period 1988-1996. Firms in the sample have their stated investment objective as growth equity.

2. LITERATURE REVIEW

Gruber (1996) states that, on average, actively managed funds reveal negative performance. The author presents empirical evidence to support persistence in mutual fund performance and that investors chase past performance. Further, this study also determines that the new cash flows underperform. This result may be explained by the existence of two clienteles, only one of which consists of sophisticated, informed investors.

Carhart (1997), on the other hand, determines that the performance of mutual funds does not persist in the long-term. The author's sample supports Hendricks, Patel and Zeckhauser's (1993) results of a short-run persistence in stock returns. The author also finds persistence in poor performance by the lowest decile of fund performers.

Warther (1995) finds that aggregate security returns are highly correlated only with the unexpected cash flows into mutual funds. The author also finds a positive relation exists between cash flows and subsequent returns, and a negative relation between returns and subsequent cash flows.

Malkiel (1995) presents two important findings for a sample of equity mutual funds examined from 1971 to 1991:
1) In the aggregate, funds underperformed the market, with the S&P 500 as the benchmark. The author obtains similar results using the Wilshire 5000 and the average general equity mutual fund as benchmarks.
2) Significant survivorship bias exists, which may be leading to an erroneous finding of performance persistence.

Ferson and Schadt (1996) and Ferson and Warther (1996) incorporate lagged market-indicator variables as explanatory variables to perform conditional performance evaluation. These studies conclude that prior studies may have inferred spurious inferior performance. Authors state this is due to a negative covariance between mutual fund betas and the conditional expected market return. Modigliani and Modigliani (1997) make a case for viewing performance on a risk-adjusted basis, a factor also taken into account by Elton, Gruber and Blake (1996).

In short, previous studies using regression analysis to determine performance and performance persistence report conflicting findings.

3. DATA & METHODOLOGY

The initial sample of mutual funds used in this study consists of all available growth mutual funds return data from Lipper Associates over the period 1978 to 1996. However, the period of study is defined as 1988 to 1996. First, in the early part of the data, the number of funds is limited. Secondly, between 1978-1987 and 1988-1996, investor psychology and net cash flows into the market have been very different. Fant and O'Neal (2000) provide evidence that the relation between mutual fund performance and fund flows has changed over time; specifically documenting that the two periods 1978-1987 and 1988-1997 have been different in terms of determinants of mutual fund flows. Lastly, having the 1987 data in the sample may tend to skew the results. The final sample consists of 943 mutual funds over the nine-year study period, with a low of 186 funds in 1988 to a high of 636 funds in 1996.

To determine performance, a fund is designated as a winner in a year it outperforms the market benchmark, and as a loser if it underperforms the benchmark. The benchmark chosen is the S&P 500's simple annual return. Instead of using the dividend reinvested annual return, the simple annual return for year 't' is calculated as the percentage change in the year-end index value from year 't-1' to year 't'.

4. RESULTS

Table 1 presents the annual return and standard deviation statistics for the sample, as well as the number of funds with data available in each year. As Table 1 shows, there was steady growth in the number of funds with return data available over the period 1988-1996.

TABLE 1: ANNUAL STATISTICS OF GROWTH FUNDS: 1988-1996

YEAR	MEAN		STD.DEV		N
1988	14.97		8.38		186
1989	27.79		8.19		196
1990	-4.26		6.52		208
1991	37.23		13.66		226
1992	8.57		6.94		257
1993	11.18		8.18		324
1994	-1.70		5.75		415
1995	31.02		8.33		532
1996	19.54		7.02		656

Given above are the annual mean returns and standard deviations for a sample of 943 U.S. equity mutual funds with "Growth" as the fund objective.

Table 2 examines performance and compares the mean annual return between the two sub-samples designated as underperformers and outperformers. The smallest difference between group performance is 7.95% (1994) and the greatest difference is 19.14% (1991). The difference in mean returns between these two groups is highly significant each year, both statistically and economically.

TABLE 2 :ANNUAL STATISTICS FOR FUNDS BASED ON COMPARISON WITH S&P 500

	UNDERPERFORM			OUTPERFORM			
YEAR	MEAN	STD. DEV	N	MEAN	STD. DEV	N	T-STAT
1988	-6.77	5.07	68	6.08	5.79	118	-13.93
1989	-7.17	4.50	92	5.34	4.77	104	-16.54
1990	-6.31	5.04	64	4.84	3.30	144	-12.83
1991	-6.22	3.87	44	12.92	11.19	182	-16.90
1992	-3.80	2.62	68	5.81	5.52	189	-16.88
1993	-5.18	3.52	107	7.52	5.65	217	-22.40
1994	-4.88	4.17	199	3.07	3.53	216	-18.73
1995	-8.14	6.33	339	3.87	4.00	193	-24.47
1996	-5.50	4.74	356	3.70	5.08	300	-22.35

Given above are the statistics for the sample of growth mutual funds, by year, based on whether the fund managed to beat the simple annual S&P 500 return (outperform) or not (underperform). The last column gives the T-statistic for the significant difference of means test.

Table 3 presents a look at one-year persistence in both outperformance and underperformance from 1989 to 1996. It shows that the percentage repeat winners exceeds repeat losers in 6 out of 8 years, the exceptions being 1990 and 1996. Thus, Table 3 demonstrates that both winners and losers in any given year show a high percentage of repeating their performance the next year. This result supports the earlier findings of a "hot hands" phenomenon reported by Hendricks, Patel and Zeckhauser (1993) and Goetzmann and Ibbotson (1994). The two years when losers are greater in repeat percentage, 1990 and 1996, are preceded by years in which the market benchmark had very high returns. The implication is two-fold: losers in really good years, on average, are far more likely to repeat their performance, and winners in really good years are less likely to repeat their performance.

TABLE 3: PERSISTENCE OF FUND PERFORMANCE: 1988-1996

			REPEAT		PERCENT REPEAT	
YEAR	WINNER	LOSER	WINNER	LOSER	WINNER	LOSER
1988	118	68				
1989	104	92	56	26	53.8	28.3
1990	144	64	78	38	54.2	59.4
1991	182	44	117	13	64.3	29.5
1992	189	68	130	7	68.8	10.3
1993	217	107	147	38	67.7	35.5
1994	216	199	118	46	54.6	23.1
1995	193	339	91	131	47.2	38.6
1996	300	356	112	214	37.3	60.1

Given above are the actual number of winners and losers in each year (columns 2 and 3); columns 4 and 5 show the one-year persistence for both winning (outperforming) and losing (underperforming). The last two columns show the one-year persistence in percentage terms of that year's performance – for example, in 1989 of the 104 winners – 56 (53.8%) were repeating for the second year.

Table 4 divides the sample into two sub-samples based on survivorship. Panel A presents statistics for the 186 mutual funds that existed for the entire nine years of the study period. Panel B presents similar statistics for the 757 funds that have between one year and eight years of data available. As reported by Malkiel (1995), the sample in this study also exhibits significant survivorship bias. The difference of means between the two groups is highly significant in each year from 1988 to 1996, with the lowest T-statistic being –3.56 (1994) to the highest being 44.91 (1989). However, there exists a fundamental difference between this sample and the proposed cause for bias as mentioned by Malkiel (1995). In the period 1971-1991, Malkiel states that funds that underperformed frequently were unlikely to survive; hence the surviving firms (which may have made riskier bets that paid off) would show biased performance, as well as persistence. In the period under study here, 1988-1996, the number of growth funds increased steadily (Table 1). None of the 757 non-surviving funds were in existence in 1988. Closer examination of these 757 firms shows that 118 of them have return data for 1996 only. Thus, the survivorship bias is due to the fact that the later entrants in the growth fund category as a group seem to have significantly underperformed the survivor group.

TABLE 4: PANEL A: FUNDS WITH RETURN DATA FOR EACH YEAR, 1988-1996

YEAR	MEAN	STD. DEV	MIN	MAX
1988	14.97	8.38	-25.85	42.44
1989	27.76	8.15	2.84	54.77
1990	-4.55	6.70	-43.80	10.43
1991	37.61	13.77	7.89	99.08
1992	8.37	6.62	-7.38	36.80
1993	11.85	7.54	-7.81	31.11
1994	-2.09	6.24	-37.10	15.75
1995	31.33	8.56	-28.21	49.32
1996	18.80	7.21	-30.36	38.43

Given above are the statistics for the "survivorship bias" group, that is, the funds that have lasted over the entire study period.

TABLE 4: PANEL B: FUNDS WITHOUT RETURN DATA FOR EACH YEAR, 1988-1996

YEAR	MEAN	STD. DEV	MIN	MAX
1988	0.00	0.00	0.00	0.00
1989	0.37	3.39	0.00	38.36
1990	-0.06	0.79	-15.51	3.13
1991	1.87	8.48	0.00	67.64
1992	0.85	3.55	-3.44	48.90
1993	1.88	5.50	-24.78	39.96
1994	-0.42	2.99	-19.85	20.91
1995	14.10	16.35	-9.52	64.60
1996	12.32	11.07	-17.70	61.99

Given above are the statistics for the "non-survivorship bias" group, funds that were not in existence for the entire study period. 118 firms have return data for 1996 only.

Given that survivorship bias exists, it is still interesting to examine if any funds managed to achieve a 1.000 batting average. Of the 186 firms in Table 4 Panel A, 4 firms have a nine-year winning streak over the market benchmark. However, it is possible that the funds were riskier than the market, as these returns are not risk-adjusted returns. In keeping with Modigliani and Modigliani (1997), both the Sharpe ratio and the Risk Adjusted Performance (RAP) measure is calculated for the funds and the market. As Modigliani & Modigliani (1997) point out, the RAP measure is easier to interpret as it shows the under- or out-performance of the fund against the benchmark in basis points.

Thus, Table 5 calculates the Sharpe ratio and the RAP, for these four perfect winners and compares them to the S&P 500. The one-year T-bill rate is taken over the period 1988-1996, and then averaged to calculate the risk adjusted fund returns. Table 5 shows that even after adjusting for risk, all four perfect winners outperformed the market. One way to look at this result is on a repeat performance basis, that is, there are 118 winners in 1988 of which 4 manage to repeat the winning performance each year for the next 8 years (3.39% of initial winning sample). Another way to look at the result is of 186 initial funds in 1988, 4 funds manage to achieve nine years of winning performance (2.15% of initial sample). Now assume an investor has no way of determining *a priori* which funds will be winners or losers in any given year, and so assumes a 50/50 probability (i.e. either outcome equally likely). Next, assume that there is no persistence in performance, whether positive or negative. If prior year's results have no influence on current year performance, for each fund either winning or losing is equally likely for each of the nine years in the study period. Thus, achieving an eight-year winning streak has a 0.39% probability, while a nine-year winning streak has a 0.20% probability.

TABLE 5: RISK-ADJUSTED PERFORMANCE OF PERFECT WINNERS

	SHARPE RATIO	SHARPE RANK	RAP	RAP RANK
FUND 1	0.893	3	18.529	3
FUND 2	1.008	2	20.142	2
FUND 3	0.775	4	16.878	4
FUND 4	1.009	1	20.162	1
S&P 500	0.552	5	13.749	5

Given above is the ranking performance of the 4 mutual funds in the sample that had a perfect winning streak, that is, they outperformed the S&P 500 in each year of the study. It is seen that for all 4, the outperformance holds even after adjusting for risk.

5. CONCLUSION AND SUMMARY

Earlier studies propose various specifications for the most appropriate regression equation to determine whether persistence in mutual fund performance persists. Typically, the alpha from the regression being positive and significant is taken to indicate the presence of superior performance. However, these studies present conflicting results.

This study examines the returns on a sample of growth mutual funds over the period 1988-1996. Instead of performing regression analysis, the sample is examined on a year-by-year basis to identify winners and losers. The determination of winning/losing is based on a fund outperforming/underperforming a market benchmark. The S&P 500 is chosen as the benchmark, as earlier studies have done likewise (Malkiel, 1995), (Ferson and Warther, 1996).

For the sample examined over the period 1988-1996, it is seen that from 1988 to 1994, winners outnumber losers each year. In the last two years, 1995 and 1996, losers are greater in number. A closer look reveals that a large number of the losers in these two years are recent additions to the sample. For example, of the 356 losers in 1996, 56 funds (15.7% of the year's losers) have only this one-year of return data.

While survivorship bias is acknowledged, an examination of the 186 funds that have returns for the entire study period shows that 4 funds achieved a nine-year winning streak. The winning performance is still evident after adjusting for risk. The percentage of funds that have a perfect winning record are far higher than would be expected assuming that mutual fund performance is a random occurrence.

In years when the market benchmark earns a high return, the losers (underperformers) in that year seem more likely to repeat their poor performance the following year. Also, winners are less likely to repeat their performance in years following high market returns.

In conclusion, the sample of mutual funds examined over the period 1988-1996 shows both significant positive performance as well as persistence in performance. Persistence in positive performance outweighs persistence in negative performance. Of the 186 funds that survive the entire study period, 11 funds have four-year losing streaks and only 3 have five-year losing streaks.

However, given the change in market dynamics, in terms of funds flows and increased number of new funds in recent years, this past persistence in performance may not carry over into the future.

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