

# Truth in Mutual Fund Advertising: Evidence on Future Performance and Fund Flows

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## ABSTRACT

We examine a sample of 294 mutual funds that are advertised in *Barron's* or *Money* magazine. The preadvertisement performance of these funds is significantly higher than that of the benchmarks. We test whether the sponsors select funds to signal continued superior performance or they use the past superior performance to attract more money into the funds. Our analysis shows that there is no superior performance in the postadvertisement period. Thus, the results do not support the signaling hypothesis. On the other hand, we find that the advertised funds attract significantly more money in comparison with a group of control funds.

THERE HAS BEEN TREMENDOUS GROWTH in the number of mutual funds and the total assets under their management in the last two decades. Many studies have indicated that mutual funds, on average, underperform relative to the market and various other benchmarks.<sup>1</sup> However, the average underperformance does not preclude the possibility of superior performance by a select group of mutual funds. Whether a select group of mutual funds can consistently exhibit superior performance continues to be of considerable interest to both academics and practitioners.

In this paper, we examine the performance and fund flows to open-end equity mutual funds that are advertised in *Barron's* or *Money* magazine. By using a sample of advertised mutual funds, we accomplish two main objectives. Our first main objective is to test whether mutual fund advertisements are used to signal superior management skills. This is accomplished by examining the performance of the mutual funds in the postadvertisement period. Since all the advertisements furnish past performance data, we expect the advertised mutual funds to exhibit above-normal performance in the period *prior* to the advertisements. The postadvertisement superior per-

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<sup>1</sup> Jensen (1968) and many other researchers since then have found that mutual funds, on average, underperform benchmark portfolios with equivalent risk.

formance would arise when the sponsors possess information about the skills of the mutual fund managers and decide to signal the high quality through advertising. If the mutual funds exhibit superior performance in the post-advertising period, we can conclude that superior skills exist and the sponsors use advertising to signal higher quality.<sup>2</sup>

Note that advertising is arguably an appropriate signal because advertising is expensive. Advertising is expensive not only because of the direct cost of advertising but also because poor performance subsequent to advertising could indirectly impose costs as an implicit promise of superior performance is not met. However, only an empirical analysis can provide us with an answer to the question of whether advertising is indeed used as a signal by the mutual fund sponsors.

Our second main objective is to test whether advertising is used to attract more money to the mutual funds. Advertising may influence fund flows if investors believe that past performance will continue. Advertising may also help to improve fund flows for other reasons, such as reduction in search costs for the investors (Sirri and Tufano (1998)). If the advertised mutual funds exhibit superior performance in the postadvertisement period, that results would support the signaling hypothesis and suggest that superior mutual fund management skills exist. If the performance is not superior but the fund flows are larger, the empirical results would be consistent with the hypothesis that advertisements are used to attract more money and there is no performance-related signal in advertising.<sup>3</sup>

Our analysis is also important for investors who examine mutual fund advertisements for information and investment. In most of these advertisements, past performance is prominently displayed. If, after advertising, the advertised funds outperform the appropriate benchmarks, we would conclude that mutual fund advertisements could serve as a valuable information source for investors in identifying superior management skills. Since open-end equity mutual funds are available at net asset value, management ability cannot be incorporated in price; however, mutual fund sponsors may be able to communicate their superior mutual fund management skills to investors through advertisements. On the other hand, if the advertised mutual funds do not outperform the benchmarks, this would suggest that any expectations of continued superior performance from the advertised funds is misplaced. The lack of signaling about future superior performance does not

<sup>2</sup> Most previous researchers attempt to identify the existence of skill for superior performance by selecting a sample of mutual funds based on past performance. The results in various studies have not been uniform. For example, Grinblatt and Titman (1992), Hendricks, Patel, and Zeckhauser (1993), Goetzmann and Ibbotson (1994), Brown and Goetzmann (1995), Elton, Gruber, and Blake (1996a), and Gruber (1996) find persistence in mutual fund performance. On the other hand, Brown et al. (1992) and Malkiel (1995), among others, have questioned the persistence results on the grounds of survivorship bias.

<sup>3</sup> The two hypotheses are not necessarily mutually exclusive. It is possible that the results are consistent with both hypotheses. Since our results are not consistent with both hypotheses, we do not discuss this possibility in detail.

mean that the advertisements are completely noninformative. For example, Brown et al. (1992) indicate that there is persistence in the worst-performing funds. Hence, in that sense, there is information in advertising in that a fund that advertises is not likely to be among the worst.

We find that for a sample of 294 advertised mutual funds, the one-year preadvertising performance is significantly superior to the performance of the four benchmarks examined in this study. In the postadvertisement period, the advertised funds, on average, underperform significantly in comparison to the S&P 500 index. The average Jensen's alpha and the four-factor alpha are also significantly negative. The performance is not significantly negative only for the benchmark based on mutual funds with the same investment objective. Overall, superior performance of the mutual funds does not continue even for a sample of mutual funds that are self-selected by the mutual fund sponsors. The results are not consistent with the signaling hypothesis. We confirm that there is indeed truth to the often cited phrase, "past performance does not guarantee future results."

For the fund flows analysis, we form a control group. The control funds are matched with the sample funds on investment objective and performance in the year before advertisements. We use a regression framework to control for a number of additional explanatory variables. We examine the coefficient to a dummy variable that captures the effect of advertising on fund flows. After controlling for prior-period performance, prior-period fund flows, and fund size, we find that the dummy variable takes a significantly positive coefficient, indicating that fund flows to the advertised funds are significantly larger than fund flows to other funds with the same investment objective. Thus, it appears that the purpose of advertising is to attract new money to the advertised mutual funds.

The rest of the paper is organized as follows. The sample is described in Section I. Section II describes the four benchmarks used for computing benchmark-adjusted returns. Sections III and IV present results for the pre- and postadvertisement period mutual fund performance, respectively. In Section V, we present results from an analysis of fund flows in a regression framework after controlling for the effects of other variables that may affect fund flows. Section VI concludes this paper.

## I. The Sample

On July 12, 1994, the Securities and Exchange Commission (SEC) approved mutual fund advertising guidelines proposed by the National Association of Securities Dealers (NASD).<sup>4</sup> These guidelines, formed in response to increasing and sometimes misleading references to rankings in mutual fund advertisements, require funds to report performance over one, five,

<sup>4</sup> See notice number 94-60 issued by the NASD to its members. The NASD proposal was based on the rules proposed by the Investment Company Institute, the national association of the U. S. mutual fund industry.

and 10 years if the fund has been in existence for that time period. Furthermore, the time period must be at least one year long and must end with the latest calendar quarter and not with any arbitrarily chosen time period. Prior to establishment of the guidelines any arbitrarily chosen time period could potentially be used. In reporting the news, the *Wall Street Journal* (July 13, 1994) concludes that the changes make it harder for funds to claim being the number one performer in misleading ways or to use narrow categories. The new constraint provides us with a unique opportunity to study the sample of advertised mutual funds.

The sample consists of 294 open-end equity mutual funds advertised in *Barron's* or *Money* magazines from July 18, 1994 through June 30, 1996. The sample has been collected manually. It appears that adding more magazines or newspapers is unlikely to significantly increase the sample size because the same funds seem to be advertised in different magazines and newspapers. We exclude advertisements that do not report the past performance of any particular fund. We also exclude foreign country funds and sector funds to avoid selecting funds for reasons that seem to be entirely different from signaling superior management skills. For the purpose of future performance analysis, the sample is free from survivorship bias as it includes all of the advertised funds. For the performance results in the year prior to advertisements, there may be some bias due to survivorship. However, the bias is likely to be small in comparison with the reported results.<sup>5</sup>

Many of the mutual funds are advertised in both magazines and in time periods that are close to one another. To avoid multiple counting, we do not include a mutual fund more than once in a calendar quarter. In particular, for a given mutual fund, all the advertisements with the same past returns are counted as one observation. Furthermore, some of the mutual funds are advertised in two or more consecutive quarters. Since mutual funds are required to report past one-year returns, the time series of advertisements across quarters may not constitute independent observations. Thus, we also examine a reduced sample of 117 advertisements in which one mutual fund is counted only once (the first advertisement). All of our analyses are performed for the full sample of 294 funds and for the subsample of 117 funds.

Table I, Panel A, presents summary statistics for the full sample of 294 mutual funds. The funds are from eight different investment objective categories as documented by Morningstar, Inc., though they fall primarily in four of the categories: 134 (46 percent of 294) are classified as growth funds, 47 are growth and income funds, 35 are small company funds, and 32 are aggressive growth funds. The remaining four categories contain fewer than 20 funds each. The mean (median) size of the funds in terms of net assets

<sup>5</sup> We find that the preadvertisement performance of the mutual funds in our sample is higher than the various benchmarks by at least 1.0 percent and up to about 6.0 percent (Table II). Results in Carhart (1997a) show that the survivorship bias for one-year time periods is about 0.17 percent. Thus, our conclusions are not affected by the small amount of survivorship bias for the preadvertisement period.

**Table I**  
**Summary Statistics for Advertised Mutual Funds**

Investment objectives are according to Morningstar, Inc.'s classification. Net assets, expense ratio, life of fund, and manager tenure are end-of-year numbers before the advertisement. Net assets is the total amount of net assets under the management of a fund, in millions of dollars. Expense ratio is the percentage of fund assets paid for operating expenses and management fees, including 12b-1 fees, administrative fees, and all other asset-based costs incurred by the fund. Sales charges are not included in the expense ratio. Life of the fund is the number of years that the fund has been in existence. Manager tenure is the number of years that the current manager has managed the fund. Panel A presents the summary statistics for a sample of 294 mutual funds advertised in *Barron's* or *Money* magazine from July 18, 1994 through June 30, 1996. Panel B presents the summary statistics for a reduced sample in which each mutual fund is counted only once (the first advertisement). When only the first advertisement is considered, the sample size is reduced to 117. We present mean and median (in brackets) for each fund characteristic.

Investment Objective	No. of Obs.	Net Assets (\$millions)	Expense Ratio (%)	Fund Age (years)	Manager Tenure (years)
		Mean [Median]	Mean [Median]	Mean [Median]	Mean [Median]
Panel A: Full Sample (294 funds)					
Aggressive growth	32	2820.17 [965.40]	1.49 [1.27]	14.42 [9.96]	6.41 [6.63]
Asset allocation	6	116.66 [46.80]	1.28 [1.43]	3.92 [2.75]	2.90 [1.25]
Balanced	19	4269.11 [1063.40]	0.94 [0.91]	32.85 [47.20]	6.63 [7.17]
Equity-income	15	5078.38 [3905.78]	0.89 [0.88]	16.44 [9.90]	4.98 [3.42]
Growth	134	1726.55 [647.30]	1.19 [1.22]	13.41 [9.04]	4.66 [3.25]
Growth & income	47	1540.44 [373.7]	1.01 [0.99]	18.97 [9.50]	4.83 [4.00]
Multi-asset global	6	1874.01 [497.07]	2.13 [2.22]	2.58 [2.38]	2.58 [2.38]
Small company	35	601.25 [291.21]	1.27 [1.22]	10.77 [9.40]	6.17 [5.00]
All	294	1987.35 [596.85]	1.19 [1.10]	15.09 [9.32]	5.12 [3.75]
Panel B: Subsample (117 funds)					
Aggressive growth	11	1648.45 [388.41]	1.37 [1.17]	16.55 [12.80]	5.05 [4.00]
Asset allocation	3	129.09 [84.10]	1.29 [1.43]	4.25 [4.00]	3.22 [1.00]
Balanced	10	2562.67 [376.25]	0.96 [0.94]	23.00 [14.09]	5.27 [5.00]
Equity-income	4	3033.53 [3554.82]	0.97 [0.92]	12.27 [6.76]	3.63 [1.75]
Growth	52	1343.60 [422.85]	1.19 [1.19]	13.56 [8.75]	4.63 [3.13]
Growth & income	20	1049.19 [305.60]	1.07 [1.01]	20.67 [9.26]	4.43 [3.50]
Multi-asset global	2	4790.07 [4790.07]	1.66 [1.66]	3.38 [3.38]	3.50 [3.50]
Small company	15	393.79 [249.20]	1.39 [1.48]	9.37 [8.20]	5.97 [5.00]
All	117	1389.91 [338.97]	1.20 [1.14]	14.87 [8.50]	4.77 [4.00]

under management is \$1,987 (\$597) million with a mean (median) expense ratio of 1.19 percent (1.10 percent). The mean (median) life of the fund is 15.09 (9.32) years and the mean (median) tenure of the manager at the time of the advertisement is 5.12 (3.75) years.<sup>6</sup> Overall, based on numbers reported in various studies (e.g., Gruber (1996) and Khorana (1996)) and our own analysis, the advertised funds do not appear to be extreme in their basic characteristics except that they are, on average, somewhat larger and older and have managers with longer tenure than the other funds reported by Morningstar.<sup>7</sup> In Panel B, the summary statistics correspond to the subsample of 117 funds. The various characteristics of this subsample appear to be similar to the characteristics of the overall sample in Panel A.

## **II. Methodology to Compute Benchmark-Adjusted Performance**

To measure the mutual fund performance, we use four benchmarks for our analysis. The first benchmark is the average return on all the mutual funds available on the Morningstar data set with the same investment objective as that of the sample fund under evaluation. For example, to examine the performance of a small company fund, the benchmark used is the average return for all the small company funds in the same time period. For our purpose, this is a conservative benchmark because mutual funds as a group are known to underperform other benchmarks such as the S&P 500 index. Thus, it should be relatively easy for the advertised funds to beat this benchmark.

The second benchmark is the return on the S&P 500 index (including dividends)—probably the most commonly used benchmark in the mutual fund industry. The third and the fourth measures of performance are Jensen's one-factor alpha and a four-factor alpha from using a four-factor model described in Carhart (1997b). The one-factor alpha and the four-factor alpha are given by the  $\alpha_{1i}$  and  $\alpha_{4i}$  in the following models, respectively.

$$R_{it} - R_{ft} = \alpha_{1i} + \beta_i(R_{mt} - R_{ft}) + error_{it}, \quad (1)$$

$$\begin{aligned} R_{it} - R_{ft} = & \alpha_{4i} + \beta_{1i}(R_{mt} - R_{ft}) + \beta_{2i}SMB_t \\ & + \beta_{3i}HML_t + \beta_{4i}Momentum_t + error_{it} \end{aligned} \quad (2)$$

where  $R_{it}$  = return on fund  $i$  in month  $t$ ,  $R_{ft}$  = the risk-free rate in month  $t$ ,  $R_{mt}$  = the return on a market portfolio in month  $t$ ,  $SMB_t$  = return on portfolios of small minus large firms in month  $t$ ,  $HML_t$  = return on portfolios of

<sup>6</sup> The data on fund size, expense ratio, and the life of the fund are the year-end data before advertisements and have been obtained from Morningstar, Inc.

<sup>7</sup> For all the funds reported by Morningstar in the categories that we examine, we compute the above-mentioned statistics as of September 30, 1994. The mean (median) fund size is \$387 million (\$63 million), the expense ratio is 1.4 percent (1.2 percent), the tenure of the fund manager is 3.6 years (2.0 years), and the fund age is 8.7 years (3.3 years).

high minus low book-to-market stocks in month  $t$ , and Momentum $_t$  = the rate of return on portfolios of high minus low momentum (prior one-year return) stocks in month  $t$ .

A detailed description of these variables is presented in Fama and French (1993) and Carhart (1997b). We also use a benchmark based on the Capital Asset Pricing Model (CAPM) to directly control for the effects from market fluctuations. Since the conclusions are similar to those from using the other benchmarks, we do not present those results in the paper.

To determine the statistical significance of the benchmark-adjusted average performance for the entire sample or a subsample, we compute a  $t$ -statistic based on the cross-sectional standard deviation of all the mutual funds in the corresponding sample. We also compute a nonparametric  $Z$ -statistic based on the percentage of funds that perform better than the benchmark. Since the conclusions are the same whether we use the parametric  $t$ -statistic or the nonparametric  $Z$ -statistic, we do not report the results from the nonparametric test. However, we report the median values to show that the results are not driven by a few outliers.

### III. Preadvertisement Returns Earned by the Advertised Mutual Funds

Table II presents an analysis of the returns earned by the advertised mutual funds for the one-year period prior to the advertisements. Panel A of Table II reports the results for the overall sample of 294 funds, Panel B reports the results for the subsample of 117 funds for which one mutual fund is included only once in the sample. Categories with fewer than 20 mutual funds are grouped as "Other."

For the overall sample (Panel A), the average (median) one-year preadvertisement return is 25.55 percent (26.61 percent). This performance is substantially higher than the corresponding mean or median returns for similar funds during the same time periods. The average similar-funds-adjusted return of 5.98 percent ( $t$ -statistic of 11.15) is statistically significant at any reasonable level of significance. About 75 percent of the funds (221 of the 294 in the sample) perform better than this benchmark in the one-year preadvertisement period. The results are similar for various subcategories. Compared to returns on the S&P 500 index, the advertised funds perform better by 1.81 percent in the preadvertisement year. However, the superior performance of 1.81 percent ( $t$ -statistic of 3.10) is not as large as that in comparison to the benchmark of similar funds.

Evaluation of Jensen's alphas and the four-factor alphas given by the intercept terms in regressions (1) and (2) yield similar conclusions, though the  $t$ -statistics are somewhat smaller. We use 12 monthly observations in the preadvertisement period to compute alphas. The average annualized Jensen's alpha is 1.02 percent ( $t$ -statistic of 1.88) and the average annualized four-factor alpha is 1.43 percent ( $t$ -statistic of 2.44). For the subsample of 117 funds (Panel B), the results are similar.

**Table II**  
**Preadvertisement Performance of Mutual Funds in the Sample**

This table presents the performance of the advertised mutual funds for the one-year period prior to the advertisements. The raw return is the net-of-expense return as reported by Morningstar, Inc. The similar-funds-adjusted return is raw return minus the average return of a group of similar funds, which is defined as all the funds with the same Morningstar investment objective as the sample fund during this period. The S&P 500-adjusted return is defined as raw return minus the return (dividends included) on the S&P 500 index. For the one-year period before advertisement, we calculate the Jensen's alpha for each fund by running a regression of monthly fund returns on the monthly returns of the market factor (RMRF). To calculate the four-factor alpha, fund returns are regressed on the market factor (RMRF), a size factor (SMB), a book-to-market factor (HML), and a momentum factor (PR1YR). The four factors are defined as those in Carhart (1997b). The alpha measures reported in this table are annualized to facilitate comparisons with other performance measures. Investment objectives are according to Morningstar's classification. The aggressive growth, growth, growth & income, and small company categories are presented separately, the other four categories are combined under the "Other" classification. Panel A presents results for the sample of 294 mutual funds advertised in *Barron's* or *Money* magazine from July 18, 1994 through June 30, 1996. Panel B presents the results for a reduced sample in which each mutual fund is counted only once (the first advertisement). When only the first advertisement is considered, the sample size is reduced to 117. For all the returns, we report both mean and median (in brackets). For the means of the abnormal performance, we also report the *t*-statistics.

Investment Objective	No. of Ob.	Raw Returns of Advertised Funds		Similar-Funds- Adjusted Returns		S&P 500- Adjusted Returns		Jensen's Alpha		Four-Factor Alpha	
		Mean [Median]	Mean [Median]	<i>t</i> -statistic	Mean [Median]	<i>t</i> -statistic	Mean [Median]	<i>t</i> -statistic	Mean [Median]	<i>t</i> -statistic	Mean [Median]
Panel A: Full Sample (294 funds)											
Aggressive growth	32	26.08% [30.25%]	3.20% [1.86%]	2.41** [1.95%]	2.71% [1.95%]	1.95* [1.29%]	-0.04% [0.12%]	-0.02 [0.08]	2.07% [0.67%]	1.01 [1.35]	
Growth	134	26.01 [27.22]	5.99 [5.21]	7.01*** [0.56]	2.07 [-0.78]	2.24** [-0.78]	0.08 [0.10]	0.10 [0.13]	1.35 [1.54]		
Growth & income	47	21.74 [25.46]	2.42 [2.48]	4.21*** [-1.08]	-1.56 [0.71]	-2.27** [0.71]	-0.37 [-0.53]	-0.53 [-1.83]	-1.83 [-2.77***]		
Small company	35	34.29 [38.80]	14.04 [14.17]	8.17*** [9.61]	10.86 [5.80]	6.32*** [5.46]	4.71 [2.41]	2.75*** [3.59***]	5.46 [2.41]		

Other	46	21.09 [21.25]	5.42 [4.50]	4.76*** [-4.49]	-3.00 [0.36]	-2.38** [0.99]	3.20 [1.84]	2.24** [0.99]	1.52 [-0.38]	0.85
All	294	25.55 [26.61]	5.98 [4.62]	11.15*** [0.36]	1.81 [0.36]	3.10*** [0.99]	1.02 [0.99]	1.88* [0.99]	1.43 [0.02]	2.44**
Panel B: Subsample (117 funds)										
Aggressive growth	11	22.48% [26.80%]	3.32% [1.68%]	1.16 [-1.53%]	2.26% [-1.26]	0.76 [-0.64]	1.34% [0.93]	0.44 [0.88]	4.26% [0.94]	1.18 [-0.75]
Growth	52	24.42 [27.07]	6.81 [6.27]	6.30*** [0.89]	2.88 [0.89]	2.40** [0.31]	1.16 [0.86]	0.86 [0.86]	2.35 [1.66]	1.83* [-0.72]
Growth & income	20	19.32 [21.31]	2.73 [2.70]	2.91*** [9.61]	-0.71 [9.61]	-0.64 [6.85]	0.88 [4.18]	0.94 [1.78*]	-0.75 [4.94]	2.08* [1.43]
Small company	15	29.22 [32.00]	12.55 [10.87]	4.32*** [-2.41]	9.73 [-1.65]	3.61*** [-0.87]	4.18 [3.20]	1.78* [2.24**]	1.52 [1.52]	0.85 [-0.38]
Other	19	17.88 [19.72]	5.21 [5.48]	3.85*** [-2.41]	-1.65 [0.37]	-0.87 [0.37]	3.20 [1.88]	2.24** [1.64]	1.52 [0.82]	0.85 [-0.38]
All	117	22.92 [23.90]	6.26 [5.04]	8.31*** [0.37]	2.35 [0.37]	2.83*** [0.37]	1.88 [1.64]	2.44** [1.64]	2.06 [0.82]	2.62*** [0.82]

\*\*\*, \*\*, and \* indicate significance at the 1, 5, and 10 percent levels (two-tailed test).

Overall, it is clear that in the preadvertisement period, the sample of 294 advertised funds exhibit superior performance compared to the benchmarks. In the next section, we examine whether the superior performance persists in the postadvertisement period.

#### **IV. Postadvertisement Returns Earned by the Advertised Mutual Funds**

##### *A. Benchmark-Adjusted Returns*

In this section, we examine whether the advertised mutual funds exhibit superior performance in the year following the month in which the advertisement appears.<sup>8</sup> Once again we report results based on the four benchmarks described in Section II. The overall sample of 294 funds earns, on average, raw returns of 18.52 percent, which is 0.82 percent (insignificantly) lower than the average return on the similar fund benchmark (see Table III). However, relative to the remaining three benchmarks, the advertised funds perform significantly worse. Compared to the S&P 500 index, their average performance is -7.88 percent (*t*-statistic of -11.46).<sup>9</sup> Results from the analysis of Jensen's alpha and the four-factor alpha yield similar conclusions. The annualized alphas are -5.42 percent (*t*-statistic of -8.01) and -3.45 percent (*t*-statistic of -6.08), respectively.

Results for the various categories based on the investment objectives of funds are generally consistent with results for the overall sample. Thus, the results are not driven by one category. For example, all of the five categories exhibit negative benchmark-adjusted returns (*t*-statistics between -3.24 and -8.83) when the S&P 500 index is used as the benchmark. Similarly, we find that for Jensen's alpha, four of the five categories, and for the four-factor alpha, five of the five categories exhibit negative risk-adjusted performance. In Panel B, we show that the results for the subsample of 117 funds (counting each mutual fund only once, using the first advertisements) are similar to those for the overall sample. This suggests that the results are not an outcome of some funds getting more weight than others. We conclude that in the year after the advertisement, the advertised funds do not exhibit superior performance relative to the various benchmarks.

##### *B. Regression Analysis to Explain Postadvertisement Returns*

Although we find that, on average, there is no superior performance in the postadvertisement period, there may be persistence in the sense that the funds which perform better (relative to other funds in the sample) in the pre-

<sup>8</sup> The last month of returns used in this study corresponds to the month of June 1997. Thus, all the funds have a full year of returns after the advertisement month. None of the funds disappears during the period of our study.

<sup>9</sup> Even if the expenses of 1.19 percent (the average for the sample) are taken into account, the advertised funds' performance is still 6.69 percent lower than that of the S&P 500 index.

advertisement period also perform better in the postadvertisement period. To examine this possibility, we estimate a linear regression with the percentage postadvertisement excess return (POST\_RET) as the dependent variable and the percentage preadvertisement excess return (PRE\_RET) as the independent variable. The excess return is defined as the difference between the fund return and the return to the benchmark portfolio. The reported results (see below) correspond to the usage of the benchmark of similar funds. If there is persistence in returns, the slope coefficient would be positive. We find that the slope coefficient is not positive, but instead is negative with a *t*-statistic of -2.98. The overall results are similar for various subgroups. We conclude that there is no persistence in superior performance and, if anything, there is some evidence of reversal in performance.

$$\text{POST\_RET} = 0.317 - 0.19 * \text{PRE\_RET} \quad (3)$$

(0.46) (-2.98)     $R^2$ : 2.63 percent

The conclusions are similar when the other three benchmarks are used for defining excess (or benchmark-adjusted) returns.<sup>10</sup> These results cast doubt on the argument that the preadvertisement superior performance should be attributed to skill.

### *C. Sensitivity Analysis: Subperiods and Additional Results*

For a sensitivity analysis, we divide the entire time period of the study into eight subperiods, each consisting of one calendar quarter of advertisements. Although not altogether even, the distribution of the sample of 294 mutual funds across the eight quarters is not extreme (20, 31, 19, 24, 37, 54, 73, and 36). We find the results across the subperiods to be remarkably consistent with the overall results. In six of the eight subperiods, the average postadvertisement performance of the mutual funds is inferior to the corresponding similar fund benchmark. For the other three benchmarks, the advertised funds exhibit negative excess returns or negative alphas in all eight subperiods. Thus, the overall results are not driven by one or two quarters.

One possible reason for the lack of persistence of superior performance may be that the fund managers moved away from the advertised funds. To avoid this potential bias, we examine the performance of a subsample of mutual funds for which the fund managers are the same throughout the time period of study from one year prior to the advertisement to one year after the advertisement. Of the 294 mutual funds studied, 246 did not ex-

<sup>10</sup> Similar to Goetzmann and Ibbotson (1994) and Malkiel (1995), we also use the  $2 \times 2$  contingency table approach to test for persistence in performance from the preadvertisement period to the postadvertisement period. We classify the winner and loser funds based on the median performance of the funds in our sample. We do not find any evidence of persistence in performance using a chi-square test of independence.

Table III

This table presents the performance of the advertised mutual funds for the one-year period after the advertisements. The raw return is the net-of-expense return as reported by Morningstar, Inc. The similar-funds-adjusted return is raw return minus the average return of a group of similar funds, which is defined as all the funds with the same Morningstar investment objective as the sample fund during this period. The S&P 500-adjusted return is defined as raw return minus the return (dividends included) on the S&P 500 index. For the one-year period after advertisement, we calculate the Jensen's alpha for each fund by running a regression of monthly fund returns on the monthly returns of the market factor (RMRF). To calculate the four-factor alpha, fund returns are regressed on the market factor (RMRF), a size factor (SMB), a book-to-market factor (HML), and a momentum factor (PR1YR). The four factors are defined as those in Carhart (1997b). The alpha measures reported in this table are annualized to facilitate comparisons with other performance measures. Investment objectives are according to Morningstars classification. The aggressive growth, growth, growth & income, and small company categories are presented separately, the other four categories are combined together under the "Other" classification. Panel A presents the results for the sample of 294 mutual funds advertised in *Barron's* or *Money* magazine from July 18, 1994 through June 30, 1996. Panel B presents the results for a reduced sample in which each mutual fund is counted only once (the first advertisement). When only the first advertisement is considered, the sample size is reduced to 117. For all the returns, we report both mean and median (in brackets). For the means of the abnormal performance, we also report the *t*-statistics.

Other	46	18.86 [18.81]	2.69 [1.45]	3.36***	-7.24 [-7.43]	-8.83***	2.49 [2.59]	2.96**	-1.64 [-2.46]	-1.50
All	294	18.52 [18.68]	-0.82 [-0.25]	-1.38	-7.88 [-6.77]	-11.46***	-5.42 [-3.30]	-8.01***	-3.45 [-2.87]	-6.08***
Panel B: Subsample (117 funds)										
Aggressive growth	11	18.74% [14.80%]	1.56% [4.16%]	0.30	-7.06% [-17.53%]	-1.18	-6.08% [-10.82%]	-1.55	-2.01% [-4.53%]	-0.51
Growth	52	20.62 [18.97]	-0.10 [0.09]	-0.06	-6.45 [-6.39]	-3.68***	-5.13 [-4.19]	-3.17**	-2.97 [-2.64]	-1.92*
Growth & income	20	21.39 [23.00]	-1.63 [0.15]	-1.35	-6.04 [-5.19]	-4.60***	-2.28 [-0.44]	-1.49	-2.08 [-1.23]	-1.76*
Small company	15	14.00 [14.10]	-5.50 [-5.06]	-1.61	-12.29 [-6.19]	-2.09*	-16.33 [-12.99]	-3.43***	-8.58 [-4.41]	-2.72**
Other	19	19.09 [19.00]	3.18 [3.11]	2.59**	-7.43 [-7.30]	-5.76***	1.66 [2.30]	1.19	-3.56 [-3.05]	-2.60**
All	117	19.48 [19.00]	-0.37 [0.52]	-0.35	-7.34 [-7.15]	-5.90***	-5.19 [-2.68]	-4.42***	-3.56 [-3.05]	-3.81***

\*\*\*, \*\*, and \* indicate significance at the 1, 5, and 10 percent levels (two-tailed test).

perience a manager turnover during the period of the study. The results for this subsample of funds are almost identical to the results for the overall sample. Thus, the lack of persistence in performance cannot be attributed to turnover of the fund managers.

## V. Fund Flows Analysis

In the previous section, we find that the results are not consistent with the hypothesis that advertisements signal superior performance. In this section, we examine whether advertisements yield higher fund flows to the advertised mutual funds. To control for a number of other factors that may also influence fund flows, we use a regression framework described below.

### A. Definition of Fund Flows

Our definition of fund flows is similar to the one used in previous literature (Patel, Zeckhauser, and Hendricks (1994) and Sirri and Tufano (1998)). We assume that the existing investors reinvest their dividends and that the new money is received at the end of the time period. Thus, the raw fund flows for period  $t$  are given by computing the change in total net assets ( $\Delta\text{TNA}_t$ ) from the end of period  $t - 1$  to the end of period  $t$  after adjusting for raw returns (i.e.,  $\text{RET}_t$  including dividends) to the stocks under management. Or,  $\Delta\text{TNA}_t = \text{TNA}_t - \text{TNA}_{t-1}(1 + \text{RET}_t)$ . Since fund flows depend on the size of the fund, we scale the raw fund flows by the beginning TNA to compute percentage fund flows. Fund flows ( $\text{FLOW}_t$ ) in terms of fraction of total net assets is thus given by

$$\text{FLOW}_t = \Delta\text{TNT}_t / \text{TNA}_{t-1}. \quad (4)$$

### B. Variables Used in Explaining Current Period Fund Flows

Sirri and Tufano (1998), among others, examine determinants of fund flows to mutual funds. Although the research design varies across studies, the main results are similar. It seems clear that three fund-specific variables are the most important explanatory variables for examining fund flows: prior-period performance, prior-period fund flows, and the size of the fund. Although previous research has generally used fund flows and the performance variables with only one lag, we use up to three lags to capture their potential effects. Since the most important explanatory variable appears to be prior-period performance, we report results for two measures of performance (one in raw return form and the other a benchmark-adjusted one). The conclusions are not affected when we use the other three benchmark-adjusted performance measures. The two measures for which the results are reported are given by

1. raw returns on the fund in one to three years prior to the advertisement ( $\text{RET}_{-1}$  to  $\text{RET}_{-3}$ )

2. Jensen's alpha given by the single-factor model in the one to three years prior to the advertisement ( $\text{ALPHA}_{-1}$  to  $\text{ALPHA}_{-3}$ ).

The fund flows variable ( $\text{FLOW}_{-1}$  to  $\text{FLOW}_{-3}$ ) is defined in the previous subsection and the size variable is defined as the natural logarithm of total net assets ( $\text{LNSIZE}$ ) at the end of the month of advertising.

### *C. Selection of Control Groups*

We use regression analysis to control for the potential effects on fund flows from a number of explanatory variables. To avoid the possibility that the results are influenced by funds that are vastly different from the funds in the sample, we first select a set of control funds that are similar to the funds in the sample and then use the regression framework. In particular, since fund performance seems to be the most important variable explaining fund flows, we use it to select a control group. However, we note that our conclusions are not affected when we use all the funds in the Lipper data set or when we use several control groups with several different criteria. For each fund in the sample, we select a maximum of eight control funds that have the same investment objective as the sample fund and are closest to the sample fund in terms of raw returns in the preadvertisement year (i.e.,  $\text{RET}_{-1}$ ).<sup>11</sup> The number of control funds is not exactly eight times the number of sample funds because of some missing net asset values in the data sets used; however, the results are almost the same whether we use only those funds with all the data available or use only one control fund for each sample fund.

### *D. Summary Statistics for the Variables Used in the Analysis of Fund Flows*

Before presenting the regression results, we present summary statistics (see Table IV) for the advertised funds and the control funds in year zero, the year immediately after the month of advertisements. The most interesting variable for this analysis is fund flows, which is represented by  $\text{FLOW}_0$ . The results show that fund flows to the advertised funds (mean of 0.4423 and median of 0.1808) are larger than the corresponding fund flows (mean of 0.3890 and median of 0.1610) to the mutual funds in the control group. These results are consistent with the hypothesis that advertised funds are associated with higher levels of fund flows. However, we later use a regression framework to show that the advertised funds also attract more money after controlling for other explanatory variables. The raw returns and

<sup>11</sup> We also use other performance measures and flow measures to construct control groups. Since our conclusions are not affected, we do not report those results. Developing a control group based on prior-period returns ( $\text{RET}_{-1}$ ) has a distinct advantage. Sirri and Tufano (1998) report that fund flows are related to  $\text{RET}_{-1}$  in a nonlinear fashion. Thus, matching on  $\text{RET}_{-1}$  avoids any problems that may arise from including control funds that may differ significantly from the sample funds in terms of  $\text{RET}_{-1}$ .

**Table IV**  
**Summary Statistics for Fund Flows Analysis:**  
**Control Funds Matched on Ret<sub>-1</sub>**

This table presents the summary statistics for the fund flows analysis. FLOW<sub>t</sub> is defined as  $\Delta \text{TNA}_t / \text{TNA}_{t-1}$ , where TNA<sub>t-1</sub> is the total net assets of the fund at the end of period  $t - 1$ , and  $\Delta \text{TNA}_t = \text{TNA}_t - \text{TNA}_{t-1}(1 + \text{RET}_t)$ . RET is the net-of-expense return as reported by Morningstar, Inc. Jensen's alpha is calculated from the one-factor model using monthly returns. Four-factor alpha is calculated from the four-factor model described in Carhart (1997b). SIZE is the total net assets of the fund at the end of the month of advertising. LNSIZE is the natural logarithm of SIZE. Variables with subscript 0 are measured over the one-year period after advertising. Variables with subscript -1 are measured over the one-year period before advertising. Control funds are the eight funds closest to the sample fund in terms of RET<sub>-1</sub> among all the funds with the same investment objective as the sample fund.

Variable	Sample Funds			Control Group Funds		
	No. of Obs.	Mean	Median	No. of Obs.	Mean	Median
FLOW <sub>0</sub>	258	0.4423	0.1808	2066	0.3890	0.1610
RET <sub>0</sub>	261	0.1898	0.1887	2088	0.1964	0.1986
Jensen's alpha <sub>0</sub>	261	-0.0052	-0.0033	2088	-0.0040	-0.0021
Four-factor alpha <sub>0</sub>	261	-0.0029	-0.0023	2088	-0.0022	-0.0015
SIZE (\$millions)	261	2357.21	761.90	2088	842.46	102.60
LNSIZE	261	6.8655	6.6358	2088	4.5692	4.6308

benchmark-adjusted returns (given by Jensen's alpha and the four-factor alpha) are similar across the two groups. The sample funds appear to be somewhat larger in size; however, size is used as the denominator in computing FLOW to control for the effect of size on the fund flow variable.

### E. The Regression Model

We use the dummy variable approach to study whether the advertised funds attract more money after controlling for the explanatory variables described in Section V.B. We define a dummy variable *D* which takes a value of one for the advertised funds and a value of zero for the control funds. The coefficient to the dummy variable determines whether the fund flows to the advertised funds are significantly different from the fund flows to the other funds after controlling for the effects of prior-period performance, prior-period fund flows, and fund size.<sup>12</sup> We estimate the regression in a number

<sup>12</sup> In addition to using the three explanatory variables (ALPHA, FLOW, and RET) themselves, we also use them in a multiplicative form (such as D \* FLOW) to allow for the possibility that the slope coefficients are different for the advertised funds than for the other control funds. In the presence of multiplicative dummies, the interpretation of the intercept term requires additional calculation. Our analysis yields similar conclusions and, for brevity, we do not present the results.

of different forms but the most general form of the regression is given by the following equation:

$$\begin{aligned} \text{FLOW}_t = & a_0 + a_1 D + b_1 \text{FLOW}_{t-1} + b_2 \text{FLOW}_{t-2} + b_3 \text{FLOW}_{t-3} \\ & + c_1 \text{RET}_{t-1} + c_2 \text{RET}_{t-2} + c_3 \text{RET}_{t-3} + d_1 \text{ALPHA}_{t-1} \\ & + d_2 \text{ALPHA}_{t-2} + d_3 \text{ALPHA}_{t-3} + e \text{LNSIZE} + \text{error}_t. \end{aligned} \quad (5)$$

As noted above, the relevant coefficient for our purpose is the coefficient  $a_1$  on the dummy variable  $D$ . A significantly positive coefficient would imply that after controlling for the effects of the explanatory variables, the advertised funds attract a larger amount of money in the postadvertisement period compared with the control funds. For the results presented, we do not use ALPHA and RET in the same regression because the two variables are highly correlated. However, even when we use them together, the coefficient to the dummy variable is essentially unchanged.

#### *F. Results of the Funds Flow Analysis from the Regression Model*

Table V presents results from various forms of the regression model to explain fund flows. The first regression is similar to the one used by Patel et al. (1994) and Sirri and Tufano (1998). In this regression, we use three explanatory variables (prior-period fund flows given by  $\text{FLOW}_{-1}$ , prior-period returns given by  $\text{RET}_{-1}$ , and firm size in logarithm form given by  $\text{LNSIZE}$ ). As expected, all three coefficients are statistically significant. The coefficient to the dummy variable captures the effect of advertising on fund flows, and it takes a value of 0.244 with a  $t$ -statistic of 4.73. This suggests that after controlling for the effects of three explanatory variables, the advertised funds experience significantly larger fund flows. In regressions 2 and 3, we use the same variables but use two and three lags of FLOW and RET, respectively. In the first three regressions, the magnitude of the coefficient to the dummy variable is between 0.249 and 0.204 and the corresponding  $t$ -statistics are between 5.14 and 4.38. A coefficient of 0.20 implies that the advertised funds attract 20 percent more money than the funds in the control group after controlling for the effects of prior-period returns, prior-period fund flows, and fund size. The adjusted  $R^2$  ranges from 0.1325 to 0.1694 for the first three regressions.

We also present results by using Jensen's alpha ( $\text{ALPHA}_{-1}$  to  $\text{ALPHA}_{-3}$ ) as the measure of performance instead of  $\text{RET}_{-1}$  to  $\text{RET}_{-3}$  and present the results in regression 4. We find that the choice of performance measure does not make a difference in results. The coefficient to the dummy variable and the corresponding  $t$ -statistic in regression 4 is about the same as that in regression 3.

In regressions 5 and 6, we provide additional evidence that added advertising is associated with more fund flows by dividing the entire sample in two subsamples. The first subsample consists of those mutual funds that

**Table V**  
**Regression Analysis of Growth Rate of Fund Flows: Control Funds Matched on Ret<sub>-1</sub>**

FLOW<sub>t</sub> is defined as  $\Delta\text{TNA}_t/\text{TNA}_{t-1}$ , where TNA<sub>t-1</sub> is the total net assets of the fund at the end of period  $t - 1$ , and  $\Delta\text{TNA}_t = \text{TNA}_t - \text{TNA}_{t-1}(1 + \text{RET}_t)$ . RET is the net-of-expense return as reported by Morningstar, Inc. ALPHA is calculated from the one-factor model using monthly returns. SIZE is the total net assets of the fund at the end of the month of advertising. LNSIZE is the natural logarithm of SIZE. Variables with subscript 0 are measured over the one-year period after advertising. Variables with subscript -1 are measured over the one-year period before advertising. The second and third years before advertising are given subscripts -2 and -3. Control funds are the eight funds closest to the sample fund in terms of RET<sub>-1</sub> among all the funds with the same investment objective as the sample fund. The general form of the regression is:

$$\begin{aligned} \text{FLOW}_0 = & a_0 + a_1 D + b_1 \text{FLOW}_{-1} + b_2 \text{FLOW}_{-2} + b_3 \text{FLOW}_{-3} + c_1 \text{RET}_{-1} + c_2 \text{RET}_{-2} + c_3 \text{RET}_{-3} \\ & + d_1 \text{ALPHA}_{-1} + d_2 \text{ALPHA}_{-2} + d_3 \text{ALPHA}_{-3} + e \text{LNSIZE}, \end{aligned}$$

where  $D$  is the advertising dummy.  $t$ -statistics are reported in the parentheses.

	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5 Advertising times $\leq 2$	Regression 6 Advertising times $> 2$
$D$ [advertising dummy; $=1$ for advertising funds, $=0$ otherwise]	0.244*** (4.73)	0.249*** (5.14)	0.204 (4.38)***	0.225 (4.78)***	0.172 (3.46)***	0.294 (2.97)***
INTERCEPT	0.485 (9.91)***	0.206 (3.50)***	0.084 (1.33)	0.478 (8.94)***	0.068 (0.98)	0.110 (0.85)
FLOW <sub>-1</sub>	0.192 (13.60)***	0.156 (6.55)***	0.163 (6.02)***	0.191 (7.11)***	0.134 (3.79)***	0.173 (3.93)***

FLOW <sub>-2</sub>	0.043 (2.36)**	0.032 (0.96)	0.008 (0.24)	0.049 (1.32)	-0.006 (-0.09)
FLOW <sub>-3</sub>		0.010 (0.52)	0.020 (1.06)	0.020 (0.96)	-0.005 (-0.13)
RET <sub>-1</sub>	0.381 (3.52)***	1.083 (7.97)***	1.112 (7.83)***		0.850 (5.53)***
RET <sub>-2</sub>		1.617 (8.80)***	1.794 (9.39)***		1.377 (6.45)***
RET <sub>-3</sub>			0.341 (2.14)**		0.335 (1.95)**
ALPHA <sub>-1</sub>				14.822 (5.94)***	
ALPHA <sub>-2</sub>				14.644 (4.68)***	
ALPHA <sub>-3</sub>				7.458 (2.80)***	
LNSIZE	-0.072 (-8.98)***	-0.076 (-8.80)***	-0.069 (-7.44)***	-0.066 (-6.92)***	-0.055 (-5.35)***
Adjusted R <sup>2</sup>	0.1325	0.1576	0.1694	0.1507	0.1351
					0.2078

\*\*\*, \*\*, and \* indicate significance at the 1, 5, and 10 percent levels (two-tailed test).

advertised either once or twice in a given quarter (172 funds) and the second group consists of those finds that advertised more than twice (89 funds). Consistent with the argument that more advertising leads to more fund flows, the coefficient to the dummy variable for the funds that advertised more than twice is 0.294 (*t*-statistic of 2.97) and the coefficient to the less-advertised funds is only 0.172 (*t*-statistic of 3.46). The difference between the two coefficients is statistically significant.

Overall, the results from this section show that the funds that advertise are associated with larger fund flows. Given that there is no signal of future superior performance in the advertisements, the fund-sponsoring companies seem to advertise funds for the purpose of attracting more money. We are not suggesting that the investors are naive or exhibit irrational behavior as they invest more in the advertised funds. One potential reason for the larger fund flows may be that advertising reduces search costs for the investors.

## VI. Conclusions

In this paper, we examine the postadvertisement performance and fund flows to open-end mutual funds that are advertised in *Barron's* or *Money* magazine. The main advantage of this sample is that the advertised funds are selected by the sponsoring organizations. We first note that the advertised funds, not surprisingly, have superior performance in the preadvertisement year. However, our interest is to determine whether this select group of funds can continue to exhibit superior performance in the postadvertisement period. Whether a select group of mutual funds can exhibit consistently superior performance is of considerable interest to both academics and practitioners. There are at least two potential reasons why the preadvertising performance is superior—skill or luck. To the extent that past performance is attributable to skill, the advertised mutual funds would exhibit superior performance in the postadvertisement period as well. Thus, a sample of advertised mutual funds presents us with a unique opportunity to ascertain if superior skills exist.

We also test whether advertising is used for attracting more money to the advertised funds. Even if the advertisements do not signal future superior performance, the mutual fund operators may advertise funds to attract more fund flows. To the extent that investors believe in persistence in performance, it would benefit the sponsoring organizations to advertise those funds that have performed well in the past. Furthermore, advertised funds may also attract more money as advertisements reduce search costs for the investors.

We examine 294 mutual funds that were advertised from July 18, 1994 through June 30, 1996 in *Barron's* or *Money* magazine. In a preadvertisement period of one year, the advertised mutual funds perform significantly above the benchmarks. However, the postadvertisement performance of these mutual funds is, on average, significantly inferior in comparison to the benchmarks. Thus, the results do not support the hypothesis that the preadver-

tisement superior performance is attributable to skills. The results also cannot be attributed to one specific category of mutual funds, such as growth funds, and are not driven by subsamples in one or two quarters. The results are also almost identical when the subsample of funds with no change in the fund manager is examined. Thus, the results cannot be attributed to the turnover of superior fund managers. Overall, we conclude that the past superior performance of the advertised funds cannot be attributed to superior skills on the part of the fund managers and there is no persistence in performance.

Our results show that the advertised funds attract significantly more money in comparison to the funds in a control group with similar characteristics. We use a dummy variable approach in a regression framework to control for the potential effects of prior-period performance, prior-period fund flows, and fund size. The coefficient to the advertising dummy variable is significantly positive, suggesting that the inflows to the advertised funds are about 20 percent larger than those for the nonadvertised funds with similar characteristics. We also find that the funds advertised more often attract more fund flows. The results are not sensitive to the usage of alternative definitions of control groups.

These results also have policy implications. The current practice in mutual fund advertisements emphasizes past performance. Our results show that past performance is not associated with future results. It seems that the emphasis on past performance in advertisements is misplaced. It is possible that the mutual fund operators are well aware of the possibility that past performance is indeed not a good predictor of future performance—that past performance is not an outcome of superior skill. Yet the fund operators choose to advertise funds with superior past performance.

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