Can mutual fund managers pick stocks? Evidence from their trades prior to earnings announcements[*]

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Abstract

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Abstract

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I. Introduction

Can mutual fund managers pick stocks that earn abnormal returns? This question has long interested financial economists due to its practical importance for investors and the light it sheds on market efficiency. Despite the many and varied approaches taken to address this question, a common difficulty emerges: defining risk-adjusted returns. Portfolio performance must be adjusted for risk, and the proper adjustment is unknown. This joint hypothesis problem, articulated by Fama (1970), clouds the interpretation of most performance studies and has led to prolonged debate about whether fund managers can pick stocks.[1]

In this paper, we introduce a new methodology to measure stock-selection ability based on returns around earnings announcements. The core idea is to associate skill with the tendency to hold stocks that are about to enjoy high earnings announcement returns and to avoid stocks that are about to suffer low announcement returns. This "earnings announcement alpha" methodology may offer both more interpretable and more powerful tests for the existence of information-based trading.

Our approach offers several advantages. First, it largely avoids the joint-hypothesis problem. As Brown and Warner (1985) show, inference based on daily returns around announcement dates is relatively insensitive to the risk adjustment model. We apply this insight to performance evaluation. Just as stock returns around earnings announcements are mostly abnormal, regardless of the risk adjustment, a mutual fund's returns from holding that stock are also mostly abnormal. Second, this approach makes

[1] Long-horizon studies that discuss or center on the risk-adjustment issue, reaching varying conclusions, include Lehman and Modest (1987), Elton, Gruber, Das, and Hlavka (1993), Grinblatt and Titman (1993), Malkiel (1995), Ferson and Schadt (1996), Daniel, Grinblatt, Titman, and Wermers (1997), Carhart (1997), Metrick (1999), and Pastor and Stambaugh (2002) among others.

intensive use of the segment of returns data, returns at earnings announcements, that contains concentrated information about a firm's fundamentals, and hence about a fund manager's skill at fundamental analysis. Third, Kothari and Warner (2001) provide simulation evidence that following trades can considerably increase power to detect skill. We combine this source of power with the additional power that comes from focusing on returns around important announcements.[2]

The data set merges mutual funds' portfolio holdings with the respective returns that each holding realized at its next quarterly earnings announcement. The holdings are drawn from mandatory, periodic SEC filings which are tabulated by Thompson Financial. These data have been used by Grinblatt and Titman (1989) and Wermers (1999), among others. For each fund-date-holding observation in these data, we merge in the return that that stock earned in the 3-day window around its next earnings announcement. The sample covers 1980 through 2002 and contains 6.3 million fund-report date-holding observations with associated earnings announcement returns.

We naturally begin the analysis by tabulating the earnings announcement returns of fund holdings, but the cleanest and most important results involve fund trades. In particular, for each fund, we track the subsequent earnings announcement returns of the stocks on which it increases portfolio weight over the prior period and the stocks on which it decreases the portfolio weight. Our main finding is that the average mutual fund

[2] Previous researchers, following other sets of investors than individual mutual fund managers, have also used trading prior to earnings announcements to detect information-based trading. For instance, Seasholes (2000) examines trading by foreign investors in emerging markets; Ali, Durtschi, Lev, and Trombley (2004), and Irvine, Lipson, and Puckett (2004) examine the trading patterns of institutional investors. Ke, Huddart, and Petroni (2003) follow trading by corporate insiders; and Christophe, Ferri, and Angel (2004) follow short sellers. On the other hand, Grinblatt and Titman (1993), Chen, Jegadeesh, and Wermers (2000), and subsequent authors have studied mutual fund trades, but do not simultaneously focus on returns at earnings announcements.

shows stock-picking skill in the sense that the subsequent earnings announcement returns on its weight-increasing stocks is significantly higher than that of its weight-decreasing stocks. The difference is about 12 basis points over the three-day window around the quarterly announcement, or, multiplying by four, about 47 "annualized" basis points. The contrast between buys that initiate a fund's position in a stock and sells that close out a position is even larger.

In addition to comparing the earnings announcement returns of stocks that funds buy and sell against each other, we also benchmark buys and sells against announcement returns earned by stocks of similar size, book-to-market, and past earnings announcement return momentum (to control for the Bernard and Thomas (1989) positive autocorrelation in announcement returns) in the same calendar quarter. This experiment indicates that the average fund displays some skill in both its buying and selling behavior. That is, stocks bought by the average fund earn significantly *higher* subsequent announcement returns than matching stocks, while stocks sold earn *lower* returns.

Although the average fund displays evidence of skill, there are also significant differences in the cross-section of funds. For instance, there is evidence of persistence in the earnings announcement alphas. In addition, funds that do better are more likely to have a growth than income style, consistent with Daniel, Grinblatt, Titman, and Wermers (1997) and several long-horizon studies. We also find that larger funds, higher turnover funds, and those that use incentive fees show better performance by our metrics. These results lend important support to long-horizon studies, including Grinblatt and Titman (1994) on turnover and Elton, Gruber, and Blake (2003) on fees. In contrast to these

papers, our methodology allows us to connect these differences in performance to information-based trading.

In summary, an "earnings announcement alpha" methodology allows us to provide new evidence that active fund managers have some degree of stock-picking skill. However, we note that this methodology, precisely because it uses only a subset of the total returns data and a particular, well-defined notion of skill, is not suited to measuring the total abnormal returns earned by fund managers, or to addressing whether active mutual fund managers earn abnormal returns that are large enough to exceed the fees they charge. (However, we find no relationship between our measures of skill and expense ratios.) Rather, our measures should be seen as putting a lower bound on the abnormal performance attributable to stock-picking skill—notably, this lower bound appears to be significantly positive. More generally, our measures offer a useful complement to traditional performance metrics.

The paper proceeds as follows. Section II presents data. Section III presents empirical results. Section IV summarizes and concludes.

II. Data

A. Data set construction

The backbone of our data set is the mutual fund holdings data from Thomson Financial (also known as CDA/Spectrum S12). Thomson's main source is the portfolio snapshot contained in the N-30D form each fund periodically files with the SEC. Prior to 1985, the SEC required each fund to report its portfolio quarterly, but starting in 1985 it

required only semiannual reports.[3] The exact report dates are set by the fund as suits its fiscal year, and a few funds voluntarily report more often than required. At a minimum, the Thomson data give us semiannual snapshots of all equity holdings for essentially all mutual funds. A sample fund-report date-holding observation is as follows: Fidelity Magellan, as of March 31, 1992, held 190,000 shares of Apple Computer. Wermers (1999) describes this data set in detail.

We extract all fund holdings data whose report date falls between the second quarter of 1980 and the third quarter of 2002. We then add "liquidating" observations, which are essentially placeholders to capture recent selling activity, to represent instances where the fund appears to have sold all of its holdings in a stock for which it reported positive holdings at the previous report date. For example, Magellan did not report a holding of Apple stock in its June 30, 1992 report, so we construct an observation with a holding of zero Apple for this report date.

To these holdings data, we merge in earnings announcement dates from the CRSP/Compustat merged industrial quarterly database. Specifically, for each fund-report date-holding observation, we merge in the first earnings announcement date that follows that holding's report date. We drop observations for which we can find no earnings announcement date within 90 days after the report date.

Next we add the stock returns around each earnings announcement. From CRSP, we merge in the raw cumulative stock returns for the [-1,+1] trading day interval around each announcement. We define a market-adjusted event return MAR as the raw announcement return minus the contemporaneous return on the CRSP value-weighted

[3] In February 2004, the SEC decided to return to a quarterly reporting requirement.

market index. We also define a benchmark-adjusted event return BAR as the raw return minus the average [-1, +1] earnings announcement return on stocks of similar book-to-market, size, and momentum that also announced earnings in the same calendar quarter as the holding in question. Other than the fact that (for reasons described below) we take "momentum" here as momentum of past earnings announcement returns, not total returns, our approach is similar to that in Daniel et al. (1997).[4] We exclude fund-report dates that do not have at least one benchmark-adjusted earnings announcement return; our results are unchanged if we restrict attention to fund-report dates containing at least 10 or at least 20 such returns.

For a subset of the remaining observations, we can obtain fund characteristics data. Russ Wermers and WRDS provided links between the Thomson holdings data and the CRSP mutual fund database. Wermers (2000) describes how those links are made. Then, from the CRSP mutual fund data, we take investment objective codes from CDA/Wiesenberger and Standard & Poor's, as well as total net assets, turnover, and expense ratios.[5] Christopher Blake shared data on incentive fees as studied in Elton,

[4] Specifically, we form the value-weighted average earnings announcement return for each of 125 benchmark portfolios (5x5x5 sorts on book-to-market, size, and earnings announcement return momentum) each calendar quarter. Book-to-market is defined following Fama and French (1995). Market value of equity is computed using the CRSP monthly file as the close times shares outstanding as of December of the calendar year preceding the fiscal year data. The book-to-market ratio is then matched from fiscal years ending in year (t-1) to earnings announcement returns starting in July of year (t) and from fiscal years ending in (t-2) to earnings announcement returns in January through June of year (t). Size is matched from June of calendar year (t) to returns starting in July of year (t) through June of year (t+1). Momentum is the average return over the past four earnings announcements. The breakpoints on book-to-market and size are based on the NYSE as reported on Ken French's website. The benchmark portfolios include only stocks with positive book equity that are ordinary common stocks (CRSP share codes 10 or 11). It is impractical to do a 5x5x5x5 sort and thus control for overall return momentum, but we have found that switching the earnings announcement momentum control with an overall momentum control leads to similar results.

[5] Turnover data for 1991 is missing in the CRSP database. Also, CRSP sometimes reports several classes of shares for a given fund, corresponding to different fee structures for the same portfolio of stocks (e.g. A, B, C, institutional, no-load). In these cases, we take the highest reported value for turnover across all classes to use as the value for turnover, and the value-weighted average of expenses across all classes as the value for the expense ratio.

Gruber, and Blake (2003). These data are originally from Lipper and cover through 1999. Fee structures are generally similar across the funds that use them, so we simply study an indicator variable for whether the fund has an incentive fee in place.

Finally, we apply a few screens to obtain the most appropriate sample. Based on keywords in the name of the fund and on reported investment objectives, we exclude funds that cannot be predominantly characterized as actively managed U.S. equity funds, such as index, bond, international, and precious metals funds. We exclude funds with less than $10 million in net asset value. Finally, we exclude each fund's first report date, as some of our analysis requires lagged portfolio weights.

B. Summary statistics

Our final sample consists of 6.3 million fund-report date-holding observations with associated earnings announcement returns, spread across 75,263 fund-report dates. Table 1 shows summary statistics. The first column shows that the number of funds filing with the SEC has increased dramatically over the sample period. Almost half of the useable fund-report dates are in the last five years of the sample.

The next three columns show the distribution of investment objectives for these fund-report dates. A consistent, comprehensive set of objectives is not available. CDA classifications are available from 1980 through 1992, with a methodology change in 1990. S&P provide a broader set of objectives, but do not start until 1992. By combining these data we obtain a fairly consistent classification for growth, growth & income, and

income styles. The remaining funds generally fall into the balanced, sector, or total return categories.[6]

The next five columns show fund holdings and trading activity. For the average fund-report date we are able to identify and benchmark a total of 84.0 holdings. Portfolio breadth has increased steadily over time. On average, 51.7 holdings receive an increase in weight in the portfolio over that in the prior report, of which 20.5 are new first buys. 50.8 holdings receive a decrease in weight, on average, and 18.5 of these decrease to zero weight. We also distinguish the performance of first buys and last sells with the view that these are especially likely to reflect a deliberate trading decision; by contrast, generic weight shifts may be caused by changes in overall fund size.[7]

The last columns summarize fund characteristics. Fund size is computed (from the holdings data) as the total market capitalization of the reported equity holdings for which we also have earnings announcement return data. Average size peaks at $84.1 million in 2000. Turnover is available for 71 percent of the sample, averages 95.1 percent per year (for the sub-sample for which it is available), and increases by 37 percentage points over the sample period. The expense ratio is available for 76 percent of the sample, averages

[6] From 1980 through 1989, the CDA investment objective is available for 76 percent of the sample fund-report dates. 92 percent of the non-missing observations are categorized as growth (44 percent), maximum capital gains (21 percent), growth and income (19 percent), and income (9 percent). In 1990 and 1991, the CDA investment objective is available for 79 percent of the sample. We group the first two into growth funds. 86 percent of the non-missing observations are categorized as maximum capital gains (14 percent), long-term growth (38 percent), small capitalization growth (4 percent), growth and current income (23 percent), equity income (4 percent), and flexible income (3 percent). We group the first three categories into growth funds, and the last two into income funds. The other significant classifications are balanced and sector. From 1992 through 2002, the S&P investment objective is available for 73 percent of the sample. 76 percent of the nonmissing observations are categorized as aggressive growth (22 percent), long-term growth (32 percent), growth and income (18 percent) and income (5 percent). We group the first two categories into growth funds. The other significant classifications are balanced, sector, and total return.

[7] Another natural way to define trading activity is to track changes in reported shares across report dates (adjusting for splits). Not surprisingly, the results for this measure tend to be bracketed by those for generic weight shifts and teminal/initiating trades, and so we omit them for brevity.

1.25 percent per year (for the sub-sample for which it is available), and increases by 45 basis points over the period. The last column shows the percentage of funds that use incentive fees. In the average year for which we have data, 2.2 percent of funds use fees. Elton et al. (2003) report that these funds account for around 10 percent of all mutual fund assets. As some of these characteristics appear to contain trends, we will sort funds into quintiles within each reporting period when we examine the relationship between characteristics and performance.

III. Results

A. Earnings announcement alphas based on holdings

Table 2 starts by summarizing the average performance of mutual fund holdings around earnings announcements. The first column considers the raw return over the three-day window around earnings announcement dates. We take the equal-weighted average earnings announcement return for each fund-report date, annualize it (multiplying by 4 quarters), average these across all fund-report dates within that year, and, finally, average the yearly averages.[8] That is, the average return of 1.08 at the bottom of the first column is given by:

$$\text{Return} = 4 \cdot \frac{1}{23} \sum_{1980}^{2002} \frac{1}{N} \sum_{i} \frac{1}{K_i} \sum_{j} \sum_{-1}^{1} r_{ij,t} \,, \tag{1}$$

where i indexes mutual funds from 1 to N, j indexes the holdings of mutual fund i from 1 to K_i, and t measures days around the earnings announcement of stock ij.

This treats each annual average as a single data point in computing an overall average and standard error at the bottom of the table. This approach, which is in the spirit

[8] Because the sample starts in the second quarter of 1980 and ends in the third quarter of 2002, the average return for 1980 is for the last three quarters while the average return for 2002 is the first three quarters.

of Fama and MacBeth (1973), gives equal weight to each time period. Taking simple averages across the pooled data, which gives more weight to the last five years of the sample, leads to similar inferences. The standard deviation of the annual averages is 1.34. Combining this with the average return of 1.08 and the sample size of 23 gives a t-statistic of 3.9.

The second and third columns adjust the raw returns. The second column reports market-adjusted returns (MAR), where we subtract the CRSP value-weighted market return over the earnings announcement window. The average MAR of 0.52 is:

$$\text{MAR} = 4 \cdot \tfrac{1}{23} \sum_{1980}^{2002} \tfrac{1}{N} \sum_i \tfrac{1}{K_i} \sum_j \sum_{-1}^{1} \left(r_{ij,t} - r_{m,t} \right). \tag{2}$$

The t-statistic here is 3.5.

More interestingly, the third column shows a benchmark-adjusted return (BAR), where each holding is matched to one of 125 benchmark portfolios by quintiles of size, book-to-market, and earnings announcement return momentum. That is, the benchmark portfolios contain the value-weighted, matched-firm average earnings announcement return in that calendar quarter. The average BAR of 0.01 is then:

$$\text{BAR} = 4 \cdot \tfrac{1}{23} \sum_{1980}^{2002} \tfrac{1}{N} \sum_i \tfrac{1}{K_i} \sum_j \left(\sum_{t=-1}^{1} r_{ij,t} - \sum_l w_l \sum_{s_l=-1}^{1} r_{l,s_l} \right), \tag{3}$$

where l indexes the characteristics-matched firms within the quarter where t is equal to zero, w_l is the market value weight of stock l in the characteristics-matched portfolio, and s_l measures days around the earnings announcement of stock l within the matched quarter. Note that in Eq. (3) the earnings announcement return and the benchmark do not overlap exactly.

BAR controls for the known predictive power of firm characteristics and prior earnings announcement returns for future announcement returns. For instance, La Porta et

al. (1997) find that small and high book-to-market firms tend to have higher earnings announcement returns than large and low book-to-market firms. Bernard and Thomas (1989) find that earnings announcement returns are positively autocorrelated. BAR controls for these effects. Further, in allowing the benchmark return to vary from quarter to quarter, BAR also controls for a "good earnings quarter for small value stocks," for example, and thus more precisely picks up individual stock-selection skill.

Of course, it may also be a valuable skill for a manager to be able to predict abnormal returns at the style level, as well as to recognize and exploit the positive autocorrelation in abnormal announcement returns or characteristics reliably associated with such abnormal returns. Because the BAR will not pick up these sources of skill, it is likely to be a conservative measure, and to understate the abilities of mutual funds to outperform. Choosing a conservative measure is in keeping with the basic goal of the earnings announcement alpha approach, outlined in the introduction, which is to establish a sturdy, and statistically significant, lower bound on abnormal performance. Naturally it is also of interest if even this lower bound turns out to be large.

Table 2 shows that mutual funds earn, on an equal-weighted average basis, 1.08 percent per year from the twelve trading days surrounding their holdings' earnings announcements. This exceeds the corresponding market return by 52 basis points, and so is an outsize average return compared to non-announcement days. The raw annualized announcement return earned by the average fund manager is not significantly larger than that earned on a portfolio of firms with matching characteristics and prior earnings announcements: the average BAR is an insignificant 6 basis points. The second set of

columns show that similar conclusions obtain when holdings are value-weighted in each fund-report date.

To the extent that the BAR accurately measures the unexpected release of information, then the average mutual fund, as measured by its holdings, does not appear to possess stock-picking ability. This would be consistent with the message of Jensen (1968), Carhart (1997), and many studies in between. Of course, the conclusion that no mutual fund manager has skill is clearly premature. A subset of managers may have skill, even if the average one does not. Alternatively, funds may hold many stocks for which they once had good information but now retain because of transaction costs or a capital gains tax overhang, an effect which would reduce the power of our tests. We turn to these possibilities next.

As an aside, the high average MAR—indicating that while funds' holdings earn above-market returns around earnings announcements, so does the average stock—raises a question of the extent to which even an event-study approach is able to fully resolve the joint-hypothesis problem. There are two interpretations. At one extreme, the high average MAR might be a general inefficiency, an irrational discount on earnings announcers. Put another way, returns around earnings announcements are in fact idiosyncratic in this interpretation, but there is a high return nonetheless. In this case, the BAR separates novel stock-picking skill from known mispricings related to size, book-to-market, and past momentum. At the other extreme, the high MAR might reflect the realization of a rational risk premium. Namely, the earnings announcement return is systematic and echoed in aggregate returns across a class of stocks or the market as a whole. Then, BAR

is best seen as a control for risk, and to the extent that it is imperfect, at least some joint-hypothesis problem inevitably remains.

We lean toward the first interpretation. The results of Ball and Kothari (1991) and Bernard and Thomas (1989) suggest that the returns around earnings announcements are largely idiosyncratic.[9] Moreover, Fama (1991) notes that the use of earnings announcement returns, if still somewhat imperfect, is probably the closest one can come to solving the joint hypothesis problem. We return to these issues in our analysis of fund trades.

B. Fund characteristics and alphas based on holdings

We next look for regularities in the distribution of earnings announcement alphas. Under the null hypothesis of no stock-picking skill, no such patterns will be apparent. We first look at performance persistence, which has been studied in long-horizon returns by Hendricks, Patel, and Zeckhauser (1993), Brown and Goetzmann (1995), and subsequent authors. Do the same funds that had high earnings announcement alphas in the past continue to have them in the future?[10]

Table 3 shows the results of tests for persistence. Following Hendricks et al. (1993) and Carhart (1997), we sort stocks each year from 1983 to 2002 into quintiles based on the average announcement return, or the average BAR alpha, that they earned over their previous eight announcements. We then compare the subsequent annualized

[9] In particular, Ball and Kothari show that betas increase only slightly around earnings announcements, while the positive autocorrelation in returns shown by Bernard and Thomas suggests that a risk premium is unlikely to be a complete explanation for announcement effects.

[10] Our tests operate at the level of funds rather than managers. Because it is possible that a manager has changed over the interval that we measure persistence, our tests may understate the true level of persistence in manager returns. Studies that control for changes in fund management include Baks (2004), and Ding and Wermers (2004).

announcement returns and BAR alphas of funds in the top quintile of prior performance to those in the bottom quintile.

The first four columns show the mean subsequent equal-weighted return and BAR alpha, where the sorting variable is, respectively, previous equal-weighted return and previous BAR alpha. Also shown are the corresponding t-statistics. There is significant persistence in earnings announcement alphas both in raw and benchmark-adjusted returns. When sorted by prior equal-weighted BAR, the subsequent equal-weighted BAR rises monotonically. The difference between the top and bottom quintiles is a significant 43 basis points per year. The fact that persistence is present in BAR, i.e., even after adjustments are made for size, book-to-market, and announcement return momentum, indicates that performance persistence cannot be explained by persistence in characteristics-adjusted announcement returns alone.[11] Value-weighted results display a similar but weaker pattern, suggesting it may be easier to pick future earnings winners among smaller stocks.

Table 4 looks at how performance is correlated with fund characteristics. Panel A considers investment objective, including growth, growth and income, and income styles. A clear pattern emerges. Growth funds earn higher earnings announcement returns than growth and income funds, which in turn earn higher returns than income funds. The same pattern is as strong, or stronger, in BAR alphas. Indeed, the BAR on the portfolio of growth funds is positive, while the BAR on income and growth and income funds is negative. One Wald test (W1 in the table) strongly rejects that the average return for each category is equal to zero, and a second (W2) strongly rejects that fund categories are

[11] This is where it is crucial to control for prior earnings announcements. In the absence of such a control, the Bernard and Thomas (1989) effect could lead to a spurious persistence.

equal to each other. Finally, comparing each style to the equal-weighted average of the other two reveals that income funds perform significantly worse than growth and growth and income categories. Similarly, growth funds perform significantly better. These results are consistent with long-horizon studies by Grinblatt and Titman (1989, 1993) and Daniel et al. (1997), who also find the most evidence of stock-selection ability among growth and aggressive growth funds. Here, we tie these earlier results closely to information-based trading.

Panel B examines returns by fund size quintiles. There is some evidence that performance around earnings announcements increases with fund size; specifically, the smallest quintile does worse than any of the larger quintiles. In unreported results, we find that the significance of this pattern is higher if one uses the number of holdings to measure fund size. Interestingly, the pattern here is opposite to the results of the long-horizon study by Chen, Hong, Huang, and Kubik (2003).

So far, we have seen that funds with high earnings announcement alphas can be identified from past performance, style, and, to some extent, size. One possibility is that differential performance is associated with, or perhaps facilitated by, higher expenses. Panel C shows that this is not the case. Expenses bear little relation to performance. In contrast, there is strong evidence that high earnings announcement alphas are associated with high turnover. Panel D shows that across all four performance measures, funds in the highest turnover quintile have significantly higher performance.

Finally, Panel E considers the effect of incentive fees. By all measures of earnings announcement alpha, funds with incentive fees earn higher returns around earnings announcements. The difference is statistically significant for three measures. This

reinforces the long-horizon results of Elton, Gruber, and Blake (2003), and again ties these earlier results more closely to information-based trading.

C. Earnings announcement alphas based on trades

We now make more powerful use of these data by examining fund *trades*. Because trading involves transaction costs and perhaps the realization of capital gains, trading may be a stronger signal than simply continuing to hold. Table 5 repeats the analysis from Table 2 but computes announcement returns only for holdings whose portfolio weight changed between the current and the previous report dates. The first three pairs of columns show equal-weighted raw and benchmark-adjusted returns for holdings whose weight increased or decreased. The second three pairs of columns focus only on first buys, i.e., when a fund moves from zero to a positive holding of the stock, and last sells, i.e., when a fund liquidated the holding.

Table 5 contains the main results of the paper. Stocks in which funds have increased their weight earn a statistically significant 20 annualized basis points more around the next earnings announcement than stocks of similar characteristics and prior announcement returns. Moreover, stocks in which funds have decreased their weight earn a significant 21 annual basis points *less* than matched stocks. Initiating buys and terminal sells reflect even stronger information: first buys earn 34 basis points more than matching stocks, while last sells earn 29 basis points less. Thus, the stocks that funds buy perform considerably better at subsequent announcements than those they sell.

This analysis also helps to address any residual joint-hypothesis problem that affects our BAR alphas based on holdings. The raw returns are fairly large for both buys

and sells, suggesting there is either a generic mispricing surrounding the revelation of idiosyncratic earnings announcement news or a rational risk premium. However, it is difficult to see why funds would systematically buy (sell) stocks with higher (lower) levels of risk. Rather, Table 5 provides a fairly clean demonstration that the average mutual fund displays some stock-picking skill in both its buys and its sells.

Table 5 also shows that the difference in total announcement returns between buys and sells is very close to the difference in BARs. The difference in total returns is slightly higher, indicating a general tendency to rebalance toward the characteristics associated with better subsequent announcement returns. However, the fact that the two measures are so close indicates that the bulk of the total difference between buys and sells is due to picking winners and losers *within* characteristic groupings, rather than choosing the winning characteristics.

Overall, these results offer considerably more convincing evidence of skill, in suggesting that even the *average* fund manager trades as if he has superior information about the earnings prospects of firms. While a direct comparison to Jensen (1968) is not appropriate, the gist of our results contrasts with his oft-cited message that the average fund underperforms. More broadly, our results from trades complement the findings of Chen, Jegadeesh, and Wermers (2000). Chen et al. document a gap between the long-horizon returns between the stocks that mutual funds buy and those they sell. We show that at least a portion of this gap can be closely tied to information-based trading.

D. Fund characteristics and alphas based on trades

The last analysis combines the power of following trades and of sorting on fund characteristics. As in Section B, we start with persistence. Table 6 tests for persistence in each of the six trade-based BAR alpha measures and the six raw return measures. For each measure, we sort funds into quintiles based on their previous performance over the past two years, and then tabulate their subsequent performance.

We find evidence of performance persistence in alphas based on trades, in particular alphas based on weight increases, weight decreases, and the difference. The gap between the BAR for the highest and lowest weight increase quintiles is a significant 37 basis points per annum, and the gap for weight decreases is an even larger 60 basis points. (Recall that sorting across quintiles has the opposite interpretation for weight increases and decreases. For weight increases, high BAR indicate forecasting skill, while for decreases, low BAR indicate skill.) There is little evidence of persistence in relative performance of first buys, last sells, and first buys minus last sells. The likely explanation is that classifications based on the performance of past first buys or last sells are less precise, there being far fewer such trades than generic buys or sells. This does not affect the means in Table 5, but does reduce the ability to classify a fund here based on past performance.

Finally, Table 7 examines the relation between fund characteristics and alphas based on trades. Panel A shows that growth funds again appears to outperform income funds based on these measures. The Wald tests again reject the hypothesis of equality in most cases. The remaining panels usually point in the same direction as the earlier results based on holdings, but tend to be weaker. Larger funds tend to outperform smaller funds,

expense ratios do not matter at all, and turnover and incentive fees are weakly positively correlated with performance. Given the stronger results of Table 5, the main takeaway is that various categories of funds buy subsequent earnings winners and sell subsequent earnings losers, but there are also differences in this measure of performance across style and other characteristics.

IV. Summary

We develop a methodology to measure the stock-picking skill by fund managers based on their holdings and trades prior to earnings announcements. Our approach offers several advantages. It uses the segment of returns data which is most informative about a fund manager's view on stock fundamentals. Further, it helps to distinguish evidence on abnormal performance from evidence on model misspecification, thereby largely avoiding the joint-hypothesis problem common to long-horizon studies of fund manager skill. We suggest that the "earnings announcement alpha" methodology offers a useful complement to standard, long-horizon measures of fund performance.

Using this methodology, we uncover new evidence that fund managers have at least some stock-picking skill. In particular, the future earnings announcement returns on stocks that funds buy are, on average, considerably higher than the future announcement returns on stocks that they sell. Very little of this difference reflects movement toward categories of stocks (size, book-to-market, and prior announcement returns) that are about to earn higher announcement returns. Instead, most of the effect comes from picking stocks within these categories: The stocks that funds buy perform significantly better at future earnings announcements than stocks with similar characteristics, and vice-

versa with stocks that funds sell. Along the way, we also note several cross-sectional patterns, such as the stronger performance of growth funds and funds with incentive fees, which were suggested in previous long-horizon studies but had never been closely tied to information-based trading.

References

Ali, Ashiq, Cindy Durtschi, Baruch Lev, and Mark Trombley, 2004, Changes in institutional ownership and subsequent earnings announcement abnormal returns, *Journal of Accounting, Auditing, and Finance* (forthcoming).

Baks, Klaas, 2004, On the performance of mutual fund managers, Emory University working paper.

Ball, Ray, and S. P. Kothari, 1991, Security returns around earnings announcements, *The Accounting Review* 66, 718-738.

Bernard, Victor, and Jacob Thomas, 1989, Post-earnings announcement drift: Delayed price response or risk premium? *Journal of Accounting Research* 27 (Supplement), 1-36.

Brown, Stephen J., and Jerold B. Warner, 1985, Using daily stock returns: The case of event studies, *Journal of Financial Economics* 14, 3-32.

Brown, Stephen J., and William N. Goetzmann, 1995, Performance persistence, *Journal of Finance* 50, 679-698.

Carhart, Mark, 1997, On persistence in mutual fund performance, *Journal of Finance* 52, 57-82.

Chen, Hsiu-Lang, Narasimhan Jegadeesh, and Russ Wermers, 2000, The value of active mutual fund management: An examination of the stockholdings and trades of mutual fund managers, *Journal of Financial and Quantitative Analysis* 35, 343-368.

Chen, Joseph, Harrison Hong, Ming Huang, and Jeffrey D. Kubik, 2003, Does fund size erode mutual fund performance? The role of liquidity and organization, *American Economic Review* (forthcoming).

Christophe, Stephen E., Michael G. Ferri, and James J. Angel, 2004, Short-selling prior to earnings announcements, *Journal of Finance* 59, 1845-1876.

Daniel, Kent D., Mark Grinblatt, Sheridan Titman, and Russ Wermers, 1997, Measuring mutual fund performance with characteristic-based benchmarks, *Journal of Finance* 52, 1035-1058.

Ding, Bill and Russell Wermers, 2004, Mutual fund "stars": The performance and behavior of U.S. mutual fund managers, State University of New York at Albany working paper.

Elton, Edwin J., Martin J. Gruber, and Christopher R. Blake, 2003, Incentive fees and mutual funds, *Journal of Finance* 58, 779-804.

Elton, Edwin J., Martin J. Gruber, Sajniv Das, and Matthew Hlavka, 1993, Efficiency with costly information: A reinterpretation of evidence from managed portfolios, *Review of Financial Studies* 6, 1-22.

Fama, Eugene F., 1970, Efficient capital markets: A review of theory and empirical work, *Journal of Finance* 25, 383-417.

Fama, Eugene F., 1991, Efficient capital markets II, *Journal of Finance* 46, 1575-1617.

Fama, Eugene F., and James MacBeth, 1973, Risk, return, and equilibrium: Empirical tests, *Journal of Political Economy* 81, 607-636.

Ferson, Wayne E., and Rudi W. Schadt, 1996, Measuring fund strategy and performance in changing economic conditions, *Journal of Finance* 51, 425-461.

Grinblatt, Mark, and Sheridan Titman, 1989, Mutual fund performance: An analysis of quarterly portfolio holdings, *Journal of Business* 62, 393-416.

Grinblatt, Mark, and Sheridan Titman, 1992, The persistence of mutual fund performance, *Journal of Finance* 47, 1977-1984.

Grinblatt, Mark, and Sheridan Titman, 1993, Performance measurement without benchmarks: An examination of mutual fund returns, *Journal of Business* 66, 47-68.

Grinblatt, Mark, and Sheridan Titman, 1994, A study of monthly mutual fund returns and performance evaluation techniques, *Journal of Financial and Quantitative Analysis* 29, 419-444.

Hendricks, Darryll, Jayendu Patel, and Richard Zeckhauser, 1993, Hot hands in mutual funds: The persistence of performance, 1974-88, *Journal of Finance* 48, 93-130.

Irvine, Paul, Mark Lipson, and Andy Puckett, 2004, Tipping, University of Georgia working paper.

Jensen, Michael C., 1968, The performance of mutual funds in the period 1945-1964, *Journal of Finance* 23, 389-416.

Ke, Bin, Stephen Huddart, and Kathy Petroni, 2003, What insiders know about future earnings and how they use it: Evidence from insider trades, *Journal of Accounting & Economics* 35, 315-346.

Kothari, S.P., and Jerold B. Warner, 2001, Evaluating mutual fund performance, *Journal of Finance* 56, 1985-2010.

La Porta, Rafael, Josef Lakonishok, Andrei Shleifer, and Robert W. Vishny, 1997, Good news for value stocks: Further evidence on market efficiency, *Journal of Finance* 52, 859-874.

Lehman, Bruce, and David Modest, 1987, Mutual fund performance evaluation: A comparison of benchmarks and benchmark comparisons, *Journal of Finance* 42, 233-265.

Malkiel, Burton G., 1995, Returns from investing in equity mutual funds 1971 to 1991, *Journal of Finance* 50, 549-572.

Metrick, Andrew, 1999, Performance evaluation with transactions data: The stock selection of investment newsletters, *Journal of Finance* 54, 1743-1775.

Pastor, Lubos, and Robert F. Stambaugh, 2002, Investing in equity mutual funds, *Journal of Financial Economics* 63, 351-380.

Seasholes, Mark, 2000, Smart foreign traders in emerging markets, University of California working paper.

Wermers, Russ, 1999, Mutual fund herding and the impact on stock prices, *Journal of Finance* 54, 581-622.

Wermers, Russ, 2000, Mutual fund performance: An empirical decomposition into stock-picking talent, style, transactions costs, and expenses, *Journal of Finance* 55, p. 1655-1695.

Table 1. Summary statistics, 1980Q2 through 2002Q3. The sample is the intersection of the Spectrum Mutual Fund holdings database, Compustat, and CRSP. To be included in the sample, a mutual fund holding must have matched earnings announcement date and book value from CRSP, and a valid return, market value of equity (price times shares outstanding), past momentum (return from months *t*-12 through *t*-2), and three-day return in the earnings announcement window from CRSP. We compute terminal holdings for stocks that exit the portfolio. Where possible, we include the investment objective from the CRSP mutual fund database as determined by CDA Weisenberger or S&P. The investment objective growth includes codes G, MCG, and LTG from CDA and LG, and AG from S&P. The investment objective growth and income includes G-I and GCI from CDA and GI and IN from S&P. The investment objective income includes I, IEQ, and IFL from CDA and IN from S&P. We classify each holding as a weight increase or weight decrease. We also record those weight increases that are first buy (from zero to positive weight), and those weight decreases that are last sells (from positive weight to zero). We measure fund size as the total market value (price times shares outstanding) of its reported equity holdings; fund turnover and fund expense ratio from the CRSP mutual fund database; and incentive fees (whether or not the fund has such a structure) from Blake, Elton, and Gruber (2003) and Lipper. Turnover is missing in CRSP in 1991 and incentive fees are not available after 1999.

	Fund-Report Date Observations				Average Fund Activity					Fund Characteristics			
Year	**All**	**Growth**	**Growth& Income**	**Income**	**Holdings**	**Weight Increases**	**Weight Decreases**	**First Buys**	**Last Sells**	**Size ($M)**	**Turnover (%)**	**Expenses (%)**	**Inc. Fees (% Yes)**
1980	810	382	107	25	49.1	27.3	28.3	6.9	6.5	14.2	75.3	0.94	0.6
1981	1,088	494	137	27	49.0	29.4	26.8	6.5	7.2	13.6	68.5	0.92	1.5
1982	903	430	122	32	49.6	29.5	29.3	9.2	9.2	14.1	74.0	0.95	2.5
1983	1,085	525	142	56	57.8	33.0	34.8	11.4	10.0	19.7	77.3	0.94	2.5
1984	1,218	579	170	71	59.0	35.0	34.5	10.5	10.5	17.8	72.9	0.96	2.4
1985	1,362	660	196	94	58.5	34.7	34.5	11.4	10.6	20.5	80.8	0.97	2.6
1986	1,530	756	224	149	60.4	35.5	36.5	12.3	11.6	24.8	78.6	0.99	2.7
1987	1,742	872	266	173	63.9	37.6	39.0	13.7	12.7	30.2	96.0	1.06	3.1
1988	1,843	931	298	168	63.8	38.6	35.8	11.3	10.6	25.1	81.5	1.18	3.2
1989	1,879	971	272	158	64.3	38.2	37.6	12.6	11.4	27.4	77.8	1.20	2.3
1990	2,012	888	370	129	65.0	37.8	39.1	12.0	12.0	26.3	88.8	1.24	2.4
1991	2,242	984	401	121	68.6	39.4	41.4	14.3	12.3	30.8	n.a.	1.23	2.2
1992	2,519	1,054	506	171	75.1	43.7	45.4	15.4	14.0	37.5	80.1	1.25	2.6
1993	2,747	1,159	466	143	84.1	49.3	51.3	19.5	16.5	44.3	80.1	1.24	2.6
1994	3,352	1,277	520	146	85.2	51.2	53.5	21.1	19.4	39.4	81.8	1.24	2.3
1995	3,552	1,432	562	149	89.3	54.6	56.5	24.6	21.7	49.3	88.4	1.25	2.3
1996	4,212	1,690	623	168	90.9	56.7	57.7	27.0	23.6	55.9	91.4	1.28	2.2
1997	4,872	2,126	678	191	90.9	58.1	56.0	25.9	23.3	65.6	91.9	1.26	2.1
1998	5,283	2,385	770	217	90.0	56.0	56.8	23.8	22.8	79.8	89.7	1.28	2.1
1999	6,352	2,722	803	232	88.7	53.7	55.4	23.7	20.4	84.0	88.1	1.30	1.4
2000	8,340	3,164	923	224	95.3	60.1	57.2	24.8	22.0	84.1	116.4	1.30	n.a.
2001	9,018	3,092	881	170	95.0	60.1	55.2	23.5	20.4	60.8	118.1	1.34	n.a.
2002	7,302	2,640	700	157	96.6	60.4	56.1	20.8	19.8	57.7	112.0	1.39	n.a.
All	75,263	31,213	10,137	3,171	84.0	51.7	50.8	20.5	18.5	54.8	95.1	1.25	2.2

Table 2. Annualized announcement effects. For each periodic mutual fund holdings report, we compute the average subsequent quarterly earnings announcement return: raw, market-adjusted, and benchmark-adjusted; and equal- and value-weighted across all holdings by fund. The characteristics benchmark return is the corresponding 5x5x5 size, book-to-market, and momentum average earnings announcement return in the matched quarter. Momentum here is defined as the return in the past 4 earnings announcements. We annualize these returns (multiplying by four) and average across all funds within a year. Returns are Winsorized at the top and bottom one percent.

	EW Earnings Announcement Alpha			VW Earnings Announcement Alpha		
Year	**Return**	**MAR**	**BAR**	**Return**	**MAR**	**BAR**
1980	-0.09	-0.49	-0.15	-0.09	-0.44	-0.03
1981	0.78	0.61	0.15	1.17	1.02	0.52
1982	1.38	0.38	0.54	1.39	0.47	0.54
1983	-0.85	0.00	0.05	-0.96	-0.09	0.01
1984	1.49	-0.06	0.40	1.65	0.05	0.41
1985	1.09	-0.42	-0.07	1.39	-0.14	0.08
1986	1.93	0.46	0.49	2.26	0.75	0.68
1987	-2.19	0.19	-0.62	-2.30	0.35	-0.69
1988	0.17	-0.01	-0.40	0.32	0.14	-0.31
1989	0.05	-0.45	0.21	0.18	-0.33	0.25
1990	1.86	0.71	0.22	2.00	0.76	0.23
1991	1.37	0.80	-0.10	1.24	0.60	-0.17
1992	1.80	0.65	-0.04	1.76	0.58	-0.09
1993	0.80	0.84	0.00	0.80	0.82	-0.11
1994	0.92	0.30	-0.17	1.01	0.39	-0.23
1995	2.46	0.92	-0.07	2.53	0.98	-0.07
1996	2.53	1.67	0.21	2.72	1.87	0.23
1997	3.51	1.32	0.13	3.62	1.40	0.08
1998	1.43	0.42	0.12	1.54	0.44	0.01
1999	3.04	2.67	0.56	3.29	2.95	0.81
2000	-1.26	0.12	0.73	-1.31	0.20	0.80
2001	1.58	0.48	-0.55	1.53	0.50	-0.65
2002	1.08	0.90	-0.33	1.41	1.18	-0.14
Avg	1.08	0.52	0.06	1.18	0.63	0.09
SD	1.34	0.71	0.35	1.41	0.75	0.40
[t]	[3.9]	[3.5]	[0.8]	[4.0]	[4.0]	[1.1]

Table 3. Annualized announcement effects: Persistence. For each periodic mutual fund holdings report, we compute the average subsequent quarterly earnings announcement return: raw and benchmark-adjusted; and equal- and value-weighted across all holdings by fund. The characteristics benchmark return is the corresponding 5x5x5 size, book-to-market, and momentum average earnings announcement return in the matched quarter. Momentum here is defined as the return in the past 4 earnings announcements. We annualize these returns (multiplying by four) and average across all funds within each past performance quintile for each report date (quintiles go from lowest past performance to highest). Past performance is defined based on the previous eight holdings reports (for the corresponding definition of performance). Returns are Winsorized at the top and bottom one percent.

Past Return	EW Earnings Announcement Alpha				VW Earnings Announcement Alpha			
Quintile	**Return**	**[t]**	**BAR**	**[t]**	**Return**	**[t]**	**BAR**	**[t]**
1	1.13	[4.0]	-0.17	[-1.3]	1.24	[4.4]	-0.09	[-0.8]
2	1.20	[4.1]	-0.08	[-0.7]	1.33	[3.9]	-0.20	[-1.5]
3	1.43	[4.1]	-0.06	[-0.6]	1.30	[3.9]	-0.05	[-0.5]
4	1.37	[4.3]	0.01	[0.1]	1.45	[4.5]	0.07	[0.6]
5	1.47	[4.1]	0.25	[1.7]	1.51	[3.8]	0.10	[0.6]
5-1	0.34	[2.9]	0.43	[3.4]	0.27	[1.5]	0.19	[1.2]

Table 4. Annualized announcement effects: Fund characteristics. For each periodic mutual fund holdings report, we compute the average subsequent quarterly earnings announcement return: raw and benchmark-adjusted; and equal- and value-weighted across all holdings by fund. The characteristics benchmark return is the corresponding 5x5x5 size, book-to-market, and momentum average earnings announcement return in the matched quarter. Momentum here is defined as the return in the past 4 earnings announcements. We annualize these returns (multiplying by four) and average across all funds by investment objective (style), total market value of reported holdings (fund size), expense ratio, turnover, and incentive fee structure for each report date. For size, expense ratio, and turnover, quintiles go from lowest to highest. Returns are Winsorized at the top and bottom one percent. For the style categories we perform Wald tests of the joint hypothesis that all three groups have returns equal to zero (W1) or a constant (W2).

	EW Earnings Announcement Alpha				VW Earnings Announcement Alpha			
	Return	**[t]**	**BAR**	**[t]**	**Return**	**[t]**	**BAR**	**[t]**
Style				Panel A. Style				
G	1.32	[4.1]	0.13	[1.0]	1.42	[4.3]	0.13	[1.0]
G&I	1.23	[5.1]	-0.08	[-0.9]	1.26	[4.6]	-0.11	[-1.2]
I	0.86	[3.7]	-0.45	[-2.9]	0.92	[3.9]	-0.44	[-2.4]
W1	30.50		24.85		21.31		16.85	
[p]	0.00		0.00		0.00		0.00	
W2	23.16		23.16		16.84		16.84	
[p]	0.00		0.00		0.04		0.00	
G,<G&I,I>	[1.6]		[3.7]		[2.0]		[4.0]	
G&I,<G,I>	[1.4]		[0.9]		[0.8]		[0.5]	
I,<G,G&I>	[-3.0]		[-4.7]		[-2.5]		[-3.3]	
Quintile				Panel B. Size				
1	1.15	[3.9]	-0.05	[-0.5]	1.25	[4.0]	0.01	[0.0]
2	1.27	[4.6]	0.05	[0.6]	1.31	[4.4]	0.03	[0.4]
3	1.23	[4.2]	0.01	[0.1]	1.35	[4.5]	0.06	[0.6]
4	1.24	[4.1]	0.03	[0.2]	1.32	[4.2]	0.01	[0.1]
5	1.26	[4.5]	0.02	[0.2]	1.38	[4.7]	0.04	[0.4]
5-1	0.11	[1.7]	0.07	[1.4]	0.13	[2.2]	0.04	[0.7]
Quintile				Panel C. Expense Ratio				
1	1.26	[4.8]	0.00	[0.0]	1.34	[4.7]	-0.01	[-0.1]
2	1.25	[4.5]	-0.01	[-0.1]	1.32	[4.5]	-0.02	[-0.1]
3	1.20	[4.0]	-0.03	[-0.2]	1.27	[4.1]	-0.03	[-0.2]
4	1.17	[3.8]	-0.03	[-0.2]	1.26	[4.0]	-0.03	[-0.2]
5	1.28	[4.2]	0.11	[0.9]	1.36	[4.4]	0.09	[0.8]
5-1	0.02	[0.2]	0.10	[1.0]	0.03	[0.3]	0.10	[1.1]
Quintile				Panel D. Turnover				
1	1.16	[4.5]	-0.07	[-0.8]	1.28	[4.5]	-0.03	[-0.3]
2	1.10	[4.1]	-0.11	[-0.7]	1.19	[4.2]	-0.10	[-0.7]
3	1.17	[3.7]	-0.03	[-0.2]	1.21	[3.7]	-0.07	[-0.6]
4	1.26	[3.8]	0.04	[0.3]	1.34	[4.1]	0.04	[0.3]
5	1.50	[4.6]	0.27	[1.9]	1.59	[4.7]	0.26	[1.8]
5-1	0.34	[2.0]	0.34	[2.9]	0.32	[2.0]	0.29	[2.7]
Fees				Panel E. Incentive Fees				
Yes	1.49	[4.5]	0.27	[2.3]	1.64	[4.8]	0.23	[1.4]
No	1.27	[4.2]	0.08	[1.1]	1.37	[4.3]	0.10	[1.2]
Yes-No	0.22	[2.1]	0.19	[1.8]	0.27	[1.7]	0.13	[0.8]

Table 5. Annualized announcement effects: Mutual fund trades. For each periodic mutual fund holdings report, we compute the average subsequent quarterly earnings announcement returns: raw and benchmark-adjusted; and equal-weighted across weight increases, weight decreases, long weight increases and short weight decreases, first buys, last sells, and long first buys and short last sells by fund. The characteristics benchmark return is the corresponding 5x5x5 size, book-to-market, and momentum average earnings announcement return in the matched quarter. Momentum here is defined as the return in the past 4 earnings announcements. We annualize these returns (multiplying by four) and average across all funds within a year. Returns are Winsorized at the top and bottom one percent.

	Weight Increases		Weight Decreases		Increases-Decreases		First Buys		Last Sells		First Buys-Last Sells	
Year	**Return**	**BAR**	**Return**	**BAR**	**Return**	**BAR**	**Return**	**BAR**	**Return**	**BAR**	**Return**	**BAR**
1980	-0.35	-0.33	-0.09	-0.18	-0.26	-0.15	-0.57	-0.56	-0.66	-0.69	0.09	0.14
1981	0.95	0.32	0.52	-0.06	0.43	0.38	0.61	-0.03	-0.02	-0.43	0.63	0.40
1982	1.87	0.91	0.40	-0.24	1.47	1.15	2.78	1.84	0.44	-0.34	2.34	2.19
1983	-0.71	0.07	-1.03	0.03	0.32	0.04	-0.41	0.39	-1.37	-0.44	0.96	0.83
1984	1.45	0.44	1.39	0.30	0.05	0.14	1.14	0.26	0.84	0.10	0.30	0.16
1985	1.33	0.13	0.83	-0.29	0.49	0.42	1.24	0.01	0.98	-0.21	0.26	0.22
1986	2.41	0.88	1.30	0.00	1.11	0.88	2.10	0.78	1.46	0.22	0.64	0.56
1987	-2.22	-0.64	-2.00	-0.52	-0.22	-0.12	-2.65	-0.81	-1.68	-0.38	-0.97	-0.43
1988	0.44	-0.15	-0.26	-0.82	0.70	0.67	1.00	0.35	-0.17	-0.72	1.17	1.06
1989	0.50	0.60	-0.80	-0.47	1.30	1.07	0.36	0.55	-1.14	-0.64	1.50	1.19
1990	2.11	0.38	1.24	-0.20	0.87	0.58	2.04	0.51	0.78	-0.54	1.26	1.05
1991	1.66	0.22	1.12	-0.41	0.54	0.63	1.65	0.23	1.46	-0.15	0.20	0.38
1992	1.75	-0.05	1.69	-0.09	0.06	0.04	2.40	0.69	1.21	-0.55	1.19	1.24
1993	0.77	0.02	0.84	-0.07	-0.07	0.09	0.79	0.14	1.01	0.01	-0.22	0.13
1994	1.01	-0.08	0.66	-0.43	0.34	0.35	1.11	0.23	0.55	-0.57	0.56	0.79
1995	2.49	-0.03	2.35	-0.22	0.14	0.19	3.01	0.53	2.34	-0.20	0.67	0.73
1996	2.58	0.26	2.31	0.08	0.27	0.18	2.16	0.10	2.26	0.16	-0.10	-0.05
1997	3.58	0.23	3.24	-0.07	0.34	0.30	3.41	0.44	3.12	-0.09	0.29	0.53
1998	1.47	0.11	1.30	0.23	0.17	-0.12	1.77	0.45	1.49	0.63	0.28	-0.18
1999	3.26	0.77	2.26	-0.19	1.00	0.96	3.58	1.09	1.48	-1.05	2.10	2.13
2000	-0.87	1.10	-2.08	-0.13	1.21	1.23	-1.47	0.99	-2.14	-0.45	0.67	1.44
2001	1.43	-0.54	1.69	-0.59	-0.26	0.05	1.91	-0.13	1.64	-0.52	0.28	0.38
2002	1.40	-0.09	0.67	-0.53	0.73	0.45	0.75	-0.27	1.47	0.22	-0.71	-0.49
Avg	1.23	0.20	0.76	-0.21	0.47	0.41	1.25	0.34	0.67	-0.29	0.58	0.63
SD	1.35	0.45	1.34	0.27	0.51	0.42	1.51	0.55	1.35	0.38	0.79	0.71
[t]	[4.4]	[2.1]	[2.7]	[-3.8]	[4.4]	[4.6]	[4.0]	[2.9]	[2.4]	[-3.6]	[3.5]	[4.2]

Table 6. Annualized announcement effects: Mutual fund trades and persistence. For each periodic mutual fund holdings report, we compute the average subsequent quarterly earnings announcement returns: raw and benchmark-adjusted; and equal-weighted across weight increases, weight decreases, long weight increases and short weight decreases, first buys, last sells, and long first buys and short last sells by fund. The characteristics benchmark return is the corresponding 5x5x5 size, book-to-market, and momentum average earnings announcement return in the matched quarter. Momentum here is defined as the return in the past 4 earnings announcements. We annualize these returns (multiplying by four) and average across all funds within each past performance quintile for each report date (quintiles go from lowest past performance to highest). Past performance is defined based on the previous eight holdings reports (for the corresponding definition of performance). Returns are Winsorized at the top and bottom one percent.

Past Return	Weight Increases		Weight Decreases		Increases-Decreases		First Buys		Last Sells		First Buys-Last Sells	
Quintile	**Return**	**BAR**	**Return**	**BAR**	**Return**	**BAR**	**Return**	**BAR**	**Return**	**BAR**	**Return**	**BAR**
1	1.27	-0.04	0.70	-0.61	0.08	0.10	1.47	0.25	0.90	-0.37	0.69	0.63
2	1.37	-0.02	1.09	-0.21	0.37	0.17	1.45	0.30	0.82	-0.45	0.61	0.57
3	1.38	0.05	1.26	-0.05	0.24	0.27	1.47	0.05	0.91	-0.24	0.35	0.58
4	1.54	0.17	1.21	-0.11	0.43	0.45	1.55	0.40	0.88	-0.28	0.79	0.61
5	1.48	0.33	1.27	-0.01	0.56	0.51	1.34	0.36	0.79	-0.46	0.48	0.63
5-1	0.21	0.37	0.57	0.60	0.48	0.40	-0.12	0.10	-0.11	-0.09	-0.21	0.00
[t]	[1.6]	[2.4]	[2.1]	[2.1]	[1.9]	[2.6]	[-0.4]	[0.4]	[-0.3]	[-0.3]	[-0.5]	[0.0]

Table 7. Annualized announcement effects: Mutual fund trades and fund characteristics. For each periodic mutual fund holdings report, we compute the average subsequent quarterly earnings announcement returns: raw and benchmark-adjusted; and equal-weighted across weight increases, weight decreases, long weight increases and short weight decreases, first buys, last sells, and long first buys and short last sells by fund. The characteristics benchmark return is the corresponding 5x5x5 size, book-to-market, and momentum average earnings announcement return in the matched quarter. Momentum here is defined as the return in the past 4 earnings announcements. We annualize these returns (multiplying by four) and average across all funds by investment objective (style), total market value of reported holdings (fund size), expense ratio, turnover, and incentive fee structure for each report date. For fund size, expense ratio, and turnover, quintiles go from lowest to highest. Returns are Winsorized at the top and bottom one percent. For the style categories we perform Wald tests of the joint hypothesis that all three groups have returns equal to zero (W1) or a constant (W2).

	Weight Increases		Weight Decreases		Increases-Decreases		First Buys		Last Sells		First Buys-Last Sells	
	Ret	**BAR**	**Ret**	**BAR**	**Ret**	**BAR**	**Ret**	**BAR**	**Ret**	**BAR**	**Ret**	**BAR**
Style						Panel A. Style						
G	1.48	0.29	0.89	-0.27	0.59	0.56	1.48	0.40	0.70	-0.41	0.78	0.81
G&I	1.37	0.03	1.06	-0.21	0.31	0.24	1.60	0.38	0.86	-0.40	0.73	0.79
I	0.97	-0.35	0.77	-0.47	0.20	0.12	1.20	-0.04	0.94	-0.32	0.27	0.28
W1	29.31	22.11	18.82	10.73	20.88	28.07	38.21	12.85	12.35	10.37	21.99	29.00
[p]	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00
W2	19.31	19.31	3.47	3.47	10.72	10.72	4.25	4.25	0.08	0.08	2.50	2.50
[p]	0.01	0.00	0.21	0.18	0.04	0.00	0.19	0.12	0.76	0.96	0.35	0.29
G,<G&I,I>	[1.7]	[3.7]	[-0.1]	[0.4]	[2.5]	[3.0]	[0.3]	[1.1]	[-0.7]	[-0.2]	[1.3]	[1.4]
G&I,<G,I>	[1.0]	[0.4]	[1.5]	[1.3]	[-0.7]	[-0.8]	[1.4]	[1.1]	[0.2]	[-0.2]	[0.8]	[0.9]
I,<G,G&I>	[-2.9]	[-3.7]	[-1.2]	[-1.6]	[-1.5]	[-1.5]	[-1.4]	[-2.1]	[0.4]	[0.3]	[-1.4]	[-1.5]
Quintile						Panel B. Size						
1	1.29	0.08	0.87	-0.31	0.42	0.38	1.17	0.03	0.79	-0.38	0.37	0.42
2	1.38	0.16	0.95	-0.22	0.44	0.38	1.46	0.40	0.92	-0.26	0.54	0.65
3	1.41	0.17	0.90	-0.26	0.51	0.43	1.55	0.42	0.92	-0.24	0.63	0.66
4	1.39	0.18	0.95	-0.25	0.45	0.44	1.57	0.46	0.84	-0.28	0.73	0.73
5	1.41	0.16	0.91	-0.28	0.50	0.44	1.44	0.33	0.56	-0.62	0.88	0.95
5-1	[1.3]	[1.0]	[0.4]	[0.3]	[0.6]	[0.6]	[1.3]	[1.4]	[-1.2]	[-1.3]	[1.9]	[2.0]
Quintile						Panel C. Expense Ratio						
1	1.40	0.10	0.97	-0.23	0.43	0.33	1.52	0.37	0.71	-0.52	0.80	0.88
2	1.39	0.13	0.99	-0.26	0.40	0.39	1.39	0.28	0.86	-0.34	0.53	0.62
3	1.37	0.13	0.91	-0.29	0.45	0.42	1.50	0.40	1.00	-0.18	0.51	0.58
4	1.44	0.24	0.70	-0.47	0.74	0.71	1.49	0.40	0.55	-0.53	0.94	0.94
5	1.36	0.18	0.86	-0.29	0.49	0.47	1.44	0.35	0.63	-0.46	0.81	0.81
5-1	[-0.3]	[0.7]	[-0.9]	[-0.5]	[0.4]	[1.2]	[-0.4]	[-0.1]	[-0.4]	[0.3]	[0.0]	[-0.3]
Quintile						Panel D. Turnover						
1	1.30	0.07	0.88	-0.33	0.42	0.39	1.21	0.14	0.66	-0.50	0.55	0.64
2	1.26	0.02	0.84	-0.32	0.41	0.34	1.20	0.18	0.63	-0.54	0.57	0.72
3	1.33	0.14	0.97	-0.19	0.37	0.33	1.47	0.37	0.99	-0.11	0.48	0.48
4	1.45	0.20	0.81	-0.34	0.64	0.54	1.52	0.36	0.64	-0.45	0.88	0.81
5	1.60	0.37	0.94	-0.26	0.65	0.63	1.67	0.50	0.80	-0.38	0.87	0.88
5-1	[1.7]	[2.3]	[0.4]	[0.6]	[1.3]	[1.4]	[1.8]	[1.7]	[0.4]	[0.5]	[0.7]	[0.6]
Fees						Panel E. Incentive Fees						
Yes	1.72	0.50	0.86	-0.28	0.86	0.78	1.76	0.74	0.67	-0.39	1.09	1.12
No	1.42	0.22	0.96	-0.17	0.46	0.39	1.51	0.41	0.83	-0.27	0.68	0.68
Yes-No	[1.7]	[1.6]	[-1.0]	[-1.6]	[1.7]	[1.8]	[0.8]	[1.0]	[-0.5]	[-0.5]	[0.8]	[0.9]