Earnings News and Institutional Trading

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Comments Welcome

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Abstract

This paper examines how institutions trade in response to earnings news. The key result is that institutions do not seem to engage in *momentum trading* in response to past earnings news, especially bad news. In multivariate tests, there is significant evidence of momentum trading in response to past returns but not with respect to past earnings news. Momentum trading is strengthened, however, when past returns are accompanied by earnings news of the same sign. There is no evidence that momentum trading in response to past returns is the result of trading in anticipation of earnings news. There is some evidence that institutions engage in *contrarian* behavior in response to sequences of good or bad news which is consistent with the *representativeness* hypothesis of Barberis, Shleifer, and Vishny (1998).

This paper studies the relationship between earnings news and institutional trading. By now, a large literature exists focusing on the trading behavior of institutions. A key finding of this literature is that institutions engage in momentum trading in response to past price movements. For example, Grinblatt, Titman, and Wermers (1995) study the holdings of a sample of 155 mutual funds and conclude that mutual funds are momentum investors.[1] Lakonishok, Shleifer, and Vishny (1992) study a sample of 769 tax-exempt pension funds and report evidence of institutional momentum trading in smaller stocks. Nofsinger and Sias (1999) and Badrinath and Wahal (2002) confirm this finding in larger samples of institutions. Grinblatt and Keloharju (2000) study the Finnish stock market and report that foreign investors in the Finnish stock market are momentum investors while domestic investors are contrarians.

While there are many studies focusing on institutional trading in response to past returns there are not many that study institutional trading in response to earnings news.[2] Focusing on earnings news is important since public earnings announcements are among the most anticipated a firm makes. These announcements occur at regular intervals and occupy much of the attention of security analysts and investors alike. Earnings news is also important from a theoretical perspective since behavioral theories often focus on under- or over-reaction to earnings news to explain observed price momentum and reversals.[3] If reaction to earnings news is the source of price momentum then the observed price momentum trading behavior may in fact be *hidden earnings* momentum trading. In other words, institutions may follow strategies that appear to researchers as price momentum strategies, buying after a price run-up, but they may in fact be implementing sophisticated

[1] See also Wermers (1999).

[2] Two papers that focus on cash flow news are Cohen, Gompers, and Vuolteenaho (2002) and Nofsinger (2001). Cohen, Gompers, and Vuolteenaho (2002) use a vector auto-regressive (VAR) approach to estimate measures of annual cash flow news. They use this measure to explain the contemporaneous correlation between changes in holdings, returns, and cash flow news. In contrast, we use measures of quarterly earnings news to examine institutional trading in the *future*. Nofsinger (2001)'s work is closer in spirit to ours since he also examines trading around public announcements. But, his focus is on trading over a shorter-term horizon than what we consider. In addition, his sample covers a three-month period from November 1990 to January 1991 involving 144 firms, while our sample spans fourteen years of quarterly data with an average of 1500 firms.

[3] See Barberis, Shleifer, and Vishny (1998), Daniel, Hirshleifer, and Subrahmanyam (1998), and Hong and Stein (1999) for behavioral theories and Jegadeesh and Titman (1993), Foster, Olsen, and Shevlin (1984), Bernard and Thomas (1989), DeBondt and Thaler (1985) for reversals.

earnings momentum strategies based on predicting future earnings surprises. This suggests that controlling for earnings momentum should weaken if not eliminate the association between past returns and future changes in institutional holdings.

On the other hand, institutions may trade very differently in response to both past price movements and past earnings surprises. As suggested by Hong and Stein (1999), investors may engage in more concentrated momentum trading immediately following earnings announcements and engage in more dispersed momentum trading in response to past returns. This is because the source of the past price momentum (whether it is due to private news or positive feedback trading) is often unclear. Empirically, this view is supported by Chan, Jegadeesh, and Lakonishok (1996) who report that while price momentum and earnings momentum are positively correlated one does not subsume the other. In order to determine which view is correct, we need to understand the interaction between past price momentum and earnings momentum in explaining future institutional trading.

Our paper sheds light on this issue by studying changes in institutional holdings in response to past earnings news. Specifically, we ask (a) whether institutions engage in momentum trading in response to past earnings news in the same manner as they do to past returns, (b) whether momentum trading in response to past returns is really "hidden" earnings momentum trading in anticipation of good or bad earnings news, and (c) whether institutions engage in *representativeness* behavior with respect to sequences of good or bad news. The last point is motivated by the work of Barberis, Shleifer, and Vishny (1998) who predict investors should overreact to sequences of good or bad earnings news.

The institutional holdings data that we use in this study comes from the CDA-Spectrum 13F Filings database. This database contains quarterly holdings of qualifying institutional investors filed with the Securities Exchange Commission (SEC).[4] The data starts in the fourth quarter of 1982 and ends in the second quarter of 1996, and allows us to compile a

[4] We explain the data in more detail in Section 2.

sample having on average 1500 NYSE/AMEX firms per quarter. A disadvantage of the quarterly holdings data is that we will be unable to detect any intra-quarter momentum trading. An advantage, however, is that it mitigates the effects of noise from short-horizon buying and selling and allows us to detect more secular patterns.

We use two kinds of empirical tests: (a) tests based on changes in holdings in event-time for portfolios of firms with high and low earnings surprises and (b) regression tests based on individual firm surprises and holdings. In the portfolio tests, we form portfolios based on past earnings news and then compute the average change in holdings for the stocks in the extreme winner/loser portfolios over a two-year period surrounding each portfolio formation date. These univariate tests are designed to provide a better sense of the magnitudes and economic significance of the findings. The regression tests use Fama-MacBeth cross-sectional regressions to study the relation between earnings surprises and current and future changes in holdings in a multivariate setting controlling for past returns, size, B/M, turnover, etc. These tests provide a better sense of the statistical significance of our findings.

In our empirical tests, we use two measures of quarterly earnings news: (a) Standardized unexpected earnings (SUE) which are based on a quarterly seasonal random walk model with drift, and (b) cumulative abnormal returns (CAR) with respect to the value-weighted market index over a four-day window surrounding the earnings announcement date. Our key findings are as follows. The univariate analysis shows momentum trading in response to past earnings news (especially with respect to bad news) is less pronounced than momentum trading in response to past price momentum. Our multivariate regression analysis shows that after controlling for firm size, B/M ratio, turnover and other firm characteristics, the positive relationship between past earnings news and future changes in institutional ownership disappears, while that between past price momentum and future changes in holdings remains positive and strongly significant. In other words, institutions engage in trend-chasing or positive feedback trading in response to past price momentum but not earnings momentum. This interpretation, however, needs to be tempered by the possibility that some of the momentum trading (both the entry and the exit) in response to

earnings news may be concentrated within the quarter and hence cannot be detected by our tests.

There is no evidence that the observed price momentum trading behavior is the result of *hidden earnings* momentum trading. Even though past returns predict future earnings surprises, controlling for such predictability does not weaken the ability of past returns to predict future changes in institutional holdings. In other words, the results do not suggest that trading in response to past returns is the result of trading in anticipation of earnings news. The momentum trading revealed by our findings (on average) is more like the momentum trading in Hong and Stein (1999) where momentum traders pay attention only to past returns. In theory there could be two kinds of momentum trading: relatively sophisticated momentum trading based on forecasting future earnings news, and less sophisticated trend-chasing. Our results suggest the latter type of momentum trading may be more prevalent.

While there is no evidence that institutions engage in momentum trading in response to the prior quarter's earnings news, we do find the prior quarter's earnings have an effect on institutional trading behavior when combined with past returns. Specifically, momentum trading in response to past returns is more pronounced when past returns are accompanied by earnings news of the same sign. We also find evidence that institutions engage in contrarian trading behavior in response to *sequences* of past good or bad earnings news. Stocks with a sequence of positive earnings surprises experience a decline in their institutional holdings over the subsequent two quarters. This is consistent with the *representativeness* hypothesis in Barberis, Shleifer, and Vishny (1998). In the BSV model, after a sequence of good news investors extrapolate a trend and their forecasts of future earnings tend to be too high. As a result, future earnings are more likely to be disappointing, causing investors to sell their holdings which in turn leads to lower future returns. While Lee and Swaminathan (2002) document evidence of lower returns after sequences of good news, our paper provides evidence of reduced holdings. What is unclear, however, is whether the reduction in holdings is caused by selling after disappointing news, or whether investors anticipate disappointing news and smartly sell

in advance. Higher frequency trading data would be needed to distinguish between these two possibilities.

Our results also show that past changes in holdings do not predict future returns after controlling for past price momentum, earnings momentum and other firm characteristics. This suggests that on aggregate institutions may not have any special stock-picking skills other than the ability to observe and chase momentum. Finally, among institutions, we find those classified as investment companies and independent investment advisors (Spectrum data institution types 3 & 4), which we group together and refer to as *investment advisors*, are the most active momentum traders. Banks and insurance companies, on the other hand, tend to be more passive. These results reveal significant heterogeneity in the trading behavior of different types of institutions. Studying such heterogeneity is likely to be a fruitful area for future research.[5] The rest of the paper proceeds as follows. Section 1 discusses the data and the portfolio formation methodology. Section 2 presents portfolio level results. Section 3 presents multivariate Fama-MacBeth cross-sectional regression results and Section 4 concludes.

1. Data and Design

1.1 Institutional investor holdings

Our sample consists of all firms listed on NYSE and AMEX between the fourth quarter of 1982 and the second quarter of 1996 with available CRSP data for at least one year prior to the portfolio formation date. We exclude NASDAQ firms because most of them tend to be smaller (and thus more difficult to trade in momentum strategies) than the firms in NYSE/AMEX during most of our sample period. We also exclude any firm that is a prime, a closed-end fund, a real-estate investment trust (REIT), an American Depository Receipt (ADR), a foreign company, or whose stock price is less than a dollar as of the portfolio formation date.

[5] One explanation for the observed heterogeneity is difference incentive structures for banks and insurance companies compared to mutual funds.

We match these firms with those on the CDA-Spectrum 13F Filings Database, which we use to compile institutional ownership data. This database contains the quarterly holdings of qualifying institutional investors that are filed with the Securities and Exchange Commission (SEC). Positions greater than 10,000 shares or $200,000 are disclosed to the SEC, and CDA-Spectrum compiles the filings. We sum the institutional holdings of each stock at the end of each quarter, and divide the sum by the number of shares outstanding at the end of the quarter to obtain the percentage of shares held by institutions. The number of shares outstanding is obtained from the Center for Research in Security Prices (CRSP) database, since this database reports shares outstanding rounded to the nearest thousand instead of the nearest million as in Spectrum. The combined sample has on average 1500 firms per quarter.

We use Spectrum's institutional classifications to form three groups of institutions. First, we combine the holdings of *banks* and *insurance companies* (Spectrum type codes 1 and 2, respectively), since preliminary work showed there were no discernable differences in the trading patterns of these two types. The next grouping combines Spectrum type codes 3 and 4, which are *investment companies* and *independent investment advisors*, respectively. As Gompers and Metrick (2001) note, categorizations into types 3 and 4 are not always precise, and in preliminary results we found that the trading patterns of the two groups were very similar. We label the combined group *Investment advisors*. Finally, we also report results for *All Institutions*, which include our first two groups and also a small number of institutions Spectrum labels as *Other*.

1.2 Price momentum and earnings momentum

As is now customary in the momentum literature, we use the prior six-month stock return (with a one-week gap between the portfolio formation date and the end of the six-month portfolio formation period) as a measure of *price momentum*. Momentum measures based on past 3, 9, or 12-month returns provide qualitatively similar results. At the beginning of each quarter, we rank all available stocks based on past six-month returns and divide them into ten portfolios with roughly an equal number of firms in each. *R1* is the loser portfolio and *R10* is the winner portfolio.

We use two measures of earnings momentum: (1) quarterly earnings surprises referred to as *standardized unexpected earnings* (SUE) and (2) the *cumulative abnormal return* (CAR) around quarterly earnings announcement dates. Our earnings data are from the Compustat quarterly database. The advantage of CAR over SUE is that the CAR does not rely on any particular parametric model of expected earnings. As such it does not suffer from model misspecification. On the other hand, it is subject to short-term volatility in the market and could reflect any overreaction to earnings news.

Following Foster, Olsen, and Shevlin (1984), we use a seasonal random walk model of quarterly earnings for our parametric measure of earnings surprises. The expected earnings for quarter q according to the quarterly seasonal random walk model can be written as follows:

$$E(e_{iq}) = \mu_i + e_{i,q-4} \tag{1}$$

where e_{iq} is the quarterly earnings of stock i in quarter q and μ_i is the drift (expected change) in quarterly earnings. The standardized unexpected earnings, SUE, of stock i for quarter q can be written as follows:

$$SUE_{iq} = \frac{e_{iq} - e_{iq-4} - \mu_{iq}}{\sigma_{iq}} \tag{2}$$

where μ_{iq} and σ_{iq} are respectively the mean and the standard deviation of earnings changes over the eight quarters prior to quarter q.

Cumulative abnormal returns with respect to the NYSE/AMEX value-weighted market index are computed from day –2 to +1 around the quarterly earnings announcement date:

$$CAR_{iq} = \sum_{t=-2}^{+1} (r_{it} - r_{mt}) \tag{3}$$

where r_{it} and r_{mt} are the returns on date t of stock i and the market index m respectively. We form 10 earnings momentum portfolios each quarter based on SUE and CAR. *E1* refers to SUE momentum losers and *E10* refers to SUE momentum winners. *C1* refers to CAR momentum losers and *C10* refers to CAR momentum winners. For each price momentum, SUE momentum, or CAR momentum portfolio, we compute the cross-sectional average quarterly institutional holdings and changes in holdings starting four quarters prior to the portfolio formation date and ending at least four quarters after the portfolio formation date. The changes in holdings from one quarter to the next are computed for each stock and then averaged across all stocks. The time series means of cross-sectional averages of both levels and changes in holdings, and their associated t-statistics, are reported in the tables discussed below.

2. Levels and Changes in Institutional Holdings of Momentum Portfolios

How do institutions trade in price momentum portfolios and earnings momentum portfolios? Are there differences in the way they trade winners and losers? We address these questions by tracking levels and changes in institutional investor holdings of momentum portfolios starting four quarters prior to the portfolio formation date and ending four quarters after the portfolio formation date. Tracking the holdings in event time around the portfolio formation date is the most intuitive way to examine the trading patterns of institutions. Increases in holdings are a direct measure of institutional buying, while decreases signify institutional selling. We report the levels and changes when necessary for all three groups of institutions defined earlier:

- Banks and Insurance Companies.
- Investment advisors.
- All Institutions.

2.1 Level of institutional holdings

Table 1 tracks the average portfolio holdings of the three groups of institutions. The holdings reported in the table are time-series averages of cross-sectional means. The numbers in parentheses are Hansen-Hodrick-Newey-West autocorrelation corrected t-

statistics with four lags of autocorrelation correction.[6] Panel A of Table 1 presents institutional holdings for SUE momentum portfolios. Panel B presents results for CAR momentum portfolios, and Panel C presents results for price momentum portfolios.

We first focus on the results for price momentum portfolios in Panel A to provide a benchmark for the findings in Panels B and C. Institutions (we focus on all institutions) decrease their holdings of losers, *R1*, from about 26% in quarter –4 to about 24% by quarter +1. Most of the decrease takes place from quarter –4 to quarter 0, i.e., over the four quarters prior to the portfolio formation date. By the end of quarter +4, the holdings are back to about 25%, implying the change in holdings is relatively temporary. On the other hand, institutions increase their holdings of winners, *R10*, from 27.5% in quarter –4 to about 30% by quarter 0 and about 33% by quarter +4. In other words, the increased holdings of winners are relatively more permanent. In quarter –4, the difference in holdings between winners and losers (R10 – R1) is only 1.5%. By quarter +4, this difference has increased to 8.4%. The overall results suggest that institutions are momentum traders, buying winners and selling losers during the four quarters after the portfolio formation date. In the long run, there is a shift in institutional preferences towards the winners (*R10*).

Among all institutions, *investment advisors* exhibit the strongest momentum-trading behavior. The relative holdings (R10–R1) of investment advisors increase from 0.1% in quarter –4 to 5.4% by quarter +4. This is a significant increase in holdings. In contrast, *banks & insurance companies* increase their holdings only by 1.6% from 1.0% in quarter –4 to 2.6% in quarter +4, and most of this change comes from their selling the losers (*R1*). The results suggest that banks and insurance companies are not as active in employing momentum strategies in their stock selection techniques.

[6] In Table 1 and subsequent portfolio holdings tables, we present all results without size-adjusting the holdings to remove any size effects. We do this so that the results are intuitive and easy to read, although we have computed size-adjusted holdings and the inferences are similar. We explicitly control for size and other firm characteristics in the multivariate cross-sectional regressions that follow in a subsequent section.

Panels B and C of Table 1 present results for earnings momentum strategies. There are significant differences in the way institutions respond to earnings momentum as opposed to price momentum—the earnings momentum results are less pronounced. There are also differences in trading depending on how earnings momentum is characterized (SUE versus CAR momentum portfolios). First note that there is little change in the institutional holdings of the loser portfolio, E1, prior to the portfolio formation date. For instance, in Panel B, the institutional holdings of the loser portfolio (of all institutions) are 34.9% in quarter -4, and 34.6% in quarter 0. The holdings of the winner portfolio, E10, increase by 4.3% from quarter –4 to quarter +4 but 2.9% of the increase occurs during the four quarters prior to the portfolio formation date. The increase after the portfolio formation date is only 1.4%. By contrast, in Panel A the increase for R10 after the portfolio formation date is a full 3%. The overall increase in E10 holdings of 4.3% from quarter -4 to quarter +4 is also somewhat smaller than that for the price momentum winner portfolio, R10, which is 5.6%. The relative holdings, E10-E1, increase by only 2.7% from quarter –4 to quarter +4, a much smaller increase than the increase of 6.9% for the relative price momentum portfolios, R10-R1.

Institutional trading in CAR momentum portfolios exhibits similar patterns with one important difference. Unlike for SUE winners (E10), the larger amount of the increase in holdings of CAR winners (C10) occurs from quarter 0 to quarter +4 as opposed to prior to the portfolio formation date. In other words, institutions buy stocks experiencing high CARs during the current quarter and then continue to buy them over the next several quarters. However, like for SUE winners, the magnitude of the overall increase in the CAR winner portfolio from quarter -4 to quarter +4 is smaller (4.1%) than that for price momentum winners (5.6%). The relative holdings, C10-C1, increase by only 2.1% from quarter –4 to +4, a much smaller increase compared to that for price momentum portfolios (but similar to SUE portfolios). Like for SUE losers, there is little selling of CAR losers by institutions. In Panels B and C, as in Panel A, we find that investment advisors are more active traders than banks and insurance companies.

These results suggest that institutions do not engage in as strong of momentum trading in response to earnings momentum as they do in response to price momentum. Stated another way, institutions seem to engage in *trend-chasing* or *positive feedback trading* more in response to past price movements than to past earnings movements. The multivariate regression results in a subsequent section, which control for past price momentum in examining the influence of SUE and CAR on future institutional trading, provide stronger evidence in support of this conclusion.

2.2 Changes in institutional holdings

Table 2 reports the quarterly change in institutional holdings for the momentum portfolios. The change is measured for each firm and then averaged across all firms in a portfolio. Figure 1 provides the same information graphically. The changes reported in Table 2 allow us to formally test whether the implied changes in Table 1 are statistically significant. The autocorrelation-corrected t-statistics are presented in parentheses. As before, Panel A reports changes in holdings for price momentum portfolios, Panel B presents results for SUE momentum portfolios and Panel C presents results for CAR momentum portfolios.

Institutions begin selling price momentum losers, R1, two quarters prior to the portfolio formation date and continue selling up to the second quarter after the portfolio date. The selling reaches a peak of 1% over the most recent quarter prior to the portfolio formation date. The quarterly declines are statistically significant only from quarter –2 to +1. Institutions begin buying winners, R10, four quarters prior to the portfolio formation date and continue buying up to four quarters after the portfolio formation date. Every quarter's increase in holdings is statistically significant. The peak buying (equal to a total of 2.1% of the outstanding stock of winners) takes place over the two quarters just prior to the portfolio formation date. Institutions collectively buy an additional 2% of winners and sell 0.7% of losers during the four quarters after the portfolio formation date. After two quarters the momentum trading tapers off. This is direct evidence of momentum trading and is consistent with the empirical implications of models of underreaction and

continuing overreaction**.** Consistent with the earlier results, investment advisors do the bulk of the momentum trading. This is shown graphically in Figure 2.

The results for earnings momentum strategies are significantly different, especially for losers. There is little decrease in institutional holdings of losers (E1 and C1) before or after the portfolio formation date. This is in spite of the fact that the level of institutional holdings, on average, is comparable across all loser portfolios, R1, E1, and C1 (see Table 1). The dearth of selling in earnings momentum losers compared to price momentum losers is dramatically illustrated in Figure 1 (see the middle graph).

Institutions do buy earnings momentum winners but there are significant differences in the way they trade in SUE momentum winners and CAR momentum winners. In the case of SUE winners, E10, the majority of the buying is complete by quarter 0. There is much less buying after quarter 0. In other words, there is relatively little positive feedback trading in SUE winners beyond the current quarter. The results are different for CAR winners. Institutions continue to buy CAR winners several quarters after the portfolio formation date (see Figure 1), engaging in momentum trading. It is unclear, however, whether CAR is a more precise way to measure earnings surprises, or whether the apparent CAR momentum trading is actually due to price momentum trading. The regression analysis we employ in a subsequent section is better able to distinguish between price momentum and CAR momentum.

The results in Table 2 and Figure 1 seem to suggest that institutions buy in anticipation of positive earnings news. During the 3 quarters prior to the most recent quarter, institutions increase their holdings of SUE winners (E10) and CAR winners (C10) by an average of 2.4% and 1.8%, respectively. This might indicate sophisticated earnings momentum strategies where institutions are able to anticipate good earnings news. However, in a subsequent section we show that past changes in holdings are unable to predict future CARs once we control for past returns and past SUEs and CARs.

The change in holdings for the momentum portfolios (R10-R1), (E10-E1), and (C10-C1) (see also Figure 2) incorporate the changes in holdings for both the winner and loser portfolios. As can be seen, the differences in momentum trading between price and earnings momentum trading are noticeable. For example, the change in holdings from quarter 0 to quarter 2 for (R10-R1) is 2.1%, while it is only 0.1% and 0.8% for (E10-E1) and (C10-C1), respectively. The temporary nature of the institutional trading in momentum portfolios can also be seen, as the increases in holdings after quarter +2 are much smaller. Overall, the results suggest that while institutions engage in momentum trading in response to past returns they do so only weakly in response to past earnings news.

3. Cross-sectional Regressions involving Earnings News and Institutional Trading

The univariate tests in Tables 1 and 2 reveal that institutional momentum trading with respect to past earnings news is weaker. In this section, we use regression tests to examine the interaction between price momentum and earnings momentum in predicting future institutional trading. The regression tests allow us to control for various firm characteristics such as size, B/M ratios and trading volume in addition to past returns in evaluating the relation between earnings news and current or future change in institutional holdings. We also use the regression tests to evaluate whether past changes in institutional holdings have the ability to predict future stock returns after controlling for past momentum.

3.1 Confirming price momentum and earnings momentum

Before we turn to multivariate tests examining the relationship between earnings news and changes in institutional holdings, it is useful to investigate whether price momentum and earnings momentum predict future returns in our sample. We examine this issue using the following Fama-MacBeth regression:

$$R_{i(t+1,t+K)} = a + b\ R6_{it} + c\ SUE_{it} + d\ CAR_{it} + e\ LnTOVR_{it} + f\ LnSIZE_{it} + g\ LnBM_{it} + h\ DH_{it} + i\ R6_{it} * DH_{it} + j\ SUE_{it} * DH_{it} + k\ CAR_{it} * DH_{it} + \varepsilon_{it+1} \quad (4)$$

$R_{i(t+1,t+K)}$ represents future holding period returns where K=1, 3, or 6 months (we use different horizons to check if past changes in holdings predict returns better over shorter or longer horizons), R6 is the past six-month return, SUE and CAR are for the most recent lagged quarter, LnTOVR, LnSIZE, and LnBM represent the natural log of average daily turnover over the prior six months, market capitalization, and the book-to-market ratio just prior to the portfolio formation date, respectively, and DH represents the past change in institutional holdings (on which more detail is provided below). We also interact changes in holdings with R6, SUE, and CAR to test whether momentum is stronger when accompanied by institutional buying.

The regression is estimated every quarter. Table 3 reports time-series averages of cross-sectional regression coefficients. The numbers in parentheses are Newey-West-Hansen-Hodrick autocorrelation corrected t-statistics (based on 4 quarterly lags). Panel A of Table 3 reports regressions in which future returns are the dependent variables. Columns 2 through 4 report results for regressions involving the change in holdings (as one of the independent variables) from quarter –3 to –1, DH(-3,-1). Columns 5 and 6 present results for the change in holdings from quarters –2 to 0, DH(-2,0). Columns 7 and 8 present results for the change in holdings from –1 to 0, DH(-1,0).

Since quarterly holdings data reported to the SEC are publicly available only with a lag, the holdings data for the current quarter (quarter 0) would not be publicly available as of the portfolio formation date. As a result, from the prediction perspective, only regressions using data from quarter –1 or earlier are valid. Regressions using data beyond quarter -1 will suffer from a peek-ahead bias. Nevertheless, we estimate these regressions to examine the information content of the most current changes in holdings for future returns. We report results using the holdings of all institutions. We have also estimated all our regressions (not reported in the paper) using the holdings only of investment advisors and the results are similar.

Column 2 in Table 3 confirms that all three measures of momentum predict future returns over the next 6 months, $R_{(t+1, t+6)}$. Changes in holdings, DH(-3,-1), DH(-2,0) or DH(-1,0),

do not predict future stock returns after controlling for past price and earnings momentum.[7] The interaction terms are also generally insignificant, suggesting that the predictive power of price momentum or earnings momentum is not enhanced by institutional trading in the same direction. There is some evidence that high turnover stocks earn lower future returns and high book-to-market stocks earn higher future returns. LnSIZE has a positive sign but is insignificant, suggesting that in our sample there is no size premium. Columns 3 and 4 report regressions predicting future one- and three-month returns, respectively. Price momentum (R6) has weaker predictive power in column 3 (t = 2.06) and is insignificant in model 4. This is not surprising since price momentum tends to be weaker at shorter horizons due to short-term reversal effects. The earnings momentum variables continue to have strong predictive power at short horizons, and past changes in holdings (DH) remains insignificant. The regressions reported in columns 5 through 8 vary the prior change in holdings variable, but this variable remains insignificant.

3.2 Earnings news and institutional trading

We now test more formally the relationship between institutional trading and earnings news (using CAR and SUE as proxies) controlling for price momentum (as measured by prior 6 month returns). Specifically, we want to know if institutions engage in momentum trading in response to past earnings news. We also want to know how earnings news interacts with past returns in explaining institutional trading behavior. We examine these issues using the following Fama-MacBeth cross-sectional regression:

$$\begin{aligned} DH_{i(t+j,t+k)} = {} & a + b\ R6_{it} + c\ SUE_{it} + d\ CAR_{it} + e\ SUE_{it} * R6_{it}(+) + f\ SUE_{it} * R6_{it}(-) \\ & + g\ CAR_{it} * R6_{it}(+) + h\ CAR_{it} * R6_{it}(-) + i\ LnTOVR_{it} + j\ LnSIZE_{it} \\ & + k\ LnBM_{it} + l\ DH_{it} + m\ R6_{it} * DH_{it} + n\ SUE_{it} * DH_{it} \\ & + o\ CAR_{it} * DH_{it} + \varepsilon_{it+1} \end{aligned} \tag{5}$$

[7] In unreported results we regress future six-month returns only on DH(-3,-1) and find that the coefficient on the change in holdings is positive and significant (t = +2.13). Since institutions contemporaneously respond to stock returns, and since price momentum exists, such a model suffers from an omitted variable bias. Thus, it is important to control for momentum when examining the relation between institutional trading behavior and future stock returns.

$DH_{i(t+j,t+k)}$ is the change in institutional holdings measured from quarter t+j to quarter t+k. We consider changes in holdings from quarters 0 to 1 and 0 to 2 to measure changes in the future, and -2 to 0 and -1 to 0 to measure changes in the past. $R6_{it}(+)$ represents the positive prior six-month stock return defined as Max (R6,0); $R6_{it}(-)$ represents negative the prior six-month stock return defined as Min (R6,0); $SUE_{it}*R6_{it}(+)$ and $CAR_{it}*R6_{it}(+)$ are interaction terms which evaluate the sensitivity to past positive returns when accompanied by good or bad SUE and CAR earnings news; and $SUE_{it}*R6_{it}(-)$ and $CAR_{it}*R6_{it}(-)$ are interaction terms which evaluate the sensitivity to past negative returns when accompanied by good or bad SUE earnings news. All other variables in equation (5) are defined in the same manner as in equation (4). The regression setting allows us to evaluate the marginal response of institutional trading to earnings momentum after controlling for price momentum and various other firm characteristics. The interaction terms help us evaluate the sensitivity of institutional trading to the interaction between price momentum and earnings momentum.

As before, the regression is estimated every quarter. Table 4 reports time-series averages of cross-sectional regression coefficients. The numbers in parentheses are Newey-West-Hansen-Hodrick autocorrelation corrected t-statistics (based on 4 quarterly lags). Columns 2 & 3 of Table 4 present results using the change in holdings over the next quarter, $DH_{0,+1}$, as the dependent variable. Column 2 reports results from a basic regression without any interaction terms. The slope coefficients corresponding to past returns, R6, SUE, and CAR are all positive, consistent with the results in Tables 1 and 2 that institutions engage in momentum trading. However, only the coefficient for R6 is statistically significant, with a highly significant t-statistic of 10.24. This suggests that institutions primarily engage in price momentum trading and do not respond in a significant way to earnings momentum beyond the current quarter.[8] It is possible that institutional trading in response to earnings news occurs primarily within the quarter, where institutions trade after earnings news but unwind their positions by the end of the quarter. If this is the case then our tests, which are based on quarterly data, would not be

[8] This result holds when we include only SUE or CAR (and not both) in this regression as well as the other regressions in Table 4.

able to detect it. What *can* be concluded, however, is that institutional trading in response to earnings news is not as persistent as that in response to past returns, or does not occur in sufficient magnitude to predict future changes in institutional holdings. An interpretation that institutions focus more on price momentum over earnings momentum is consistent with the findings in Guttierez and Pirinsky (2002). They report that institutional trading is related to firm specific return shocks, but not to residuals from monthly market regressions (which presumably capture earnings information not reflected in price movements).

The coefficient on past change in holdings, $DH_{-3,-1}$, is negative and statistically significant, indicating there is mean reversion in institutional buying. A negative and significant coefficient on R6*$DH_{-3,-1}$ would suggest that if past positive (negative) returns are accompanied by institutional buying (selling), then institutions tend to buy less in the future. The coefficient is indeed negative, but it is not statistically significant. Columns 4 replicates the findings in column 2 using change in holdings over the next two quarters, $DH_{0,+2}$, and the results are similar.

Column 3 presents results for the full regression containing all of the interaction terms. Recall that the dependent variable is the change in holdings over the next quarter, $DH_{0,+1}$. The results with respect to the stand-alone terms from column 2 are similar. The interaction terms provide additional insights into how institutions respond to the interaction between price momentum and earnings momentum. The coefficient on the interaction term, SUE*R6(+), is positive and insignificant while the coefficient on the interaction term, SUE*R6(-), is negative and highly significant. The coefficient corresponding to SUE*R6(+) does become statistically significant when we use change in holdings over the next two quarters, $DH_{0,+2}$, as the dependent variable (see column 5).

The significant coefficients on the interaction terms involving SUE and returns suggest that momentum trading is strengthened when past returns are accompanied by earnings news of the same sign. Thus, institutions buy more when high returns are accompanied by good earnings news and sell more when low returns are accompanied by bad earnings

news, in spite of earnings news on its own not being significantly related to institutional trading. While SUE interacts with past returns to predict future changes in holdings, CAR does not. This might be because SUE is a cleaner measure of fundamental news, since unlike CAR it is unaffected by short term price information around earnings announcements. Price movements around earnings announcements are likely to be influenced by any under- or overreaction to fundamental news. Another interesting result in column 5 is the relation between earnings news and future institutional trading. The coefficients on both CAR and SUE are negative, significantly so for SUE (t = -2.00). This suggests that controlling for price momentum (through R6), some type of contrarian trading behavior may exist with respect to earnings surprises. We explore this result in more detail in a subsequent section.

Column 6 reports a regression of the change in holdings from quarter –2 to 0, $DH_{-2,0}$, on contemporaneous returns, earnings surprises, the interaction terms, and also the control variables of turnover, size, and book-to-market. The positive and significant coefficient on R6 confirms the positive contemporaneous correlation between returns and changes in holdings reported in prior literature (e.g. Wermers (1999), Nofsinger and Sias (1999), and Cohen, Gompers, and Vuolteenaho (2002)). Controlling for price momentum, the *contemporaneous* relation between earnings surprises and institutional trading is mixed. The coefficient on CAR is positive and weakly significant (t = 1.84), but the coefficient on SUE is negative and more strongly significant (t = -2.03). This again suggests some sort of contrarian trading behavior may exist, but in particular based on actual earnings (benchmarked against mean prior earnings).

3.3 Are price momentum strategies in reality hidden earnings momentum strategies?

Our results thus far show that institutions engage in momentum trading over the subsequent two quarters in response to past returns but not past earnings news. As we discussed earlier, one possible explanation for this result is that momentum trading in response to earnings news is completed within the quarter. Our analysis, using quarterly data, would not be able to detect trading that is reversed within the quarter. The other

possibility is that the observed institutional trading strategies may look to us as price momentum strategies but they are in reality earnings momentum strategies.

To understand this, suppose institutions are able to forecast future earnings news (possibly because they are able to predict the biased expectations of other investors). Then they will buy in anticipation of good earnings news, and in doing so push the prices up. They will do relatively little trading around the subsequent earnings announcement (since they already traded in advance of news they anticipated). They may repeat this process by trading in anticipation of the next earnings news, moving the prices as a result, and so on. This would appear to us like a relatively unsophisticated price momentum strategy, even through the strategy being used is based on predicting earnings news. Consequently, the tests we have reported would detect no relationship between earnings news and institutional trading.

One direct way to test for the existence of hidden earnings momentum strategies is to recognize that the hidden earnings argument implies that past buying should be positively related to future abnormal returns around earnings announcements. (Presumably the abnormal returns would occur because some institutional investors, as well as some non-institutional investors, would have biased expectations of future earnings). To test this prediction we estimate the following cross-sectional Fama-MacBeth regression:

$$CAR_{i(t+1)} = a + b\ R6_{it} + c\ SUE_{it} + d\ CAR_{it} + e\ LnTOVR_{it} + f\ LnSIZE_{it} + g\ LnBM_{it} + h\ DH_{it} + i\varepsilon_{it+1} \quad (6)$$

$CAR_{i(t+1)}$ is the cumulative abnormal return around the next quarter's earnings announcement. Table 5 reports the results from this regression. In this table, two measures of past changes in holdings are used: one measured over the last one quarter and another measured over the last two quarters. For comparison purposes, Table 5 also reports results from a regression in which next quarter's SUE is the dependent variable. From an investment perspective, note that predicting CAR is more value-relevant than predicting SUE, since CAR measures a stock's price movement.

There are several interesting findings in Table 5. First, all three measures of momentum (past returns or R6, SUE, and CAR) strongly predict next quarter's CAR with a positive sign. Thus, past returns are able to predict future CARs even after controlling for the information in past changes in holdings. Although this result does not definitely rule out the hidden earnings argument, it provides no support for it either and suggests that past price movements are not merely a proxy of past institutional investor trading. In addition, low turnover and high B/M ratios predict high CAR the next quarter. This is consistent with the findings of Lee and Swaminathan (2000) that low turnover stocks experience positive earnings surprises, and those of LaPorta, Lakonishok, Shleifer, and Vishny (1997) that value stocks experience positive earnings surprises.

The key result is the one with respect to past changes in holdings. While past changes in holdings do have a positive sign in columns 2 and 3, which suggests institutions tend to buy ahead of good news and sell ahead of bad news, the t-stats are insignificant. In contrast, past changes in holdings are able to strongly predict future SUEs. The key to a successful investment strategy, however, is predicting future CARs which represent stock price movements. Thus, institutions, on average, do not seem to possess valuable information about returns around future quarterly earnings announcements (beyond past returns, SUE, CAR, and other firm characteristics). This conclusion needs to be tempered by the caveat that our result is an average result. It is possible that there are some institutions in our sample that do trade based on their ability to predict a firm's future CAR.

In Table 6 we perform an additional test. The earlier results suggest that future changes in institutional holdings may be positively related to future CARs. (The last regression in Table 4 implies the two may be contemporaneously correlated, since the most recent CAR is shown to be positively related to the change in holdings over the past quarter). To the extent to which past returns predict future CARs (due to momentum being related to earnings surprises), it is possible that past returns (being related to future CARs) are related to future changes in holdings through the relation between future holdings and future CARs. The hidden earnings argument thus predicts that past returns should not

predict future changes in holdings once we remove the influence of future CARs. We test this prediction using the following cross-sectional Fama-MacBeth regression:

$$DH_{i(t+j,t+k)} = a + b\ R6_{it} + c\ SUE_{it} + d\ CAR_{it} + i\ LnTOVR_{it} + j\ LnSIZE_{it} + k\ LnBM_{it} + l\ DH_{it} + m\ CAR_{t+1} + n\ CAR_{t+2} + \varepsilon_{it+1} \quad (7)$$

Table 6 summarizes the findings. We consider holdings changes over two horizons, over the next quarter (0,+1), and over the next two quarters (0,+2). While our main results are based on including future CARs (CAR_{t+1} and CAR_{t+2}), for comparison we also estimate regressions replacing CARs with SUEs. The key result in Table 6 is that past returns continue to predict future changes in holdings even after controlling for future CARs or SUEs.[9] Past SUEs and CARs continue to be unable to predict future changes in holdings. Overall, the results in Tables 5 and 6 do not support the notion of hidden earnings momentum trading explaining the relation between price movements and institutional holdings.

3.4 Representativeness and institutional trading in response to sequences of good or bad earnings news

The results thus far show that institutions do not engage in momentum trading in response to earnings news. In fact, there is some evidence suggesting institutions may in fact be acting as *contrarians* in response to past earnings news, selling after good news and buying after bad news conditional on past returns and other firm characteristics. (As discussed previously, this is suggested by the negative coefficients on SUE and CAR in the 4th regression in Table 4). We examine this possible contrarian trading behavior in more detail in this section.

Barberis, Shleifer, and Vishny (1998) build a model based on *representativeness* hypothesis to explain investors' reaction to a sequence of good or bad news. Their model predicts that investors should overreact to a sequence of good news leading to overly optimistic expectations of future earnings. This is because investors extrapolate past good

performance too far into the future believing the past to be *representative* of the future. The high expectations lead, on average, to earnings disappointments in the future which in turn results in low stock returns as investors divest their holdings of the stock and push stock prices down. Lee and Swaminathan (2002) test this hypothesis using stock returns and find that stock prices exhibit weaker momentum and stronger reversals in response to a sequence of good or bad quarterly earnings news.

In the context of our paper, BSV model predictions would imply that institutions should exhibit stronger contrarian trading behavior in response to a sequence of good or bad news. In other words, institutions should sell more after a sequence of good news and buy more after a sequence of bad news. This is because after a sequence of good news institutions get disappointed on average and so tend to reduce their holdings of the disappointing stock. We test this prediction using the following regression model:

$$\begin{aligned} DH_{i(t+k,t+l)} &= a + b\ R6_{it} + c\ RnkSUE_{it}(J) + d\ RnkCAR_{it}(J) + i\ LnTOVR_{it} \\ &+ j\ LnSIZE_{it} + k\ LnBM_{it} + l\ DH_{it} + m\ CAR_{t+1} + n\ CAR_{t+2} + \varepsilon_{it+1} \end{aligned} \quad (8)$$

The two key variables in this regression are RnkSUE(J) and RnkCAR(J). The two represent average SUE and CAR ranks over the last J quarters where J=1, 4, or 6. To illustrate, the average SUE rank over the last 4 quarters (RnkSUE(4)) is computed as follows. At the beginning of each quarter, we sort all available stocks independently by their quarterly SUEs in each of the last 4 quarters and rank them into 10 portfolios (10 for winner and 1 for loser). Thus, a stock has 4 individual ranks corresponding to its SUEs in the last 4 quarters. We then take the simple average of the 4 quarterly SUE ranks to compute RnkSUE(4). We follow an analogous procedure to compute RnkSUE(1), RnkSUE(6), and the three CAR rank variables (1, 4, and 6 quarters). We use RnkSUE(J) (or RnkCAR(J)) instead of the SUEs (or CARs) themselves to prevent any one quarter's SUE (or CAR) from dominating the average. A high average rank implies that the SUE or CAR is more likely to be consistently ranked high in the sorting procedure. In other

[9] In unreported regressions we have also included CARs or SUEs up to eight quarters into the future. Results are qualitatively unaffected.

words, this is a stock more likely to have a sequence of good news**.** We are primarily interested in the average rank over the last 4 or 6 quarters, but we also estimate regressions using the rank from the most recent quarter (J=1) for comparison purposes.

The results are provided in Table 7. To benchmark our results, we start with the results for the one-quarter rank variable (J=1). As expected, the coefficient on the SUE rank is negative but insignificant. The magnitude of the slope coefficients and the t-stats increase dramatically when we use 4-quarter (J = 4) or 6-quarter SUE ranks (J=6). The t-stats for the 4-quarter SUE rank in regressions involving DH(0,1) and DH(0,2), change in holdings over the next quarter and next two quarters, are -4.00 and -4.36 respectively. The t-stats for the 6-quarter ranks are -4.35 and -5.22. The magnitudes of the slope coefficients are 5 to 6 times the slope coefficient for the 1-quarter rank. The results suggest institutions tend to act as contrarians following sequences of good news or bad news conditional on past returns and other firm characteristics. Univariate portfolio tests would be unable to pick up these patterns given the strong relationship between past returns and future changes in holdings. We note the results in Table 7 are economically significant. Focusing on the 6-quarter SUE rank coefficient for DH(0,2) (the last column in Table 7), the results suggest an increase in the average SUE rank by 1 leads to a decline of about 1.5% in institutional investor holdings of the stock over the next two quarters which is a fairly significant decline. These results are consistent with the *representativeness* hypothesis and the predictions of Barberis, Shleifer, and Vishny (1998).

Average CAR ranks are not significantly related to future changes in holdings. One reason for this is that average CAR ranks do not vary as much cross-sectionally as average SUE ranks.[10] This is because it is a fairly rare for firms to consistently earn very high returns around quarterly earnings announcements, while it is relatively more common for firms to report earnings significantly higher than recent prior earnings. (Recall that CAR measures abnormal returns, while SUE measures current earnings

[10] For example, for the 6-quarter ranks, the SUE and CAR ranks have standard deviations of 1.581 and 1.225, respectively. The 90th (10th) percentile of the SUE rank is 8.0 (3.3), while that for the CAR rank is 7.0 (4.0).

benchmarked against prior earnings). It is also possible that a stock reporting consistently higher earnings than expected, thereby achieving high earnings growth, is more likely to be considered a good performer than stocks earning high returns around quarterly earnings announcements. Initial high returns following an earnings announcement could be ultimately reversed and may not be accompanied by consistently higher earnings growth. Whatever the reason may be, empirically, average SUE ranks are better able to predict changes in holdings than do CAR ranks.

4. Conclusions

We find that institutions do not engage in significant momentum trading in response to prior earnings news. In fact, institutions seem to engage in contrarian trading behavior in response to sequences of good or bad prior earnings news. In contrast, institutions do seem to engage in strong momentum in trading in response to past returns. Our results do not support the notion that the observed price momentum trading is the result of a hidden earnings momentum strategy where institutions buy in anticipation of good earnings news in the future. Overall, our results reveal significant differences in the way institutions respond to past returns and past earnings news. We also find an interaction effect, where price momentum trading is stronger when past returns are accompanied by earnings news in the same direction.

What is different about past returns (price momentum) and past earnings news (earnings momentum)? One possibility is that more institutions follow relatively unsophisticated price momentum strategies than follow relatively sophisticated earnings momentum strategies. In other words, price momentum may capture varying degrees of sophistication among institutions capturing those that follow sophisticated momentum strategies as well as those that do not. It is also possible that momentum trading around big earning news is concentrated right around the announcement, since such news generates news stories and increased attention. If such trading is largely unwound before the quarter's end, then our tests based on quarterly data would not detect such short-term, earnings-based momentum trading. In contrast, past high or low returns probably do not gain as much attention since they are often spread out over several months. As in Hong

and Stein (1999) this would cause price momentum traders (different generations in the language of Hong and Stein) to arrive at different points in time making their trading more dispersed over time. Overall, the results suggest either no earnings-based momentum trading, or only transient, earnings-based momentum trading relative to the longer-lived, price momentum trading that we observe.

Our results also have implications for future generations of behavioral models. The current generation of behavioral models, to varying degrees, rely on biased earnings expectations to generate momentum and reversal patterns. Our results suggest the need for models with different types of momentum traders having varying degrees of sophistication when implementing trading strategies based on earnings momentum, price momentum, or a combination thereof. Such models might be able to produce sharper predictions on the trading patterns of institutional and individual investor.

Rational explanations (Conrad and Kaul (1998), Chordia and Shivkumar (2001)) suggest momentum profits can be explained by differences in risk across winners and losers. According to these explanations, winners are either conditionally or unconditionally more risky than losers. The implication of our findings for these explanations is not clear since none of these explanations rely on investor heterogeneity. At a minimum, rational explanations would have to explain the significant differences in the trading by institutions and individuals. Institutions buy winners and sell losers engaging in momentum trading. In contrast, the results imply that individuals take the other side and sell winners and buy losers, engaging in contrarian behavior even though contrarian behavior is not profitable at these horizons.

If winner stocks are indeed riskier than losers, then rational explanations would need to consider why institutions rebalance their portfolios from less risky stocks (losers) to more risky stocks (winners) temporarily over a period of four to six quarters. The other side of the coin is to explain why individuals move from more risky stocks (winners) to less risky stocks (losers). If time-varying risk is at the heart of the observed momentum patterns, then what causes individuals and institutions to respond so differently to such time-varying risk? What our results suggest is that asset pricing models based on a

representative investor may not be able to provide a satisfactory explanation of these findings. What is needed is a rational model that can explain the heterogeneity in investor behavior and set out the nature of the fundamental risk behind momentum portfolios. We leave the development of such models for future research.

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Table 1

Institutional Holdings of Momentum Portfolios

This table presents institutional investor holdings of momentum portfolios. Panel A presents holdings for price momentum portfolios. Panel B presents holdings for earnings momentum portfolios based on standardized unexpected earnings (SUE), a measure of quarterly earnings surprise. The SUEs are estimated based on quarterly seasonal random walk model for quarterly earnings. Panel C presents holdings for earnings momentum portfolios based on cumulative abnormal returns (CAR) around quarterly earnings announcement dates. The CAR is sum of daily excess returns with respect to the NYSE/AMEX value-weighted market index from day –2 to day +1 around the earnings announcement date. The institutional holdings are available quarterly from 1980 to 1996. The holdings data are from the CDA-Spectrum database. The earnings and return data are from Compustat and CRSP respectively and involve only NYSE/AMEX stocks. The price momentum portfolios are based on stock returns over the previous six months (with a one-week gap between the return measurement period and the portfolio formation date). SUE and CAR portfolios are based on the most recent quarter's SUE or CAR prior to the portfolio formation date. At the end of each quarter, all eligible stocks are ranked by their past price momentum, SUE, or CAR and grouped into ten portfolios. *R1* represents price momentum losers and *R10* represents price momentum winners. *E1* represents earnings momentum losers and *E10* represents earnings momentum winners. *C1* represents CAR momentum losers and *C10* represents CAR momentum winners. *All* represents all institutions, and the rest are self-explanatory. The table presents the *level* of institutional holdings starting four quarters prior and ending 4 quarters after the portfolio formation date. Quarter *0* represents the quarter ending as of the portfolio formation date. The numbers in parentheses represent Hansen-Hodrick-Newey-West autocorrelation corrected t-statistics. We use four lags of autocorrelation correction.

Portfolio	Institution Type	Quarterly Holdings in Percent						
		-4	-2	-1	0	1	2	4
Panel A: Institutional Holdings of Price Momentum Portfolios								
R1	All	26.0	26.2	25.5	24.4	23.9	23.9	24.6
	Banks & Ins.Cos.	8.5	8.4	8.2	7.9	7.7	7.6	7.7
	Investment Advisors	15.5	15.8	15.3	14.4	14.1	14.2	14.9
R10	All	27.5	28.3	29.1	30.1	31.0	31.9	33.1
	Banks & Ins.Cos.	9.5	9.6	9.6	9.5	9.7	9.9	10.3
	Investment Advisors	15.6	16.3	17.2	18.3	19.1	19.6	20.2
R10-R1	All	1.5	2.1	3.6	5.7	7.1	8.0	8.4
		(1.05)	(1.44)	(2.76)	(4.83)	(5.94)	(6.29)	(5.84)
	Banks & Ins.Cos.	1.0	1.2	1.4	1.7	2.0	2.3	2.6
		(1.57)	(1.86)	(2.22)	(2.83)	(3.34)	(3.50)	(3.86)
	Investment Advisors	0.1	0.6	2.0	3.9	5.0	5.4	5.4
		(0.20)	(0.83)	(3.39)	(6.94)	(8.14)	(8.51)	(7.40)
Panel B: Institutional Holdings of SUE Momentum Portfolios								
E1	All	34.9	34.9	34.7	34.6	34.9	35.3	36.5
	Banks & Ins.Cos.	12.7	12.6	12.5	12.3	12.3	12.3	12.4
	Investment Advisors	18.9	18.9	18.8	18.7	19.1	19.5	20.4
E10	All	33.9	35.3	36.1	36.8	37.2	37.6	38.2
	Banks & Ins.Cos.	12.6	12.7	12.8	12.9	13.0	13.0	13.1
	Investment Advisors	18.0	19.3	20.0	20.6	20.9	21.2	21.6
E10-E1	All	-1.0	0.5	1.4	2.2	2.4	2.3	1.7
		(-1.04)	(0.49)	(1.55)	(2.90)	(3.53)	(3.50)	(2.52)
	Banks & Ins.Cos.	-0.1	0.1	0.3	0.5	0.7	0.7	0.6
		(-0.30)	(0.20)	(0.68)	(1.50)	(2.16)	(2.22)	(1.99)
	Investment Advisors	-0.9	0.4	1.2	1.9	1.9	1.7	1.2
		(-2.01)	(0.91)	(2.63)	(4.27)	(4.46)	(4.48)	(3.67)
Panel C: Institutional Holdings of CAR Momentum Portfolios								
C1	All	27.9	28.4	28.6	28.3	28.4	28.8	29.9
	Banks & Ins.Cos.	9.4	9.5	9.5	9.4	9.3	9.3	9.5
	Investment Advisors	16.2	16.6	16.7	16.6	16.7	17.1	17.9
C10	All	28.0	28.8	29.1	29.8	30.4	31.0	32.1
	Banks & Ins.Cos.	9.5	9.5	9.4	9.4	9.6	9.7	9.9
	Investment Advisors	16.0	16.9	17.3	17.9	18.4	18.8	19.6
C10-C1	All	0.1	0.4	0.6	1.4	1.9	2.2	2.2
		(0.18)	(1.21)	(1.78)	(4.32)	(5.27)	(6.06)	(4.98)
	Banks & Ins.Cos.	0.1	-0.1	-0.1	0.0	0.2	0.4	0.4
		(0.36)	(-0.36)	(-0.54)	(0.07)	(1.61)	(3.24)	(2.64)
	Investment Advisors	-0.2	0.3	0.5	1.4	1.7	1.8	1.7
		(-0.93)	(1.48)	(2.16)	(4.39)	(4.56)	(5.03)	(3.87)

Table 2
Changes in Institutional Holdings of Momentum Portfolios

This table presents changes in institutional investor holdings of momentum portfolios. Panel A presents holdings for price momentum portfolios. Panel B presents holdings for earnings momentum portfolios based on standardized unexpected earnings (SUE), a measure of quarterly earnings surprise. The momentum portfolios are formed as described in Table 1. *R1* represents price momentum losers and *R10* represents price momentum winners. *E1* represents earnings momentum losers and *E10* represents earnings momentum winners. *C1* represents CAR momentum losers and *C10* represents CAR momentum winners. *All* represents all institutions, and the rest are self-explanatory. The table presents changes starting four quarters prior to the current quarter and ending 4 quarters after the portfolio formation date. Quarter *0* represents the quarter ending as of the portfolio formation date. A column titled *–K to –L* represents change in holdings from quarter –K to quarter –L and is computed as holdings in quarter L minus holdings in quarter K The numbers in parentheses represent Hansen-Hodrick-Newey-West autocorrelation corrected t-statistics. We use four lags of autocorrelation correction.

Portfolio	Institution Type	Changes in Quarterly Holdings							
		-4 to -3	-3 to -2	-2 to -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4
Panel A: Changes in Institutional Holdings of Price Momentum Portfolios									
R1	All	0.3	0.2	-0.6	-1.0	-0.6	-0.2	0.0	0.1
		(2.35)	(1.12)	(-3.31)	(-5.37)	(-3.92)	(-1.22)	(0.24)	(1.12)
	Banks & Ins.Cos.	0.0	0.0	-0.2	-0.3	-0.2	-0.1	-0.1	-0.1
		(-0.16)	(-0.13)	(-2.46)	(-3.57)	(-3.65)	(-1.21)	(-1.11)	(-0.71)
	Investment Advisors	0.2	0.1	-0.4	-0.6	-0.4	-0.1	0.1	0.2
		(2.49)	(1.36)	(-2.86)	(-4.82)	(-4.22)	(-0.76)	(1.92)	(2.18)
R10	All	0.5	0.6	1.0	1.1	0.8	0.5	0.4	0.3
		(5.76)	(4.98)	(5.15)	(3.63)	(4.87)	(5.91)	(2.65)	(2.64)
	Banks & Ins.Cos.	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1
		(1.31)	(1.33)	(0.78)	(0.04)	(1.34)	(1.86)	(1.38)	(1.20)
	Investment Advisors	0.3	0.4	0.8	0.9	0.7	0.4	0.2	0.1
		(4.43)	(4.82)	(6.07)	(4.85)	(4.56)	(4.70)	(2.06)	(1.68)
R10-R1	All	0.2	0.4	1.6	2.1	1.4	0.7	0.3	0.1
		(1.83)	(2.58)	(5.71)	(4.89)	(7.07)	(5.79)	(1.84)	(0.75)
	Banks & Ins.Cos.	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.1
		(1.27)	(1.19)	(2.92)	(2.29)	(6.28)	(3.56)	(2.77)	(2.31)
	Investment Advisors	0.1	0.3	1.1	1.5	1.0	0.4	0.0	-0.1
		(1.65)	(3.36)	(6.78)	(6.07)	(6.91)	(5.28)	(0.28)	(-0.56)
Panel B: Changes in Institutional Holdings of SUE Momentum Portfolios									
E1	All	0.2	0.0	-0.1	-0.1	0.2	0.3	0.3	0.4
		(2.49)	(-0.31)	(-0.76)	(-0.58)	(2.01)	(2.45)	(4.24)	(4.03)
	Banks & Ins.Cos.	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0
		(0.94)	(-1.12)	(-1.26)	(-1.61)	(-1.73)	(-0.69)	(-0.45)	(0.11)
	Investment Advisors	0.1	0.0	-0.1	0.0	0.3	0.3	0.4	0.4
		(1.17)	(0.32)	(-0.66)	(0.06)	(4.36)	(3.04)	(5.41)	(4.42)
E10	All	0.8	0.9	0.8	0.7	0.4	0.2	0.2	0.2
		(5.59)	(6.68)	(6.52)	(5.37)	(4.08)	(1.86)	(1.73)	(1.44)
	Banks & Ins.Cos.	0.1	0.1	0.1	0.1	0.1	0.0	-0.1	0.0
		(1.43)	(1.37)	(1.66)	(1.69)	(1.31)	(-0.13)	(-0.72)	(-0.05)
	Investment Advisors	0.6	0.6	0.6	0.5	0.3	0.2	0.2	0.1
		(5.15)	(5.69)	(5.59)	(5.08)	(4.08)	(1.92)	(2.84)	(1.37)
E10-E1	All	0.6	0.9	0.9	0.8	0.2	-0.1	-0.2	-0.3
		(5.89)	(6.96)	(7.28)	(5.66)	(1.66)	(-0.90)	(-1.68)	(-2.56)
	Banks & Ins.Cos.	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.0
		(1.13)	(2.68)	(2.94)	(3.43)	(2.80)	(0.63)	(-0.67)	(-0.17)
	Investment Advisors	0.5	0.6	0.6	0.5	0.0	-0.1	-0.2	-0.3
		(7.24)	(5.77)	(7.98)	(5.84)	(0.25)	(-1.65)	(-2.55)	(-3.10)

Table 2 continued on the next page.

Table 2 Continued.

Panel C: Changes in Institutional Holdings of CAR Momentum Portfolios									
Portfolio	Institution Type	Changes in Quarterly Holdings							
		-4 to -3	-3 to -2	-2 to -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4
C1	All	0.3	0.4	0.3	-0.1	0.0	0.2	0.2	0.4
		(2.58)	(3.31)	(1.69)	(-0.97)	(0.30)	(1.63)	(2.18)	(2.61)
	Banks & Ins.Cos.	0.0	0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0
		(0.60)	(1.52)	(0.30)	(-0.98)	(-1.20)	(-1.24)	(-0.36)	(0.49)
	Investment Advisors	0.2	0.2	0.2	0.0	0.1	0.3	0.3	0.3
		(1.87)	(2.47)	(2.10)	(-0.47)	(1.78)	(3.27)	(3.06)	(3.29)
C10	All	0.6	0.6	0.5	0.7	0.6	0.5	0.4	0.4
		(5.92)	(4.26)	(5.78)	(7.36)	(6.45)	(5.66)	(3.56)	(5.20)
	Banks & Ins.Cos.	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.1
		(1.15)	(0.52)	(0.49)	(0.38)	(1.66)	(0.84)	(0.27)	(1.27)
	Investment Advisors	0.4	0.4	0.4	0.6	0.4	0.4	0.3	0.2
		(5.08)	(3.76)	(4.07)	(7.22)	(4.20)	(6.25)	(3.96)	(3.07)
C10-C1	All	0.3	0.2	0.3	0.9	0.5	0.3	0.2	0.0
		(4.63)	(1.26)	(1.96)	(5.16)	(4.34)	(3.35)	(1.06)	(0.04)
	Banks & Ins.Cos.	0.0	-0.1	0.0	0.1	0.3	0.2	0.0	0.0
		(1.11)	(-1.41)	(0.01)	(1.75)	(3.10)	(2.22)	(0.48)	(0.69)
	Investment Advisors	0.2	0.2	0.2	0.6	0.3	0.1	0.1	-0.1
		(4.05)	(4.20)	(2.06)	(6.68)	(3.94)	(2.65)	(0.94)	(-0.68)

Table 3
Predictability of Future Returns

This table presents time-series averages of slope coefficients from quarterly Fama-MacBeth cross-sectional regressions. The regressions examine the predictability of stock returns based on past returns, earnings surprises, changes in institutional investor holdings and other firm characteristics. The holdings represent aggregate institutional investor holdings, which include banks, insurance companies and investment advisors. *R6* is returns over the past six months, *SUE* is *standardized unexpected earnings* which is a measure of quarterly earnings surprise, *CAR* is the cumulative abnormal return with respect to the NYSE/AMEX value-weighted index from day –2 to day +1 around the most recent quarterly earnings announcement date, and *DH(j, k)* is the change in past institutional investor holdings from quarter *j* to quarter *k*. *LnTOVR* is the natural logarithm of average daily turnover (shares traded/shares outstanding) over the past six months, *LnSize* is the natural logarithm of market capitalization, and *LnBM* is the natural logarithm of book-to-market ratio. *R(t+1,t+k)* represents the future k-month stock return. The numbers in parentheses are Hansen-Hodrick-Newey-West autocorrelation corrected t-statistics.

Dependent Variable is Future Stock Returns							
	Past Changes in Holdings DH(j,k)						
Independent	DH(-3,-1)			DH(-2, 0)		DH(-1, 0)	
Variables	Y = R(t+1, t+6)	R(t+1, t+3)	R(t+1)	R(t+1, t+3)	R(t+1)	R(t+1, t+3)	R(t+1)
Intercept	0.0392	0.0170	-0.0035	0.0186	-0.0037	0.0182	-0.0041
	(0.90)	(0.70)	(-0.20)	(0.75)	(-0.21)	(0.75)	(-0.24)
R6	0.4296	0.1465	0.0305	0.1462	0.0339	0.1480	0.0327
	(3.79)	(2.06)	-0.8000	(1.89)	(0.89)	(1.97)	(0.87)
SUE	0.0034	0.0024	0.0009	0.0023	0.0008	0.0024	0.0009
	(4.07)	(6.09)	-4.6700	(5.41)	(4.27)	(5.60)	(4.34)
CAR	0.1100	0.0518	0.0372	0.0464	0.0327	0.0456	0.0313
	(4.04)	(3.22)	-3.6100	(3.32)	(3.37)	(3.23)	(3.23)
LnTOVR	-0.0117	-0.0064	-0.0041	-0.0059	-0.0040	-0.0062	-0.0042
	(-2.00)	(-2.15)	(-1.56)	(-1.87)	(-1.50)	(-2.01)	(-1.61)
LnSize	0.0038	0.0021	0.0009	0.0020	0.0009	0.0020	0.0009
	(0.97)	(0.96)	(0.70)	(0.94)	(0.73)	(0.92)	(0.73)
LnBM	0.0234	0.0127	0.0065	0.0130	0.0068	0.0126	0.0067
	(3.68)	(3.46)	-2.4400	(3.50)	(2.54)	(3.41)	(2.52)
DH	0.0040	0.0234	-0.0120	0.0066	0.0005	-0.0424	0.0056
	(0.12)	(0.93)	(-1.13)	(0.21)	(0.04)	(-1.36)	(0.27)
R6*DH	1.2629	0.0442	-0.0838	-0.1926	-0.2230	-0.5664	-0.4134
	(1.66)	(0.09)	(-0.28)	(-0.36)	(-0.77)	(-0.69)	(-1.20)
SUE*DH	-0.0150	-0.0032	-0.0012	-0.0068	-0.0022	-0.0055	0.0001
	(-1.67)	(-0.61)	(-0.44)	(-1.22)	(-0.65)	(-0.79)	(0.01)
CAR*DH	-0.6014	-0.2286	-0.2099	-0.0452	-0.1390	0.4627	-0.1170
	(-1.13)	(-0.59)	(-1.39)	(-0.18)	(-0.93)	(1.27)	(-0.44)

Table 4
Predictability of Future Changes in Institutional Holdings

This table presents time-series averages of slope coefficients from quarterly Fama-MacBeth cross-sectional regressions. The regressions examine the predictability of future changes in institutional holdings based on past stock returns, earnings surprises, changes in institutional investor holdings and other firm characteristics. The holdings represent aggregate institutional investor holdings, which include banks, insurance companies and investment advisors. *R6* is returns over the past six months, *R6(+)* = Max (R6, 0), *R6(-)* = Min (R6, 0), *SUE* is *standardized unexpected earnings* which is a measure of quarterly earnings surprise, *CAR* is the cumulative abnormal return with respect to the NYSE/AMEX value-weighted index from day –2 to day +1 around the most recent quarterly earnings announcement date, and *DH(j, k)* is the change in past institutional investor holdings from quarter *j* to quarter *k*. *LnTOVR* is the natural logarithm of average daily turnover (shares traded/shares outstanding) over the past six months, *LnSize* is the natural logarithm of market capitalization, and *LnBM* is the natural logarithm of book-to-market ratio. *R(t+1,t+k)* represents the future k-month stock return. The numbers in parentheses are Hansen-Hodrick-Newey-West autocorrelation corrected t-statistics.

Ind.	Dependent Variable is Change in Holdings					
Variables	Qtr 0 to +1		Qtr 0 to +2		Qtr -2 to 0	Qtr -1 to 0
Intercept	0.0034	0.0072	0.0075	0.0146	0.0143	0.0058
	(6.33)	(4.60)	(7.24)	(4.79)	(4.27)	(2.94)
R6	0.0859	0.0976	0.1357	0.1459	0.2605	0.1539
	(10.24)	(11.49)	(11.70)	(11.47)	(10.49)	(11.18)
SUE	0.0001	-0.0001	-0.0001	-0.0005	-0.0001	-0.0003
	(0.55)	(-0.58)	(-0.57)	(-2.00)	(-0.60)	(-2.03)
CAR	0.0025	-0.0017	0.0067	-0.0059	0.0051	0.0147
	(0.75)	(-0.33)	(1.59)	(-1.52)	(0.62)	(1.84)
SUE*R6(+)		0.0020		0.0255	0.0256	0.0146
		(0.30)		(2.68)	(1.94)	(2.64)
SUE*R6(-)		-0.0113		-0.0182	-0.0218	-0.0130
		(-2.37)		(-3.54)	(-3.84)	(-3.40)
CAR*R6(+)		0.0027		-0.1417	-0.3370	-0.2302
		(0.02)		(-1.20)	(-1.64)	(-1.40)
CAR*R6(-)		0.0617		-0.3061	0.2324	0.1770
		(0.20)		(-1.10)	(0.55)	(0.67)
LnTOVR		0.0003		0.0005	0.0015	0.0003
		(0.65)		(0.63)	(1.30)	(0.44)
LnSize		-0.0004		-0.0009	-0.0010	-0.0005
		(-2.93)		(-3.00)	(-3.10)	(-2.51)
LnBM		0.0002		0.0007	-0.0014	-0.0006
		(0.35)		(0.58)	(-1.16)	(-0.92)
$DH_{-3,-1}$	-0.0396	-0.0364	-0.0429	-0.0508		
	(-3.09)	(-3.84)	(-2.25)	(-3.80)		
$R6*DH_{-3,-1}$	-0.1517	-0.1775	-0.3667	-0.3100		
	(-1.00)	(-1.34)	(-1.41)	(-1.58)		
$SUE*DH_{-3,-1}$		-0.0028		-0.0047		
		(-1.04)		(-1.20)		
$CAR*DH_{-3,-1}$		0.0136		0.1455		
		(0.12)		(0.93)		

Table 5
Predictability of Future Earnings Surprises

This table presents time-series averages of slope coefficients from Fama-MacBeth cross-sectional regressions involving the prediction of next quarter's earnings surprise. Two measures of earnings surprises are employed: CAR(+1) which is cumulative abnormal return with respect to the NYSE/AMEX value-weighted index from day –2 to day +1 around the next quarterly earnings announcement date, and SUE(+1) which is the standardized unexpected earnings for the next quarter. *R6* is the past six-month return with a one-month lag, *DH(j, k)* is the change in past institutional investor holdings from quarter *j* to quarter *k*. *LnTOVR* is the natural logarithm of average daily turnover (shares traded/shares outstanding) over the past six months, *LnSize* is the natural logarithm of market capitalization, and *LnBM* is the natural logarithm of book-to-market ratio. *R(t+1,t+k)* represents the future k-month stock return. The numbers in parentheses are Hansen-Hodrick-Newey-West autocorrelation corrected t-statistics.

Ind. Var	Dep. Var = CAR(+1)		Dep. Var = SUE(+1)	
Intercept	-0.0037	-0.0034	-0.4260	-0.4094
	(-1.15)	(-1.05)	(-5.75)	(-5.70)
R6	0.0721	0.0729	9.4222	9.6067
	(5.29)	(5.22)	(17.70)	(18.24)
SUE	0.0008	0.0008	0.1364	0.1339
	(5.14)	(5.14)	(7.72)	(7.75)
CAR	0.0178	0.0187	1.0618	1.0600
	(2.55)	(2.67)	(5.15)	(4.92)
LnTOVR	-0.0024	-0.0024	-0.1351	-0.1329
	(-3.77)	(-3.72)	(-8.35)	(-8.78)
LnSize	0.0001	0.0000	-0.0220	-0.0229
	(0.45)	(0.30)	(-1.56)	(-1.65)
LnBM	0.0025	0.0024	-0.0429	-0.0424
	(3.64)	(3.42)	(-1.18)	(-1.17)
DH(-2,0)	0.0108		1.4638	
	(1.56)		(5.19)	
DH(-1,0)		0.0143		1.3511
		(1.21)		(4.39)

Table 6
Predictability of Future Changes in Institutional Holdings Controlling for Future Earnings Surprises

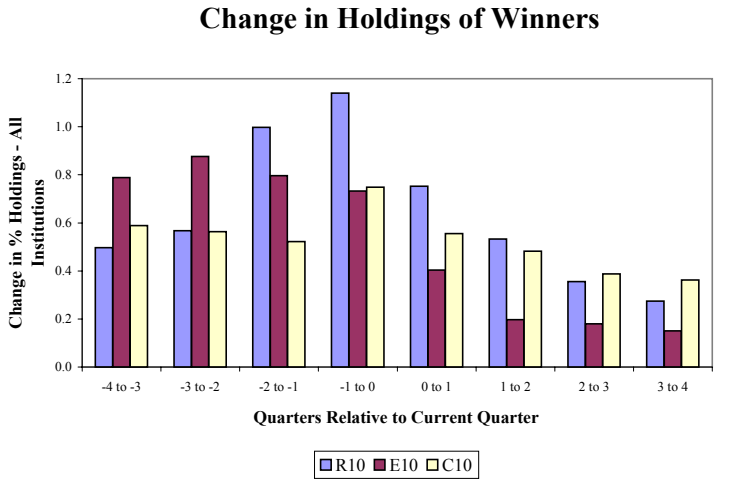
This table presents time-series averages of slope coefficients from quarterly Fama-MacBeth cross-sectional regressions. The regressions examine the predictability of future changes in institutional holdings based on past stock returns, past and future earnings surprises, past changes in institutional investor holdings and other firm characteristics. The holdings represent aggregate institutional investor holdings, which include banks, insurance companies and investment advisors. *R6* is returns over the past six months, *SUE(k)* is *standardized unexpected earnings* for the k^{th} quarter (where k=0 is the most recent quarter prior to the portfolio formation date), *CAR(k)* is the cumulative abnormal return with respect to the NYSE/AMEX value-weighted index from day –2 to day +1 around the k^{th} quarter's earnings announcement date, and *DH(j, k)* is the change in past institutional investor holdings from quarter *j* to quarter *k*. *LnTOVR* is the natural logarithm of average daily turnover (shares traded/shares outstanding) over the past six months, *LnSize* is the natural logarithm of market capitalization, and *LnBM* is the natural logarithm of book-to-market ratio. *R(t+1,t+k)* represents the future k-month stock return. The numbers in parentheses are Hansen-Hodrick-Newey-West autocorrelation corrected t-statistics.

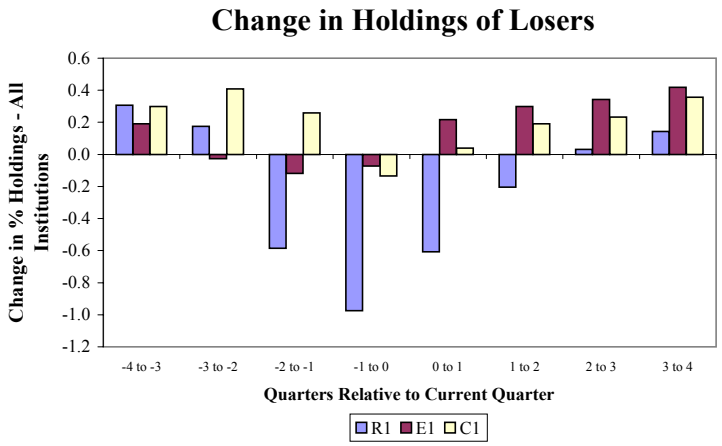
Ind.Var	Dep. Var. = Change in Holdings from							
	Qtr 0 to +1				Qtr 0 to +2			
Intercept	0.0066	0.0064	0.0069	0.0067	0.0141	0.0135	0.0143	0.0139
	(4.53)	(4.09)	(4.48)	(4.09)	(4.83)	(4.53)	(4.75)	(4.51)
R6	0.0992	0.1100	0.0954	0.1058	0.1465	0.1590	0.1422	0.1539
	(13.40)	(13.12)	(13.08)	(12.52)	(13.60)	(15.07)	(13.97)	(14.83)
SUE(-1)	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0002	-0.0003	-0.0003
	(-0.06)	(-0.56)	(-0.54)	(-1.00)	(-0.83)	(-1.26)	(-1.37)	(-1.80)
CAR(-1)	-0.0020	0.0002	-0.0022	-0.0001	0.0024	0.0051	0.0022	0.0049
	(-0.69)	(0.06)	(-0.74)	(-0.03)	(0.70)	(1.42)	(0.60)	(1.30)
LnTOVR	0.0002	0.0001	0.0002	0.0001	0.0005	0.0003	0.0004	0.0002
	(0.52)	(0.28)	(0.42)	(0.21)	(0.60)	(0.34)	(0.43)	(0.20)
LnSize	-0.0004	-0.0004	-0.0004	-0.0004	-0.0009	-0.0008	-0.0009	-0.0008
	(-2.66)	(-2.48)	(-2.64)	(-2.48)	(-2.94)	(-2.71)	(-2.92)	(-2.71)
LnBM	0.0000	-0.0001	0.0001	0.0001	0.0004	0.0004	0.0007	0.0006
	(-0.08)	(-0.18)	(0.14)	(0.00)	(0.33)	(0.28)	(0.57)	(0.50)
DH(-3,-1)	-0.0329		-0.0328		-0.0536		-0.0536	
	(-3.67)		(-3.58)		(-5.26)		(-5.13)	
DH(-1,0)		-0.0779		-0.0778		-0.1077		-0.1085
		(-4.81)		(-4.81)		(-5.26)		(-5.23)
CAR(+1)	0.0294	0.0294			0.0451	0.0446		
	(5.27)	(5.15)			(5.81)	(5.63)		
CAR(+2)	0.0032	0.0030			0.0309	0.0306		
	(0.85)	(0.85)			(3.94)	(3.87)		
SUE(+1)			0.0003	0.0003			0.0005	0.0005
			(5.10)	(5.06)			(4.90)	(4.91)
SUE(+2)			0.0006	0.0006			0.0010	0.0011
			(5.01)	(5.19)			(5.58)	(5.80)

Table 7
Institutional Trading in Response to String of Earnings Surprises

This table presents time-series averages of slope coefficients from quarterly Fama-MacBeth cross-sectional regressions that examine future changes in institutional holdings in response to strings of earnings surprises. The dependent variable is either change in holdings over the next quarter DH(0,1) or change in holdings over the next two quarters DH(0,2). The holdings represent aggregate institutional investor holdings, which include banks, insurance companies and investment advisors. *R6* is returns over the past six months, *R6(+)* = Max (R6, 0), *R6(-)* = Min (R6, 0), *RnkSUE(J)* and *RnkCAR(J)* are the averages of last J quarters' SUE and CAR ranks respectively. Each quarter's rank varies from 1 to 10 where 1 represents losers and 10 represents winners. *CAR(k)* is the cumulative abnormal return with respect to the NYSE/AMEX value-weighted index from day –2 to day +1 around the k^{th} quarter's earnings announcement date, and *DH(k, l)* is the change in institutional investor holdings from quarter *k* to quarter *l*. *LnTOVR* is the natural logarithm of average daily turnover (shares traded/shares outstanding) over the past six months, *LnSize* is the natural logarithm of market capitalization, and *LnBM* is the natural logarithm of book-to-market ratio. *R(t+1,t+k)* represents the future k-month stock return. The numbers in parentheses are Hansen-Hodrick-Newey-West autocorrelation corrected t-statistics.

	J=1		J=4		J=6	
	DH(0,1)	DH(0,2)	DH(0,1)	DH(0,2)	DH(0,1)	DH(0,2)
Intercept	0.0064	0.0135	0.0100	0.0192	0.0108	0.0201
	(4.09)	(4.53)	(3.92)	(4.67)	(4.14)	(4.54)
R6	0.1100	0.1590	0.1156	0.1663	0.1127	0.1647
	(13.12)	(15.07)	(12.43)	(14.77)	(12.25)	(13.69)
RnkSUE(J)	-0.0001	-0.0002	-0.0006	-0.0011	-0.0008	-0.0015
	(-0.56)	(-1.26)	(-4.00)	(-4.36)	(-4.35)	(-5.22)
RnkCAR(J)	0.0002	0.0051	0.0001	0.0002	0.0002	0.0005
	(0.06)	(1.42)	(0.21)	(0.85)	(0.65)	(1.36)
LnTOVR	0.0001	0.0003	0.0002	0.0005	0.0002	0.0004
	(0.28)	(0.34)	(0.43)	(0.56)	(0.45)	(0.50)
LnSize	-0.0004	-0.0008	-0.0005	-0.0009	-0.0005	-0.0010
	(-2.48)	(-2.71)	(-2.45)	(-2.61)	(-2.65)	(-2.82)
LnBM	-0.0001	0.0004	-0.0002	0.0004	-0.0002	0.0003
	(-0.18)	(0.28)	(-0.20)	(0.24)	(-0.26)	(0.17)
DH(-1,0)	-0.0779	-0.1077	-0.0805	-0.1000	-0.0785	-0.1034
	(-4.81)	(-5.26)	(-4.92)	(-5.39)	(-5.50)	(-5.69)
CAR(+1)	0.0294	0.0446	0.0310	0.0487	0.0318	0.0490
	(5.15)	(5.63)	(4.72)	(6.02)	(5.14)	(5.70)
CAR(+2)	0.0030	0.0306	0.0032	0.0322	0.0034	0.0339
	(0.85)	(3.87)	(0.77)	(3.50)	(0.80)	(3.67)





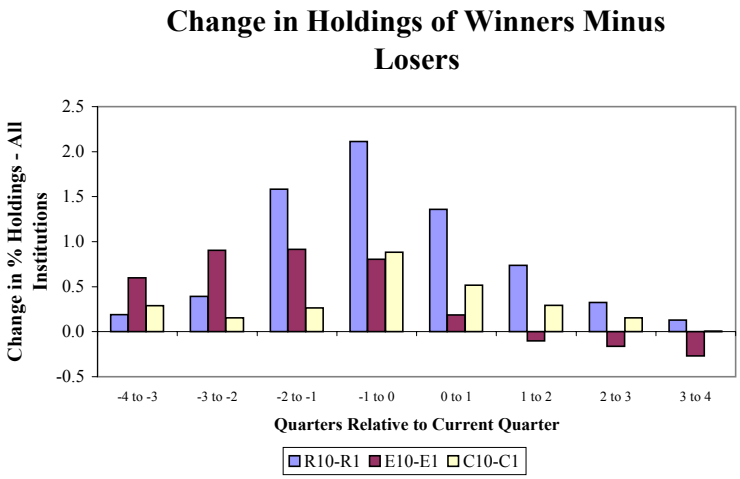
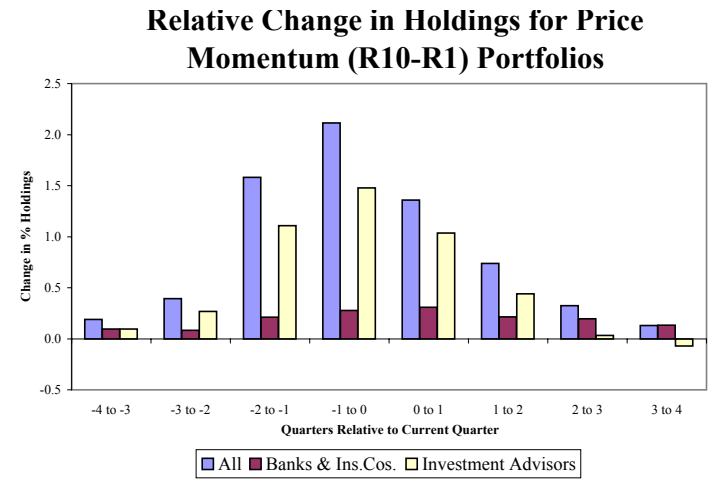
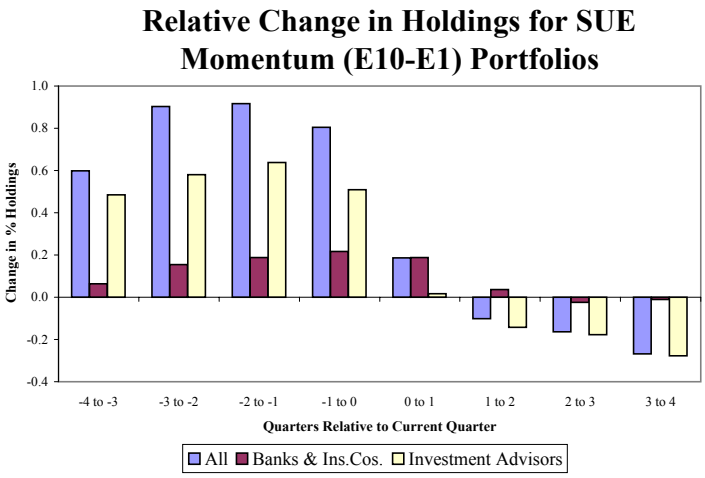


Figure 1: Change in Holdings of Momentum Portfolios. This table graphs changes in institutional investor holdings of momentum portfolios. The holdings are graphed for winners (top), losers (middle) and winners minus losers (bottom). Quarter *0* is the contemporaneous quarter when portfolios are formed. R1, E1, and C1 represent price, SUE and CAR *loser* portfolios and R10, E10 and C10 represent corresponding *winner* portfolios.





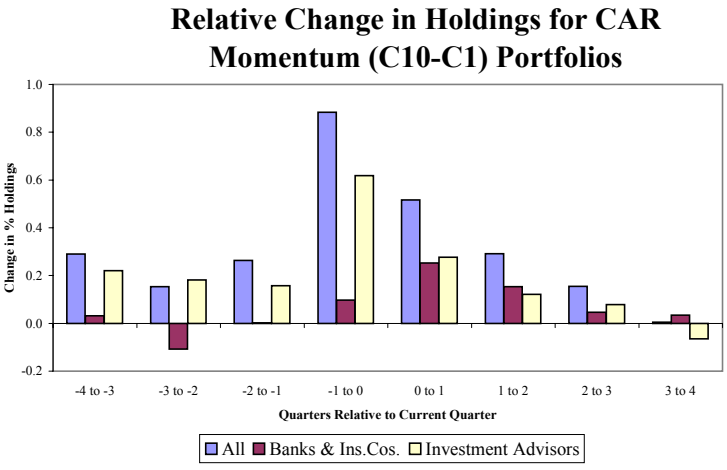


Figure 2: Relative Change in Holdings of (Winner – Loser) Momentum Portfolios. This table graphs relative changes in institutional investor holdings between winner and loser momentum portfolios for various institutions. The holdings are graphed for price momentum (top), SUE earnings momentum (middle) and CAR earnings momentum (bottom). Quarter *0* is the contemporaneous quarter when portfolios are formed.