Anchoring, the 52-Week High and Post Earnings Announcement Drift

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Abstract

We examine whether anchoring on the 52-week high explains why markets underreact to extreme earnings news for individual stocks. We decompose returns into pure earnings, pure anchoring and interaction effects using the entire cross-section of stocks. The earnings effect is generally insignificant and the interaction dominates. Post earnings announcement drift (PEAD) occurs when stocks prices are anchored near or far from 52-week highs and not otherwise. Corroborating evidence is obtained from an analysis of returns around current and future earnings announcements for stocks that sustain extreme earnings surprises. It is anchoring on the 52-week high, and not the surprise in earnings itself, that drives the market's underreaction to extreme earnings news.

Introduction

According to Fama (1998), return momentum and post earnings announcement drift (PEAD) are two anomalies that pose the greatest challenges to the efficient markets paradigm.[1] These anomalies are similar in that predictably high returns follow either high past returns or high unexpected earnings. This similarity leads naturally to the questions of whether they are independent or different manifestations of the same phenomenon, and whether one subsumes the other.

The evidence is mixed. Chan, Jegadeesh and Lakonishok (1996) show that both past returns and past earnings surprises predict large drifts in future returns after controlling for the other. Chordia and Shivakumar (2006) conclude that PEAD is the dominant effect because the systematic component of PEAD explains the returns to momentum strategies—the return to a long-short portfolio of stocks with extreme surprises explains the long-short momentum return. Despite this, Kothari, Lewellen and Warner (2006) document that PEAD does not exist in market returns. Market-wide earnings surprises do not predict market-wide returns.

The return momentum examined in both Chan et. al. (1996) and Chordia and Shivakumar (2006) is based on Jegadeesh and Titman (1993), which is measured by the returns to an investment strategy that ranks stocks by returns over the past six or twelve months. George and Hwang (2004) consider a momentum strategy that ranks stocks by how close is the current price to the 52-week high price. Their strategy takes a long position in the quintile of stocks whose prices are close to the 52-week high and shorts stocks whose prices are far from the 52-week high.

George and Hwang (2004) show that the profits to this strategy dominate the profits generated by return momentum strategies. Li and Yu (2011) show there is a strong systematic element to this relation also—Dow Index returns are predictable based on nearness to the index 52-week high. Both George and Hwang and Li and Yu explain their findings as consistent with an anchoring bias, whereby investors are reluctant to immediately revise their beliefs upward when good news arrives if the price is already near its 52-week high. Similarly, investors are reluctant to revise downward on bad news if the price is far below its 52-week high.[2] Neither study tests whether the 52-week high serves as an anchor with respect to a particular type of news, however.

In this paper, we examine whether anchoring on the 52-week high affects how investors react to extreme earnings news and the degree to which anchoring is responsible for PEAD. Our principal finding is that the drift in prices subsequent to earnings surprises is mostly attributable to anchoring.

[1] See Jegadeesh and Titman (1993), Ball and Brown (1968), Foster, Ohlson and Shevlin (1984) and Bernard and Thomas (1989) and the vast literatures that cite them.

[2] See Kahneman (2011) Ch. 11 for a review of the literature on anchoring biases.

In the full-sample, extreme earnings surprises generate PEAD *only* among stocks whose prices are near or far from 52-week highs. In addition, anchoring is strong on its own. Stocks with prices near or far from 52-week highs have significant future returns even if they do not experience earnings surprises. In contrast, there is no ex-post return associated with earnings surprises in the absence of anchoring. These findings suggest that the PEAD anomaly arises entirely because investors anchor their beliefs on 52-week high prices when reacting to the information in extreme earnings surprises.

The value to an investor of recognizing that PEAD is driven by anchoring is large in economic terms. The traditional zero-investment PEAD trading strategy that does not discriminate between anchored an unanchored stocks produces a Fama-French (1993) factor risk-adjusted return of about 9% per year. However, by also conditioning on whether a stock's price is anchored (which uses about 1/3 of the original sample), the profit is nearly double at 16% per year. As noted above, this is not a summation of separate earnings and anchoring effects, but the result of an interaction—investors underreact to earnings surprises when stocks' prices are near or far from 52-week highs.

Corroborating evidence that anchoring constrains price reactions to earnings comes from analyzing returns in the days surrounding earnings announcements. The anchoring hypothesis predicts that price reactions to extreme earning surprises are more muted the stronger is the anchoring effect. This must correct itself in the long-run as investors update their mistaken beliefs. Consequently, the returns that occur around subsequent earnings announcements should contain a larger correction the stronger was the prior anchoring effect. For example, the contemporaneous price reaction for stocks with extreme positive earnings surprises should be *less* positive the nearer the pre-announcement stock price is to the 52-week high (i.e., the stronger is the anchoring effect). Returns around subsequent earnings announcements should then be *more* positive to correct for this underreaction. A corresponding pattern should exist for extreme negative surprises. This is indeed what we find. It too suggests that PEAD is primarily a consequence of investors anchoring their beliefs on the 52-week high when reacting to extreme earnings surprises.

We also examine subsamples. Several authors argue that the prices of small and low analyst coverage firms are affected strongly by behavioral biases because less news and analysis is generally available than for large firms or firms with greater analyst coverage [see Hirshleifer (2001), Hong, Lim and Stein (2006) and Zhang (2006) among others]. Accordingly, if our interpretation of the interaction effect as a behavioral anchoring bias is correct, it should be stronger for small and low-coverage firms. Indeed, we find that the PEAD for firms with both extreme earnings surprises and anchored prices is greater for small than large firms, and for firms with low rather than high coverage. The dominant effect in generating these differences is again the interaction component, which is larger for small and low-coverage firms than the others. In other words, small or low coverage firms have larger PEAD than other firms *because* nearness to (or distance from) a 52-week high restrains price reactions to extreme earnings surprises. This pattern is consistent with the interpretation that investors are subject to a behavioral bias in which they anchor their beliefs on 52-week high prices when reacting to earnings surprises.

For robustness, we also examine the two fifteen-year subperiods in our sample. A test of whether the components relating to earnings, anchoring and their interaction does not reject the hypothesis that the subperiods are the same. However, the point estimates are weaker in the latter half of the sample. The analysis of returns in the days surrounding earnings announcements yields strong results for both subperiods, and even stronger results in the latter subperiod for good earnings news. This evidence suggests that the interaction remains strong throughout, but it is obscured by noisier monthly returns in the last fifteen years.

Our results help to sharpen the interpretation of prominent theoretical explanations of PEAD based on behavioral biases. Daniel, Hirshleifer and Subrahmanyam (1998) show that overconfidence and self-attribution biases can lead investors to overweight their priors and private information, and to underweight public information, when forming their beliefs. Our evidence identifies the 52-week high specifically as the component of their prior that investors rely too heavily upon when underweighting earnings news. Hirshliefer, Lim and Teoh (2011) show that PEAD can arise solely because of investors' inattention to earnings news. Their broader message is that more information competes for investors' attention than investors can effectively process. The important role played by anchoring helps pinpoint the information sources involved in this tradeoff. Investors pay insufficient attention to earnings and too much attention to whether prices are near or far from 52-week highs in assessing the value relevance of earnings news.[3]

The next section describes the data and presents descriptive statistics. Section 2 explains our approach, presents estimates for the full sample, and discusses the implications for interpreting the PEAD anomaly. There we show that underreaction to extreme earnings surprises occurs only for stocks whose prices are anchored on the 52-week high. We also confirm Chordia and Shivakumar's (2006) conclusion that PEAD dominates traditional *return* momentum using our approach. However, we do find that PEAD and return momentum have independent effects on returns as in Chan, et.al. (1996). Section 3 analyzes returns around earnings announcements and shows that price reactions to extreme earnings and subsequent earnings are consistent with the anchoring hypothesis.

[3]This extends beyond the normal course of competitive equity markets trading. Baker, Pan and Wurgler (2009) show that the target's 52-week high anchors bidders' strategies in M&A transactions.

Section 4 presents sub-period results for the three decades in our sample. Section 5 concludes.

1. Data and Descriptive Statistics

The data consist of common stocks traded on the NYSE, AMEX and NASDQ from 1980 to 2011. Stock returns and prices are obtained from CRSP, and quarterly earnings are from obtained from COMPUSTAT.

We begin by sorting stocks each month independently by the nearness of stocks' prices to 52-week highs (PRC) and by standardized unexpected earnings (SUE). To reduce the influence of illiquid stocks for which investors would find it costly to arbitrage mispricing, we delete stocks with prices less than \$5 at the portfolio formation month. PRC is the anchoring variable used in George and Hwang (2004), defined as the stock's current price divided by its 52-week high price. To construct PRC, the current price and the 52-week high price are measured 10 days prior to the most recent earnings announcement date (see Figure 1). This avoids having news leaks introduce a bias into tests involving earning announcement period returns.

Stocks are sorted into quintiles by PRC. We denote by PRC5 the quintile with the largest ratios, which we refer to as stocks that are anchored high (denoted "H"). Similarly PRC1 is the quintile with the smallest ratios, which we refer to as stocks that are anchored low ("L"). SUE is defined as in Chan et al (1996) and Chordia and Shivakumar (2006). It is calculated as $(e_q - e_{q-4})/\sigma_q$, where e_q is the most recently announced earnings, e_{q-4} is earnings in the same quarter of the previous year, and σ_q is the standard deviation of the difference $(e_q - e_{q-4})$ over the prior eight quarters. Stocks are sorted into five groups by SUE. SUE5 is the quintile of extreme positive surprises (extreme good news "GG") and SUE1 contains the quintile with extreme negative surprises (extreme bad news "BB"). Although the extreme SUE groups are quintiles, the middle three groups are not evenly split because earnings surprises are positive on average in the sample. The group of moderate positive surprises is therefore larger than the group of moderate negative surprises so that the middle group has an unconditional mean SUE near zero.[4]

Panel A of Table 1 reports the average numbers of stocks in each group and the averages of SUE and PRC within each group. Two things are worth noting about these tables. First, a substantial portion of the sample lies *outside* the extremes of both rankings. This is important because

[4]The specifics of the procedure are as follows. Each month, we rank firms by SUE into 50 subgroups. SUE5 and SUE1 are the top and bottom 10 subgroups—i.e., the top and bottom quintiles ranked by SUE. The middle group consists of subgroups 19 - 23, which is the decile whose time-series average SUE is nearest zero. The moderate positive surprises are then defined as including subgroups 24 - 39, and the moderate negative surprises are defined to include subgroups 11 - 18.

separating the effects of earnings and anchoring in our hypothesis tests relies on the information in the non-extreme portions of the sample. Second, the average SUE values within each group are affected very little by the stocks' PRC rankings. The same is true of PRC values; they are insensitive to SUE rankings. This means that neither ranking is merely identifying extremes in the other ranking criterion. Independent variation in both criteria is available in the sample to explain returns if indeed such relations exist.

Post-ranking raw returns (including and excluding January) are reported in Panel B of Table 1. They are calculated the same way as in Chan et.al. (1996) and Chordia and Shivakumar (2006). The returns have a six-month holding horizon beginning in the month after stocks are ranked by SUE and PRC. The month-t return to each SUE/PRC group is based on six portfolios that are formed in each of the previous six months $t-6$ to $t-1$. The raw return to each SUE/PRC group at month t is the average of the six month-t portfolio returns. Risk-adjusted returns in Panel C are computed as the intercepts from time-series regressions of the month-t SUE/PRC group returns on the three Fama-French (1993) factors (labeled FF3 Alpha).

The results in both panels are very similar. Average returns are nearly monotonic across the rows and columns. Stocks with extreme bad news that are anchored low have the lowest future returns, and stocks with extreme good news that are anchored high have the highest future returns. The magnitudes are quite striking and highly significant. For example, the FF3 risk-adjusted return difference between *all* extreme good and extreme bad news firms is 76bp (= 43 + 33) per month. The corresponding difference between extreme good news firms that are anchored high and extreme bad news firms that are anchored low is 133bp *per month*. Conditioning on whether stocks are anchored high and low nearly doubles the PEAD over six months.

The return differences that exclude January are even larger at 85bp and 172bp for FF3 because the January effect generates high returns for stocks in the bad news low anchor group. These stocks have low returns over the prior year, which makes them prime candidates for tax-loss selling. Most of our discussion emphasizes FF3 because George and Hwang (2004) and Chordia and Shivakumar (2006) show that anchoring and PEAD explain momentum. Nevertheless, the corresponding figures for the Fama-French model augmented with Carhart's (1997) momentum factor (labeled FF4 in Panel D) are 58bp and 72bp, which are also large and significant. These are smaller than the FF3-adjusted returns because traditional momentum has variation in common with anchoring and PEAD.

Regardless of whether January is included or excluded, or how returns are benchmarked, the combined effect of extreme earnings news and anchoring is bigger than the individual effects of either extreme earnings or anchoring by itself. The next section decomposes the return differences across groups to identify whether two separate effects exist, whether there is a single effect that is reinforced by the other, or whether neither effect stands alone.

2. Decomposition of Returns

Our first set of results is based on a simple decomposition of returns into components attributable purely to earnings surprises, purely to anchoring on the 52-week high, and to an interaction (i.e., anchoring on the 52-week high when earnings are surprising). We find that the pure earnings effect is small and generally insignificant, and that the interaction effect dominates in explaining PEAD.

2.a Estimation Strategy

It is possible that PEAD has nothing to do with anchoring. In this case, PEAD occurs regardless of whether stock prices are close to or far from their 52-week highs at the time of the earnings announcement—i.e., PEAD is attributable purely to earning surprises. In this instance, future returns will be similar for stocks with extreme earnings surprises regardless of whether prices are near or far from 52-week highs at the time of the surprise.

Another possibility is that anchoring is responsible for the underreaction to earnings news. In this case, PEAD occurs only when firms with earnings surprises are *also* anchored on 52-week highs. The high (low) returns to firms with extreme good (bad) earnings surprises will then be isolated among firms whose pre-announcement prices are near (far from) 52-week highs. In other words, PEAD occurs because anchoring and the surprise occur together (i.e., they interact), and it does not occur when there is a surprise for stocks whose prices are not anchored.

Instead of a positive interaction, whereby anchoring prevents the market from reacting to earnings surprises, there could be a negative interaction. It could be that anchoring and earnings news are sources of underreaction that weaken when they occur together. In this case, anchoring and earnings surprises would behave as substitutes in generating underreaction. For example, markets might underreact to large earning surprises yet the surprises themselves weaken the effect of anchoring.

In measuring these effects, we also have to account for the degree to which investors anchor on 52-week highs regardless of whether or not there is an earnings surprise (i.e., unconditionally as in George-Hwang (2004)). For this we allow for pure anchoring effects in returns.

To accommodate these possibilities, we model returns as the sum of up to four components.

Consider, for example, firms with extreme positive earnings surprises that also have pre-earnings prices that are close to 52-week highs. We specify their mean return as

$$R_{GG,H} = \mu + E_{GG} + A_H + I_{GG,H}. \tag{1}$$

The parameter μ is the return to stocks that have neither extreme earnings surprises, nor prices that are close to or far from 52-week highs. These are the benchmark stocks against which those with earnings surprises and anchoring are compared. The parameter E_{GG} is the incremental return associated with having had an extreme positive earnings surprise, and A_H is the incremental return associated with the stock having a price that is near to its 52-week high (anchored high "H") prior to the earnings surprise.

The parameter $I_{GG,H}$ is the incremental return associated with the interaction of extreme earnings and anchoring. This parameter is positive if the market's underreaction to extreme good earnings news is stronger for stocks whose prices are also close to 52-week highs than stocks with extreme good earnings news but whose prices are neither near nor far from 52-week highs. Alternatively, if PEAD arises because the market underreacts to good earnings news regardless of anchoring, then E_{GG} is positive and $I_{GG,H}$ is zero.

A similar specification applies to the mean return for stocks with extreme negative earnings surprises and prices far from 52-week highs (anchored "low" L):

$$R_{BB,L} = \mu + E_{BB} + A_L + I_{BB,L}. \tag{2}$$

The $I_{BB,L}$ parameter is negative if the market's underreaction to extreme bad earnings news is stronger for stocks whose prices are anchored low than otherwise. If the market underreacts to bad earnings news regardless of anchoring, then this parameter is zero, and E_{BB} is negative. A_L captures the returns associated purely with being anchored low and not having an earnings surprise.

Stocks without earnings surprises have $E = 0$. Likewise, A is zero if the stock's price is neither near nor far from its 52-week high. The interactions are set to zero if a stock that has an extreme positive (negative) earnings surprise is anchored low (high). None of the underreaction in this case is attributable to an interaction, and instead is attributed to the earnings surprise itself. Stocks that do not have extreme earnings surprises *and also* prices that are neither near nor far from their 52-week highs are modeled with zero E, A and I components, and their return is μ. This group of stocks is the benchmark for the others.

In keeping with the literature on PEAD, we classify extreme earnings surprises as those in the lowest and highest quintiles of earnings surprises. Similarly, George and Hwang (2004) use the highest and lowest quintile rankings by PRC for anchoring. The decompositions below combine the middle three anchoring quintiles together. However, we maintain distinctions among the middle earnings surprise groups to test whether the interaction effects are monotonic across earnings surprises that are moderate versus extreme. We denote moderate earnings surprises by E_G and E_B (see footnote 3). This helps us assess whether more information is left unincorporated into prices when earnings surprises are extreme, or whether extreme versus moderate earnings surprises help investors to overcome the effect of anchoring. The specifications of the mean returns of the various groups appear in Table 2.[5]

We are interested in the degree to which the differences in future returns documented in Table 1 are attributable purely to underreaction to extreme earnings, purely to anchoring on the 52-week high, and also to the possibility that the effects reinforce each other. Equations (1) and (2) imply a convenient decomposition of the difference in average returns between the lower-right and upper-left corners in Table 1, which can be written as

$$R_{GG,H} - R_{BB,L} = (E_{GG} - E_{BB}) + (A_H - A_L) + (I_{GG,H} - I_{BB,L}). \tag{3}$$

The first component $(E_{GG} - E_{BB})$ is the contribution that extreme earnings alone makes to the difference between average returns in the lower-right and upper-left corners of Table 1. The second component is the contribution of anchoring alone. The last component is the return associated with stocks that have both extreme earnings and prices that are anchored high or low on the 52-week high. Through these components, we are able to estimate the magnitude and assess the statistical significance of these three effects. Though the difference on the left-hand side of Equation (3) is between returns in the extreme corners of Table 1, the individual components of the decomposition are estimated from the entire sample.

It turns out that monthly estimates of the fifteen E, A, I and μ return components in Table 2 are exactly identified as linear combinations of the coefficients of Fama-MacBeth regressions involving the entire cross-section of returns on an intercept, dummy variables for the PRC and SUE quintile groups, and all pairwise products of those dummy variables (see the Appendix for the detailed specification). Like the Fama-MacBeth regression coefficients on dummy variables, the estimates of Es, As, Is and μ are returns to specific portfolios (e.g., stocks with earning surprises but no anchoring, stocks whose prices are anchored but whose earnings are not surprising, etc.). In the tables that follow, we report means and t-statistics for these components both raw and risk-adjusted.

[5] If the high and low groupings by earnings and anchoring are viewed as "treatments," then our specification of mean returns is similar to that of a two-factor analysis of variance.

2.b Return Decomposition Results

The top of Table 3 reports averages of the Fama-MacBeth regression coefficients. As with the returns in Table 1, these estimates represent monthly returns to a strategy of holding portfolios for six-months beginning in the month following the ranking month. Every month, the strategy's return has six components, one each from portfolios formed in the past six months whose return is estimated from a Fama-MacBeth regression. Intercepts are averaged after subtracting the risk-free rate to obtain excess returns for the benchmark group because the benchmark is not a zero-investment portfolio. The t-statistics are computed from the time-series of non-overlapping monthly strategy returns.

The bottom of the table reports averages of the monthly E, A and I components implied by the monthly strategy returns. Also reported are tests of differences in means between various combinations of those components. Estimates are reported with and without January. Estimates in the columns labeled FF3 and FF4 are alphas from time-series regressions of the Fama-MacBeth coefficient or return components on the Fama-French factors (FF3), and also Carhart's (1997) momentum factor (FF4).

The most striking result is that *none* of the the average E estimates are significantly different from zero. This inference is uniform across all six variations of the procedure for calculating returns—with and without January, and using raw, FF3- and FF4-adjusted returns. The estimate that comes closest is for E_{BB} in raw returns excluding January with a t-statistic of -1.82; however the t-statistics are only -1.17 and -1.26 with and without January after risk adjusting with FF3. Tests of pairwise differences, such as $E_{BB} - E_{GG}$, also do not reject the null that the differences in means are zero. There is no tendency for stocks with either moderate or extreme earnings surprises (of either sign) to have significant future returns *unless* those stocks are also anchored high or low. In other words, significant underreaction to the information contained in earnings surprises typified by PEAD is limited to stocks that are anchored.

The inferences regarding the individual A and I components explain how this happens. Consider first stocks with good earnings surprises. The average $I_{GG,H}$ is positive and significant, while A_H is not significant (across all six variations of the procedure for calculating returns). This means that the underreaction of stocks with extreme good news is attributable to those that are *also* anchored high. However, merely being anchored high is not enough to generate underreaction.

Something different happens for stocks with bad earnings surprises. In four of the six specifications (the exceptions are raw and FF4-adjusted returns including January), the mean of A_L

is negative and significant while almost all of the average $I_{\cdot,L}$s are insignificant. This means the underreaction associated with stocks with extreme bad earnings surprises and that are anchored low occurs only because those stocks' prices are anchored low (i.e., far from the 52-week high). For the FF3-adjusted returns excluding January, the $I_{BB,L}$ component is negative and significant, suggesting that low earnings accentuate the FF3-adjusted return effect of low anchoring.

We can also examine whether more information remains *un*incorporated into prices after extreme earnings surprises or if instead extreme surprises help investors to overcome the effect of anchoring. The former possibility is equivalent to the hypotheses that $I_{BB,L} < I_{B,L}$ and $I_{GG,H} > I_{G,H}$. Both inequalities hold among the point estimates for all six variations of the procedure for calculating returns, and the hypothesis that the $I_{GG,H} = I_{G,H}$ is rejected. In contrast, we cannot reject the hypothesis that $I_{BB,L} = I_{B,L}$. More information remains unincorporated into prices for extreme versus moderate earnings surprises when news is good.

The pattern and magnitude of the estimates indicates that anchoring on the 52-week high restrains the market's response to good news more than its response to bad news. This is consistent with a behavioral bias, and not consistent with the hypothesis that costly short sales merely restrain the market's response to earnings news. If that were the case, underreaction would be concentrated among stocks with bad news and/or those that are anchored low.

To assess the economic significance of these effects, the numerical values on the right-hand side of the decomposition in Equation (3) for FF3 including January are

$$\begin{aligned} R_{GG,H} - R_{BB,L} &= Earnings + Anchoring + Interaction \\ &= \underset{(0.93)}{0.14} + \underset{(3.09)}{0.56} + \underset{(2.92)}{0.62} = 1.32 \end{aligned} \tag{4}$$

where t-statistics are in parentheses. Underreaction for stocks with extreme earnings that are also anchored generates a return of 1.32% per month over a six-month horizon. A statistically insignificant 14bp is attributable to underreaction to earnings alone, a significant 56bp is attributable to anchoring on the 52-week high that occurs regardless of earnings news. The largest portion is 62bp, which is attributable to the effect of anchoring on restraining price reactions to extreme earnings.

2.c Decompositions by Size and Analyst Coverage

Next, we estimate the return components separately for subsamples based on firm size and analyst coverage. We would expect that small or low-coverage firms lack news or analysis that could help investors to interpret the value relevance of extreme earnings surprises. Consequently, investors might anchor their beliefs even more firmly on historical prices and underreact more to the earnings surprises of such stocks.[6] Bernard and Thomas (1990) show that PEAD is larger for smaller firms. We examine how the return components differ by firm size or analyst coverage. In particular, we test whether the anchoring and interaction components are more prominent among small and low-coverage firms to corroborate the interpretation that they arise from a behavioral bias.

In a given month, we split the sample and label firms whose equity market capitalization is below the median as small, and the rest as large. The cross-sectional regressions are estimated separately for small and large firms each month, and inferences are based on the temporal distributions of small and large firm coefficient estimates. Stocks with two or less analysts are labeled as low-coverage, the rest are labeled as high-coverage stocks.

Panel A of Table 4 reports the return decomposition in Equation (3) separately for small and large firms with January included; January is excluded from Panel B. The numbers in the first row of each panel are raw and risk-adjusted estimates of $R_{GG,H} - R_{BB,L}$. This difference is twice as big for small firms as large firms in raw returns and about 50% bigger in FF3 risk-adjusted returns. The same pattern exists in Panels C and D for low versus high coverage stocks. This means that the underreaction to extreme earnings news for stocks whose prices are anchored is greater for small than large stocks and for low-coverage than high-coverage stocks.

The numbers in the next three rows of each panel are the individual earnings, anchoring and interaction components in Equation (3). Among small or low-coverage firms, both the anchoring and interaction effects are significant in FF3 risk-adjusted returns with or without January. The earnings effect is significant only for small firms outside January; and it is the smallest component. Among large and high-coverage firms, the anchoring component is significant in FF3 risk-adjusted returns and the earnings component is not. The interaction is significant for high-coverage firms in raw returns and in FF3-adjusted returns outside January.

These findings are consistent with investors whose beliefs exhibit greater biases for small or low-coverage firms than for large or high-coverage firms. The individual components indicate that the interaction and anchoring effects dominate in generating this pattern. There is some evidence that investors underreact to small firms' earnings surprises even without anchoring, but the primary determinant of underreaction is whether the stock's price is anchored—i.e., near or far from its 52-week high—when an earnings surprise arrives.

[6] As Hirshleifer (2001) colorfully puts it: "...people are likely to be more prone to bias in valuing securities for which information is sparse. This suggests that misperceptions are strongest in the dusty, idiosyncratic corners of the market place." (p. 1537).

2.d Decomposition Using Return Momentum in Place of Anchoring

To show how different anchoring on the 52-week high is from traditional momentum, we repeat the estimation in Table 3 after replacing the anchoring dummy variables with dummies for high and low *past returns* as in traditional momentum strategies. The results are reported in Table 5. They are nearly the reverse of the results for anchoring, and they help to clarify the apparent conflict between the conclusions of Chan et.al. (1996) and Chordia and Shivakumar (2006).

The striking result in this table is that the interaction component is *in*significant across all six variations of the procedure for calculating returns. In stark contrast to the evidence above that investors anchor on the 52-week high price *level,* there is no tendency for investors to underreact to good (bad) earning surprises because *returns* have recently been high (low). In addition, the earnings component is strong and significant across all six, and the momentum component is significant in FF3-adjusted returns. The FF3-adjusted results are consistent with Chan et.al.'s conclusion that the momentum and earnings drift strategies are profitable independently of each other.

The earnings component is the larger of the two, however; and it does not disappear even in FF4-adjusted returns. This means the systematic component of momentum does not explain PEAD, which is similar in spirit to Chordia and Shivakumar's conclusion that PEAD is the dominant effect. Nevertheless, momentum does have significant explanatory power in FF3-adjusted returns that is independent of whether stocks experience extreme earnings surprises or not. So it does not appear that PEAD *subsumes* return momentum. The numerical values of the decomposition for FF3-adjusted returns including January are

$$\begin{aligned} R_{GG,H} - R_{BB,L} &= Earnings + Momentum + Interaction \\ &= \underset{(3.51)}{0.56} + \underset{(2.63)}{0.46} + \underset{(1.03)}{0.23} = 1.25 \end{aligned} \tag{5}$$

3. Returns Around Current and Future Earnings Announcements

The tests in the tables above examine monthly returns. We now focus specifically on the three days around earnings announcements for stocks in the extreme earnings surprise quintiles. If PEAD is caused by the stocks in these groups whose prices are anchored, then variation in PRC *within* these groups will explain both current and future returns.

This is a very useful way to assess the importance of anchoring on PEAD because the predicted relations are quite specific and unlikely to arise by chance. If anchoring is an important determinant of underreaction to earnings news, then price reactions among firms with extreme earnings surprises should be more muted the closer is the price to the 52-week high for good news surprises, and the farther is the price from the 52-week high for bad news. In addition, when *subsequent* earnings are announced, the price reaction should contain a correction for the prior anchoring bias. Bernard and Thomas (1990) estimate that about 25% of the drift following extreme earnings surprises occurs around subsequent earnings announcement. If anchoring on the 52-week high causes the initial underreaction, then returns and subsequent earnings will be related to whether prices were anchored at the *prior* earnings announcement.

We use the independent monthly rankings of stocks by SUE and PRC for the most recent earnings announcement as described in connection with Table 1. However, because this is done every month, there can be duplicates among the most recently announced earnings between quarter ends. We eliminate duplicates and include only the first appearance of each earnings announcement. So each earnings announcement appears no more than once in either the 'good news' or 'bad news' samples analyzed below.

Panel A of Table 6 reports the earnings announcement returns of good news (SUE5) and bad news (SUE1) firms stratified by the degree of anchoring (PRC). The column labeled "Current Month" contains the three-day return centered on the most recent earnings announcement prior to the end of month t. The column labeled "Next Six Months" reports the average three-day announcement return of all earnings announcements within six months *after* month t. "Next One Year" reports the average three-day earnings announcement return of all earnings announcements within one year after month t.

Among firms experiencing extreme good news, the anchoring hypothesis predicts that the current-month returns are smaller for firms anchored high (PRC5) than for firms that are not anchored high. The returns in Panel A for good news confirm this. They are actually monotonic across PRC quintiles ranging from 1.34%, for firms whose pre-announcement prices are nearest to their 52-week highs, to 3.24% for stocks whose prices are farthest from the 52-week high.

The subsequent price reactions to earnings should contain a correction for the prior anchoring bias, which means the subsequent returns should be higher for the PRC5 group than the others. This is indeed the case, and again the point estimates are monotonic across PRC groups ranging from -3bp to 33bp for announcements occurring in the next year.

The prediction for bad news is that returns should be less negative on extreme bad news if the stock price is anchored low (PRC1), and more negative otherwise. This is generally true across PRC groups except for the PRC5 group which has the least negative reaction. The returns associated with subsequent earnings announcements should be more negative for PRC1 than the others. This is what we find, and the pattern is mostly increasing across quintiles from PRC1 to PRC5 (the exception is PRC3). The differences between good and bad news groups are consistent with our earlier finding that PEAD and anchoring in monthly returns is driven mostly by underreaction to good news.

In Panel B, we use regression in order to control for the impact of firm characteristics (size, book-to-market and analyst coverage) on the earnings announcement returns. Rather than stratifying firms by PRC quintile, we include the PRC variable itself as a regressor. We also include SUE as a control to capture any variation it might explain *within* the extreme good and bad news categories. Since the size of the earnings surprise is likely to affect the return around the earnings announcement, including SUE ensures that the coefficient on PRC is capturing the effect of a stock's price being near or far from the 52-week high that is incremental to the effect of the size of the earnings surprise itself. We estimate a pooled regression with time fixed effects (i.e., a dummy for each month). Standard errors are clustered by both firm and portfolio formation month using the approach of Thompson (2011) [see also Petersen (2008)].

If anchoring explains the underreaction to earnings news, the current-month reaction to extreme good (bad) earnings news should be more muted the closer (farther) the pre-announcement stock price is to the 52-week high. This means the coefficient on PRC should be negative for good news (i.e., a less positive reaction when PRC is high), and also negative for bad news (i.e., a more positive reaction when PRC is low). In addition, the price reactions to subsequent earnings should contain corrections for the previous underreaction, so the coefficients on PRC should be positive for both good and bad news.

This is indeed what we find. The current-month coefficients are negative and significant for both good and bad news, and all four coefficients on future earnings are positive and significant. This means that returns around earnings announcements are affected by strong anchoring effects in the good and bad news SUE quintiles—price reactions to extreme earnings surprises are incomplete when prices are anchored. This corroborates the evidence in the decompositions of monthly returns that PEAD is attributable to stocks whose prices are anchored. We believe this is convincing evidence reinforcing the anchoring interpretation of PEAD because these particular patterns seem difficult to reconcile with other explanations or merely an occurrence by chance.

The coefficients on the control variables are interesting also. SUE is positive and significant in the current-month regressions indicating that bigger surprises move prices more than smaller surprises even among stocks in the same earnings surprise quintile. Among good-news surprises, variation in SUE also has explanatory power for returns around future earnings. However, in all cases, the t-statistics are much smaller than those on PRC. Returns around earnings are generally negatively related to firm size, similar to returns in other months. However, firm size has a bigger incremental effect on current returns when news is bad than good, probably because extreme earnings misses are better anticipated by investors for large than small firms.

The coefficients on book-to-market indicate that extreme news (both good and bad) results in lower returns for value stocks relative to growth stocks, suggesting that investors have a relative aversion to earnings volatility for value versus growth stocks. These differences partially reverse themselves as indicated by the significant positive coefficients on the subsequent earnings announcements.

The current-month coefficients on analyst coverage are negative and significant for both good and bad news, and insignificant in the regressions involving future earnings. This means that price reactions to good news are less positive, and reactions to bad news are less negative, for high-coverage firms; and that these effects are permanent. This is consistent with analyst reports being informative to market participants in a way that helps in pricing the news in earnings into stocks prior to earnings announcements. Panel C includes momentum as a control and the results are very similar.

4. Subperiod Results

To check whether PEAD and its characterization above are consistent over time, we present estimates and tests separately for the two halves of our sample. We examine return decompositions as in Table 3 first, then returns around current and future earnings announcements as in Table 6.

4.a Decomposition of Monthly Returns by Subperiod

Table 7 reports FF3-adjusted return decompositions with and without January, for the years 1980-1995, and 1996-2011. The subperiod results confirm the general conclusion from the full-sample that underreaction to earnings itself is not a source of post-earnings price drift.

The estimates and t-statistics for the 1980-1995 period excluding January are:

$$\begin{aligned} R_{GG,H} - R_{BB,L} &= \mathit{Earnings} + \mathit{Anchoring} + \mathit{Interaction} \\ &= \underset{(1.51)}{0.26} + \underset{(3.92)}{0.71} + \underset{(2.87)}{0.72} = 1.69 \end{aligned}$$

The component associated with anchoring contributes 71bp per month, and the interaction contributes 72bp. The earnings component, at 26bp, is the smallest of the three and is not significant. The results that include January are similar.

The corresponding figures for the 1996-2011 period are:

$$
\begin{aligned}
R_{GG,H} - R_{BB,L} &= Earnings + Anchoring + Interaction \\
&= \underset{(0.51)}{0.13} + \underset{(2.69)}{0.79} + \underset{(1.54)}{0.54} = 1.46
\end{aligned}
$$

The earnings component is not significant. The point estimate of the anchoring component is slightly larger in this sub period and significant. However, the interaction is smaller and insignificant. When January is included, none of the components are significant.

Although the earnings component is small and insignificant throughout, the interaction that drives PEAD in the overall sample appears weaker in the later subperiod. Either monthly returns are more noisy in the second subperiod or the market became more efficient in reacting to the extreme earnings news of stocks whose prices were anchored.

Difference in means tests between the subperiods do not reject the null for any of the three components, suggesting that the full-sample results provide a clearer picture of price dynamics than the subperiod results.[7] The absence of significant differences between the subperiods and the strong interaction in the full sample favor the interpretation that noisy monthly returns are responsible for the differences between subperiods rather than an improvement in market efficiency. In addition, the tests below that focus on the days surrounding earnings announcements indicate that the effect of anchoring on restraining the market reaction to earnings remained strong throughout. This also favors the explanation that that monthly returns are noisier in the later subperiod resulting in weaker evidence from monthly returns.

4.b Earnings Announcement Returns by Subperiod

Table 8 reports subperiod results corresponding to the regressions in Panels B and C of Table 6. Recall that the anchoring hypothesis makes two predictions about earnings announcement returns. First, returns around current good (bad) earnings surprises are muted if stock prices are near (far from) 52-week highs. So the coefficient on PRC in the column labeled "Current Month" should be negative for both good and bad news surprises. Second, returns around subsequent earnings announcements should contain a correction of the prior underreaction. This implies the coefficients on PRC in the columns labeled "Next Six Months" and "Next One Year" should be positive for both good and bad news.

[7] These were conducted as two-sample t-tests for the three components in Equation (3). The t-statistics for differences between the 1996-2011 and 1980-1995 subperiods are -0.41 for the earnings component, 0.24 for the anchoring component and -0.41 for the interaction when January is excluded. The t-statics are similar in magnitude when January is included.

Both predictions hold for *both* subperiods. All four of the current month coefficients are negative and significant, and all eight coefficients relating to subsequent earnings are positive and significant. This means that even in the 1996-2011 period, the price reactions to extreme earnings were restrained by anchoring. In fact, anchoring is stronger in the returns around good news earnings announcements in the *later* sub period. As noted above, noise in monthly returns obscure this. The fact that the anchoring effect is stronger for good news than bad by a factor of about 1.5 in the early subperiod, and expands to a factor of three in the later period, is consistent with our earlier observation that PEAD is dominated by underreaction to *good* news, and therefore unlikely to be explained by frictions that make short sales costly.

5. Conclusion

This study considers whether anchoring on 52-week high prices explains why equity prices underreact to extreme earnings surprises, resulting in post-earnings announcement drift (PEAD). George and Hwang (2004) show that stocks whose prices are near (far from) 52-week highs generate high (low) raw and risk-adjusted returns. Furthermore, returns to a long-short strategy based on the 52-week high dominate and subsume the returns to traditional return momentum strategies [Jegadeesh and Titman (1993)]. They attribute this to an anchoring bias whereby investors are reluctant to bid prices up (down) further for stocks whose prices are already near (far from) their 52-week high prices.

We begin by sorting stocks into groups by earnings surprises and the nearness of their pre-earnings stock price to the 52-week high. Ranking stocks on both earnings surprises and nearness to 52-week highs nearly doubles the return to a long-short strategy in comparison to a ranking on earnings alone (9% vs 16% per year risk-adjusted). Using the cross-section of all stocks, we decompose monthly returns into pure earnings surprise, pure anchoring and interaction effects. We find that the pure earnings component is insignificant while the interaction and pure anchoring effects are significant. This means that PEAD is attributable to stocks whose prices are anchored by the 52-week high when earnings surprises occur, and that returns are related to anchoring even in the absence of earnings surprises.

We examine subsamples by firm type (large and small market capitalization, high and low analyst coverage) and we find that PEAD is stronger among small firms or low-coverage firms *because* anchoring is stronger for those firms. We compare nearness to 52-week highs to past returns in order to gauge whether traditional momentum explains our findings. It does not. Interactions between past returns and earnings surprises are insignificant, meaning that there is no tendency for investors to underreact to extreme earnings surprises when past returns are high or low. This suggests that investors anchor on 52 week high prices rather than on past returns.

We also examine the three-day returns surrounding earnings announcements at which extreme surprises occur and around subsequent earnings announcements for those firms. The hypothesis that anchoring on the 52-week high is why PEAD occurs implies some very specific relations between the nearness of a stock's price to its 52-week high, and current and subsequent earnings announcement returns. First, price reactions to extreme earnings should be more muted for stocks whose prices are near or far from 52-week highs. Second returns around subsequent earnings should contain a larger correction to prior underreaction for stocks whose prices were near or far from 52-week highs at the prior extreme earning surprise. This is exactly what we find.

Taken together, our findings are consistent with the hypothesis that investors anchor their beliefs about securities' values on the 52-week high price in reacting to news of extreme earnings. These findings are difficult to reconcile with explanations based on rational pricing, and instead are broadly supportive of theories such as Daniel, Hirshleifer and Subrahmanyam (1998) and Hirshleifer, Lim and Teoh (2011) in which investors underweight public information in forming their beliefs. We provide some specificity to *how* this happens by identifying the 52-week high as the component of beliefs upon which investors rely at the expense of underemphasizing public information.

The evidence in Batallio and Mendenhall (2005) and Ayers, Li and Yeung (2011) indicates that trading activity during and after earnings surprises contributes to resolving the underreaction to earnings news. This would not happen if the beliefs of market makers and limit order traders adjusted fully and instantaneously to the news in earnings. Combining their results and ours suggests that the underreaction to earnings news is not entirely attributable to unsophisticated traders. The beliefs of liquidity *providers* (generally non-retail traders during our sample period) are also biased by anchoring on 52-week highs.

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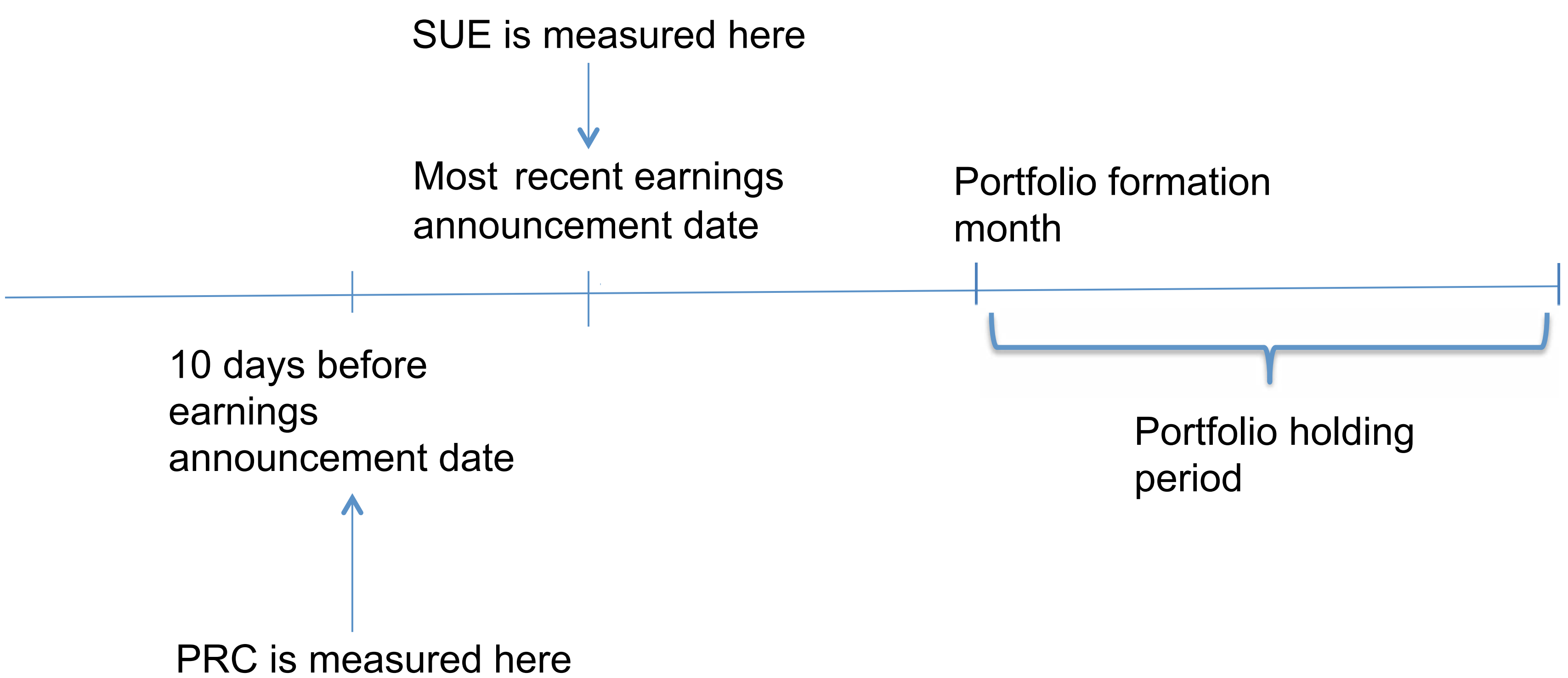
Figure 1

Time Line



APPENDIX

The Fama-MacBeth regression from which we estimate the return components is specified as

$$
\begin{aligned}
R_{i,t} = b_0 &+ b_{1jt}\, SUE5_{i,t-j} + b_{2jt}\, SUE4_{i,t-j} + b_{3jt}\, SUE2_{i,t-j} + b_{4jt}\, SUE1_{i,t-j} \\
&+ b_{5jt}\, PRC5_{i,t-j} + b_{6jt}\, PRC1_{i,t-j} \\
&+ b_{7jt}\, SUE5_{i,t-j} \times PRC5_{i,t-j} + b_{8jt}\, SUE4_{i,t-j} \times PRC5_{i,t-j} \\
&+ b_{9jt}\, SUE2_{i,t-j} \times PRC5_{i,t-j} + b_{10jt}\, SUE1_{i,t-j} \times PRC5_{i,t-j} \\
&+ b_{11jt}\, SUE5_{i,t-j} \times PRC1_{i,t-j} + b_{12jt}\, SUE4_{i,t-j} \times PRC1_{i,t-j} \\
&+ b_{13jt}\, SUE2_{i,t-j} \times PRC1_{i,t-j} + b_{14jt}\, SUE1_{i,t-j} \times PRC1_{i,t-j} + \varepsilon_{i,t}
\end{aligned}
$$

where the independent variables are all dummies that are equal to zero for observations in their respective SUE or PRC group. The average return within each SUE/PRC group is therefore given by the sum of the coefficients in the cell in the following table to which that SUE/PRC group corresponds:

	PRC1	PRC2 – PRC4	PRC5
SUE1	$b_0 + b_4 + b_6 + b_{14}$	$b_0 + b_4$	$b_0 + b_4 + b_5 + b_{10}$
SUE2	$b_0 + b_3 + b_6 + b_{13}$	$b_0 + b_3$	$b_0 + b_3 + b_5 + b_9$
SUE3	$b_0 + b_6$	b_0	$b_0 + b_5$
SUE4	$b_0 + b_2 + b_6 + b_{12}$	$b_0 + b_2$	$b_0 + b_2 + b_5 + b_8$
SUE5	$b_0 + b_1 + b_6 + b_{11}$	$b_0 + b_1$	$b_0 + b_1 + b_5 + b_7$

The components of the return decomposition given in Table 2 is then obtained by equating the sums of Fama-MacBeth coefficients in the table just above to the contents of each cell in Table 2 (or its transpose as given here):

	PRC1	PRC2 – PRC4	PRC5
SUE1	$\mu + A_L + E_{BB} + I_{BB,L}$	$\mu + E_{BB} + I_{BB,M}$	$\mu + A_H + E_{BB}$
SUE2	$\mu + A_L + E_B + I_{B,L}$	$\mu + E_B + I_{B,M}$	$\mu + A_H + E_B$
SUE3	$\mu + A_L$	μ	$\mu + A_H$
SUE4	$\mu + A_L + E_G$	$\mu + E_G + I_{G,M}$	$\mu + A_H + E_G + I_{G,H}$
SUE5	$\mu + A_L + E_{GG}$	$\mu + E_{GG} + I_{GG,M}$	$\mu + A_H + E_{GG} + I_{GG,H}$

Finally, solve for the individual components to obtain:

$\mu = b_0$ $\quad A_H = b_5$ $\quad A_L = b_6$

$E_{GG} = b_1 + b_{11}$ $\quad E_G = b_2 + b_{12}$ $\quad E_B = b_3 + b_9$ $\quad E_{BB} = b_4 + b_{10}$

$I_{GG,H} = b_7 - b_{11}$ $\quad I_{G,H} = b_8 - b_{12}$ $\quad I_{B,L} = b_{13} - b_9$ $\quad I_{BB,L} = b_{14} - b_{10}$

$I_{GG,M} = -\, b_{11}$ $\quad I_{G,M} = -\, b_{12}$ $\quad I_{B,M} = -\, b_9$ $\quad I_{BB,M} = -\, b_{10}$

Table 1 Portfolio Returns and Characteristics

At the end of each month *t*, stocks are sorted independently by *SUE* and *PRC* based on the most recent earnings announcement during the past four months (i.e., from month *t-3* to month *t*). *SUE* is standardized unexpected earnings, calculated as $(e_q - e_{q-4}) / \sigma_q$, where e_q is the most recently announced earnings, e_{q-4} is the earnings of the same quarter in the previous year, and σ_q is the standard deviation of $(e_q - e_{q-4})$ over the prior eight quarters. Stocks are sorted into 50 equal subgroups based on *SUE*, then collected into five groups. The SUE1 group includes subgroups 1 – 10, the 20% of stocks with the smallest *SUE*. The SUE5 group includes subgroups 40 – 50, the 20% of stocks with the largest *SUE*. SUE3 includes subgroups 19 – 23, which consists of the 10% of the sample having the smallest magnitude *SUE*. Subgroups 11 – 18 form SUE2, while subgroups 24 – 39 form SUE4. *PRC* is the 52-week high anchoring measure, which is calculated as the stock price (adjusted for stock splits and stock dividends) 10 days prior to the date of the recent earnings announcement divided by the highest stock price during the prior 52 weeks. Stocks are sorted into five quintiles based on *PRC*. PRC1 includes stocks with the lowest *PRC*, while PRC5 includes stocks with the highest *PRC*. The combinations of five SUE groups (SUE1- SUE5) and five PRC quintiles (PRC1-PRC5) define 25 portfolios that are formed each month. The portfolios are equally weighted and are held for the next six months. Panel A reports the average number of stocks, average *SUE* and average *PRC* in each of the 25 groups. *SUE* is winsorized at the 1st and 99th percentiles to reduce the impact of extreme values. Panel B reports the time series average of monthly return (in percent) to each of the 25 groups with and without the January return. As portfolios are held for six months, the monthly return in each of the 25 groups is the average return of six portfolios formed during the past six months. The last row of Panel B (labeled ‘ALL’) reports the monthly returns to the five groups sorted by SUE (i.e. SUE1 – SUE5) only. Panels C and D report risk-adjusted returns computed as intercepts from time series regressions of monthly returns on the three Fama-French (1993) factors (labelled as FF-3 Alpha), and on the Fama-French (1993) factors augmented by Carhart (1997)’s momentum factor (labelled as FF-4 Alpha). The *t*-statistics are in parentheses. The sample period is Jan 1980 to Dec 2011.

Table 1 Continued

Panel A Portfolio Characteristics

	Number of Stocks					Mean SUE					Mean PRC				
	SUE1	SUE2	SUE3	SUE4	SUE5	SUE1	SUE2	SUE3	SUE4	SUE5	SUE1	SUE2	SUE3	SUE4	SUE5
PRC1	158	97	45	110	46	-1.52	-0.35	0.01	0.54	1.99	0.56	0.58	0.59	0.60	0.60
PRC2	103	84	49	149	72	-1.44	-0.34	0.01	0.56	2.11	0.76	0.76	0.76	0.76	0.76
PRC3	78	72	48	165	94	-1.43	-0.33	0.01	0.57	2.18	0.84	0.84	0.84	0.85	0.85
PRC4	63	61	45	174	113	-1.40	-0.33	0.01	0.58	2.25	0.91	0.91	0.91	0.91	0.91
PRC5	53	53	41	179	131	-1.41	-0.32	0.01	0.60	2.25	0.97	0.97	0.97	0.97	0.97

Panel B Raw Returns

	Jan Inc.					Jan Exc.				
	SUE1	SUE2	SUE3	SUE4	SUE5	SUE1	SUE2	SUE3	SUE4	SUE5
PRC1	0.65	0.82	0.96	0.96	0.89	0.36	0.56	0.71	0.73	0.68
PRC2	0.91	1.10	1.24	1.34	1.36	0.79	0.99	1.12	1.21	1.27
PRC3	0.94	1.17	1.24	1.39	1.51	0.89	1.11	1.20	1.33	1.49
PRC4	0.96	1.21	1.35	1.50	1.60	0.93	1.17	1.35	1.49	1.60
PRC5	1.11	1.22	1.25	1.50	1.67	1.11	1.24	1.27	1.52	1.70
ALL	0.84	1.09	1.31	1.39	1.50	0.70	0.98	1.24	1.33	1.47

Table 1 Continued

	Panel C FF-3 Alpha									
	Jan Inc.					Jan Exc.				
	SUE1	SUE2	SUE3	SUE4	SUE5	SUE1	SUE2	SUE3	SUE4	SUE5
PRC1	-0.66	-0.48	-0.36	-0.27	-0.31	-0.87	-0.67	-0.52	-0.44	-0.47
	(-4.26)	(-3.45)	(-2.60)	(-2.22)	(-2.10)	(-5.97)	(-5.03)	(-3.84)	(-3.60)	(-3.28)
PRC2	-0.27	-0.10	0.03	0.18	0.24	-0.33	-0.14	-0.02	0.12	0.19
	(-3.31)	(-1.28)	(0.37)	(2.36)	(2.43)	(-4.02)	(-1.78)	(-0.27)	(1.51)	(1.95)
PRC3	-0.15	0.03	0.11	0.28	0.42	-0.15	0.03	0.13	0.27	0.45
	(-2.41)	(0.46)	(1.49)	(4.02)	(4.83)	(-2.25)	(0.46)	(1.73)	(3.75)	(4.95)
PRC4	-0.10	0.15	0.27	0.44	0.55	-0.07	0.17	0.32	0.48	0.60
	(-1.57)	(2.39)	(3.53)	(6.34)	(6.58)	(-1.00)	(2.60)	(3.93)	(6.61)	(6.87)
PRC5	0.11	0.21	0.20	0.49	0.67	0.17	0.29	0.28	0.56	0.75
	(1.37)	(2.77)	(2.34)	(6.3)	(7.74)	(2.19)	(3.68)	(3.16)	(7.14)	(8.54)
ALL	-0.33	-0.08	0.18	0.30	0.43	-0.40	-0.12	0.17	0.29	0.45
	(-4.47)	(-1.40)	(3.29)	(5.37)	(5.94)	(-5.85)	(-2.10)	(2.93)	(5.00)	(5.97)

Table 1 Continued

Panel D FF-4 Alpha										
	Jan Inc.					Jan Exc.				
	SUE1	SUE2	SUE3	SUE4	SUE5	SUE1	SUE2	SUE3	SUE4	SUE5
PRC1	-0.21	-0.08	0.01	0.07	0.02	-0.35	-0.21	-0.09	-0.03	-0.11
	(-2.22)	(-0.96)	(0.09)	(0.84)	(0.13)	(-3.74)	(-2.33)	(-0.86)	(-0.30)	(-0.90)
PRC2	-0.09	0.05	0.14	0.31	0.37	-0.13	0.04	0.10	0.27	0.35
	(-1.41)	(0.73)	(1.78)	(4.61)	(4.11)	(-1.78)	(0.52)	(1.13)	(3.75)	(3.56)
PRC3	-0.10	0.09	0.13	0.31	0.44	-0.09	0.09	0.14	0.29	0.47
	(-1.58)	(1.39)	(1.82)	(4.35)	(4.96)	(-1.38)	(1.26)	(1.81)	(3.88)	(5.00)
PRC4	-0.15	0.12	0.23	0.36	0.48	-0.13	0.12	0.26	0.36	0.50
	(-2.39)	(1.9)	(3.01)	(5.34)	(5.75)	(-1.97)	(1.80)	(3.13)	(5.17)	(5.73)
PRC5	-0.04	0.06	0.07	0.32	0.51	0.00	0.10	0.11	0.35	0.55
	(-0.55)	(0.93)	(0.82)	(5.05)	(6.72)	(-0.05)	(1.40)	(1.31)	(5.36)	(7.01)
ALL	-0.15	0.04	0.22	0.31	0.43	-0.21	0.01	0.21	0.29	0.44
	(-2.70)	(0.81)	(4.10)	(5.48)	(5.83)	(-3.73)	(0.25)	(3.67)	(4.90)	(5.65)

Table 2 Specification of Return Decompositions

This table describes the specification of returns for the 15 groups used in the return decompositions. The definitions of each SUE group (SUE1 – SUE5) and each PRC group (PRC1 – PRC5) are the same as in Table 1. Parameter estimates are obtained from Fama-MacBeth regression coefficients using the formulas in the Appendix.

	SUE1	SUE2	SUE3	SUE4	SUE5
PRC1	$\mu + A_L + E_{BB} + I_{BB,L}$	$\mu + A_L + E_B + I_{B,L}$	$\mu + A_L$	$\mu + A_L + E_G$	$\mu + A_L + E_{GG}$
PRC2 – PRC4	$\mu + E_{BB} + I_{BB,M}$	$\mu + E_B + I_{B,M}$	μ	$\mu + E_G + I_{G,M}$	$\mu + E_{GG} + I_{GG,M}$
PRC5	$\mu + A_H + E_{BB}$	$\mu + A_H + E_B$	$\mu + A_H$	$\mu + A_H + E_G + I_{G,H}$	$\mu + A_H + E_{GG} + I_{GG,H}$

Table 3 Return Decomposition Results

Each month between Jan 1980 and Dec 2011, six cross-sectional regressions (one each for $j = 1,\ldots,6$) of the following form are estimated:

$$R_{i,t} = b_0 + b_{1jt}\, SUE5_{i,t-j} + b_{2jt}\, SUE4_{i,t-j} + b_{3jt}\, SUE2_{i,t-j} + b_{4jt}\, SUE1_{i,t-j} + b_{5jt}\, PRC5_{i,t-j} + b_{6jt}\, PRC1_{i,t-j}$$

$$+\, b_{7jt}\, SUE5_{i,t-j} \times PRC5_{i,t-j} + b_{8jt}\, SUE4_{i,t-j} \times PRC5_{i,t-j} + b_{9jt}\, SUE2_{i,t-j} \times PRC5_{i,t-j} + b_{10jt}\, SUE1_{i,t-j} \times PRC5_{i,t-j}$$

$$+\, b_{11jt}\, SUE5_{i,t-j} \times PRC1_{i,t-j} + b_{12jt}\, SUE4_{i,t-j} \times PRC1_{i,t-j} + b_{13jt}\, SUE2_{i,t-j} \times PRC1_{i,t-j} + b_{14jt}\, SUE1_{i,t-j} \times PRC1_{i,t-j} + \varepsilon_{i,t}$$

where $R_{i,t}$ is the return of stock i in month t; $SUEX_{i,t-j}$ (X = 1, 2, 4 and 5) is a dummy variable which takes the value of 1 if stock i is in *SUE* group X at month t-j, and zero otherwise; $PRCY_{i,t-j}$ (Y = 1, 2, 4 and 5) is a dummy variable which takes the value of 1 if stock i is in *PRC* group Y at month t-j, and zero otherwise. $SUEX \times PRCY$ is the product of the *SUEX* and *PRCY* dummies. The definitions of *SUE* groups (SUE1 – SUE5) and *PRC* groups (PRC1– PRC5) are provided in Table 1. The six (j = 1,…,6) monthly coefficient estimates of a given independent variable are averaged. Estimates of the return components (i.e., the *A*, *E* and *I* parameters) are obtained monthly from the average coefficient estimates using the formulas in the Appendix. The numbers reported in the raw return column are time series averages of the monthly average coefficients and return components in percent per month. The *t*-statistics (in parentheses) are calculated from the time series. To obtain risk-adjusted returns, we estimate time series regressions of the monthly coefficients and components on the contemporaneous Fama-French (1993) factors (labelled as FF-3 Alpha), and the Fama-French factors augmented by Carhart (1997)'s momentum factor (labelled as FF-4 Alpha). The numbers reported as the risk-adjusted returns are intercepts from these time series regressions and their *t*-statistics are in parentheses.

Table 3 Continued

	Jan Inc.			Jan Exc.		
	Raw Return	FF-3 Alpha	FF-4 Alpha	Raw Return	FF-3 Alpha	FF-4 Alpha
Intercept – risk free return	0.85	0.13	0.16	0.80	0.13	0.16
	(3.40)	(1.97)	(2.48)	(3.03)	(1.96)	(2.29)
SUE5	0.24	0.30	0.28	0.26	0.32	0.30
	(3.43)	(5.01)	(4.58)	(3.81)	(5.09)	(4.62)
SUE4	0.14	0.18	0.16	0.13	0.17	0.15
	(3.42)	(4.77)	(4.31)	(3.21)	(4.25)	(3.73)
SUE2	-0.12	-0.12	-0.08	-0.14	-0.13	-0.08
	(-2.91)	(-2.69)	(-1.91)	(-3.18)	(-2.93)	(-1.87)
SUE1	-0.34	-0.32	-0.27	-0.36	-0.34	-0.28
	(-6.65)	(-6.18)	(-5.37)	(-6.82)	(-6.33)	(-5.22)
PRC5	-0.03	0.08	-0.10	0.05	0.15	-0.05
	(-0.30)	(0.90)	(-1.35)	(0.64)	(1.79)	(-0.68)
PRC1	-0.32	-0.49	-0.15	-0.51	-0.65	-0.24
	(-1.87)	(-3.58)	(-1.50)	(-2.98)	(-4.79)	(-2.31)
SUE5 × *PRC5*	0.18	0.16	0.16	0.16	0.15	0.15
	(2.38)	(2.03)	(2.01)	(2.00)	(1.88)	(1.76)
SUE4 × *PRC5*	0.11	0.10	0.09	0.11	0.11	0.09
	(1.61)	(1.40)	(1.20)	(1.58)	(1.52)	(1.25)
SUE2 × *PRC5*	0.10	0.13	0.08	0.11	0.14	0.07
	(1.20)	(1.55)	(0.95)	(1.29)	(1.69)	(0.85)
SUE1 × *PRC5*	0.21	0.22	0.17	0.21	0.23	0.17
	(2.67)	(2.79)	(2.16)	(2.60)	(2.87)	(2.05)
SUE5 × *PRC1*	-0.31	-0.26	-0.28	-0.29	-0.27	-0.32
	(-2.62)	(-2.20)	(-2.28)	(-2.46)	(-2.21)	(-2.59)

Table 3 Continued

	Jan Inc.			Jan Exc.		
	Raw Return	FF-3 Alpha	FF-4 Alpha	Raw Return	FF-3 Alpha	FF-4 Alpha
SUE4 × PRC1	-0.13	-0.10	-0.11	-0.11	-0.08	-0.09
	(-1.52)	(-1.06)	(-1.16)	(-1.21)	(-0.90)	(-0.93)
SUE2 × PRC1	-0.01	0.00	-0.01	-0.01	-0.01	-0.03
	(-0.10)	(-0.04)	(-0.11)	(-0.06)	(-0.14)	(-0.36)
SUE1 × PRC1	0.03	0.02	0.05	0.01	-0.01	0.02
	(0.30)	(0.17)	(0.52)	(0.14)	(-0.08)	(0.17)
E_{GG} = *(SUE5 + SUE5 × PRC1)*	-0.07	0.04	0.01	-0.03	0.05	-0.03
	(-0.53)	(0.36)	(0.06)	(-0.23)	(0.39)	(-0.20)
E_G = *(SUE4 + SUE4 × PRC1)*	0.00	0.08	0.06	0.02	0.08	0.06
	(0.04)	(0.96)	(0.66)	(0.23)	(0.91)	(0.65)
E_B = *(SUE2 + SUE2 × PRC5)*	-0.03	0.01	0.00	-0.04	0.01	-0.01
	(-0.37)	(0.13)	(-0.06)	(-0.45)	(0.11)	(-0.17)
E_{BB} = *(SUE1 + SUE1 × PRC5)*	-0.13	-0.10	-0.10	-0.16	-0.11	-0.11
	(-1.60)	(-1.17)	(-1.19)	(-1.82)	(-1.26)	(-1.26)
$E_{GG} - E_G$	-0.07	-0.04	-0.05	-0.05	-0.03	-0.09
	(-0.74)	(-0.41)	(-0.52)	(-0.52)	(-0.33)	(-0.86)
$E_{BB} - E_B$	-0.11	-0.11	-0.10	-0.12	-0.12	-0.10
	(-1.61)	(-1.62)	(-1.44)	(-1.78)	(-1.67)	(-1.37)
$E_G - E_B$	0.03	0.07	0.06	0.06	0.07	0.07
	(0.28)	(0.66)	(0.55)	(0.50)	(0.66)	(0.64)
$E_{GG} - E_{BB}$ *(Earnings)*	**0.07**	**0.14**	**0.11**	**0.13**	**0.16**	**0.09**
	(0.41)	**(0.93)**	**(0.70)**	**(0.80)**	**(1.02)**	**(0.54)**

Table 3 Continued

	Jan Inc.			Jan Exc.		
	Raw Return	FF-3 Alpha	FF-4 Alpha	Raw Return	FF-3 Alpha	FF-4 Alpha
$A_H = PRC5$	-0.03	0.08	-0.10	0.05	0.15	-0.05
	(-0.30)	(0.90)	(-1.35)	(0.64)	(1.79)	(-0.68)
$A_l = PRC1$	-0.32	-0.49	-0.15	-0.51	-0.65	-0.24
	(-1.87)	(-3.58)	(-1.50)	(-2.98)	(-4.79)	(-2.31)
$A_H - A_L$ *(Anchoring)*	**0.29**	**0.56**	**0.06**	**0.56**	**0.80**	**0.20**
	(1.33)	**(3.09)**	**(0.48)**	**(2.61)**	**(4.51)**	**(1.60)**
$I_{GG,H} = (SUE5 \times PRC5 - SUE5 \times PRC1)$	0.49	0.42	0.44	0.45	0.42	0.47
	(3.55)	(3.02)	(3.08)	(3.23)	(2.97)	(3.24)
$I_{G,H} = (SUE4 \times PRC5 - SUE4 \times PRC1)$	0.25	0.20	0.19	0.23	0.20	0.18
	(2.33)	(1.82)	(1.76)	(2.08)	(1.78)	(1.62)
$I_{B,L} = (SUE2 \times PRC1 - SUE2 \times PRC5)$	-0.11	-0.13	-0.09	-0.11	-0.15	-0.11
	(-0.95)	(-1.19)	(-0.80)	(-0.99)	(-1.38)	(-0.93)
$I_{BB,L} = (SUE1 \times PRC1 - SUE1 \times PRC5)$	-0.18	-0.20	-0.12	-0.19	-0.24	-0.15
	(-1.52)	(-1.74)	(-1.03)	(-1.59)	(-1.99)	(-1.23)
$I_{GG,H} - I_{G,H}$	0.24	0.22	0.24	0.23	0.22	0.28
	(2.39)	(2.17)	(2.31)	(2.21)	(2.14)	(2.67)
$I_{BB,L} - I_{B,L}$	-0.07	-0.07	-0.03	-0.08	-0.09	-0.04
	(-0.75)	(-0.74)	(-0.31)	(-0.84)	(-0.87)	(-0.45)
$I_{G,H} - I_{B,L}$	0.35	0.33	0.28	0.34	0.35	0.29
	(1.86)	(1.71)	(1.45)	(1.75)	(1.81)	(1.46)
$I_{GG,H} - I_{BB,L}$ *(Interaction)*	**0.67**	**0.62**	**0.56**	**0.65**	**0.66**	**0.62**
	(3.14)	**(2.92)**	**(2.57)**	**(2.99)**	**(3.06)**	**(2.80)**

Table 4 Return Decomposition Results for Subsamples

This table reports return decompositions as in Table 3 for sub-samples, divided by firm size and analyst coverage. The regression specification is the same as in Table 3. For the month *t-j* regression, a firm is classified as large if its market capitalization is below the cross-sectional median at month *t-j*, otherwise it is classified as small. A firm is classified as having low analyst coverage if the number of analysts following it is no more than 2 at month *t-j*, otherwise it is classified as having high analyst coverage. $R_{GG,H}$ is the return of the group with the highest *SUE* and highest *PRC* (i.e., SUE5&PRC5), while $R_{BB,L}$ is the return of the group with the lowest *SUE* and lowest *PRC* (i.e., SUE1&PRC1), computed as the sum of their respective components. The calculations of $E_{GG} - E_{BB}$, $A_H - A_L$ and $I_{GG,H} - I_{BB,L}$ are the same as those in Table 3. The *t*-statistics are in parentheses.

Panel A Division by Firm Size, Jan Inc.

	Small Firms			Large Firms		
	Raw Return	FF-3 Alpha	FF-4 Alpha	Raw Return	FF-3 Alpha	FF-4 Alpha
$R_{GG,H} - R_{BB,L}$	1.40	1.65	1.15	0.69	1.08	0.37
$E_{GG} - E_{BB}$ *(Earnings)*	0.31	0.32	0.28	-0.07	0.12	0.06
	(1.49)	(1.53)	(1.31)	(-0.36)	(0.64)	(0.32)
$A_H - A_L$ *(Anchoring)*	0.30	0.52	0.08	0.28	0.66	0.06
	(1.35)	(2.62)	(0.52)	(1.08)	(2.94)	(0.40)
$I_{GG,H} - I_{BB,L}$ *(Interaction)*	0.78	0.80	0.78	0.48	0.30	0.25
	(2.56)	(2.58)	(2.47)	(1.65)	(1.01)	(0.82)

Table 4 Continued

Panel B Division by Firm Size, Jan Exc.						
	Small Firms			Large Firms		
	Raw Return	FF-3 Alpha	FF-4 Alpha	Raw Return	FF-3 Alpha	FF-4 Alpha
$R_{GG,H} - R_{BB,L}$	1.71	1.96	1.39	0.95	1.31	0.44
$E_{GG} - E_{BB}$ *(Earnings)*	0.45	0.43	0.35	-0.08	0.06	-0.08
	(2.11)	(1.98)	(1.57)	(-0.41)	(0.29)	(-0.39)
$A_H - A_L$ *(Anchoring)*	0.64	0.83	0.36	0.46	0.81	0.03
	(2.92)	(4.40)	(2.19)	(1.72)	(3.48)	(0.18)
$I_{GG,H} - I_{BB,L}$ *(Interaction)*	0.63	0.70	0.68	0.57	0.45	0.49
	(1.99)	(2.17)	(2.07)	(1.94)	(1.52)	(1.61)

Panel C Division by Analyst Coverage, Jan Inc.						
	Low Analyst Coverage			High Analyst Coverage		
	Raw Return	FF-3 Alpha	FF-4 Alpha	Raw Return	FF-3 Alpha	FF-4 Alpha
$R_{GG,H} - R_{BB,L}$	1.61	1.81	1.35	0.74	1.09	0.43
$E_{GG} - E_{BB}$ *(Earnings)*	0.30	0.27	0.22	-0.11	0.05	0.01
	(1.30)	(1.13)	(0.90)	(-0.60)	(0.28)	(0.03)
$A_H - A_L$ *(Anchoring)*	0.23	0.40	0.00	0.28	0.61	0.05
	(0.98)	(1.81)	(0.00)	(1.16)	(2.94)	(0.38)
$I_{GG,H} - I_{BB,L}$ *(Interaction)*	1.07	1.14	1.13	0.57	0.43	0.37
	(2.95)	(3.07)	(3.00)	(2.16)	(1.64)	(1.40)

Table 4 Continued

Panel D Division by Analyst Coverage, Jan Exc.						
	Low Analyst Coverage			High Analyst Coverage		
	Raw Return	FF-3 Alpha	FF-4 Alpha	Raw Return	FF-3 Alpha	FF-4 Alpha
$R_{GG,H} - R_{BB,L}$	1.97	2.16	1.67	1.02	1.35	0.55
$E_{GG} - E_{BB}$ *(Earnings)*	0.38	0.35	0.29	-0.08	0.01	-0.10
	(1.58)	(1.45)	(1.15)	(-0.42)	(0.07)	(-0.54)
$A_H - A_L$ *(Anchoring)*	0.56	0.71	0.29	0.49	0.78	0.07
	(2.39)	(3.35)	(1.49)	(1.96)	(3.68)	(0.48)
$I_{GG,H} - I_{BB,L}$ *(Interaction)*	1.03	1.10	1.09	0.61	0.55	0.58
	(2.72)	(2.85)	(2.73)	(2.29)	(2.09)	(2.12)

Table 5 Return Decomposition by Earnings and Return Momentum

Each month between Jan 1980 and Dec 2011, six cross-sectional regressions (one each for $j = 1,\ldots,6$) of the following form are estimated:

$$R_{i,t} = b_0 + b_{1jt}\,SUE5_{i,t-j} + b_{2jt}\,SUE4_{i,t-j} + b_{3jt}\,SUE2_{i,t-j} + b_{4jt}\,SUE1_{i,t-j} + b_{5jt}\,RETMOM5_{i,t-j} + b_{6jt}\,RETMOM1_{i,t-j}$$

$$+ b_{7jt}\,SUE5_{i,t-j} \times RETMOM5_{i,t-j} + b_{8jt}\,SUE4_{i,t-j} \times RETMOM5_{i,t-j} + b_{9jt}\,SUE2_{i,t-j} \times RETMOM5_{i,t-j}$$

$$+ b_{10jt}\,SUE1_{i,t-j} \times RETMOM5_{i,t-j} + b_{11jt}\,SUE5_{i,t-j} \times RETMOM1_{i,t-j} + b_{12jt}\,SUE4_{i,t-j} \times RETMOM1_{i,t-j}$$

$$+ b_{13jt}\,SUE2_{i,t-j} \times RETMOM1_{i,t-j} + b_{14jt}\,SUE1_{i,t-j} \times RETMOM1_{i,t-j} + \varepsilon_{i,t}$$

where $R_{i,t}$ is the return of stock i in month t; $SUEX_{i,t-j}$ (X = 1, 2, 4 and 5) is a dummy variable which takes the value of 1 if stock i is in *SUE* group X at month t-j, and zero otherwise. The definition of *SUE* groups (SUE1 – SUE5) is the same as that in Table 1. $RETMOM_{i,t-j}$ is return momentum of stock i for the six months ending the month prior to the most recent earnings announcement as of month t-j. Stocks are sorted into five deciles based on *RETMOM* each month. $RETMOMY_{i,t-j}$ (Y =1, 2, 4 and 5) is a dummy variable which takes the value of 1 if stock i is in *RETMOM* decile Y at month t-j, and zero otherwise. $SUEX \times RETMOMY$ is the product of the *SUEX* and *RETMOMY* dummies. The six ($j = 1,\ldots,6$) monthly coefficient estimates of a given independent variable are averaged. Estimates of the return components (i.e., the A, E and I parameters) are obtained monthly from the average coefficient estimates using the formulas in the Appendix. The numbers reported in the raw return column are the time series averages of these monthly average coefficients and return components in percent per month. The t-statistics (in parentheses) are calculated from the time series. To obtain risk-adjusted returns, we estimate times series regressions of the average coefficients and components on the contemporaneous Fama-French (1993) factors (labeled as FF-3 Alpha), and on the contemporaneous Fama-French factors augmented by Carhart (1997)'s momentum factor (labelled as FF-4 Alpha). The numbers reported for the risk-adjusted returns are intercepts from these time series regressions and their t-statistics are in parentheses.

Table 5 Continued

	Jan Inc.			Jan Exc.		
	Raw Return	FF-3 Alpha	FF-4 Alpha	Raw Return	FF-3 Alpha	FF-4 Alpha
Intercept – risk free return	0.79	0.07	0.11	0.73	0.07	0.11
	(3.23)	(1.06)	(1.68)	(2.87)	(1.05)	(1.57)
SUE5	0.28	0.37	0.34	0.32	0.39	0.36
	(4.37)	(6.4)	(5.87)	(4.97)	(6.60)	(5.99)
SUE4	0.15	0.21	0.19	0.15	0.20	0.18
	(3.59)	(5.43)	(4.89)	(3.62)	(5.01)	(4.34)
SUE2	-0.08	-0.06	-0.02	-0.10	-0.09	-0.04
	(-1.77)	(-1.48)	(-0.54)	(-2.39)	(-2.12)	(-1.01)
SUE1	-0.24	-0.24	-0.18	-0.29	-0.27	-0.21
	(-4.61)	(-4.48)	(-3.53)	(-5.38)	(-5.10)	(-3.88)
RETMOM5	0.17	0.16	-0.03	0.14	0.17	-0.07
	(1.18)	(1.47)	(-0.28)	(0.94)	(1.48)	(-0.73)
RETMOM1	-0.17	-0.30	0.00	-0.25	-0.38	0.01
	(-1.29)	(-2.59)	(-0.03)	(-1.85)	(-3.17)	(0.08)
SUE5 × RETMOM5	0.04	0.02	0.01	0.05	0.03	0.02
	(0.45)	(0.17)	(0.09)	(0.50)	(0.30)	(0.23)
SUE4 × RETMOM5	0.07	0.04	0.02	0.09	0.07	0.06
	(0.89)	(0.45)	(0.24)	(1.12)	(0.82)	(0.72)
SUE2 × RETMOM5	-0.01	-0.02	-0.06	0.03	0.03	-0.01
	(-0.11)	(-0.26)	(-0.65)	(0.35)	(0.28)	(-0.12)
SUE1 × RETMOM5	-0.22	-0.20	-0.22	-0.20	-0.19	-0.21
	(-2.29)	(-2.12)	(-2.26)	(-1.98)	(-1.84)	(-2.02)
SUE5 × RETMOM1	-0.27	-0.25	-0.24	-0.30	-0.28	-0.31
	(-2.59)	(-2.35)	(-2.23)	(-2.76)	(-2.6)	(-2.75)

Table 5 Continued

	Jan Inc.			Jan Exc.		
	Raw Return	FF-3 Alpha	FF-4 Alpha	Raw Return	FF-3 Alpha	FF-4 Alpha
SUE4 × RETMOM1	-0.12	-0.11	-0.09	-0.13	-0.12	-0.11
	(-1.43)	(-1.28)	(-1.12)	(-1.60)	(-1.43)	(-1.29)
SUE2 × RETMOM1	-0.11	-0.12	-0.12	-0.15	-0.15	-0.17
	(-1.38)	(-1.42)	(-1.37)	(-1.79)	(-1.74)	(-1.90)
SUE1 × RETMOM1	-0.16	-0.16	-0.14	-0.21	-0.22	-0.22
	(-1.71)	(-1.75)	(-1.47)	(-2.23)	(-2.34)	(-2.23)
E^M_{GG} = *(SUE5 + SUE5 × RETMOM1)*	0.01	0.12	0.10	0.02	0.11	0.05
	(0.06)	(1.06)	(0.87)	(0.21)	(0.94)	(0.47)
E^M_{G} = *(SUE4 + SUE4 × RETMOM1)*	0.03	0.10	0.10	0.02	0.08	0.06
	(0.41)	(1.33)	(1.21)	(0.22)	(0.97)	(0.77)
E^M_{B} = *(SUE2 + SUE2 × RETMOM5)*	-0.09	-0.09	-0.08	-0.07	-0.07	-0.06
	(-0.94)	(-0.97)	(-0.9)	(-0.76)	(-0.73)	(-0.59)
E^M_{BB} = *(SUE1 + SUE1 × RETMOM5)*	-0.47	-0.44	-0.40	-0.49	-0.46	-0.42
	(-4.43)	(-4.28)	(-3.87)	(-4.45)	(-4.27)	(-3.77)
$E^M_{GG} - E^M_{G}$	-0.03	0.01	0.00	0.01	0.03	-0.01
	(-0.32)	(0.15)	(0.01)	(0.08)	(0.33)	(-0.13)
$E^M_{BB} - E^M_{B}$	-0.38	-0.35	-0.32	-0.42	-0.39	-0.36
	(-4.18)	(-3.83)	(-3.43)	(-4.40)	(-4.06)	(-3.63)
$E^M_{G} - E^M_{B}$	0.12	0.19	0.18	0.09	0.15	0.12
	(0.98)	(1.60)	(1.47)	(0.73)	(1.20)	(0.97)
$\boldsymbol{E^M_{GG} - E^M_{BB}}$ ***(Earnings)***	**0.47**	**0.56**	**0.50**	**0.51**	**0.56**	**0.47**
	(2.93)	**(3.51)**	**(3.12)**	**(3.09)**	**(3.47)**	**(2.82)**

Table 5 Continued

	Jan Inc.			Jan Exc.		
	Raw Return	FF-3 Alpha	FF-4 Alpha	Raw Return	FF-3 Alpha	FF-4 Alpha
$M_H = PRC5$	0.17	0.16	-0.03	0.14	0.17	-0.07
	(1.18)	(1.47)	(-0.28)	(0.94)	(1.48)	(-0.73)
$M_l = PRC1$	-0.17	-0.30	0.00	-0.25	-0.38	0.01
	(-1.29)	(-2.59)	(-0.03)	(-1.85)	(-3.17)	(0.08)
$M_H - M_L$ (Momentum)	**0.34**	**0.46**	**-0.02**	**0.39**	**0.54**	**-0.08**
	(1.88)	**(2.63)**	**(-0.21)**	**(2.11)**	**(3.04)**	**(-0.69)**
$I^M_{GG,H} = (SUE5 \times RETMOM5 - SUE5 \times RETMOM1)$	0.32	0.27	0.25	0.34	0.31	0.33
	(2.41)	(2.02)	(1.87)	(2.6)	(2.34)	(2.40)
$I^M_{G,H} = (SUE4 \times RETMOM5 - SUE4 \times RETMOM1)$	0.19	0.14	0.11	0.22	0.19	0.17
	(1.82)	(1.38)	(1.08)	(2.13)	(1.77)	(1.58)
$I^M_{B,L} = (SUE2 \times RETMOM1 - SUE2 \times RETMOM5)$	-0.10	-0.09	-0.05	-0.18	-0.17	-0.15
	(-0.96)	(-0.87)	(-0.5)	(-1.71)	(-1.62)	(-1.40)
$I^M_{BB,L} = (SUE1 \times RETMOM1 - SUE1 \times RETMOM5)$	0.07	0.04	0.08	-0.01	-0.03	-0.01
	(0.52)	(0.34)	(0.66)	(-0.05)	(-0.27)	(-0.05)
$I^M_{GG,H} - I^M_{G,H}$	0.13	0.13	0.14	0.12	0.12	0.16
	(1.35)	(1.29)	(1.4)	(1.23)	(1.26)	(1.55)
$I^M_{BB,L} - I^M_{B,L}$	0.17	0.14	0.14	0.18	0.14	0.15
	(1.62)	(1.28)	(1.29)	(1.63)	(1.27)	(1.30)
$I^M_{G,H} - I^M_{B,L}$	0.29	0.24	0.17	0.41	0.36	0.33
	(1.55)	(1.25)	(0.88)	(2.16)	(1.91)	(1.68)
$I^M_{GG,H} - I^M_{BB,L}$ (Interaction)	**0.25**	**0.23**	**0.17**	**0.35**	**0.35**	**0.34**
	(1.14)	**(1.03)**	**(0.75)**	**(1.56)**	**(1.55)**	**(1.46)**

Table 6 Abnormal Returns around Current and Future Earnings Announcements

This table reports the abnormal returns around earnings announcements for stocks that experience extreme good and bad news earnings surprises. The good news sample in month *t* includes stocks in the highest *SUE* group (SUE5) and the bad news sample includes stocks in the lowest *SUE* group (SUE1), as ranked in month *t* in the manner described in Table 1. However, we eliminate duplicates so a given earnings announcement places a stock into the good or bad news sample only in the month that the announcement first appears. Panel A reports the time series average abnormal returns (in percent) around earnings announcements for various time horizons stratified by PRC quintiles. Abnormal returns are computed as the three-day return centered on the earnings announcement date, benchmarked using the NYSE-AMEX-NASDAQ – size decile return to which each stock belongs. The column labeled *Current Month* reports the average abnormal return around the most recent earnings announcement's first appearance in the sample. The column labeled *Next Six Months* reports the average abnormal three-day returns around the earnings announcements that occur during the six months after the stock is included in the good or bad news samples. The column labeled *Next One Year* reports the average abnormal three-day returns around earnings announcements during the following year. Panels B and C report the results of the following pooled regression estimated separately for the good and bad news samples:

$$Dependent\ Variable_i = b_0 + b_1 SUE_i + b_2 PRC_i + b_3 LOGMV_i + b_4 LOGBM_i + b_5 LOGCOVER_i + b_6 RETMOM_i + \varepsilon_i$$

The dependent variables are three-day abnormal returns around earnings announcements at different time horizons. *SUE* and *PRC* are defined in Table 1; as there, *SUE* is winsorized at the 1st and 99th percentiles to reduce the impact of extreme values. *LOGMV* is the natural log of market capitalization, *LOGBM* is the natural log of book to market value calculated as the ratio of book value of equity to market capitalization, *LOGCOVER* is the natural log of one plus the number of analysts covering the firm, and *RETMOM* is the buy-and-hold return to the stock over the past six months. These characteristics are measured at the end of month *t*. We also include time fixed effects (dummies for each month *t*). The *t*-statistics (in parentheses) are based on standard errors clustered by both stock and portfolio formation month. Panels B and C report the regression results with and without *RETMOM* as an explanatory variable, respectively.

Table 6 Continued

Panel A Abnormal Returns Stratified by PRC						
	Good News			Bad News		
	Current Month	*Next Six Months*	*Next One Year*	*Current Month*	*Next Six months*	*Next One Year*
PRC1	3.24	0.00	-0.03	-1.07	0.00	0.20
PRC2	2.43	0.28	0.18	-1.35	0.17	0.29
PRC3	2.04	0.36	0.24	-1.23	0.03	0.16
PRC4	1.57	0.38	0.30	-1.26	0.14	0.28
PRC5	1.34	0.43	0.33	-1.00	0.17	0.25

Panel B Regression Estimates						
	Good News			Bad News		
	Current Month	*Next Six Months*	*Next One Year*	*Current Month*	*Next Six months*	*Next One Year*
Intercept	0.01	0.00	0.00	0.00	0.00	0.00
	(0.08)	(0.25)	(0.15)	(0.18)	(0.20)	(0.15)
SUE	0.11	0.06	0.06	0.19	0.04	0.06
	(2.78)	(2.00)	(2.52)	(3.54)	(1.11)	(1.93)
PRC	**-5.35**	**1.29**	**1.33**	**-2.03**	**0.77**	**0.59**
	(-10.73)	**(4.55)**	**(6.39)**	**(-5.67)**	**(3.37)**	**(3.39)**
LOGMV	-0.25	-0.08	-0.04	0.53	0.00	-0.06
	(-7.32)	(-2.82)	(-1.86)	(15.75)	(0.03)	(-2.18)
LOGBM	-0.57	0.18	0.23	-0.45	0.24	0.23
	(-8.21)	(3.74)	(6.02)	(-6.97)	(4.20)	(4.73)
LOGCOVER	-0.65	0.04	0.07	-0.48	0.05	0.02
	(-11.80)	(0.77)	(1.93)	(-8.82)	(1.01)	(0.56)

Table 6 Continued

Panel C Regression Estimates – Controlling for Return Momentum						
	Good News			Bad News		
	Current Month	*Next Six Months*	*Next One Year*	*Current Month*	*Next Six months*	*Next One Year*
INTERCEPT	0.01	0.00	0.00	0.00	0.00	0.00
	(0.83)	(0.16)	(0.20)	(-0.36)	(0.15)	(0.08)
SUE	0.11	0.06	0.06	0.19	0.05	0.07
	(2.80)	(1.88)	(2.32)	(3.47)	(1.24)	(2.14)
PRC	**-5.49**	**1.41**	**1.53**	**-1.23**	**0.65**	**0.62**
	(-9.93)	**(4.68)**	**(6.58)**	**(-3.05)**	**(2.32)**	**(3.01)**
LOGMV	-0.25	-0.08	-0.05	0.51	0.00	-0.06
	(-7.12)	(-2.99)	(-2.16)	(15.29)	(0.09)	(-2.09)
LOGBM	-0.55	0.17	0.20	-0.52	0.26	0.24
	(-7.28)	(3.37)	(5.09)	(-8.20)	(4.85)	(5.09)
LOGCOVER	-0.64	0.03	0.06	-0.48	0.06	0.02
	(-11.61)	(0.70)	(1.73)	(-8.84)	(1.09)	(0.55)
RETMOM	0.12	-0.09	-0.18	-0.81	0.15	-0.03
	(0.66)	(-1.01)	(-2.36)	(-4.36)	(0.90)	(-0.30)

Table 7 Return Decompositions by Subperiod

This table reports the results of the regressions in Table 3 for the subperiods: Jan 1980 – Dec 1995 and Jan 1996 – Dec 2011.

	Jan Inc.		Jan Exc.	
	Jan 1980 – Dec 1995	Jan 1996 – Dec 2011	Jan 1980 – Dec 1995	Jan 1996 – Dec 2011
Intercept – risk free return	0.13	0.14	0.12	0.14
	(2.22)	(1.39)	(2.01)	(1.41)
SUE5	0.41	0.25	0.44	0.22
	(5.13)	(2.77)	(5.53)	(2.33)
SUE4	0.21	0.16	0.21	0.13
	(3.73)	(3.14)	(3.74)	(2.34)
SUE2	-0.12	-0.13	-0.12	-0.16
	(-2.24)	(-1.94)	(-2.15)	(-2.26)
SUE1	-0.35	-0.31	-0.35	-0.34
	(-5.65)	(-3.86)	(-5.65)	(-4.07)
PRC5	0.03	0.07	0.12	0.13
	(0.31)	(0.54)	(1.18)	(1.05)
PRC1	-0.49	-0.42	-0.58	-0.66
	(-3.38)	(-1.9)	(-4.08)	(-2.96)
SUE5×PRC5	0.16	0.14	0.11	0.19
	(1.57)	(1.15)	(1.08)	(1.48)
SUE4×PRC5	0.09	0.10	0.08	0.14
	(0.91)	(0.94)	(0.77)	(1.26)

Table 7 Continued

	Jan Inc.		Jan Exc.	
	Jan 1980 – Dec 1995	Jan 1996 – Dec 2011	Jan 1980 – Dec 1995	Jan 1996 – Dec 2011
SUE2×PRC5	0.06	0.18	0.06	0.21
	(0.51)	(1.44)	(0.53)	(1.65)
SUE1×PRC5	0.09	0.30	0.07	0.37
	(0.84)	(2.65)	(0.65)	(3.14)
SUE5×PRC1	-0.46	-0.07	-0.46	-0.06
	(-3.04)	(-0.41)	(-3.15)	(-0.33)
SUE4×PRC1	-0.08	-0.12	-0.12	-0.05
	(-0.66)	(-0.89)	(-0.99)	(-0.36)
SUE2×PRC1	-0.05	0.05	-0.07	0.04
	(-0.46)	(0.33)	(-0.59)	(0.29)
SUE1×PRC1	-0.06	0.12	-0.08	0.08
	(-0.46)	(0.81)	(-0.58)	(0.53)
E_{GG} = *(SUE5 + SUE5×PRC1)*	-0.05	0.17	-0.03	0.15
	(-0.34)	(0.88)	(-0.18)	(0.75)
E_{G} = *(SUE4 + SUE4×PRC1)*	0.13	0.05	0.09	0.08
	(1.09)	(0.34)	(0.8)	(0.55)
E_{B} = *(SUE2 + SUE2×PRC5)*	-0.07	0.05	-0.06	0.05
	(-0.66)	(0.43)	(-0.58)	(0.43)
E_{BB} = *(SUE1 + SUE1×PRC5)*	-0.26	-0.01	-0.28	0.02
	(-2.53)	(-0.05)	(-2.74)	(0.18)

Table 7 Continued

	Jan Inc.		Jan Exc.	
	Jan 1980 – Dec 1995	Jan 1996 – Dec 2011	Jan 1980 – Dec 1995	Jan 1996 – Dec 2011
$E_{GG} - E_G$	-0.18	0.13	-0.12	0.08
	(-1.49)	(0.81)	(-1)	(0.49)
$E_{BB} - E_B$	-0.19	-0.05	-0.22	-0.03
	(-1.91)	(-0.59)	(-2.2)	(-0.26)
$E_G - E_B$	0.19	0.00	0.15	0.03
	(1.36)	(-0.02)	(1.09)	(0.16)
$\boldsymbol{E_{GG} - E_{BB}}$***(Earnings)***	**0.20**	**0.18**	**0.26**	**0.13**
	(1.17)	**(0.7)**	**(1.51)**	**(0.51)**
$A_H = PRC5$	0.03	0.07	0.12	0.13
	(0.31)	(0.54)	(1.18)	(1.05)
$A_I = PRC1$	-0.49	-0.42	-0.58	-0.66
	(-3.38)	(-1.9)	(-4.08)	(-2.96)
$\boldsymbol{A_H - A_L}$***(Anchoring)***	**0.53**	**0.49**	**0.71**	**0.79**
	(2.7)	**(1.63)**	**(3.92)**	**(2.69)**
$I_{GG,H} = (SUE5 \times PRC5 - SUE5 \times PRC1)$	0.62	0.21	0.57	0.25
	(3.75)	(0.96)	(3.64)	(1.08)
$I_{G,H} = (SUE4 \times PRC5 - SUE4 \times PRC1)$	0.17	0.21	0.20	0.19
	(1.24)	(1.31)	(1.46)	(1.09)
$I_{B,L} = (SUE2 \times PRC1 - SUE2 \times PRC5)$	-0.11	-0.13	-0.13	-0.16
	(-0.78)	(-0.77)	(-0.92)	(-0.93)
$I_{BB,L} = (SUE1 \times PRC1 - SUE1 \times PRC5)$	-0.15	-0.19	-0.15	-0.29
	(-0.98)	(-1.06)	(-0.95)	(-1.57)

Table 7 Continued

	Jan Inc.		Jan Exc.	
	Jan 1980 – Dec 1995	Jan 1996 – Dec 2011	Jan 1980 – Dec 1995	Jan 1996 – Dec 2011
$I_{GG,H} - I_{G,H}$	0.45	0.00	0.37	0.06
	(3.56)	(-0.01)	(3.08)	(0.37)
$I_{BB,L} - I_{B,L}$	-0.04	-0.06	-0.02	-0.13
	(-0.26)	(-0.44)	(-0.14)	(-0.93)
$I_{G,H} - I_{B,L}$	0.28	0.34	0.33	0.35
	(1.13)	(1.18)	(1.34)	(1.15)
$I_{GG,H} - I_{BB,L}$*(Interaction)*	**0.77**	**0.40**	**0.72**	**0.54**
	(2.93)	**(1.18)**	**(2.87)**	**(1.54)**

Table 8 Earnings Announcement Returns by Subperiod

This table reports results of the regressions in Table 6 for the subperiods: Jan 1980 – Dec 1995 and Jan 1996 – Dec 2011.

Panel A Jan 1980 – Dec 1995						
	Good News			Bad News		
	Current Month	*Next Six Months*	*Next One Year*	*Current Month*	*Next Six months*	*Next One Year*
Intercept	0.01	0.00	0.00	-0.01	0.00	0.00
	(0.5)	(-0.01)	(0.14)	(-0.41)	(0.03)	(-0.04)
SUE	0.10	0.09	0.06	0.12	-0.06	-0.01
	(2.13)	(2.28)	(1.98)	(1.74)	(-1.14)	(-0.23)
PRC	**-3.61**	**1.51**	**1.13**	**-2.39**	**0.90**	**0.56**
	(-6.25)	**(3.97)**	**(4.08)**	**(-6.84)**	**(3.09)**	**(2.47)**
LOGMV	-0.35	-0.09	-0.03	0.61	0.06	0.00
	(-6.86)	(-2.11)	(-0.89)	(12.82)	(1.47)	(-0.1)
LOGBM	0.00	0.23	0.24	-0.43	0.22	0.24
	(0.04)	(3.41)	(4.56)	(-4.88)	(3.19)	(4.17)
LOGCOVER	-0.48	-0.04	-0.02	-0.46	-0.04	-0.04
	(-6.72)	(-0.73)	(-0.34)	(-6.73)	(-0.6)	(-0.75)

Panel B Jan 1996 – Dec 2011						
	Good News			Bad News		
	Current Month	*Next Six Months*	*Next One Year*	*Current Month*	*Next Six months*	*Next One Year*
Intercept	0.02	0.00	0.00	0.00	0.00	0.01
	(0.78)	(0.08)	(0.1)	(0)	(0.22)	(0.21)
SUE	0.17	0.05	0.07	0.24	0.10	0.11
	(2.97)	(1.17)	(1.89)	(3.03)	(1.92)	(2.37)
PRC	**-6.03**	**1.22**	**1.42**	**-1.93**	**0.71**	**0.59**
	(-9.24)	**(3.35)**	**(5.28)**	**(-3.86)**	**(2.34)**	**(2.56)**
LOGMV	-0.22	-0.08	-0.05	0.50	-0.03	-0.08
	(-5.06)	(-2.26)	(-1.73)	(11.71)	(-0.65)	(-2.31)
LOGBM	-0.84	0.18	0.24	-0.46	0.25	0.22
	(-9.25)	(2.68)	(4.66)	(-5.61)	(3.29)	(3.48)
LOGCOVER	-0.75	0.10	0.14	-0.51	0.10	0.05
	(-9.76)	(1.63)	(2.67)	(-6.63)	(1.37)	(0.8)