

Limited Attention and the Earnings Announcement Returns of Past Stock Market Winners

David Aboody
Anderson School of Management
University of California, Los Angeles
e-mail: daboody@anderson.ucla.edu

Reuven Lehavy
Ross School of Business
University of Michigan
e-mail: rlehavy@bus.umich.edu

and

Brett Trueman
Anderson School of Management
University of California, Los Angeles
btrueman@anderson.ucla.edu

Original version: September 2006
This version: April 2008

This paper has benefited from the comments of workshop participants at Columbia University , NYU, UC Berkeley, and UC Irvine.

Abstract

We document that stocks with the strongest prior 12-month returns experience a significant average market-adjusted return of 1.58 percent during the five trading days before their earnings announcements and a significant average market-adjusted return of -1.86 percent in the five trading days afterward. These returns remain significant even after accounting for transactions costs. We empirically test two possible explanations for these anomalous returns. The first is that unexpectedly positive news hits the market over the few days prior to these firms' earnings announcements, and that unexpectedly negative news comes out just afterwards. The second possibility is that stocks with sharp run-ups tend to attract individual investors' attention, and investment dollars, particularly before their earnings announcements. We do not find evidence for an information-based explanation; however, our analysis suggests the possibility that the trading decisions of individual investors are at least partly responsible for the return pattern we observe.

Limited Attention and the Earnings Announcement Returns of Past Stock Market Winners

Introduction

The concept of limited attention and its impact on the market response of small, unsophisticated investors to accounting information has been the subject of increasing levels of research in recent years. In this paper we examine whether this phenomenon can explain a striking return pattern that we document around the earnings releases of firms with strong prior twelve-month price performance: economically large market-adjusted returns in the week leading up to these firms' earnings announcements, followed by a sharp reversal during the subsequent five days.

Limited attention refers to the notion that limited time and resources preclude individual investors from considering all possible equity investments and also restrict the amount of information they can analyze. It has been examined as an explanation for investors' underreaction to earnings surprises (Hirshleifer et al., 2008 and Hou et al., 2006), their underreaction to the information in pro-forma earnings announcements (Doyle et al., 2003), the price impact of Friday earnings releases (Della Vigna and Pollett, 2005), observed investor over-optimism with respect to firms with high levels of net operating assets (Hirshleifer et al., 2004), the average stock price increase around earnings announcements (Lamont and Frazzini, 2007), and the abnormally high levels of individual investor share purchases around the time of earnings announcements (Lee, 1992 and Barber and Odean, 2008).

We show here that for the thirty-five year period beginning in 1971, the top percentile of stocks in terms of prior twelve-month price performance (sometimes referred to as the past winners) experience a significant average market-adjusted return of 1.58 percent during the week

prior to their earnings announcements (the “pre-announcement period”) and a significant average market-adjusted return of -1.86 percent in the week after (the “post-announcement period”).¹ By way of contrast, the average pre-announcement market-adjusted return for our entire sample of stocks is a meager 0.30 percent, while the average post-announcement market-adjusted return is a negligible -0.1 percent.²

There are two sources of noise in our estimates of pre-announcement and post-announcement period returns. The first is uncertainty over the exact timing of some of the announcements in our sample, which leads to uncertainty over the beginning and ending dates of our pre- and post-announcement periods. The second is the presence of intraday earnings announcements, which makes it impossible to precisely separate pre-announcement and post-announcement returns (unless intraday pricing data is available). To abstract from these sources of noise we recalculate our pre- and post-announcement returns for just those earnings announcements whose dates can be verified through press releases and that occur outside of regular trading hours. The average pre-announcement period market-adjusted return for this subsample is 3.09 percent, which is almost double that of our top percentile as a whole. The corresponding return for the post-announcement period, -3.05 percent, is over 60 percent larger in magnitude than that of our top percentile sample.³

¹ This anomalous return pattern is consistent with that reported in Trueman et al. (2003). They document an economically large abnormal return over the five days prior to internet stocks’ earnings releases during the 1998-2000 period, and a sharp reversal over the subsequent five days. Their sample period coincides with a time when internet stocks were among the top market performers. In untabulated results, we find that just 30 percent of our sample are high-tech stocks.

² These returns are similar in magnitude to those documented by Ball and Kothari (1991) and Berkman and Truong (2006). They find small average pre-announcement abnormal returns of 0.17 and 0.34 percent, respectively, and a negligible average abnormal return of -0.01 percent post-announcement. While not reporting abnormal returns, Chari et al. (1988) find an average pre-announcement *raw* return of 0.29% and an average post-announcement *raw* return of 0.26%.

³ Like Trueman et al. (2003) we define the pre-announcement period for this subsample as extending through the market open after the earnings release.

These returns are gross of transactions costs, which stem principally from the bid-ask spread and brokerage commissions. To account for the impact of the bid-ask spread, we recompute returns under the assumption that all purchases are executed at the prevailing ask price while all sales are executed at the prevailing bid price. Doing so we find that, once again, average pre-announcement (post-announcement) market-adjusted returns are reliably positive (negative), both for our sample as a whole (with average market-adjusted returns of 0.94 percent during the pre-announcement period and -0.85 percent post-announcement) as well as for the subsample of announcements occurring outside of normal trading hours (1.66 percent pre-announcement and -1.34 percent post-announcement). Brokerage commissions lower these returns only slightly; the average pre-announcement (post-announcement) market-adjusted return, net of transactions costs, remains significantly greater (less) than zero.⁴

We examine two possible explanations for this anomalous return pattern. The first, an information-based explanation, requires that unexpectedly positive news comes out during the few days before the earnings announcements of our past winner sample, followed by unexpectedly negative news just afterwards. We proxy for the release of positive pre-announcement news by upward revisions in analysts' pre-announcement earnings forecasts. We proxy for negative post-announcement news by downward revisions in analysts' post-announcement forecasts and/or negative earnings surprises. We find that less than 2 percent of our sample observations are characterized by both an upward revision in analysts' forecasts in the week prior to the earnings announcements and a negative earnings surprise or downward

⁴ Our return pattern is distinct from that of the well-documented post-announcement drift (see, for example, Bernard and Thomas (1989) and Foster et al. (1984)). That phenomenon is evidenced by the continuation of post-announcement returns over a relatively long period of time, rather than a reversal of abnormally high pre-announcement returns in the immediate post-announcement period. Further, on an annualized basis, the returns we document are much larger than those generated by the post-announcement drift.

forecast revision during the week thereafter. Not surprisingly, dropping these few observations from our sample does not significantly affect the magnitude of the pre- and post-announcement returns. The same is true if we eliminate all observations having positive pre-announcement analyst forecast revisions (regardless of the sign of the earnings surprise or post-announcement forecast revision, if any) or all observations having negative surprises or post-announcement forecast revisions (regardless of the sign of any pre-announcement revision). These results therefore provide no support for an information-based explanation for the documented return pattern.

The alternative explanation, that of limited attention, posits that individual investors are more likely to buy stocks that draw their attention. The stocks we focus on likely attract investors' attention due to their sharp past returns.⁵ It is likely to be further heightened just prior to the firms' earnings announcements – another attention-grabbing event.

Similar to Barber and Odean (2008), we test this possible explanation by calculating the abnormal order imbalance (as defined in Lee (1992)) for small, medium-sized, and large traders, around the time of our past winners' earnings announcements. Since smaller investors are arguably the less sophisticated ones, they are more likely to be motivated to buy stocks with strong prior returns just before the earnings release. Consequently, we would expect to observe an unusually large number of buyer-initiated trades relative to seller-initiated trades in the pre-announcement period for these traders, but not necessarily for larger ones. Once earnings are released and the focus shifts from these stocks, this positive abnormal order imbalance should disappear.

⁵ Consistent with this conjecture, Barber and Odean (2008) find a positive abnormal order imbalance for individual investors in stocks with large prior-day price movements.

Our results are consistent with these conjectures. During the pre-announcement period small and medium-sized traders evidence a significantly positive abnormal order imbalance. In contrast, the imbalance is insignificant for large traders. In the post-announcement period the positive abnormal order imbalances of the small and medium-sized traders disappear. Taken together, this evidence suggests that limited attention on the part of small, naïve investors is at least partly responsible for the observed return pattern around the earnings announcements of past stock market winners. We conduct a number of supplementary tests, the results of which all support our conclusion.

Our findings also provide a number of insights for future research. First, they reveal the importance of controlling for prior stock returns when measuring the price reaction to earnings announcements. Second, they suggest that long-term price momentum strategies can be improved upon by deliberately avoiding the sale of stock during the week after earnings announcements.⁶ Third, they open up the possibility that previously documented short-term return reversal results might be partly explained by the phenomenon documented here. If so, then excluding earnings announcement periods from the analysis has the potential to significantly reduce the returns to short-term momentum strategies.⁷

The plan of this paper is as follows. In Section I we describe our sample selection process and present descriptive statistics. In Section II we analyze the earnings announcement returns of stocks displaying strong prior performance. Potential explanations for the anomalous

⁶ Jegadeesh and Titman (1993), among others, show that a strategy of buying stocks that have performed well in the recent past and selling those that have performed poorly generates significant positive returns over three to twelve month holding periods.

⁷ Lehmann (1990) finds that stocks which increased (decreased) in price during a given week had negative (positive) average returns the following week. However, he does not examine whether these reversals are associated with firms' earnings announcements since he does not distinguish between earnings announcement and non-earnings announcement periods.

return pattern we observe are explored in Section III. A summary and conclusions section ends the paper.

I. Sample Selection and Descriptive Statistics

Our sample consists of all quarterly earnings announcements on *COMPUSTAT* issued between January 1, 1971 and September 30, 2005 by firms (a) that are listed on *CRSP*, (b) that have a December 31 fiscal year-end, and (c) whose stock price at the end of the previous quarter is at least \$5. These requirements yield a sample of 293,630 firm-quarter observations.⁸

For all the firms in our sample with earnings announcements in quarter t , we compute raw stock returns for the 12-month period ending on the last trading day of quarter $t-1$.⁹ We rank the stocks in ascending order according to their returns, and partition the firms into deciles. Table 1 presents descriptive statistics for each decile. As reported in panel A, average end-of-quarter market value increases monotonically from decile 1 (\$775 million) to decile 8 (\$2,267 million). This is not surprising since firms in higher deciles have experienced greater percentage share price increases (and greater percentage increases in market value) than those in lower deciles. Average market values decrease as we move to deciles 9 (\$1,941 million) and 10 (\$1,243 million). This drop is consistent with extreme returns being more prevalent in less established firms, which tend to be smaller in size. In untabulated results we find that median market values display a similar pattern across deciles.

Panel B presents the average prior 12-month raw return for each decile; by construction, it is monotonically increasing across deciles. Not surprisingly, the average raw returns for the

⁸ We have excluded from our sample all announcements with *COMPUSTAT* issue dates more than 90 days after quarter end since those dates are almost certainly in error.

⁹ For a firm whose earnings announcement date falls within the first 5 trading days of quarter t , the prior 12-month return accumulation period ends the day before the pre-announcement period begins. This ensures that there is no overlap between the two periods.

bottom and top deciles, containing the most extreme returns, are particularly large. The average raw return of -39.5 percent for the first decile is more than twice the size of that of the second decile, while the average raw return for the tenth decile, 153.5 percent, is 2½ times that of decile nine.

The average market-adjusted return during the pre-announcement period (the five trading days up to and including the earnings announcement date as recorded in *COMPUSTAT*) appears in panel C for each decile. The corresponding returns for the post-announcement period (the five trading days after the earnings announcement date) are presented in panel D. There is an almost monotonic increase in pre-announcement average market-adjusted returns as we move from lower to higher deciles. Moreover, the average market-adjusted return for the top decile, 0.83 percent, is more than 50 percent greater than that of the ninth decile and is almost three times as large as the average pre-announcement market-adjusted return of 0.3 percent over our entire sample.

The negative average post-announcement market-adjusted return of the first decile, -0.29 percent, is suggestive of price momentum, with the negative prior 12-month returns continuing into the post-announcement period. In contrast, the negative average market-adjusted return of the top decile, -0.71 percent, reflects a sharp reversal of the returns generated both in the pre-announcement period and over the prior 12 months. It is over seven times the size of the average post-announcement market-adjusted return of -0.1 percent for our sample as a whole.¹⁰

¹⁰ As a robustness check, we rank stocks based on prior 3-month and prior 6-month returns. Untabulated results are both qualitatively and quantitatively similar to those reported above.

II. The Top Percentile

II.1. Descriptive Statistics

The results obtained thus far suggest the possibility that the return reversal pattern observed in the top decile is even sharper within the highest percentile. To investigate this possibility, we partition the top decile into ten percentiles according to prior 12-month return. Table 2 provides descriptive statistics for each of these percentiles. As seen from panel A, average market values exhibit a mostly decreasing trend as we move from the 91st percentile (\$1,872 million) to the 100th percentile (\$726 million). The prior 12-month return (panel B) varies over a wide range, from an average of 81.8 percent for the 91st percentile to 399.0 percent for the top percentile. That top percentile return is almost twice the size of the corresponding return for the 99th percentile and is over twice the average return for the top decile overall.

Panels C and D report average pre-announcement and post-announcement market-adjusted returns for the top 10 percentiles. These returns generally increase in magnitude as we move from the 91st to the 100th percentile. The average pre-announcement market-adjusted return for the top percentile, 1.36 percent, is over 60 percent higher than that of the top decile as a whole. The top percentile's average post-announcement market-adjusted return of -1.75 percent is over twice the size of that for the top decile. Given their economically large pre- and post-announcement returns, we focus the remainder of our analysis on this top percentile of observations.

II.2. Refining the Earnings Announcement Dates

There are two drawbacks to using the *COMPUSTAT* database to obtain earnings announcement dates. First, the dates provided are not always correct. Second, the times of the

earnings releases aren't provided. To understand why the latter is an issue, consider two firms that release earnings on the same day, one before normal trading hours begin and one after they end. For the firm announcing before the market opens, the post-announcement period actually begins with that trading day. For the firm announcing after the market closes, the post-announcement period actually begins on the next trading day.¹¹ Not knowing the time of the earnings release then leaves in doubt the exact end of the pre-announcement period and beginning of the post-announcement period.

To mitigate the impact these ambiguities have on our analysis, we turn to the actual earnings press releases, when available, to obtain the precise dates and times of the earnings announcements within our top percentile. (The *Factiva* database is our source of press releases.) If the time of a press release is either before the market opens or during normal trading hours, the previous trading day is set as the last day of the pre-announcement period.¹² If the time of the press release is after regular trading hours, the just-ended trading day is the end of the pre-announcement period. If the press release has no time stamp, then we arbitrarily assume that the announcement is made after trading hours and take as the last trading day of the pre-announcement period the day of the release. To the extent that these announcements are actually made before or during trading hours, this assumption has the effect of artificially dampening the positive pre-announcement period returns. This is because the actual first day of the post-announcement period (and its associated negative returns) will mistakenly be included within the

¹¹ With after-hours trading more prevalent in recent years, the market response to these earnings releases often begins after regular trading hours on the earnings announcement day.

¹² If there are several press releases pertaining to the same earnings announcement in *Factiva*, we take the disclosure time to be that of the earliest release.

pre-announcement period (and its positive returns).¹³ For an earnings announcement without an accompanying press release on *Factiva*, we end the pre-announcement period on the *COMPUSTAT* announcement date. For simplicity, and where it will not cause confusion, we sometimes refer to the last day of the pre-announcement period as the earnings announcement day.

A by-product of our detailed examination of each observation in the top percentile is the identification of a number of observations which clearly have data errors. Dropping those observations leaves us with a final sample of 2,868 earnings announcements. Press releases with date and time stamps were found for 2,314, or 81 percent, of them. For 55 percent of those observations, the press release and *COMPUSTAT* announcement dates are identical; for 42 percent the *COMPUSTAT* date is between one and five days after that of the press release.

For our final sample, Table 3 presents the average daily and cumulative market-adjusted returns over the pre- and post-announcement periods.¹⁴ Average daily pre-announcement returns are all positive, and are significant for days -2 through 0 (where day 0 denotes the last day of the pre-announcement period). Average daily post-announcement returns are all negative and significant. Cumulative market-adjusted returns over the pre- and post-announcement periods average 1.58 and -1.86 percent, respectively; both are reliably different from zero.¹⁵

¹³ More generally, this problem will arise whenever the announcement date recorded on *COMPUSTAT* is between one and five days after the actual earnings release date.

¹⁴ In calculating the cumulative market-adjusted return for the pre-announcement period we drop observations with one or more missing daily returns. We do the same for the post-announcement period. This leaves us with 2,866 observations pre-announcement and 2,864 post-announcement.

¹⁵ To ensure that our findings are not driven by the use of market-adjusted returns as a control for risk, we recompute abnormal returns using the four-factor model of Carhart (1997). We apply this model to calendar-time returns generated by following a two-pronged strategy of (a) purchasing the top percentile of stocks at the close of trading on day -5 and selling them at the close on day 0 and (b) selling the stocks short at the close on day 0 and covering the positions at the end of day 5. Untabulated results reveal an average daily abnormal return for the pre-announcement portfolio of a significant 33.3 basis points and a significant -28 basis points for the post-announcement portfolio. Multiplying by five to put these numbers on a comparable footing with the five-day pre-

To view these returns in a broader context, we expand the pre-announcement period to the 20 trading days prior to, and including, day 0, and the post-announcement period to the 20 trading days afterward. In order to ensure that the prior return accumulation period does not overlap with the pre-announcement period, we end the accumulation of returns (for this analysis only) one month before quarter end. The composition of the top percentile is then determined using this shortened return accumulation period. Table 4 presents the average daily market-adjusted returns from day -19 through day 20, as well as the cumulative average market-adjusted returns (CAR). Figure 1 depicts the CAR graphically.¹⁶ As the figure and table reveal, the CAR is almost monotonically increasing during the pre-announcement period, with the rate of increase growing in the few days before the earnings announcement. The mean of the average daily market-adjusted returns is 0.11 percent during the period from day -19 to day -5, jumping to an average of 0.35 percent during days -4 through 0. After the announcement the CAR abruptly turns down, decreasing most rapidly during the first few post-announcement days and continuing downward, almost without interruption, through the 13th post-announcement day. For days 1 through 5 the mean of the average daily market-adjusted returns is -0.35 percent, decreasing in magnitude to -0.06 percent over days 6 through 13. At that point it resumes its upward trend, averaging 0.12 percent daily for days 14 through 20.

Taking the 40-day period as a whole, there is a clear upward trend in prices. Since it follows on the heels of strong positive returns over the prior 11 months, it is likely to be a manifestation of price momentum. The 1.98 percent cumulative market-adjusted return we

and post-announcement returns previously calculated yields average abnormal returns of 1.67 percent and -1.40 percent, respectively. These are of the same order of magnitude as our event-time market-adjusted returns.

¹⁶ Since the composition of the top percentile of stocks changes when the shorter prior return period is used, the average daily market-adjusted returns for days -4 through 5 differ somewhat from those reported in Table 3.

observe over these 40 days would then translate into a momentum return of approximately 1 percent per month.

II.3. Earnings announcements outside normal trading hours

In this subsection we compute pre- and post-announcement returns for the subsample of earnings announcements that were made either before or after normal trading hours. By excluding those announcements made during the trading day, we eliminate the noise that arises from days that are mixtures of pre- and post-announcement trading. By dropping observations for which we do not have an exact announcement time, we eliminate any uncertainty over which days constitute the pre- and post-announcement periods. This ensures that the returns of one period are not inadvertently included in the returns of the other. Of the 2,868 announcements in our sample, 1,462 are known to have been made outside normal trading hours.

Table 5, panel A presents average daily and cumulative pre-announcement and post-announcement market-adjusted returns for this subsample. With the pre-announcement period no longer contaminated by returns from the post-announcement period, the average market-adjusted return for the five days prior to the earnings announcement increases from 1.58 percent to 2.25 percent. Not surprisingly, much of that increase comes on day 0, when the market-adjusted return averages 0.89 percent, as compared to 0.59 percent for our entire sample. For the post-announcement period the average market-adjusted return decreases from -1.86 to -2.2 percent.

We gain further insights by partitioning the day 1 (close-to-close) return into its overnight (close-to-open) and daytime (open-to-close) components. The impetus for doing so stems from Trueman et al. (2003) who find that positive pre-announcement period returns continue through

the overnight period of day 1, but turn negative for the remainder of the day. The *Trade and Quotation (TAQ)* database compiled by the National Association of Securities Dealers is our source for opening stock prices. This database contains the prices and trading sizes of intraday stock trades, as well as intraday bid-ask quotes. Since *TAQ* begins in 1993, this analysis is restricted to the 1993-2005 time period. Of the 1,462 after-hours announcements in our subsample, 795 have opening prices on *TAQ*.

As reported in panel B of Table 5, there is a significantly positive day 1 close-to-open average return of 0.93 percent associated with these observations, which is more than offset by a significantly negative open-to-close average return of -1.21 percent.¹⁷ Extending the accumulation of pre-announcement period returns through the open on day 1 therefore increases the average market-adjusted return for this period to 3.09 percent. Commencing the post-announcement period at the open on day 1, rather than at the close on day 0, increases the magnitude of the average market-adjusted return for that period to -3.05 percent. Purchasing our subset of stocks five days before their earnings announcements, closing the positions at the open on day 1, and then initiating short positions which are closed at the end of day 5 would generate an average market-adjusted return over the ten day period of more than 6 percent.

II.3.iv. Accounting for transactions costs

We demonstrate in this subsection that our results are robust to the inclusion of transactions costs, stemming principally from the bid-ask spread and brokerage commissions. To assess the bid-ask spread's impact on pre- and post-announcement period returns, we recompute those returns under the assumption that all share purchases are executed at the

¹⁷ We report average raw, rather than market-adjusted, returns for these intraday periods because of the lack of data on close-to-open and open-to-close market returns. Given that these periods are very short, raw and market-adjusted returns should be very similar in magnitude.

prevailing ask price and all share sales occur at the prevailing bid price.¹⁸ More precisely, in calculating pre-announcement returns for our full sample, we assume shares are purchased at the closing ask price on day -5 and sold at the closing bid price on day 0. In computing post-announcement returns, we assume that shares are shorted at the day 0 closing bid price and replaced at the closing ask price on day 5. For the subsample of announcements made outside normal trading hours, the pre-announcement position is assumed to be closed at the opening bid price on day 1; the post-announcement short position is established at that price as well.

The *TAQ* database is our source for opening and closing bid and ask prices. We take as each day's opening bid-ask quote the first one reported on *TAQ* with a time stamp of 9:30 a.m. Eastern time or later. The day's closing bid-ask quote is the last one reported on *TAQ* with a time stamp of no later than 4:00 p.m. Eastern time. Our analysis covers the years 1993 through 2005, the period over which the *TAQ* data is available.

An examination of the data reveals a number of instances where there are large differences between a day's closing (opening) bid or ask and the day's closing (opening) stock price. These deviations likely arise from an erroneous time stamp on an after-hours or before-hours quote, which makes the quote appear to have been in effect during normal trading hours. To ensure that these errors do not affect our results, we drop from our full-sample pre-announcement return calculations any observation for which either (1) the day -5 closing ask is greater than 150 percent of that day's closing stock price or (2) the day 0 closing bid is less than 50 percent of that day's closing stock price. For the post-announcement period return calculations we drop any observation for which either (1) the day 0 closing bid is less than 50

¹⁸ Depending on the liquidity of the market at the time of order placement and on the number of shares being traded, share purchases (sales) might be executed at a price different from the quoted ask (bid). Small orders for highly liquid stocks are more likely to be executed, at least in part, within the bid-ask quote, while large orders for less liquid stocks are more likely to occur at least partly outside of the prevailing quote.

percent of that day's closing stock price or (2) the day 5 closing ask is greater than 150 percent of that day's closing stock price. Similar criteria are applied to eliminate outliers from our subsample of announcements made outside of normal trading hours. As a result of applying these criteria, 49 (45) observations are dropped from our full-sample pre-announcement (post-announcement) period calculations; 51 observations are removed from our subsample calculations for both the pre- and post-announcement periods.

As presented in Table 5, panel C, cumulative average market-adjusted returns remain significantly different from zero after accounting for the impact of the bid-ask spread. For our sample as a whole, the 5-day pre-announcement period market-adjusted return averages 0.94; for the 5-day post-announcement period it averages -0.85 percent. For the subsample of announcements made outside of normal trading hours, market-adjusted returns average 1.66 percent for the 5-day pre-announcement period and -1.34 percent post-announcement.¹⁹

The imposition of brokerage commissions lowers these market-adjusted returns. Our full-sample cumulative average pre- and post-announcement period market-adjusted returns will both remain significant, though, as long as round-trip commissions do not exceed 0.12 percent of transaction value.²⁰ Assuming a commission of \$10 for each 1,000 shares traded (in line with the commissions charged by discount brokers during the period of our analysis), the round-trip cost of a 1,000 share trade will be less than 0.12 percent as long as the price of the shares traded exceeds \$18.20. The average end-of-quarter share price (untabulated) for the firms in our sample

¹⁹ We also applied this analysis to calendar-time returns, adjusting for risk using the four-factor model. In untabulated results we find that, after accounting for the bid-ask spread, the average daily pre-announcement (post-announcement) abnormal return remains reliably positive (negative).

²⁰ The imposition of brokerage commissions of c percent lowers the absolute value of pre-announcement and post-announcement average market-adjusted returns to $0.94 - c$ and $0.85 - c$ percent, respectively. With average return standard errors (untabulated) of 0.36 and 0.44 for the pre- and post-announcement periods, respectively, the t -statistic for the after-commissions average return will exceed 1.65 (which corresponds to a 10 percent significance level) as long as c does not exceed 0.35 and 0.12, respectively, for the two periods.

is greater than \$33; consequently, the pre- and post-announcement average market-adjusted returns will retain their significance in the presence of both the bid-ask spread and brokerage commissions. For the subsample of announcements made outside normal trading hours, average market-adjusted returns will remain significant as long as round-trip commissions do not exceed 0.52 percent of transactions value.²¹ They fall below 0.52 percent as long as the traded share price exceeds \$4. Since all of the stocks in our sample have share prices greater than \$5, the average market-adjusted returns for our subsample will remain reliably different from zero after the imposition of both the bid-ask spread and brokerage commissions.

III. Potential Explanations for the Return Pattern Around Earnings Announcements

III.1. Information Disclosures Around Earnings Announcements

In this subsection we examine whether the release of public information around earnings announcements can partly explain the positive pre-announcement and negative post-announcement returns we document. To do so requires that unexpectedly positive news comes out during the five days before the earnings announcements of our sample of past winners, followed by unexpectedly negative news during the five days thereafter. We use the revisions in analysts' forecasts and analysts' earnings forecast errors to proxy for the information coming into the marketplace.

The *IBES* database is our source for analysts' forecasts. Since these forecasts only go back to 1985, our analysis is restricted to the 1985-2005 period. The information disclosed during the pre-announcement period is measured by the difference between the day 0 consensus forecast of current year's annual earnings (or of the year just ended, in the case of a fourth

²¹ The calculation parallels that for the full sample, given subsample average return standard errors of 0.41 and 0.50 (untabulated) for the pre- and post-announcement periods, respectively.

quarter earnings announcement) and the consensus forecast on day -5. The consensus forecast on any date is calculated as the simple average of the forecasts issued within the prior 90 calendar days. If an analyst issues more than one forecast during this period, only the latest one is used in the calculation. The information disclosed during the post-announcement period is measured, alternatively, by (a) the forecast error, defined as the difference between the firm's per-share *quarterly* earnings, as reported on *IBES*, and the consensus *quarterly* forecast on day 0, and (b) the post-announcement forecast revision, which is calculated as the difference between the day 5 consensus forecast of the current year's earnings and the consensus forecast at day 0.²² All revisions and forecast errors are scaled by share price one month before quarter-end.

Table 6, panel A presents cumulative pre-announcement and post-announcement average market-adjusted returns for all announcements *exclusive of* those characterized by a positive consensus forecast revision during the pre-announcement period and a negative forecast error or forecast revision during the post-announcement period. This restriction reduces our sample by 54 (56) observations pre- (post-) announcement. If unexpectedly positive (negative) news during the pre-announcement (post-announcement) period is driving our results, then the reduced sample should not evidence significant average market-adjusted returns either pre- or post-announcement. However, it does; pre- and post-announcement average market-adjusted returns are a significant 1.52 and -1.8 percent, respectively. Moreover, these returns are not reliably distinguishable from those of our sample as a whole.

²² It is possible that a portion of the pre-announcement revision stems from the fact that forecasts issued between days -95 and -91 are part of the day -5 consensus, but not of the consensus on day 0. Similarly, part of the post-announcement revision may be due to the fact that the day 0 consensus includes forecasts issued between days -90 and -86, while the day 5 consensus does not. Revisions that come from the dropping of old forecasts do not represent true changes in analysts' expectations during the pre- and post-announcement periods. To ensure that this is not influencing our results, we repeat our analysis, redefining the consensus forecast on any date as the average of the individual forecasts issued within 90 days of quarter-end. Our untabulated findings are qualitatively similar to the ones we report here.

Excluding those observations characterized by positive forecast revisions during the pre-announcement period *as well as* negative forecast errors or forecast revisions during the post-announcement period may be overly restrictive, for two reasons. First, analysts' sometimes informally circulate "whisper numbers" that are more positive than their public forecasts and may better reflect the information coming into the market just prior to the earnings announcement. In such cases realized earnings could exceed the published forecast, but still be considered negative news to the market. Second, analysts may be slow to formally revise their forecasts downward in response to negative information arriving on the heels of the earnings announcement, not doing so until after our post-announcement period ends. Acknowledging these possibilities, we expand our set of excluded observations to any announcement that is preceded by a positive consensus forecast revision during the pre-announcement period, regardless of the sign of the forecast error or of any post-announcement forecast revision.

Using this criterion, 199 (201) announcements, or 7 percent of our original sample, are dropped for the pre- (post-) announcement period. As reported in panel B, the market-adjusted return for our reduced sample averages 1.4 percent in the pre-announcement period and -1.8 percent in the post-announcement period. Once again, both returns are significantly different from zero and cannot be reliably distinguished from the corresponding numbers for our full sample.²³

²³ These findings are subject to two caveats. First, since the *IBES* database does not cover the entire universe of analysts, it is possible that some announcements in our subsample are, in fact, preceded by positive pre-announcement forecast revisions (just not by any of the analysts in the database). Second, even for a firm that is truly without any analyst coverage, it is possible that investors receive unexpectedly positive news during the pre-announcement period. As a check on our results, we calculate pre- and post-announcement returns for those 909 observations not preceded by a positive forecast revision, but for which there is known (from *IBES*) to be analyst coverage. Untabulated results reveal an average market-adjusted return of 2.08 percent for the pre-announcement period and -1.9 for the post-announcement period. As before, these returns are significantly different from zero but do not differ reliably from those of our entire sample.

To allow for the possibility that unexpectedly favorable information arrives during the pre-announcement period but that analysts do not formally revise their forecasts upward, we recompute returns for a subsample that excludes observations with negative post-announcement forecast revisions or forecast errors, regardless of the sign of any pre-announcement revision. There are 2,563 (2,559) firms in this subsample for the pre- (post-) announcement period. As reported in panel C, the average pre-announcement market-adjusted return is a significant 1.53 percent. Post-announcement it is a significant -1.46. Once again, these returns are not reliably different from those of our sample as a whole.²⁴

That average pre-announcement and post-announcement market-adjusted returns remain significant for each of our subsamples clearly implies that information coming into the market around the time of the earnings announcements of our sample of past winners cannot fully explain the anomalous returns we document. Furthermore, since the magnitudes of these subsample returns are not reliably different from those of our sample as a whole, there is no evidence that information disclosures explain any of these anomalous returns.²⁵

²⁴ As a robustness check, we calculate pre- and post-announcement returns for those 805 observations not followed by either a negative post-announcement forecast revision or a negative forecast error, but for which there is analyst coverage on *IBES*. Untabulated results reveal a significant average pre-announcement market-adjusted return of 2.58 percent for this subsample, which is reliably *more* positive than that for the sample as a whole. The corresponding return for the post-announcement period is a significant -0.85 percent, which is reliably less negative than that of our entire sample.

²⁵ A related potential explanation for the observed return pattern in the top percentile is that generally positive earnings news leaks out during the pre-announcement period, investors overreact to it, and then the price adjusts post-announcement. To test this possibility, we run two regressions, across all our percentiles. The dependent variable in the first regression is the cumulative pre-announcement market-adjusted return. The independent variables are (a) the forecast error, (b) the pre-announcement analyst forecast revision (as defined above), and (c) a dummy variable taking on the value 1 if the observation is in the top percentile, and 0 otherwise. In the second regression the dependent variable is the cumulative post-announcement market-adjusted return and the independent variables are (a) the forecast error, (b) the post-announcement analyst forecast revision (as defined above), and (c) a dummy variable that takes on the value 1 if the observation is in the top percentile, and 0 otherwise. (Since we rely on the *IBES* database for analysts' earnings forecasts, these regressions span the 1985-2005 period.) If overreaction to information leakage were driving the top percentile returns, then the dummy variables would not be significantly different from zero. Untabulated results reveal that they are significant in both regressions.

III.2. Limited Attention and Price Pressure From Individual Investors

A second potential explanation for the anomalous return pattern we document is related to the concept of limited attention, in which smaller investors, faced with limited time and resources, are more likely to invest in stocks that draw their attention. Among stocks capturing these investors' attention are arguably those that have increased sharply in price. Attention is likely to be heightened just before earnings releases, another attention-grabbing event.

Consistent with the presence of smaller investors in these firms, untabulated results reveal that the average end-of-quarter percentage of shares owned by non-institutional investors is highest (at 70.4 percent) for our past winners. (The average over all the other percentiles is 63.1 percent.) As well, average end-of-quarter analyst following (at 3.1 analysts), another sign of institutional interest, is lowest. (The average over the remaining percentiles is 4.2 analysts.)

Price pressure from these investors might partially explain the positive pre-announcement returns. A lessening of that pressure subsequent to the earnings announcements could, in part, explain the post-announcement return reversal. This would manifest itself in an abnormally large number of buyer-initiated relative to seller-initiated trades (that is, a positive abnormal order imbalance) for smaller investors during the pre-announcement period (but not necessarily for larger traders). Once the earnings are released, the smaller investors' positive abnormal order imbalance should disappear.

We employ the Lee-Ready (2001) algorithm to determine whether a trade is buyer-initiated or seller-initiated. A trade is considered to be buyer-initiated (seller-initiated) if it occurs (a) at the asking price (bid price) of the prevailing quote, (b) within the prevailing quote, but closer to the ask than the bid (closer to the bid than the ask), or (c) at the midpoint of the

quote and the last price change was positive (negative).²⁶ The *TAQ* database is our source for intraday prices, quotes, and trading sizes. We include only those trades made during the normal trading hours of 9:30 a.m. to 4:00 p.m. Eastern Time. Lee and Ready (2001) find that quotes are sometimes incorrectly recorded in time ahead of trades and show that trade direction misclassifications can be reduced by comparing the trade price to the quote in effect five seconds earlier. We employ that refinement in our analysis.

We partition the trades reported on *TAQ* into three subgroups: (1) those with a value of \$50,000 or less, which we associate with small traders, (2) those with a value between \$50,000 and \$100,000, which we assume are generated by medium-sized traders, and (3) those with a value of \$100,000 or greater, which we assume come from large traders. In our analyses we include only those announcements for which there are small, medium-sized, and large trades on at least one day of the pre-announcement period as well as on at least one day of the post-announcement period.²⁷

Following Lee (1992), the order imbalance for trades of size s , $s = \text{small, medium-sized, and large}$, on event day $t \in [-4,5]$ for earnings announcement n , OI_m^s , is defined as follows:

$$OI_m^s = \frac{NBUY_m^s - NSELL_m^s}{NTRD_m^s} \quad (2)$$

where $NBUY_m^s$ ($NSELL_m^s$) denotes the number of buyer-initiated (seller-initiated) trades of size s during event day t for observation n . The difference between $NBUY_m^s$ and $NSELL_m^s$ is normalized by the total number of trades of size s during that day, $NTRD_m^s$.

²⁶ Using Nasdaq market data on known trade direction for 313 stocks during the September 1996 – September 1997 period, Ellis et al. (2000) find that the Lee-Ready algorithm correctly classifies 81.05 percent of the trades as buyer- or seller-initiated, the highest percentage among the three different classification schemes they examine.

²⁷ This ensures that the same set of announcements make up our small, medium-sized, and large trade subsamples.

Analogous to the daily order imbalance, we define the order imbalance over days $t=a$ to $t=b$ for announcement n , $OI_n^{a,b}$, as follows:

$$OI_n^{a,b} = \frac{\sum_{t=a}^b NBUY_m - \sum_{t=a}^b NSELL_m}{\sum_{t=a}^b NTRD_m} \quad (3)$$

where the size superscript, s , is suppressed for notational simplicity. The abnormal order imbalance for the five-day pre-announcement period, denoted by AOI_n^{pre} , is then given by:

$$AOI_n^{pre} = OI_n^{-4,0} - \frac{1}{12} \sum_{i=0}^{11} OI_n^{30+5i,34+5i} \quad (4)$$

where the “normal” five-day order imbalance is estimated by averaging the order imbalances of the twelve five-day periods beginning 30 days after the earnings announcement and ending 89 days after.²⁸ Similarly, the abnormal order imbalance for the five-day post-announcement period, denoted by AOI_n^{post} , is given by:

$$AOI_n^{post} = OI_n^{1,5} - \frac{1}{12} \sum_{i=0}^{11} OI_n^{30+5i,34+5i} \quad (5)$$

The average abnormal order imbalance for each trader size during the pre- and post-announcement periods is presented in Table 7. The numbers are consistent with limited attention partially explaining the documented anomalous return pattern around earnings announcements. Small and medium-sized traders, those more likely to exhibit limited attention, have significantly positive average abnormal order imbalances during the pre-announcement period (columns (1) and (2)). In contrast, the average abnormal order imbalance for large traders (column 3), those more likely to be sophisticated, is not reliably different from zero. Once the announcement is

²⁸ The “normal” order imbalance is measured using data after the post-announcement period, rather than before, because the earlier period’s order imbalances are biased by our sample selection criteria.

made and the attention paid to these stocks ebbs, the significantly positive average order imbalance evidenced by the small and medium-sized traders disappears. The average abnormal order imbalance for the large traders remains insignificantly different from zero (at the 5 percent level).

A number of supplementary tests support the notion of limited attention as a driver of the return pattern around past winners' earnings announcements. In the first test, we regress pre-announcement market-adjusted returns on the abnormal order imbalances of the small, medium-sized, and large traders (as calculated above). If limited attention is at least partially responsible for our results, then the abnormal order imbalance of the small traders should be positively related to the magnitude of these returns. As seen in panel A of Table 8, the coefficient on the small trader abnormal order imbalance is, indeed, positive and significant. In contrast, the coefficients on the medium-sized and large trader abnormal order imbalances are not reliably different from zero.

Next, we subdivide our sample period into two subperiods, 1971-1989 and 1990-2005, and calculate average pre-announcement market-adjusted returns for each. During the first subperiod it was arguably more difficult for small investors to access a wide array of media sources and more expensive for them to act on their information (prior to the widespread use of the internet for information gathering and trading) than during the second subperiod. Consequently, we conjecture that if limited attention plays a role in generating the anomalous return pattern we document, then the average pre-announcement market-adjusted return will be smaller during 1971-1989 than during 1990-2005. Our results are consistent with this conjecture. As reported in Table 8, panel B, the average pre-announcement market-adjusted

return during the second subperiod is significantly greater than during the first (1.69 percent as compared to 0.74 percent).

Finally, we partition our sample of past winners into quartiles, according to the predictability of their earnings announcement dates, and compare pre-announcement returns across quartiles. Since the attention of small traders is most likely drawn to firms whose earnings announcement timing is most predictable, we conjecture that pre-announcement returns will be highest for the shares of these firms. This is what we find. To measure the predictability of a firm's current quarter earnings announcement date, we compute, for each of the firm's prior 20 quarters, the difference between the earnings announcement date and the announcement date for the immediately preceding quarter, advanced by 90 days. Earnings predictability is then defined as the variance of these differences.²⁹ As reported in panel C of Table 8, the average pre-announcement market-adjusted return for the most predictable earnings announcement date quartile is 2.37 percent. This compares to 1.24 percent for the remaining three quartiles. The difference of 1.13 percent is reliably greater than zero.³⁰

IV. Summary and Conclusions

In this paper we find a predictable pattern to the returns of past stock market winners around the times of their earnings announcements. For the 1971 – 2005 period, the top percentile of stocks ranked by prior twelve-month price performance experience an economically large and significant average market-adjusted return of 1.58 percent during the five trading days before their earnings announcements and a corresponding return of -1.86 percent in the five days

²⁹ For this analysis we include only those firms that have at least 15 consecutive quarters of earnings announcement dates on *COMPUSTAT*. This leaves us with a sample of 2,312 observations.

³⁰ We obtain qualitatively similar results when we define the most predictable announcement dates as those occurring within 85 - 95 days after the previous announcement.

after. The average pre- and post-announcement market-adjusted returns for the subset of stocks that announced earnings outside of normal trading hours are 3.09 and -3.05 percent, respectively. These returns remain significant even after accounting for transactions costs.

We empirically test two possible explanations for these anomalous return patterns. The first is that unexpectedly positive news hits the market over the few days prior to the earnings announcements of our sample of past winners, followed by unexpectedly negative news just afterwards. We find no evidence to support this potential explanation.

The second possibility is that stocks with strong prior returns capture the attention of smaller investors, especially just before their earnings releases, and that the resulting heightened demand for shares pushes up their prices. A lessening of that demand subsequent to the earnings announcements leads to a reversal of returns. Our results support this explanation. In particular, we find that during the pre-announcement period small and medium-sized traders evidence a significantly positive abnormal order imbalance, but large traders do not. After the earnings announcement, the small and medium-sized traders' positive abnormal order imbalances disappear.

This study's findings are reminiscent of the adage "buy on the rumor, sell on the fact." There is a difference here, though, in that the "rumor" is simply that there is an upcoming earnings announcement, not that the news will necessarily be better than expected. In this sense, our results are of a similar nature to those of Bradley et al. (2003). They find that stocks recently taken public rise in price in advance of the ending of the quiet period, with the "rumor" being only that the lead banker's analyst will shortly be issuing a research report, not that the content of the report will be any more positive than expected.

References

- Ball, R., Kothari, S., 1991, "Security Returns Around Earnings Announcements," *The Accounting Review*, 66, 718-738.
- Barber, B., Odean, T., 2008, "All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors," *Review of Financial Studies*.
- Berkman, H, Truong, C., "Event Day 0? After-hours Earnings Announcements," working paper, Massey University, 2006.
- Bernard, V., Thomas, J., 1989, "Post-earnings-announcement Drift: Delayed Price Response or Risk Premium?," *Journal of Accounting Research*, 27 (supplement), 1-36.
- Bradley, D., Jordan, B., Ritter, J., 2003, "The Quiet Period Goes Out With a Bang," *Journal of Finance*, 58, 1-36.
- Carhart, M., 1997, "Persistence in Mutual Fund Performance," *Journal of Finance*, 52, 57-82.
- Chari, V., Nathan, R., Ofer, A., 1988, "Seasonalities in Security Returns: The Case of Earnings Announcements," *Journal of Financial Economics*, 21, 101-121.
- Della Vigna, S., Pollett, J., "Investor Inattention, Firm Reaction, and Friday Earnings Announcements," working paper, University of California, Berkeley, 2005.
- Doyle, J., Lundholm, R., Soliman, M., 2003, "The Predictive Value of Expenses Excluded From Pro Forma Earnings," *Review of Accounting Studies*, 8, 145-174.
- Ellis, K., Michaely, R., O'Hara, M., 2000, "The Accuracy of Trade Classification Rules: Evidence From Nasdaq," *Journal of Financial and Quantitative Analysis*, 35, 529-551.
- Fama, E., French, K., 1993, "Common Risk Factors in the Return on Bonds and Stocks," *Journal of Financial Economics*, 33, 3-53.

Foster, G., Olsen, C., Shevlin, T., 1984, "Earnings Releases, Anomalies, and the Behavior of Security Returns," *The Accounting Review*, 59, 574-603.

Hirshleifer, D., Hou, K., Teoh, S., Zhang, Y., 2004, "Do Investors Overvalue Firms With Bloated Balance Sheets?," *Journal of Accounting and Economics*," 38, 297-331.

Hirshleifer, D., Myers, J., Myers, L., Teoh, S., "Do Individual Investors Cause Post-Earnings Announcement Drift? Direct Evidence from Personal Trades," working paper, University of California, Irvine, 2008.

Hou, K., Peng, L., Xiong, W., "A Tale of Two Anomalies: The Implication of Investor Inattention for Price and Earnings Momentum," working paper, Ohio State University, 2006.

Lamont, O., Frazzini, A., "The Earnings Announcement Premium and Trading Volume," working paper, National Bureau of Economic Research, 2007.

Lee, C., 1992, "Earnings News and Small Traders: An Intraday Analysis," *Journal of Accounting and Economics*, 15, 265-302.

Lee, C., Ready, M., 1991, "Inferring Trade Direction From Intraday Data," *Journal of Finance*, 46, 733-746.

Lehmann, B., 1990, "Fads, Martingales, and Market Efficiency," *Quarterly Journal of Economics*, 105, 1-28.

Trueman, B., Wong, F., Zhang, X-J., 2003, "Anomalous Stock Returns Around Internet Firms' Earnings Announcements," *Journal of Accounting and Economics*, 34, 249-271.

Figure 1

Cumulative Average Pre- and Post-Announcement Market-Adjusted Returns for Top Percentile of Observations Ranked According to Prior 11-Month Raw Return

For the firm-quarters in our sample, this table reports the cumulative average market-adjusted return on each day from day -19 to day +20 around earnings announcements for the top percentile of observations ranked according to prior 11-month raw return. Prior 11-month raw return is the raw stock return for the 11-month period ending on the last trading day of the just-ended quarter. The daily market-adjusted return equals the raw return minus the market return for that day. The cumulative market-adjusted return equals the sum of the market-adjusted returns from day -19 through the current day. Day 0 is the earnings announcement day.

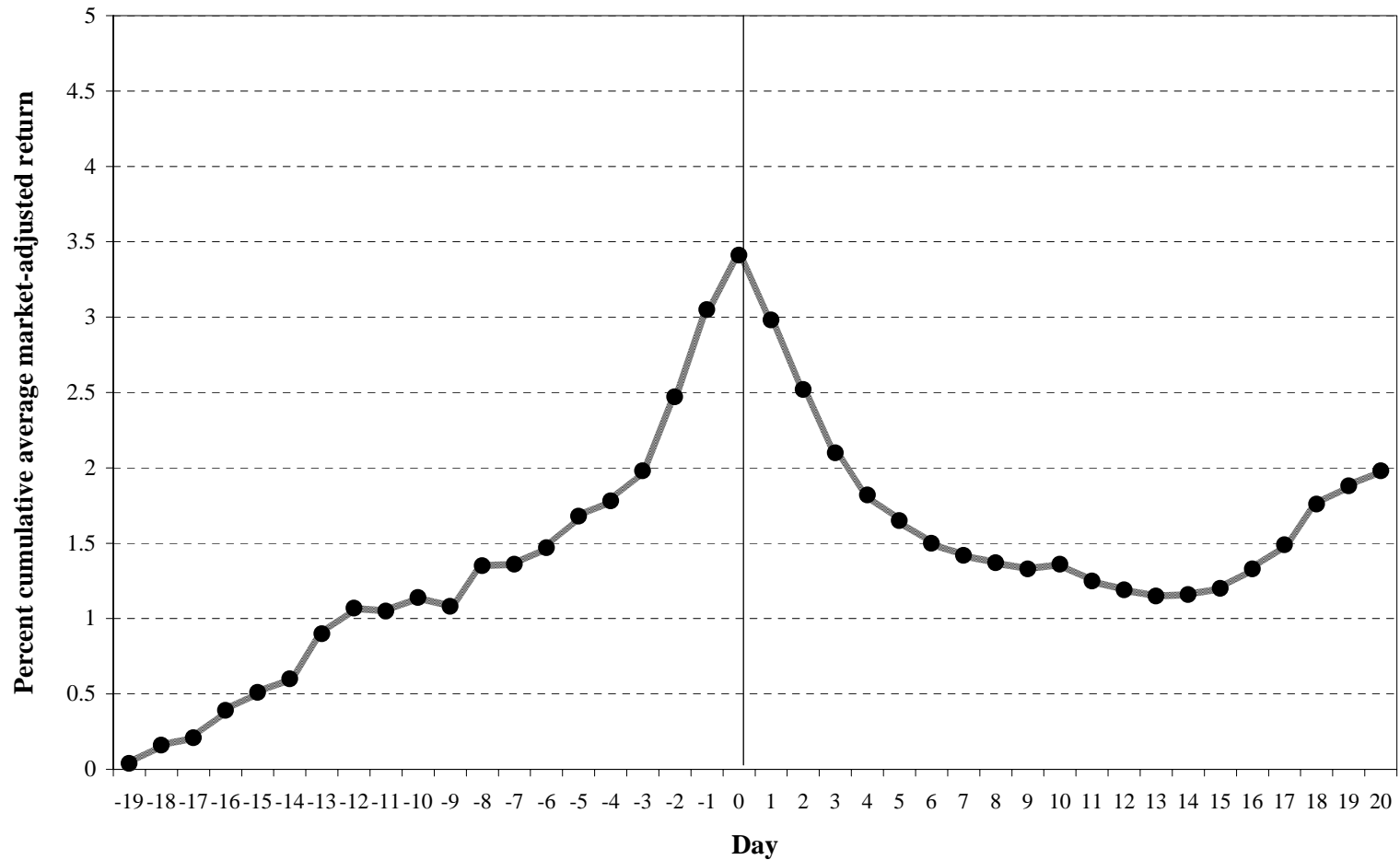


Table 1
Descriptive Statistics by Decile of Prior 12-Month Raw Return

For the firm-quarters in our sample, this table reports statistics on end-of-quarter market capitalization (panel A), prior 12-month raw return (panel B), pre-announcement market-adjusted return (panel C), and post-announcement market-adjusted return (panel D), by decile of prior 12-month raw return. Prior 12-month raw return is the raw stock return for the 12-month period ending on the last trading day of the just-ended quarter. The daily market-adjusted return equals the raw return minus the market return for that day. The market-adjusted return for the pre-announcement period equals the sum of the daily market-adjusted returns for the five trading days up to and including the earnings announcement date. The market-adjusted return for the post-announcement period equals the sum of the daily market-adjusted returns for the five trading days after the earnings announcement date. *t*-statistics for the pre- and post-announcement average market-adjusted returns are also presented.

Panel A: Market value (in millions)

Decile of prior 12-month raw return	Number of observations	Mean
1 (lowest)	29,349	775
2	29,362	1,515
3	29,381	1,802
4	29,354	2,067
5	29,333	2,102
6	29,401	2,224
7	29,365	2,164
8	29,364	2,267
9	29,375	1,941
10 (highest)	29,346	1,243
Overall	293,630	1,810

Panel B: Prior 12-month raw return (in percent)

Decile of prior 12-month raw return	Number of observations	Mean
1 (lowest)	29,349	-39.5
2	29,362	-18.4
3	29,381	-7.1
4	29,354	1.7
5	29,333	9.6
6	29,401	17.7
7	29,365	26.9
8	29,364	39.5
9	29,375	61.0
10 (highest)	29,346	153.5
Overall	293,630	24.5

Panel C: Pre-announcement market-adjusted return (in percent)

Decile of prior 12-month raw return	Number of observations	Mean	t-stat
1 (lowest)	29,300	-0.22	-4.00
2	29,333	0.23	5.32
3	29,346	0.18	4.73
4	29,324	0.23	6.67
5	29,306	0.24	7.02
6	29,367	0.31	9.33
7	29,330	0.34	9.97
8	29,320	0.34	9.24
9	29,332	0.53	13.28
10 (highest)	29,295	0.83	16.28
Overall	293,253	0.30	23.53

Panel D: Post-announcement market-adjusted return (in percent)

Decile of prior 12-month raw return	Number of observations	Mean	t-stat
1 (lowest)	29,299	-0.29	-5.19
2	29,317	-0.04	-0.97
3	29,323	0.02	0.49
4	29,305	0.07	2.22
5	29,299	0.02	0.66
6	29,364	0.04	1.15
7	29,310	0.03	0.95
8	29,307	-0.02	-0.59
9	29,298	-0.12	-2.98
10 (highest)	29,262	-0.71	-14.04
Overall	293,084	-0.10	-7.79

Table 2
Descriptive Statistics for the Top Ten Percentiles of Observations Ranked
According to Prior 12-Month Raw Return

For the firm-quarters in our sample, this table reports statistics on end-of-quarter market capitalization (panel A), prior 12-month raw return (panel B), pre-announcement market-adjusted return (panel C), and post-announcement market-adjusted return (panel D), for the top ten percentiles of observations ranked according to prior 12-month raw return. Prior 12-month raw return is the raw stock return for the 12-month period ending on the last trading day of the just-ended quarter. The daily market-adjusted return equals the raw return minus the market return for that day. The market-adjusted return for the pre-announcement period equals the sum of the daily market-adjusted returns for the five trading days up to and including the earnings announcement date. The market-adjusted return for the post-announcement period equals the sum of the daily market-adjusted returns for the five trading days after the earnings announcement date. *t*-statistics for the pre- and post-announcement average market-adjusted returns are also presented.

Panel A: Market value (in millions)

Percentile of prior 12-month raw return	Number of observations	Mean
91	2,936	1,872
92	2,939	1,421
93	2,940	1,624
94	2,935	1,433
95	2,939	1,270
96	2,936	1,261
97	2,938	984
98	2,941	987
99	2,930	844
100 (highest)	2,912	726

Panel B: Prior 12-month raw return (in percent)

Percentile of prior 12-month raw return	Number of observations	Mean
91	2,936	81.8
92	2,939	87.6
93	2,940	94.6
94	2,935	103.2
95	2,939	113.5
96	2,936	126.6
97	2,938	144.1
98	2,941	170.4
99	2,930	216.6
100 (highest)	2,912	399.0

Panel C: Pre-announcement market-adjusted return (in percent)

Percentile of prior 12-month raw return	Number of observations	Mean	t-stat
91	2,930	0.41	2.93
92	2,929	0.61	4.02
93	2,936	0.5	3.39
94	2,935	0.84	5.64
95	2,932	0.63	4.14
96	2,934	0.81	5.43
97	2,934	1.03	6.21
98	2,933	0.95	5.29
99	2,926	1.15	6.53
100 (highest)	2,906	1.36	7.11

Panel D: Post-announcement market-adjusted return (in percent)

Percentile of prior 12-month raw return	Number of observations	Mean	t-stat
91	2,932	-0.33	-2.40
92	2,929	-0.39	-2.75
93	2,934	-0.5	-3.43
94	2,928	-0.26	-1.80
95	2,931	-0.38	-2.49
96	2,927	-0.74	-4.74
97	2,930	-0.75	-4.65
98	2,928	-0.86	-5.06
99	2,923	-1.13	-6.28
100 (highest)	2,900	-1.75	-9.03

Table 3**Average Daily Market-Adjusted Return for the Top Percentile of Observations Ranked According to Prior 12-Month Raw Return**

For the 2,868 firm-quarters in our sample, this table reports the average daily market-adjusted return (in percent) around earnings announcements for the top percentile of observations ranked according to prior 12-month raw return. (The results reflect the use of the refined earnings announcement dates.) Prior 12-month raw return is the raw stock return for the 12-month period ending on the last trading day of the just-ended quarter. The daily market-adjusted return equals the raw return minus the market return for that day. The market-adjusted return for the pre-announcement period equals the sum of the daily market-adjusted returns for the five trading days up to and including the earnings announcement date (day -4 to day 0). The market-adjusted return for the post-announcement period equals the sum of the daily market-adjusted returns for the five trading days after the earnings announcement date (day +1 to day +5). *t*-statistics appear below each day's average market-adjusted return.

Trading day relative to earnings announcement day	Average daily market-adjusted return
-4	0.04 0.52
-3	0.11 1.29
-2	0.29 3.14
-1	0.53 5.83
0	0.59 5.27
+1	-0.31 -2.21
+2	-0.51 -5.85
+3	-0.44 -5.47
+4	-0.37 -4.59
+5	-0.24 -3.02
Pre-announcement period (days -4 to 0)	1.58 8.36
Post-announcement period (days +1 to +5)	-1.86 -8.66

Table 4

**Average Daily and Cumulative Average Market-Adjusted Returns from Day -19 to Day +20
Around Earnings Announcements for the Top Percentile of Observations Ranked
According to Prior 11-Month Raw Return**

For the firm-quarters in our sample, this table reports the average daily and cumulative average market-adjusted returns (in percent) from day -19 to day +20 around earnings announcements for the top percentile of observations ranked according to prior 11-month raw return. (Since the top percentile changes somewhat when the shorter prior return period is used, the average daily market-adjusted returns for days -4 through 5 differ somewhat from those reported in Table 3.) Day 0 is the earnings announcement day. Prior 11-month raw return is the raw stock return for the 11-month period ending on the last trading day of the just-ended quarter. The daily market-adjusted return equals the raw return minus the market return for that day. The cumulative market-adjusted return on any day is the sum of the daily market-adjusted returns through that day.

Trading day relative to earnings announcement day	Average daily market- adjusted return	<i>t</i> -statistic	Cumulative average market-adjusted return
-19	0.04	0.49	0.04
-18	0.12	1.45	0.16
-17	0.05	0.61	0.21
-16	0.18	1.96	0.39
-15	0.12	1.41	0.51
-14	0.09	1.03	0.60
-13	0.30	3.32	0.90
-12	0.17	2.12	1.07
-11	-0.02	-0.25	1.05
-10	0.09	1.12	1.14
-9	-0.06	-0.73	1.08
-8	0.27	3.03	1.35
-7	0.01	0.12	1.36
-6	0.11	1.33	1.47
-5	0.21	2.49	1.68
-4	0.10	1.28	1.78
-3	0.20	2.43	1.98
-2	0.49	5.21	2.47
-1	0.58	6.02	3.05
0	0.36	3.09	3.41
+1	-0.43	-3.26	2.98
+2	-0.46	-5.50	2.52
+3	-0.42	-5.40	2.10
+4	-0.28	-3.49	1.82
+5	-0.17	-2.23	1.65
+6	-0.15	-2.05	1.50
+7	-0.08	-0.99	1.42
+8	-0.05	-0.62	1.37
+9	-0.04	-0.57	1.33
+10	0.03	0.33	1.36
+11	-0.11	-1.55	1.25
+12	-0.06	-0.75	1.19
+13	-0.04	-0.47	1.15
+14	0.01	0.09	1.16
+15	0.04	0.53	1.20
+16	0.13	1.60	1.33
+17	0.16	2.06	1.49
+18	0.27	3.06	1.76
+19	0.12	1.48	1.88
+20	0.10	1.35	1.98

Table 5
Robustness Tests of Pre-Announcement and Post-Announcement Returns for the Top Percentile of Observations Ranked According to Prior 12-Month Raw Return

Panel A reports the average daily market-adjusted returns (in percent) for a subsample of our top percentile of observations that includes only those earnings announcements made outside of normal trading hours. Panel B reports average daily market-adjusted returns (in percent) for a subsample that includes only those earnings announcements made outside of normal trading hours for which day +1 opening prices are available on the Trade and Quotation (TAQ) database. For this panel, the market-adjusted return for the pre-announcement period equals the sum of the daily market-adjusted returns for the five trading days up to and including the earnings announcement date (day -4 to day 0) plus the close-to-open raw return on day +1 (close on day 0 to open on day +1). The market-adjusted return for the post-announcement period equals the sum of the day +1 open-to-close raw return and the market-adjusted returns for days +2 through +5. Panel C presents cumulative average market-adjusted returns for the pre- and post-announcement periods, for both the full sample and the subsample of after-hours announcements, taking the bid-ask spread into account. These returns are calculated assuming that all share purchases are executed at the prevailing ask price and all share sales are executed at the prevailing bid price.

Panel A: Average market-adjusted returns for the subsample of earnings announcements made outside of normal trading hours

Trading day relative to earnings announcement day	Number of observations	Mean	t-statistic
-4	1,462	0.19	1.41
-3	1,462	0.13	1.06
-2	1,462	0.37	2.57
-1	1,461	0.64	4.63
0	1,462	0.91	6.35
Pre-announcement period (days -4 to 0)	1,461	2.25	8.29
+1	1,462	-0.30	-1.28
+2	1,462	-0.63	-4.77
+3	1,460	-0.52	-4.26
+4	1,461	-0.46	-3.73
+5	1,461	-0.29	-2.48
Post-announcement period (days +1 to +5)	1,460	-2.20	-6.35

Panel B: Average market-adjusted returns for the subsample of earnings announcements made outside of normal trading hours and where opening prices are available on TAQ

Trading day relative to earnings announcement day	Number of observations	Mean	t-statistic
-4	795	0.21	1.19
-3	795	-0.04	-0.23
-2	795	0.40	1.99
-1	795	0.71	3.62
0	795	0.89	4.61
Close day 0 to open day 1	795	0.93	4.25
Pre-announcement period (day -4 through day 1 open)	795	3.09	7.11
Open-to-close day 1	795	-1.21	-4.79
+2	795	-0.61	-3.41
+3	795	-0.48	-2.62
+4	795	-0.66	-3.86
+5	795	-0.11	-0.69
Post-announcement period (open on day +1 through day +5)	795	-3.05	-6.99

Table 5 - Continued

Panel C: Average market-adjusted returns after accounting for the impact of the bid-ask spread

	Number of observations	Mean	t-statistic
Overall sample:			
Pre-announcement period (days -4 to 0)	943	0.94	2.60
Post-announcement period (days +1 to +5)	945	-0.85	-1.91
Subsample of earnings announcements made outside of normal trading hours:			
Pre-announcement period (day -4 through day 1 open)	759	1.66	4.09
Post-announcement period (day 1 open through day +5)	756	-1.34	-2.67

Table 6
Pre- and Post-Announcement Market-Adjusted Returns After Controlling for Signs of Earnings Revision and Earnings Surprise

For the firm-quarters in our sample, this table reports the average pre-announcement market-adjusted return (equal to sum of the raw minus market returns for the five trading days up to and including the earnings announcement date) and post-announcement market-adjusted return (equal to the sum of the raw minus market returns for the five trading days after the earnings announcement date) for all announcements in the top percentile exclusive of those characterized by a positive consensus earnings forecast revision during the pre-announcement period *and* a negative forecast error or negative forecast revision during the post-announcement period (panel A); all announcements in the top percentile exclusive of those characterized by a positive consensus earnings forecast revision during the pre-announcement period (panel B); all announcements exclusive of those characterized by a negative forecast error or negative forecast revision during the post-announcement period (panel C). The pre-announcement period analyst forecast revision is defined as the difference between the day 0 consensus forecast of the current year's annual earnings (or of the year just ended, in the case of a fourth quarter earnings announcement) and the consensus forecast on day -5. The consensus forecast on any date is calculated as the simple average of the forecasts issued within the prior 90 calendar days. If an analyst issued more than one forecast during this period, only the latest one is used in the calculation. The forecast error is defined as the difference between the firm's per-share *quarterly* earnings and the consensus *quarterly* forecast on day 0. The post-announcement forecast revision is the difference between the day +5 consensus forecast of current year's earnings and the consensus forecast at day 0. All revisions and forecast errors are scaled by share price one month before quarter-end. Day 0 is the earnings announcement date. All returns are in percent. In addition to the *t*-statistics for the mean returns, the table presents the *t*-statistics for the difference between subsample returns and those for the entire top percentile of observations.

Panel A: Excluding announcements with *positive* pre-announcement earnings forecast revision and either *negative* post-announcement earnings forecast revision or *negative* earnings forecast error

Period	Number of observations	Mean	t-statistic	t-statistic for difference between subsample market-adjusted return and that for entire sample
Pre-announcement period (days -4 to 0)	2,812	1.523	8.0	-0.1
Post-announcement period (days +1 to +5)	2,808	-1.799	-8.4	-0.1

Panel B: Excluding announcements with *positive* pre-announcement earnings forecast revision

Period	Number of observations	Mean	t-statistic	t-statistic for difference between subsample market-adjusted return and that for entire sample
Pre-announcement period (days -4 to 0)	2,667	1.404	7.1	0.3
Post-announcement period (days +1 to +5)	2,663	-1.796	-8.2	-0.1

Panel C: Excluding announcements with *negative* post-announcement earnings forecast revision or *negative* forecast error

Period	Number of observations	Mean	t-statistic	t-statistic for difference between subsample market-adjusted return and that for entire sample
Pre-announcement period (days -4 to 0)	2,563	1.53	7.9	-0.1
Post-announcement period (days +1 to +5)	2,559	-1.46	-6.6	-1.2

Table 7**Pre- and Post-Announcement Period Average Abnormal Order Imbalances, by Trade Size**

This table reports the average abnormal order imbalance during the pre-announcement period and during the post-announcement period for small trades (less than \$50,000 in value), medium-sized trades (between \$50,000 and \$100,000), and large trades (greater than \$100,000). For each trade size and each period, the order imbalance is calculated as the difference between the total number of buyer-initiated trades of that size minus the total number of seller-initiated trades of that size over the period, scaled by the total number of those size trades. The abnormal order imbalance equals the order imbalance less the average order imbalance over days +30 to +89. Day 0 is the earnings announcement day. t-statistics appear below each abnormal order imbalance.

Period	Number of observations	Average abnormal order imbalance for		
		small trades	medium-sized trades	large trades
Pre-announcement period (days -4 to 0)	570	0.0145	0.0287	0.0039
		2.74	3.29	0.39
Post-announcement period (days +1 to +5)	570	-0.0088	-0.0130	-0.0183
		-1.71	-1.65	-1.93

Table 8
Additional Tests for Limited Attention

This table reports the results of additional tests of limited attention as a driver of the return pattern around past winners' earnings announcements. Panel A presents the coefficient estimates (and corresponding *t*-statistics) for a regression of the pre-announcement market-adjusted return (equal to the sum of the raw minus market returns for the five trading days up to and including the earnings announcement date) on the average abnormal order imbalance during the pre-announcement period for small trades (less than \$50,000 in value), medium-sized trades (between \$50,000 and \$100,000), and large trades (greater than \$100,000). For each trade size and each period, the order imbalance is calculated as the difference between the total number of buyer-initiated trades of that size minus the total number of seller-initiated trades of that size over the period, scaled by the total number of those size trades. The abnormal order imbalance equals the order imbalance less the average order imbalance over days +30 to +89. Day 0 is the earnings announcement day. Panel B reports the average pre-announcement market-adjusted return for the 1971-89 and 1990-2005 subperiods. Panel C presents the average pre-announcement market-adjusted return for the top quartile of observations in terms of earnings announcement date predictability and for all other quartiles. To measure the predictability of a firm's current quarter earnings announcement date, we compute, for each of the firm's prior 20 quarters, the difference between the earnings announcement date and the announcement date for the immediately preceding quarter, advanced by 90 days. Earnings predictability is defined as the variance of these differences.

Panel A: Regression of pre-announcement market-adjusted return (days -4 to 0) on small, medium-sized, and large trade abnormal order imbalances

	Number of observations	pre-announcement abnormal order imbalance for:		
		small trades	medium-sized trades	large trades
Coefficient estimate	570	0.285	0.012	0.022
t-statistic		7.47	0.51	1.10

Panel B: Average pre-announcement market-adjusted return (days -4 to 0): 1971-89 vs. 1990-2005

	1971-89	1990-2005	t-statistic of return difference
Average pre-announcement market-adjusted return	0.74%	1.69%	2.59
Number of observations	1007	1899	

Panel C: Average pre-announcement market-adjusted return (days -4 to 0) according to predictability of earnings announcement date

	Top quartile	All other quartiles	t-statistic of return difference
Average pre-announcement market-adjusted return	2.37%	1.24%	2.38
Number of observations	544	1768	